THE PLANT SUBSISTENCE STRATEGIES OF NEOLITHIC NORTHWEST TÜRKİYE

by

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A Dissertation Submitted to the

Graduate School of Social Sciences and Humanities

in Partial Fulfillment of the Requirements for the

Degree of

Doctor of Philosophy

in

Archaeology and History of Art



KOÇ UNIVERSITY

Spring, 2025

The Plant Subsistence Strategies of Neolithic Northwest Türkiye

Koç University

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The PhD process is a journey that you must carry out alongside all the dynamics of your life—one in which you learn to keep alive all the hopes and goals you set out with despite the obstacles, to adapt yourself to the firm yet winding stability of life like the course of a river, and to manage countless emotions—good and bad, success and failure, happiness and heartbreak. What makes the doctorate arduous is not simply the ease or difficulty of your research topic, but the realization, at the end of the road, that the person who began the journey is no longer the same as the one who finishes it. My journey, too, was such a journey!

To those who didn't give up on their childhood dreams...

ABSTRACT

The Plant Subsistence Strategies of Neolithic Northwest Türkiye

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Doctor of Philosophy in Archaeology and History of Art,

Spring, 2025

This study investigates the process of Neolithization of Northwest Türkiye in the 7th and early 6th millennium BC through a detailed macro-archaeobotanical analysis of four Neolithic sites: Barcın Höyük, Bahçelievler, Hoca Çeşme, and Aşağı Pınar. Moving beyond simplistic diffusion models, the research frames Neolithization as a mosaic of localized adaptations rather than a uniform transition. Employing comparative methods grounded in archaeobotanical datasets and informed by Human Behavioral Ecology, the thesis examines plant-based subsistence strategies and their spatial and chronological variations. The results reveal a cereal-centered plant economy across all sites, with pulses and gathered plants integrated in site-specific ways. Barcın Höyük presents evidence for early structured agricultural knowledge and crop storage, Bahçelievler shows gradual changes and increasing diversification over time, while Aşağı Pınar displays a high frequency of pulses alongside cereals, suggesting a well-integrated storage strategy and diverse crop range. These patterns reflect how ecological niches, cultural choices, and adaptive behaviors jointly shaped the uptake and modification of the Neolithic way of life. By introducing new archaeobotanical data and emphasizing intra-site and inter-site variability, this research contributes to broader discussions on the diversity of early agricultural practices and underscores the importance of regional perspectives in understanding the complex dynamics of Neolithization.

Keywords:

Archaeology; Neolithic period; archaeobotany; agriculture; crop choices; human behavioral ecology; Northwest Türkiye; Barcın Höyük; Bahçelievler; Aşağı Pınar; Hoca Çeşme

ÖZET

Neolitik Kuzeybatı Türkiye'de Bitki Geçim Stratejileri

Hüreyla Balcı

Arkeoloji ve Sanat Tarihi Bölümünde Doktora Derecesi

Bahar 2025

Bu çalışma, Kuzeybatı Türkiye'de MÖ 7. bin ve erken 6. binde Neolitikleşme sürecini, Barcın Höyük, Bahçelievler, Hoca Çeşme ve Aşağı Pınar olmak üzere dört Neolitik yerleşimde gerçekleştirilen ayrıntılı makro-arkeobotanik analizler aracılığıyla incelemektedir. Basit yayılma modellerinin ötesine geçerek, Neolitikleşmeyi tekdüze bir geçişten ziyade yerel uyarlamaların bir mozaiği olarak ele almaktadır. Arkeobotanik veri setlerine dayanan ve İnsan Davranışsal Ekolojisi yaklaşımından beslenen karşılaştırmalı yöntemler kullanılarak, bitki temelli geçim stratejileri ile bunların mekânsal ve kronolojik farklılıkları değerlendirilmiştir. Sonuçlar, tüm yerleşimlerde tahıl merkezli bir bitki ekonomisi olduğunu ortaya koymakta; baklagiller ve toplanan bitkiler ise yerleşime özgü biçimlerde entegrasyon göstermektedir. Barcın Höyük, erken döneme ait yapılandırılmış tarımsal bilgi ve ürün depolama kanıtları sunarken; Bahçelievler, zaman içinde kademeli değişimler ve artan çeşitlenme göstermektedir. Aşağı Pınar ise tahıllarla birlikte yüksek oranda baklagil buluntularına sahiptir ve bu durum, iyi entegre edilmiş bir depolama stratejisini ve geniş ekonomik ürün yelpazesini düşündürmektedir. Bu örüntüler, ekolojik nişlerin, kültürel tercihlerin ve uyarlanma davranışlarının, Neolitik yaşam biçiminin benimsenmesi ve dönüştürülmesi sürecini birlikte şekillendirdiğini yansıtmaktadır. Yeni arkeobotanik veriler sunarak ve yerleşim içi ile yerleşimler arası çeşitliliğe vurgu yaparak, bu araştırma erken tarımsal uygulamaların çeşitliliğine dair genel tartışmalara katkıda bulunmakta ve Neolitikleşmenin karmaşık dinamiklerini anlamada bölgesel bakış açılarını önemli bir yere oturtmaktadır.

Anahtar Kelimeler:

Arkeoloji; Neolitik dönem; arkeobotanik; tarım; ürün seçimi; insan davranışsal ekolojisi; Kuzeybatı Türkiye; Barcın Höyük; Bahçelievler; Aşağı Pınar; Hoca Çeşme

ACKNOWLEDGMENTS

There are many precious people in my career journey who, by believing in me, contributed to laying the groundwork for this PhD process, and I would like to thank them once again. At the forefront of these individuals is my dear advisor, Assoc. Prof. Dr. Rana Özbal. I have known her since my undergraduate years, and beyond being a role model to me with her character and scientific outlook, her supportive attitude toward me has never waned for over a decade—and I have always strived to reciprocate that support with perseverance. I could fill pages here expressing my gratitude to her.

My interest in archaeobotanical studies dates back to my undergraduate years. Through that time, I realized that it would not be sufficient to truly understand and learn about past human life without integrating life sciences into archaeology. When I also recognized that research in these areas was being conducted at a minimal level by local scholars in Türkiye, my interest in what is generally defined as Environmental Archaeology grew steadily. Although in today's industrial conditions we tend to forget it, humans are part of nature. From past to present, no matter how much cultural material we produce or how much we believe we shape our environment, our life story is ultimately shaped within the dynamism of nature at the end. I owe special thanks to my undergraduate professor, Prof. Dr. Ali Umut Türkcan, who encouraged my interest during that period and invited me, even in the very first semester of my first year in undergrade, on a field trip that allowed me to see the sites of Kültepe, Aşıklı Höyük, and Çatalhöyük—an experience that helped me discover my passion for the Prehistoric periods at an early stage. I am also deeply grateful to Prof. Dr. Hadi Özbal, with whom my path crossed while I was looking for ways to study archaeobotany, and who also introduced me to my dear advisor, Rana Özbal.

Being introduced to B. Düring by Prof. Türkcan during my undergraduate years, hearing about Barcın Höyük, and later meeting Prof. Hadi Özbal, whose scientific and personal integrity always impressed me, ultimately led my path to intersect at Barcın Höyük with Fokke Gerritsen and Rana Özbal. Through this chain of encounters, I eventually met my dear supervisor, Prof. Dr. René Cappers, to whom I owe the fact that I was able to specialize in archaeobotany today. I am especially grateful for the patient and dedicated teaching and motivation that Prof. Cappers has shown me over the years during our meetings in Istanbul and Groningen. His work ethic and teaching discipline have always been an inspiration, and I am proud to have fulfilled the

faith and dedication he placed in me by completing this work and staying true, at least so far, to the academic path I have drawn in this field.

I would also like to express my gratitude to Prof. Dr. Necmi Karul, who recognized my persistence in learning and progress in this field, continually supported me, and enabled me to institutionalize my work and create an infrastructure as a Lecturer at Istanbul University since 2020, having also supervised my master's thesis in 2016-2018.

Another very important acknowledgment goes to Director of NIT, Assist. Prof. Fokke Gerritsen. Since he accepted me as a member of the Barcın Höyük team in 2011, he has never withheld his support as both a mentor and colleague and has allowed me to study the Barcın Höyük material during both my master's and doctoral research. The long-term collaboration and experience I have had with him over the years have been a great privilege for me. Throughout both my Master's and PhD, I would like to express my sincere gratitude to my dear professor, Assoc. Prof. Dr. Eylem Özdoğan, who participated in my thesis committees and provided invaluable feedback, enabled me to work on the Layer 7 material from the Aşağı Pınar settlement included in this study, and with whom I continued professional collaboration, forming a true companionship along the way.

I also wish to thank Prof. Dr. Mehmet Özdoğan, who allowed me to work on the Aşağı Pınar material and consistently supported me by responding to all my questions promptly and in detail; Prof. Dr. Erken Fidan, who gave me the opportunity to study one of the key sites of this research, Bahçelievler; and Prof. Dr. Necmi Karul, who made it possible for me to include the Hoca Çeşme material in this work. On this occasion, I also extend my thanks to all the team members of Barcın Höyük, Bahçelievler, Aşağı Pınar, and Hoca Çeşme for their direct and indirect contributions during the excavation, sampling, and data collection processes.

I am deeply grateful to Prof. Dr. Ian Hodder, who accepted to be on my PhD defense jury and also on my thesis monitoring committee; to Prof. Dr. Andrew Fairbairn and Assist. Prof. Michael Jones, who also accepted to be a jury member and whose valuable feedback helped me to better highlight the significance of my research and move it a step further, and to Assoc. Prof. Christina Luke, who contributed during my doctoral qualification stage.

On my path to embracing the dual identity of archaeologist and archaeobotanist, I owe heartfelt thanks to Koç University, which opened an important chapter in my life during my

PhD by providing me with opportunities and support, and to all of its members who contributed to my development. Here, I would especially like to thank Prof. Dr. Erdem Kabadayı for giving me the opportunity to work part-time in an ERC project at the beginning of my doctoral program. Digitizing population and agricultural records from the Late Ottoman and Early Republican periods for about a year and a half provided me with a valuable perspective for my future research.

I would also like to extend my sincere gratitude to Ms. Deniz Ataç, Chair of the Board of TEMA Foundation, who has been an inspiring figure for me since I met her in 2011. Ms. Ataç has always made me feel her support and, at a very critical point in my life, just before I started at Istanbul University, gave me the opportunity to attend an interview for a short-term project assistant position in the Department of Environmental Policy. Being at the heart of an environmental organization for which I had volunteered for years was an invaluable experience for me.

Specially in recent times, even though my family was far away, I would like to thank my dear friends Esra and Ceyhun, who, eased my exhaustion by offering me a sense of home with their warm conversations and delicious meals sometimes; and I owe a thank you to Dear Renié, who is like a family member for me and gave me the name 'Merel', for her all supports especially during the PhD study between October-November 2023 in Groningen, and my dear friend and cousin Sema, who kindly opened her home to me during my work in Ankara; and I owe a thank you to my friends Güven who helped me for editing plant photos and Suay for the regional maps in GIS that saved my life at the last minute, and my always-encouraging friends Betül, Derya, Arzella, Kezban, Simge, Ayşen, Güher, Aymesey, Aysel, Cansu, Eren, and Nil as well as my friends from the French group, and more, for their presence and mental support in my life.

In Turkish for my family; yılda bir veya iki kez ziyaret etmek zorunda kaldığım ama hep yanımda olduklarını hissettiren Sevgili Aileme, artık her telefonda "ne yapıyorsun Hüreyla" diye soran ve "çalışıyorum" cevabımdan bıksa da sabırla bu sürecin tamamlanmasını bekleyen Anneme ve Babama, ve her daim yanımda olan sevgili ablam Ayşe ve Fatma olmak üzere tüm kardeşlerim Büşra, Ali ve Bora'ya, ve son olarak kurduğu hayallerden vazgeçmediği için çocuk ve 18'lerindeki Hüreyla'ya teşekkür ederim.

TABLE OF CONTENTS

ABSTRACT v

ÖZET vi

ACKNOWLEDGMENTS vii

LIST OF TABLES xvi

LIST OF FIGURES xx

Chapter 1 1

1. INTRODUCTION 1

1.1. Aims and Aspects 2

1.2. Challenges and Limitations 4

1.3. Research Questions 5

1.4. Chapter Breakdown 5

Chapter 2 8

2. THE SPREAD OF FARMING AND PLANT-BASED SUBSISTENCE STRATEGIES IN NEOLITHIC ANATOLIA 8

2.1. Neolithization, Archaeobotany, and Human Behavioral Ecology (HBE) 8

2.2. The Beginning and Spread of Farming 13

2.3. A Brief Discussion: Hunter-Gatherer Settlers? 17

2.4. Neolithic Subsistence Strategies 18

2.4.1. Neighboring Region: Early Cultivation in Cyprus 18

2.4.2. Anatolia 20

2.4.3. Neighboring Region: Southeast Europe 31

2.5. Conclusion 34

Chapter 3 36

3. THE NEOLITHIZATION OF WESTERN ANATOLIA 36

3.1. A Critical Review of Neolithic / Neolithization Concepts 36

3.2. The Neolithization of Western Anatolia 38

3.2.1. Lakes District and Aegean Coast of Anatolia 38

3.2.2. Northwestern Anatolia 42

3.3. Research Area: Northwest Türkiye 45

3.3.1. Environmental Setting 45

3.3.2. Background Information 50

3.3.3. The Stratigraphy and Chronology 53

3.3.4. The Architecture 56

3.3.5. Material Culture 60
3.3.6. Subsistence Economy 66
3.4. Discussion 68
Chapter 4 71
4. MATERIALS AND METHODS 71
4.1. Field 71
4.1.1. Deposition and Preservation 72
4.1.2. Sampling 74
4.2. Sample preparation 77
4.3. Documentation 78
4.3.1. Laboratory 78
4.3.2. Identification and Terminology 82
4.3.3. Counting of Plant Remains 86
4.4. Evaluation of the Data 87
4.4.1. Identity and Monograph of Plant Dataset and Ubiquity of Taxa 88
4.4.2. Distribution of Plant Remains 89
4.4.3. Crop Ratios 89
Chapter 5 92
5. SUBFOSSIL PLANT DIVERSITY IN THE KEY SITES 92
5.1. Plant Identity 92
5.2. Cereals 93
5.2.1. Barley 94
5.2.2. Hulled wheats 100
5.2.3. Naked wheat 108
5.2.4. Unidentified wheats (Triticum sp.) 113
5.2.5. An Overview of Cereal by-products 115
5.3. Pulses 116
5.3.1. Bitter vetch 118
5.3.2. Chickpea 121
5.3.3. Faba bean 122
5.3.4. Grass pea 123
5.3.5. Lentil 125
5.3.6. Pea 130
5.4. Oily-Fibre Plants 133

5.4.1. Flax 133
5.5. Gathered Plants - Deciduous Forests/Shrubs 135
5.5.1. Acorn (Quercus sp.) 136
5.5.2. Bramble (Rubus fruitcosus) 137
5.5.3. Cornelian cherry (Cornus mas) 140
5.5.4. Fig (Ficus carica) 140
5.5.5. Grape (Vitis sp.) 142
5.5.6. Hazelnut (Corylus avellana) 143
5.5.7. Hackberry (Celtis sp.) 146
5.5.8. Plum/Almond (Prunus L./Amygdalus L.) 147
5.5.9. Pistacia/Terebinth (Pistacia sp./Pistacia terebinthus) 148
5.6. Wild Plants 149
5.6.1. Adoxaceae 149
5.6.2. Amaranthaceae 150
5.6.3. Asteraceae 156
5.6.4. Apiaceae 157
5.6.5. Boraginaceae 158
5.6.6. Caprifoliaceae 167
5.6.7. Caryophyllaceae 167
5.6.8. Convolvulaceae 170
5.6.9. Cyperaceae 172
5.6.10. Euphorbiaceae 177
5.6.11. Fabaceae 177
5.6.12. Geraniaceae 182
5.6.13. Lamiaceae 182
5.6.14. Malvaceae 183
5.6.15. Papaveraceae 186
5.6.16. Plantaginaceae 188
5.6.17. Poaceae 189
5.6.18. Polygonaceae 196
5.6.19. Primulaceae 202
5.6.20. Ranunculaceae 203
5.6.21. Rosaceae 205
5.6.22. Rubiaceae 206

5.6.23. Solanaceae 210
5.6.24. Thymelaeaceae 213
5.7. Unidentified plant remains in the assemblages 215
5.7.1. Barcın Höyük 215
5.7.2. Bahçelievler 219
5.8. Other remains 224
5.9. Summary of Archaeobotanical Assemblages of Key Sites 229
5.9.1. Barcın Höyük 229
5.9.2. Bahçelievler 234
5.9.3. Hoca Çeşme 235
5.9.4. Aşağı Pınar 237
Chapter 6 240
6. SPATIAL ASSESSMENT BASED ON PLANT DISTRIBUTION IN BARCIN HÖYÜK 240
6.1. General Site Background 240
6.2. Phase VIe 244
6.2.1. Outdoor Area (Northernmost) 246
6.2.2. Indoor Areas 247
6.2.3. Outdoor Area (Central-South) 252
6.2.4. Assessment 255
6.3. Phase VId1 256
6.3.1. Indoor Areas 259
6.3.2. Outdoor areas 270
6.3.3. Assessment 273
6.4. Phases VId2, VId3, VIc 276
6.4.1. Phase VId2 277
6.4.2. Phase VId3 280
6.4.3. Phase VIc 284
6.5. Phases VIb-VIa 289
6.5.1. Phase VIb 289
6.5.2. Phase VIa 294
6.6. Discussion 295
Chapter 7 298
7. SPATIAL ASSESSMENT BASED ON PLANT DISTRIBUTION IN BAHÇELİEVLER 298
7.2. Phase 8 299

7.3. Phase 7 ... 301
7.4. Phase 6 ... 304
7.5. Phase 5 ... 308
7.6. Phase 4 ... 312
7.7. Phase 3 ... 314
7.8. Phase 2 ... 316
7.9. Discussion ... 317
Chapter 8 ... 319
8. SPATIAL ASSESSMENT BASED ON PLANT DISTRIBUTION IN AŞAĞI PINAR ... 319
8.1. General Site Background ... 319
8.2. Layer 7 ... 322
8.2.1. Structures ... 322
8.2.2. Ditch I (H1-1, H1-2, H1-3, H1-4, H1-5) ... 325
8.2.3. Ditch II (H2) ... 336
8.3. Discussion ... 345
Chapter 9 ... 348
9. CROP RATIOS IN KEY SITES ... 348
9.1. The ratio of Wheat and Barley ... 349
9.1.1. Barcın Höyük ... 349
9.1.2. Bahçelievler ... 353
9.1.3. Aşağı Pınar ... 355
9.2. Hulled Wheats ... 356
9.2.1. Barcın Höyük ... 356
9.2.2. Bahçelievler ... 360
9.2.3. Aşağı Pınar ... 361
9.3. Hulled wheat and naked wheat ... 362
9.3.1. Barcın Höyük ... 362
9.3.2. Bahçelievler ... 366
9.3.3. Aşağı Pınar ... 368
9.4. Pulses ... 370
9.4.1. Barcın Höyük ... 370
9.4.2. Bahçelievler ... 375
9.4.3. Aşağı Pınar ... 376
9.5. Discussion ... 378

Chapter 10 379
10. DISCUSSION AND CONCLUSION 379
10.1. Discussion 379
10.2. Conclusion 395
BIBLIOGRAPHY 397
APPENDIX I 434
11. LIST OF SAMPLES STUDIED IN THIS RESEARCH 434
11.1. Barcın Höyük 434
11.2. Bahçelievler 461
11.3. Aşağı Pınar 467
APPENDIX II 482
12. PLANT DISTRIBUTION ACCORDING TO THE CONTEXTS IN KEY SITES 482
12.1. Barcın Höyük 482
APPENDIX III 524
13. EXCEL WORKSHEETS SAMPLE BY SAMPLE OF THE SITES 524
13.1. Barcın Höyük 524
13.2. Bahçelievler 543
13.3. Aşağı Pınar 549
APPENDIX IV 558
14. CROP RATIOS BASED ON ABSOLUTE COUNTS FOR RELATIVE FREQUENCY 558

LIST OF TABLES

Table 4.1: The total number of archaeobotanical samples and soil volumes per phase at Barcın Höyük. 75
Table 4.2: The total number of archaeobotanical samples and soil volumes per phase at Bahçelievler. 75
Table 4.3: The total number of archaeobotanical samples and soil volumes per phase at Aşağı Pınar. 76
Table 4.4: Investigated archaeobotanical samples at Late Neolithic Hoca Çeşme. 76
Table 4.5: The list of Latin names of economic plants and identified plant parts in the assemblage. 84
Table 4.6: The list of Latin names of wild plant taxa and identified plant parts in the assemblage. 85
Table 4.7: The calculation method of the plant remains in the data for all case sites. 86
Table 5.1: The cereal species only represent the documented species in the botanical assemblages in the research. 94
Table 5.2: The classification of pulse species. 117
Table 5.3: Summarized of plant groups per phase at Barcın Höyük. 229
Table 5.4: The summarized list of documented economic plants per phase at Barcın Höyük. 230
Table 5.5: The summarized list of documented wild plants per phase at Barcın Höyük. 231
Table 5.6: The summarized list of documented wild plants per phase at Barcın Höyük (continued). 232
Table 5.7: Summary of plant groups per phase at Bahçelievler. 234
Table 5.8: The summarized list of documented economic plants per phase at Bahçelievler. 234
Table 5.9: Summarized of plant groups in per phase at Hoca Çeşme. 235
Table 5.10: The summarized list of documented economic plants per phase at Hoca Çeşme. 236
Table 5.11: Summarized of plant groups in per phase at Aşağı Pınar. 237
Table 5.12: The summarized list of documented economic plants per phase at Aşağı Pınar. 238
Table 5.13: The summarized list of documented economic plants per phase at Aşağı Pınar. 238
Table 6.1: The total samples per Neolithic phase evaluated in the GIS data. 243
Table 6.2: The quantity of plant groups per context in Phase VIe. 255
Table 6.3: The quantity of plant groups per context in Phase VId1. 274
Table 6.4: The quantity of plant groups per context in Phase VId2. 280
Table 6.5: The quantity of plant groups per context in Phase VId3. 283
Table 6.6: The quantity of plant groups per context in Phase VIc. 284
Table 6.7: The quantity of plant groups per context in Phase VIb. 289
Table 6.8: The quantity of plant groups per context in Phase VIa. 294
Table 7.1: The distribution of plant groups according to the indoor and outdoor spaces in Phase 8 at Bahçelievler. 300
Table 7.2: The distribution of plant groups according to the indoor and outdoor spaces in Phase 7 at Bahçelievler. 302
Table 7.3: The distribution of plant groups according to the indoor and outdoor spaces in Phase 7 at Bahçelievler. 303
Table 7.4: The distribution of plant groups according to the indoor and outdoor spaces in Phase 6 at Bahçelievler. 305
Table 7.5: The distribution of plant groups according to the indoor and outdoor spaces in Phase 6 at Bahçelievler. 306
Table 7.6: The distribution of plant groups according to the indoor and outdoor spaces in Phase 6 at Bahçelievler. 307
Table 7.7: The distribution of plant groups according to the outdoor spaces in Phase 5 at Bahçelievler. 309
Table 7.8: The distribution of plant groups according to the indoor area in Phase 5 at Bahçelievler. 311
Table 7.9: The distribution of plant groups according to the indoor and outdoor spaces in Phase 4 at Bahçelievler. 313

Table 7.10: The distribution of plant groups according to the indoor and outdoor spaces in Phase 3 at Bahçelievler. 315
Table 7.11: The distribution of plant groups according to the indoor and outdoor spaces in Phase 2 at Bahçelievler. 317
Table 8.1: Documented archaeobotanical remains in the structures in Layer 7 at Aşağı Pınar. 324
Table 8.2: The summarized archaeobotanical dataset in ditch H1-1 and related pits in layer 7 at Aşağı Pınar. 329
Table 8.3: The summarized archaeobotanical dataset in ditch H1-2 and related pits in layer 7 at Aşağı Pınar. 334
Table 8.4: The summarized archaeobotanical dataset in ditches H1-3, H1-4, and H1-5 in layer 7 at Aşağı Pınar. 335
Table 8.5: The summarized plant distribution according to the ditch H2 in layer 7 at Aşağı Pınar. 337
Table 8.6: The summarized plant distribution according to the pits of ditch H2 layer 7 at Aşağı Pınar. 341
Table 8.7: The summarized plant data in the eastern pits, which are related to ditch H2 in layer 7 at Aşağı Pınar. 343
Table 8.8: The plant distribution depending on the contexts in layer 7 at Aşağı Pınar. 346
Table 9.1: The total samples per phase for the ratio of wheat and barley grain kernels at Barcın Höyük. 349
Table 9.2: The total samples per phase for the ratio of wheat and barley grain kernels at Bahçelievler. 353
Table 9.3: The total samples per phase for the ratio of wheat and barley grain kernels at Bahçelievler. 355
Table 9.4: The total samples per phase for the ratio of einkorn and emmer wheat grain kernels. 357
Table 9.5: The total samples per phase for the ratio of hulled wheat grain kernels at Bahçelievler. 360
Table 9.6: The total samples per phase for the ratio of hulled wheat grain kernels at Aşağı Pınar. 361
Table 9.7: The total samples per phase for the ratio of hulled and naked wheat grain kernels in Neolithic Phases at Barcın Höyük. 363
Table 9.8: The total samples per phase for the ratio of hulled and naked wheats grain kernels at Bahçelievler. 366
Table 9.9: The total samples per phase for the ratio of hulled and naked wheats grain kernels at Aşağı Pınar. 368
Table 9.10: The total samples per phase for the ratio of pulses types at Barcın Höyük. 370
Table 9.11: The total samples per phase for the ratio of pulses types at Bahçelievler. 375
Table 9.12: The total samples per phase for the ratio of pulses types at Aşağı Pınar. 376
Table 10.1: The comparison of economic plants of Neolithic and partly Chalcolithic sites in Northwest Türkiye and neighboring regions that were mentioned in the thesis. 393
Table 11.1: Investigated archaeobotanical samples in Phase VIe at Barcın Höyük. 434
Table 11.2: Investigated archaeobotanical samples in Phase VId1 at Barcın Höyük. 440
Table 11.3: Investigated archaeobotanical samples in Phase VId2 at Barcın Höyük. 448
Table 11.4: Investigated archaeobotanical samples in Phase VId3 at Barcın Höyük. 449
Table 11.5: Investigated archaeobotanical samples in Phase VIc at Barcın Höyük. 452
Table 11.6: Investigated archaeobotanical samples in Phase VIb at Barcın Höyük. 455
Table 11.7: Investigated archaeobotanical samples in phase VIa at Barcın Höyük. 459
Table 11.8: Investigated archaeobotanical samples from Phases Middle Chalcolithic to Early/Middle Bronze Age at Barcın Höyük. 459
Table 11.9: Investigated archaeobotanical samples in Phase 8 at Bahçelievler. 461
Table 11.10: Investigated archaeobotanical samples in Phase 7 at Bahçelievler. 461
Table 11.11: Investigated archaeobotanical samples in Phase 6 at Bahçelievler. 462
Table 11.12: Investigated archaeobotanical samples in Phase 5 at Bahçelievler. 464
Table 11.13: Investigated archaeobotanical samples in Phase 4 at Bahçelievler. 465
Table 11.14: Investigated archaeobotanical samples in Phase 3 at Bahçelievler. 466

Table 11.15: Investigated archaeobotanical samples in Phase 2 at Bahçelievler. 466
Table 11.16: Investigated archaeobotanical samples in Layer 7 at Aşağı Pınar. 467
Table 11.17: Investigated archaeobotanical samples in Layer 7 mixed and later levels at Aşağı Pınar. 478
Table 12.1: The plant distribution according to the contexts in Structure 25 in Phase VIe at Barcın Höyük. ... 482
Table 12.2: The plant distribution according to the indoor contexts in Structure 24 in Phase VIe at Barcın Höyük. 483
Table 12.3: The plant distribution according to the contexts in Structure 24 in Phase VIe at Barcın Höyük (continued). 484
Table 12.4: The plant distribution according to the contexts in Structure 24 in Phase VIe at Barcın Höyük (continued). 485
Table 12.5: The plant distribution according to the contexts in front of the structures (south) in Phase VIe at Barcın Höyük. 486
Table 12.6: The plant distribution according to the context in the central courtyard of Phase VIe at Barcın Höyük. 487
Table 12.7: The plant distribution according to the context in the central courtyard of phase VIe at Barcın Höyük (continued). 488
Table 12.8: The plant distribution according to the contexts of the South Outdoor Area in Phase VIe at Barcın Höyük. 489
Table 12.9: The plant distribution according to the contexts of the Northernmost Outdoor Area in Phase VId1 at Barcın Höyük. 491
Table 12.10: The plant distribution according to the contexts of Structure 19 in Phase VId1 at Barcın Höyük. 492
Table 12.11: The plant distribution according to the contexts of Structure 2a in Phase VId1 at Barcın Höyük. 493
Table 12.12: The plant distribution according to the contexts of Structure 2b in Phase VId1 at Barcın Höyük. 495
Table 12.13: The plant distribution according to the contexts of Structure 21 in Phase VId1 at Barcın Höyük. 499
Table 12.14: The plant distribution according to the contexts of Central Courtyard (East) in Phase VId1 at Barcın Höyük. 500
Table 12.15: The plant distribution according to the contexts of Central Courtyard (West) in Phase VId1 at Barcın Höyük. 501
Table 12.16: The plant distribution according to the contexts of South Courtyard in Phase VId1 at Barcın Höyük. 503
Table 12.17: The plant distribution according to the contexts of South Courtyard in Phase VId1 at Barcın Höyük (continued). 505
Table 12.18: The plant distribution according to the contexts of north and central indoor and outdoor areas in Phase VId2 at Barcın Höyük. 506
Table 12.19: The plant distribution according to the contexts of central-southern outdoor areas in phase VId2 at Barcın Höyük. 507
Table 12.20: The plant distribution according to the contexts of north-central indoor and outdoor areas in Phase VId3 at Barcın Höyük. 509
Table 12.21: The plant distribution according to the contexts of the central-southern indoor area in Phase VId3 at Barcın Höyük. 510
Table 12.22: The plant distribution according to the contexts of the central-southern indoor and outdoor areas in Phase VId3 at Barcın Höyük. 512
Table 12.23: The plant distribution according to the contexts of North Outdoor and Indoor Areas in Phase VIc at Barcın Höyük. 513
Table 12.24: The plant distribution according to the contexts of Central-South Outdoor and Indoor Areas in Phase VIc at Barcın Höyük. 514
Table 12.25: The plant distribution according to the contexts of South Outdoor and Indoor Areas in Phase VIc at Barcın Höyük. 516

Table 12.26: The plant distribution according to the contexts of North Area in Phase VIb at Barcın Höyük. ... 517
Table 12.27: The plant distribution according to the contexts of Central Area in Phase VIb at Barcın Höyük. 519
Table 12.28: The plant distribution according to the contexts of the Central Indoor Area in Phase VIb at Barcın Höyük. ... 521
Table 12.29: The plant distribution according to the contexts of the Central Outdoor Area in Phase VIb at Barcın Höyük. ... 521
Table 12.30: The plant distribution according to the contexts of Phase VIa at Barcın Höyük. ... 523
Table 13.1: Archaeobotanical investigation on per sample at Barcın Höyük. ... 524
Table 13.2: Archaeobotanical investigation on per sample at Bahçelievler. ... 543
Table 13.3: Archaeobotanical investigation on per sample at Aşağı Pınar. ... 549

LIST OF FIGURES

Figure 2.1: The locations in environmental setting of the Epipaleolithic and Neolithic Sites in Central Anatolia (Fairbairn et al. 2014, Fig.1). 10
Figure 3.1: The locations of case-study sites in Northwest Türkiye. 46
Figure 3.2: Marmara Region (Atalay and Mortan 1997, 83). 47
Figure 3.3: Rectangular box from Barcın's Phase VIc which is typical for Fikirtepe sites in the Marmara Region (Özbal and Gerritsen 2019, Fig.10). 61
Figure 4.1: Neolithic Phases of case-study sites. 74
Figure 4.2: Manual flotation stages at Bahçelievler. 77
Figure 4.3: Working on Barcın Höyük assemblage at the Museum of Anatolian Civilizations in Ankara. 79
Figure 4.4: Working on the Bahçelievler assemblage in the Bilecik Museum. 79
Figure 4.5: Working on the Aşağı Pınar assemblage at Istanbul University Rıdvan Çelikel Archaeology Museum. 80
Figure 4.6: Working on the Aşağı Pınar assemblage at the laboratory of the Prehistory Department at Istanbul University. 81
Figure 4.7: Several plant catalog sources were used in the research. 82
Figure 4.8: The Excel data from Barcın Höyük. 83
Figure 4.9: Three-level classification of domesticated grasses (Poaceae) (Cappers and Bekker 2021, 296). 83
Figure 4.10: Suggested interpretation of relative frequency of small numbers of plant remains per sample (minimum numbers of seeds/fruits from 1 to 5). 90
Figure 5.1: The structure of cereal grain (online source). 93
Figure 5.2: Six-row barley floret (BH46515) in phase VId1 at Barcın Höyük (photo: H. Balcı). 96
Figure 5.3: Six-row barley floret (frontal-dorsal) (BH5639) in phase VIb at Barcın Höyük (photo: H. Balcı). 96
Figure 5.4: Six-row barley florets (BH12679) and barley rachis nodes (BH12397) in phase VIb at Barcın Höyük (photo: H. Balcı). 97
Figure 5.5: Six/two-row barley grains (left: B3-24.16) in Phase 5, (right: B3-27.2) in Phase 6 at Bahçelievler (photo: H. Balcı). 98
Figure 5.6: Six-row barley (naked) grain (14N-12.8) and rachis node (15M-2.11) at Hoca Çeşme (photo: H. Balcı). 99
Figure 5.7: Six-row barley fragmented grains (8K-285-A025) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 99
Figure 5.8: Einkorn grains (BH41101) in VId1 at Barcın Höyük (Balcı 2018). 101
Figure 5.9: Einkorn grain (B3-C3-13.3) in Phase 6, and einkorn/emmer rachis node (B5-8.5) in Phase 2 at Bahçelievler (photo: H. Balcı). 102
Figure 5.10: Einkorn grain (6M-120-A80) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 103
Figure 5.11: Emmer grains (BH46359) in VIe at Barcın Höyük (photo: H. Balcı). 105
Figure 5.12: Einkorn/emmer rachis nodes (BH5639) in VIb at Barcın Höyük (photo: H. Balcı). 105
Figure 5.13: Emmer grains (left: A3-3.1) in Phase 8, and (right: B3-C3-12.3) in Phase 6 at Bahçelievler (photo: H. Balcı). 106
Figure 5.14: Emmer grains (8K-302) and einkorn/emmer rachis nodes (6V-311) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 107
Figure 5.15: Bread/hard wheat grains (BH46359) from frontal and dorsal sides in VIe at Barcın Höyük (photo: H. Balcı). 110
Figure 5.16: Bread/hard wheat grains (BH9592) from frontal and dorsal sides in VIb at Barcın Höyük (photo: H. Balcı). 110
Figure 5.17: Bread/hard wheat grain (B3-59.1) in Phase 6 at Bahçelievler (photo: H. Balcı). 111

Figure 5.18: Bread/hard wheat grain and rachis (15M-2.11) at Hoca Çeşme (photo: H. Balcı). 112
Figure 5.19: Bread/hard wheat grain (6V-308) and rachis (8K-285-A025) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 112
Figure 5.20: Small-sized naked wheat grains in phase VId1 at Barcın Höyük (Balcı 2018). 113
Figure 5.21: Unidentified wheat (Triticum, possibly emmer) grains (BH2040) in EBA II at Barcın Höyük (photo: H. Balcı). 114
Figure 5.22: Unidentified wheat (Triticum) grains (BH12677) in VIc at Barcın Höyük (photo: H. Balcı). 114
Figure 5.23: General vegetational parts of Pisum sativum: (a) entire flowering plant, (b) flower, (c) fresh fruit, (d) dehiscent fruit and seed, e) seeds (edited by H. Balcı from online sources). 116
Figure 5.24: The main structure of a legume seed (Sharifi et al. 2024). 116
Figure 5.25: Bitter vetch seed from different sides (BH36876) in VId1 at Barcın Höyük (photo: H. Balcı). 119
Figure 5.26: Bitter vetch seed from different sides (BH5639) in phase VIb at Barcın Höyük (photo: H. Balcı). 119
Figure 5.27: Bitter vetch seeds (B4-5.2) in Phase 3 at Bahçelievler (photo: H. Balcı). 120
Figure 5.28: Bitter vetch seeds (6M-111-A71) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 120
Figure 5.29: Chickpea seeds (BH36239) in VId1 at Barcın Höyük (Balcı 2018). 121
Figure 5.30: Grass pea/faba bean seed fragments (BH2579) in Late Chalcolithic at Barcın Höyük (photo: H. Balcı). 123
Figure 5.31: Grass pea seed (8K-284-A024) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 125
Figure 5.32: Lentil seeds (BH36876) in phase VId1 at Barcın Höyük (photo: H. Balcı). 126
Figure 5.33: Lentil seeds (BH36876) from storage in phase VId1 at Barcın Höyük (photo: H. Balcı). 127
Figure 5.34: Lentil seed (BH10058) in phase VIa at Barcın Höyük (photo: H. Balcı). 127
Figure 5.35: Lentil seeds (C2-22.3) in Phase 6 at Bahçelievler (photo: H. Balcı). 128
Figure 5.36: Lentil seed (15M-2.11) at Hoca Çeşme (photo: H. Balcı). 129
Figure 5.37: Lentil seeds (8K-285-A025) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 129
Figure 5.38: Pea seed (BH45640) in Phase VIe at Barcın Höyük (photo: H. Balcı). 131
Figure 5.39: Pea seed (15M-12.11) at Hoca Çeşme (photo: H. Balcı). 132
Figure 5.40: Pea seeds (6M-134-A47) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 132
Figure 5.41: General vegetative parts of flax plant (edited from online source). 133
Figure 5.42: Flax seeds in phase VId1 at Barcın Höyük (edited from Balcı 2018). 134
Figure 5.43: Mineralized flax seeds (BH44708) in phase VIe at Barcın Höyük (photo: H. Balcı). 135
Figure 5.44: The morphology of acorn: a) apex; b) pale area at the base of the fruit; c) cupule; d) seed (two cotyledons); e) half of the seed (one cotyledon) showing the embryo; f) transversal section shows two cotyledons (Primavera and Fiorentino 2013, Fig.2). 136
Figure 5.45: Acorn (a piece of cotyledon, B3-68.3) in Phase 6 at Bahçelievler (photo: H. Balcı). 137
Figure 5.46: General morphology of bramble (edited by H. Balcı from online sources). 138
Figure 5.47: Bramble fruitlets (a: BH36371) in Phase VIc at Barcın Höyük, and (b: 8K-285-A025) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 139
Figure 5.48: Floral morphology of fig (Stover et al. 2007, 1084; from Armstrong, 2006). 140
Figure 5.49: Mineralized fig fruits (a: BH10372, b: BH8039) in phase VIa and M/L Bronze Age at Barcın Höyük, (photo: H. Balcı) 141
Figure 5.50: Fig fruit (BH7083) in phase VIb at Barcın Höyük, (photo: H. Balcı). 142
Figure 5.51: Morphology of grapes (de Noronha 2010, fig.1). 142
Figure 5.52: Grape seed (B3-13.7, magnification:10x) in Phase 5 at Bahçelievler (photo: H. Balcı). 143
Figure 5.53: Hazelnut shells from frontal and dorsal sides (fruit fragments, BH41698) in phase VId1 at Barcın Höyük (photo: H. Balcı). 144

Figure 5.54: Hazelnut shells from frontal, dorsal and side views (fruit fragments, BH17700) in phase VIe at Barcın Höyük (photo: H. Balcı). 144
Figure 5.55: Hazelnut shells from frontal, dorsal and side views (fruit fragments, left: B2-29.11) in Phase 7 and (right: B3-16.2) Phase 5 at Bahçelievler (photo: H. Balcı). 145
Figure 5.56: Hackberry shells from frontal and dorsal views (C3-33.1) in Phase 6b at Bahçelievler (photo: H. Balcı)..... 146
Figure 5.57: Terebinth/pistacia fruits (left: B3-51.1-2021, right: B3-13.7-2020) in Phase 5 at Bahçelievler (photo: H. Balcı). 148
Figure 5.58: General morphology of Pistacia atlantica (scale: 1mm) from different views (Rousou et al.'s 2021, Fig.4, 630)..... 149
Figure 5.59: Elder (Sambucus sp.) seed/fruit in Phase 7 at Aşağı Pınar (photo: H. Balcı)...... 149
Figure 5.60: An example of the general morphology of the Amaranthaceae family...... 150
Figure 5.61: A general morphology of Chenopodium album (edited by H. Balcı from online sources). 151
Figure 5.62: A group of Chenopodium fruits/seeds (left: BH6612) in phase VIb and (right: BH11893) in phase VIc at Barcın Höyük (photo: H. Balcı)...... 153
Figure 5.63: A group of Chenopodium fruits/seeds (left: B4-13.1) in Phase 4b and (right: B2-29.4) in Phase 7 at Bahçelievler (photo: H. Balcı)...... 154
Figure 5.64: A group of Chenopodium fruits/seeds (AP17, 6M, 134.39) in Layer 7 at Aşağı Pınar (photo: H. Balcı)..... 155
Figure 5.65: Chenopodium polyspermum fruit/seed (frontal-dorsal, BH12397) in phase VIb at Barcın Höyük (photo: H. Balcı). 155
Figure 5.66: An example of the general morphology of the Asteraceae flower (a: a flower, b: a ray floret, c: a tubular floret, ov: ovary, pe: petal, st: stigma) (image: Deng et al. 2010, Fig. 1). 156
Figure 5.67: Type of fruit/seed (B2-29) in Asteraceae family in Phase 7 at Bahçelievler (photo: H. Balcı). 157
Figure 5.68: A general structure of Apiaceae fruitlets (edited by H.Balcı from internet sources)...... 158
Figure 5.69: An example of the general morphology of the Boraginaceae family from Echium vulgare species (edited by H. Balcı from online source)..... 159
Figure 5.70: A fruitlet of Boraginaceae family in Layer 7 at Aşağı Pınar (photo: H. Balcı)...... 160
Figure 5.71: The fruitlet of Anchusa arvensis in Layer 7 at Aşağı Pınar (photo: H. Balcı). 160
Figure 5.72: Echium vulgare fruitlet from side view (BH45341) in phase VIe at Barcın Höyük (photo: H. Balcı). 161
Figure 5.73: Echium vulgare fruitlet from frontal view (15M-2.11) in phase VIe at Hoca Çeşme (photo: H. Balcı)..... 161
Figure 5.74: Echium vulgare fruitlets (6L-77) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 162
Figure 5.75: Lithospermum cf. arvense fruitlets (BH5908) in phase VIe at Barcın Höyük (photo: H. Balcı)..... 163
Figure 5.76: Lithospermum cf. arvense fruitlet from side and dorsal views (14N-12.8) at Hoca Çeşme (photo: H. Balcı)..... 164
Figure 5.77: Lithospermum cf. arvense fruitlet (6M-134.39) in Layer 7 at Aşağı Pınar (photo: H. Balcı)...... 164
Figure 5.78: A general diversity of fruits (pods) within the Brassicaceae family (Łangowski et al. 2016, Fig.4). 165
Figure 5.79: Brassicaceae seeds (BH45080) in phase VIe at Barcın Höyük (photo: H. Balcı)...... 166
Figure 5.80: Brassicaceae fruits/perianths with seeds (16M-12.20) at Hoca Çeşme (photo: H. Balcı). 167
Figure 5.81: Unidentified seed from the Caryophyllaceae cf. Solanaceae family (14N-12.8) at Hoca Çeşme (photo: H. Balcı). 168
Figure 5.82: Silene cf. Portulaca (?) seed (B2-29.4) in Phase 7 at Bahçelievler (photo: H. Balcı)...... 168
Figure 5.83: Silene (?) seed from the Caryophyllaceae family (8K-284-A024) at Aşağı Pınar (photo: H. Balcı). 169

Figure 5.84: Spergula arvensis seed (BH7214) in phase VIb at Aşağı Pınar (photo: H. Balcı). 169
Figure 5.85: Steleria media seed (BH12536) in the Middle Bronze Age at Barcın Höyük (photo: H. Balcı). ... 170
Figure 5.86: The general morphology of Convolvulus arvensis plant: (a) entire plant, (b) fruit with perianth, (c) seed (edited by H. Balcı from online source). 171
Figure 5.87: Convolvulus arvensis seeds (BH36876) in phase VId1 at Barcın Höyük (photo: H. Balcı). 172
Figure 5.88: The general morphology of Carex divulsa: (a) infructescence, (b) utricle, (c) fruit (edited by H. Balcı from online source). 173
Figure 5.89: Indeterminate Cyperaceae fruits from a surface in phase VId3 at Barcın Höyük (photo: H. Balcı). 174
Figure 5.90: Unidentified type of Cyperaceae fruit (14N-12.8) at Hoca Çeşme (photo: H. Balcı). 174
Figure 5.91: Cypreaceae fruits/seeds (BH40800, Scirpus maritimus?) in phase VId1 at Barcın Höyük (photo: H. Balcı). 175
Figure 5.92: Bolboschoenus cf. glaucus fruit (BH6612) in phase VIb at Barcın Höyük (photo: H. Balcı). 176
Figure 5.93: Fruits of Carex sp. (6M-134.42) in Layer 7 at Aşağı Pınar (photo: H. Balcı). 177
Figure 5.94: An example of the plant parts of a legume from hairy vetch (Vicia villosa) (edited by H. Balcı from an online source). 178
Figure 5.95: Astragalus/Trigonella seeds in phase VIb at Barcın Höyük (photo: H. Balcı). 179
Figure 5.96: Medicago sp. seed (BH7214) in Phase VIb at Barcın Höyük (photo: H. Balcı). 180
Figure 5.97: Medicago sp. seed (8K-285-A025) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 180
Figure 5.98: Onobrychis fruit (BH12385) in Phase VIb at Barcın Höyük (photo: H. Balcı). 181
Figure 5.99: The seed of Trifolium sp. in Layer 7 at Aşağı Pınar (photo: H. Balcı). 181
Figure 5.100: An example of the Malvaceae family from Malva sylvestris: (a) entire plant with flower, (b) fruit with perianth, (c) fruit, (d) fruitlet, (e) seed (edited by H. Balcı from online sources). 183
Figure 5.101: A fruitlet from Malvaceae family in Phase 7 at Aşağı Pınar. 184
Figure 5.102: Malvaceae/Amaranthaceae fruitlets/fruits (BH40800) in Phase VId1 at Barcın Höyük (photo: H. Balcı). 185
Figure 5.103: The fruit of Tilia platyphllos in Phase 7 at Aşağı Pınar. 185
Figure 5.104: The main parts of Papaveraceae plants: Papaver rhoeas (a) entire plant with flowers, (b) fruit (capsule), (c) seed; Fumaria officinalis (d) plant view with flowers, (e) young fruits, (f) ripen fruit (edited by H. Balcı from online sources). 186
Figure 5.105: Fumaria sp. fruit in Phase 7 at Aşağı Pınar (photo: H. Balcı). 187
Figure 5.106: Fumaria densiflora fruit (BH12536) in the Early/Middle Bronze Age at Barcın Höyük (photo: H. Balcı). 187
Figure 5.107: Papaver sp. seed (BH12536) in Phase VIb at Barcın Höyük (photo: H. Balcı). 188
Figure 5.108: Different kinds of grasses as arable weeds in the field (online source). 189
Figure 5.109: Unidentified Poaceae hulled grain at Hoca Çeşme (photo: H. Balcı). 190
Figure 5.110: Aegilops grain (BH2040) in Phase EBA II at Barcın Höyük (photo: H. Balcı). 190
Figure 5.111: Avena/T. dicoccoides grain from frontal and dorsal views (BH11650) in phase VId2 at Barcın Höyük (photo: H. Balcı). 191
Figure 5.112: Bromus sterilis grains (left: floret, right: grain, BH12536) in Early/Middle Bronze Age at Barcın Höyük (photo: H. Balcı). 192
Figure 5.113: Spikelets of Digitaria sp. in Phase 7 at Aşağı Pınar (photo: H. Balcı). 192
Figure 5.114: Hordeum spontaneum/marinum (?) grains (BH46341) in Phase VIe at Barcın Höyük (photo: H. Balcı). 193
Figure 5.115: Phalaris fruit/seed grains (BH12536) in Early/Middle Bronze Age at Barcın Höyük (photo: H. Balcı). 195
Figure 5.116: Setaria pumila florets grains (BH46341) in Phase VIe at Barcın Höyük (photo: H. Balcı). 195

Figure 5.117: Floret of Eragrostis/Setaria/ Panicum in Layer 7 at Aşağı Pınar (photo: H. Balcı). 196
Figure 5.118: The entire plant in the field (a), inflorescence (b), and fruit (c) of Polygonum aviculare L. (edited by H. Balcı from online source). 197
Figure 5.119: Fruits from Polygonaceae family, Fallopia/Rumex? (left: BH45634) and Persicaria maculosa? (right: BH45640) in Phase VIe at Barcın Höyük (photo: H. Balcı). 198
Figure 5.120: Fruit of Polygonaceae family in Phase 7 at Aşağı Pınar (photo: H. Balcı). 198
Figure 5.121: The fruit of Fallopia sp. (BH12667) in Phase VIb at Barcın Höyük (photo: H. Balcı). 199
Figure 5.122: The fruit of Fallopia sp. in Phase 7 at Aşağı Pınar (photo: H. Balcı). 199
Figure 5.123: Perianth of Persicaria sp. (BH5639) in phase VIe at Barcın Höyük (photo: H. Balcı). 200
Figure 5.124: The fruit of Persicaria cf. maculosa (BH11400) in phase VIb at Barcın Höyük (photo: H. Balcı). 200
Figure 5.125: Fruit of Polygonum sp. in Phase 7 at Aşağı Pınar (photo: H. Balcı). 201
Figure 5.126: The fruits of Rumex sp. (BH7236) in Phase VIb at Barcın Höyük (photo: H. Balcı). 202
Figure 5.127: The entire plant of Androsace maxima. (a) inflorescence; (b) infructescence (edited by H. Balcı from online source). 202
Figure 5.128: A half-fruit piece of Androsace maxima (BH8471) in phase VIb at Barcın Höyük (photo: H. Balcı). 203
Figure 5.129: The leaves and flower of Adonis aestivalis (online source). 204
Figure 5.130: The fruitlets of Adonis sp. (left: BH7236) in phase VIe and (right: BH10058) in VIa at Barcın Höyük (photo: H. Balcı). 205
Figure 5.131: The fruits of Rosaceae family (left: BH9592) and (right: BH12678) in phase VIb at Barcın Höyük (photo: H. Balcı). 206
Figure 5.132: The entire plant -plants with white flowers in front- of Galium L. in the cereal field (photo taken by R. Cappers). 207
Figure 5.133: The fruits of Galium sp. (BH36876) in Phase VId1 at Barcın Höyük (photo: H. Balcı). 208
Figure 5.134: The fruits of Galium sp. (BH7214) in Phase VIb at Barcın Höyük (photo: H. Balcı). 208
Figure 5.135: The fruits of Galium sp. (14N-12.8) at Hoca Çeşme (photo: H. Balcı). 209
Figure 5.136: The fruits of Galium sp. in Phase 7 at Aşağı Pınar (photo: H. Balcı). 209
Figure 5.137: The fruit (capsule) and seeds of Datura stramonium (online source). 210
Figure 5.138: The entire plant Datura stramonium within bean plants in the field from Yenişehir, Bursa (Photo taken by R. Cappers, online source). 211
Figure 5.139: Two seeds of Datura (BH2031) in EBA II at Barcın Höyük (photo: H. Balcı). 212
Figure 5.140: Two seeds of Solanum nigrum (BH8039) in E/M Bronze Age at Barcın Höyük (photo: H. Balcı). 213
Figure 5.141: The fruit of Thymelaeaceae (BH44937) in VIe at Barcın Höyük (photo: H. Balcı). 213
Figure 5.142: The fruit of Thymelaeaceae (BH2031) in EBA II at Barcın Höyük (photo: H. Balcı). 214
Figure 5.143: The fruit of Thymelaeaceae in Phase 7 at Aşağı Pınar (photo: H. Balcı). 214
Figure 5.144: Unidentified seeds/fruits from Poaceae / Rosaceae (BH45523) in Phase VIe at Barcın Höyük (photo: H. Balcı). 215
Figure 5.145: Unidentified possible straw nodes/fragments (BH46515) in Phase VId1 at Barcın Höyük (photo: H. Balcı). 215
Figure 5.146: Unidentified culms from Poaceae (BH42637) in Phase VId1 at Barcın Höyük (photo: H. Balcı). 216
Figure 5.147: Unidentified seed/fruit (BH38876) in Phase VId1 at Barcın Höyük (photo: H. Balcı). 216
Figure 5.148: Unidentified seed/fruit (BH41246) in Phase VId1 at Barcın Höyük (photo: H. Balcı). 217
Figure 5.149: Compact organic remains/prepared food (BH34902, pyrotechnic feature) in Phase VIe at Barcın Höyük (photo: H. Balcı). 217

Figure 5.150: Unidentified plant part (BH45758) in Phase VIe at Barcın Höyük (photo: H. Balcı). 218
Figure 5.151: Unidentified plant part (BH45906) in Phase VIe at Barcın Höyük (photo: H. Balcı). 218
Figure 5.152: Unidentified fruit/fruitlet, Boraginaceae? (BH45640) in Phase VIe at Barcın Höyük (photo: H. Balcı)..... 219
Figure 5.153: Unidentified hulled Poaceae grain, Hordeum? (B3-9.6) in Phase 4b at Bahçelievler (photo: H. Balcı)..... 219
Figure 5.154: Unidentified Poaceae rachis? at Bahçelievler (photo: H. Balcı)..... 220
Figure 5.155: Unidentified fruit from Polygonaceae? (B3-66.1) in Phase 4b at Bahçelievler (photo: H. Balcı). 220
Figure 5.156: Unidentified fruits/fruitlets (Type 1, 6M-134) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 221
Figure 5.157: Unidentified fruit (Poaceae/Asteraceae) (6M, 115.67) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 221
Figure 5.158: Unidentified seed (Linum cf. bienne?) (6M, 117.43) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 222
Figure 5.159: Unidentified fruit/floret (Setaria/Eragrostis?, 6M, 134.39) in Phase 7 at Aşağı Pınar (photo: H. Balcı)..... 222
Figure 5.160: Unidentified perianth/fruit (Rosaceae?, 6L, 74) in Phase 7 at Aşağı Pınar (photo: H. Balcı). ... 223
Figure 5.161: Unidentified awn pieces (Avena?, 6L, 74) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 223
Figure 5.162: Goat or sheep dung (BH41698, M10, loc. 411, platform) in Phase VId1 at Barcın Höyük (photo: H. Balcı). 224
Figure 5.163: Mineralized goat or sheep dung/seed? (BH42523, M11, loc. 507, wall) in Phase VId1 at Barcın Höyük (photo: H. Balcı). 224
Figure 5.164: Compact organic remains (BH46271, L10, loc. 443, layer) in Phase VIe at Barcın Höyük (photo: H. Balcı). 225
Figure 5.165: Fungal spores (?) (BH45913, exploratory_locus_sounding) in Phase VIe at Barcın Höyük (photo: H. Balcı). 225
Figure 5.166: Compact organic remains/phytolith? (C2-22.3, indoor) in Phase 6 at Bahçelievler (photo: H. Balcı)..... 226
Figure 5.167: Compact organic remains/phytolith? (B3-59.2, indoor) in Phase 6 at Bahçelievler (photo: H. Balcı)..... 226
Figure 5.168: Compact organic remains/phytolith? (C3-34.7, inside door area) in Phase 6 at Bahçelievler (photo: H. Balcı). 227
Figure 5.169: Unidentified remain (6M, 117.43) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 227
Figure 5.170: Unidentified remain (insect feces?, 6N, 121.55) in Phase 7 at Aşağı Pınar (photo: H. Balcı).... 228
Figure 5.171: Small bones (rodent/mice?, 6M, 134.39) in Phase 7 at Aşağı Pınar (photo: H. Balcı)..... 228
Figure 5.172: Spinal bone (fish?), 6M, 134.39) in Phase 7 at Aşağı Pınar (photo: H. Balcı). 229
Figure 5.173: The quantity of plant groups per phase at Barcın Höyük. 233
Figure 5.174: The quantity of plant groups per phase at Bahçelievler. 235
Figure 5.175: The quantity of plant groups per phase at Hoca Çeşme. 236
Figure 5.176: The quantity of plant groups per phase at Aşağı Pınar. 239
Figure 6.1: Locations of Barcın Höyük and Bahçelievler in Northwest Anatolia (Balcı et al. 2022, Fig.1a, 29). 241
Figure 6.2: Excavated area between 2007-2015 at Barcın Höyük (Gerritsen and Özbal 2016, 200, Fig.2). 241
Figure 6.3: Excavated area at Barcın Höyük that shows trench borders (Gerritsen and Özbal 2016, Fig.3). .. 242
Figure 6.4: The sequences Barcın Höyük occupation sequences (van den Bos 2021, Fig. 7.3, 167). 243
Figure 6.5: Barcın Höyük schematic view of structure row in E-W direction (van den Bos 2021, Fig. 7.5, 168). 244

Figure 6.6: The generalized plan of phase VIe (c. 6600-6500 cal. BC) in the excavated area at Barcın Höyük (plan: F. Gerritsen). 245
Figure 6.7: The density of plant remains per liter in VIe1 and VIe2 at Barcın Höyük. 246
Figure 6.8: The distribution of cereal types per liter in VIe1 and VIe2 at Barcın Höyük. 248
Figure 6.9: The distribution of crops versus wild plants per liter in VIe1 and VIe2 at Barcın Höyük. 249
Figure 6.10: The distribution of pulses types per liter in VIe1 and VIe2 at Barcın Höyük. 251
Figure 6.11: The distribution of oily/fiber and gathered plants per liter in VIe1 and VIe2 at Barcın Höyük. ... 253
Figure 6.12: The distribution of hulled wheats and by-products per liter in VIe1 and VIe2 at Barcın Höyük. .. 256
Figure 6.13: The generalized plan of phase VId1 (c. 6500-6400 cal. BC) in the excavated area at Barcın Höyük (F. Gerritsen). 257
Figure 6.14: The density of plant remains per liter in VId1 early and VId1 late at Barcın Höyük. 258
Figure 6.15: The density of plant remains per liter in VId1 burnt fire/collapse at Barcın Höyük. 258
Figure 6.16: The distribution of cereal types in the earliest level of VId1 and VId1 pre-fire at Barcın Höyük. . 259
Figure 6.17: The distribution of cereal types in the late fire/collapse level of VId1 at Barcın Höyük. 260
Figure 6.18: The red floor in str19 from the northwest (Gerritsen and Özbal 2016, Fig.6). 261
Figure 6.19: The distribution of pulses types per liter in phase VId1 early and VId1 late pre-fire at Barcın Höyük. 262
Figure 6.20: The distribution of pulses types per liter in phase VId1 late fire/collapse at Barcın Höyük. 262
Figure 6.21: Ear of emmer wheat found in the platform bench ledge in str2a in VId1 late burnt/collapse phase at Barcın Höyük (excavation archive). 263
Figure 6.22: Well-preserved emmer grains from ear sample (above) (BH41000) in VId1 at Barcın Höyük (photo: H. Balcı). 264
Figure 6.23: Lentil storage at str2a in VId1 late burnt/collapse phase at Barcın Höyük. 264
Figure 6.24: Lentils in layer (collapse) at str2a in subphase VId1 late burnt/collapse phase at Barcın Höyük. 265
Figure 6.25: The photo of the right footprint, found at the entrance of str2a in VId1 (Atamtürk et al. 2018, 168, Fig.4) 266
Figure 6.26: The distribution of crops versus wild plants per liter in VId1 early and VId1 late pre-fire at Barcın Höyük. 268
Figure 6.27: The distribution of crops versus wild plants per liter in VId1 late fire/collapse at Barcın Höyük. 269
Figure 6.28: The western walls of str20 and the adjacent semi-subterranean str22 in phase VId1 late (Gerritsen and Özbal 2016). 271
Figure 6.29: The distribution of oily/fiber and gathered plants per liter in VId1 early and VId1 late pre-fire at Barcın Höyük. 272
Figure 6.30: The distribution of oily/fiber and gathered plants per liter in VId1 late fire/collapse at Barcın Höyük. 273
Figure 6.31: The distribution of hulled wheat and by-products per liter in VId1 early and VId1 late pre-fire at Barcın Höyük. 275
Figure 6.32: The distribution of hulled wheat and by-products per liter in VId1 late fire/collapse at Barcın Höyük. 275
Figure 6.33: The density of plant remains per liter in VId2 at Barcın Höyük. 277
Figure 6.34: The distribution of cereal types and hulled wheat (einkorn-emmer) and BP per liter in phase VId2 at Barcın Höyük. 278
Figure 6.35: The distribution of pulses types and oily/fiber and gathered plants per liter in VId2 at Barcın Höyük. 279
Figure 6.36: The distribution of crops versus wild plants per liter in VId2 at Barcın Höyük. 279
Figure 6.37: The density of plant remains per liter in VId3 at Barcın Höyük. 281

Figure 6.38: The distribution of cereal types and hulled wheat (einkorn-emmer) per liter in phase VId3 at Barcın Höyük. 282
Figure 6.39: The distribution of pulses types and oily/fiber and gathered plants per liter in VId3 at Barcın Höyük. 282
Figure 6.40: The distribution of crops versus wild plants per liter in VId3 at Barcın Höyük. 283
Figure 6.41: The density of plant remains per liter in VIc at Barcın Höyük. 285
Figure 6.42: The distribution of cereal types and hulled wheat (einkorn-emmer) per liter in phase VIc at Barcın Höyük. 286
Figure 6.43: The distribution of pulses types and oily/fiber and gathered plants per liter in VIc at Barcın Höyük. 287
Figure 6.44: The distribution of crops versus wild plants per liter in VIc at Barcın Höyük. 288
Figure 6.45: The density of plant remains per liter in VIb at Barcın Höyük. 290
Figure 6.46: The distribution of cereal types and hulled wheat (einkorn-emmer) per liter in phase VIb at Barcın Höyük. 291
Figure 6.47: The distribution of pulse-types and oily/fiber and gathered plants per liter in VIb at Barcın Höyük. 292
Figure 6.48: The distribution of crops versus wild plants per liter in VIb at Barcın Höyük. 293
Figure 6.49: The density of plant remains per liter in VIa at Barcın Höyük. 294
Figure 6.50: Structure row from the west to the east in VIe (left) and VId1 (right) at Barcın Höyük (photo: excavation archive). 295
Figure 7.1: The site of Bahçelievler with Phases (8-2) and trench locations indicated by associated color legend (excavation archive). 298
Figure 7.2: The drawing of site organization of all phases at Bahçelievler (excavation archive). 299
Figure 7.3: The oval/round buildings (trenches B2-C2) from the south side in Phase 7 (Fidan 2020, 31, Fig.3). 301
Figure 7.4: Drawings of the buildings in Phase 7 (Fidan, excavation report season 2020, 3). 301
Figure 7.5: The drawing shows the structures and courtyard area in Phase 6 (Fidan, 2020 excavation report, 8). 304
Figure 7.6: The locations of the contexts (trench B3) in Phase 6 (excavation database). 308
Figure 7.7: The upper level of courtyard area in Phase 5 (B3, 13/1, red line) (photo: excavation database). 310
Figure 7.8: The lower level of courtyard area in Phase 5 (photo: excavation database). 310
Figure 7.9: Pottery finding (trench B3, unit 17) and fragmented cereal remains in Phase 5 at Bahçelievler. 311
Figure 7.10: One of the half-oval/round structures with post-holes in Phase 4a at Bahçelievler (Fidan, excavation report 2020, 9). 314
Figure 7.11: Partly Phase 3 with oval/round structure (south, trench B4) and some of the walls which belong to rectangular buildings (north, trench B5) in Phase 2 at Bahçelievler (Fidan, excavation report 2020, 11-12). 315
Figure 7.12: General plan of rectangular structures in Phase 2 at Bahçelievler (edited from excavation archive). 316
Figure 8.1: The location of Aşağı Pınar in Turkish Thrace. 319
Figure 8.2: The comparative chronology of Aşağı Pınar layers with the Karanovo Culture (E. Özdoğan). 320
Figure 8.3: Drawing the settlement organization of Phase 7 at Aşağı Pınar (Aşağı Pınar archive). 321
Figure 8.4: A view of layer 7 at Aşağı Pınar (photo: Aşağı Pınar archive). 321
Figure 8.5: The pits in the profile in south ditch II (H2) in Phase 7 at Aşağı Pınar (Akyol et al. 2022, Fig. 5). 322
Figure 8.6: Plan of the structures in the Northeast part of the excavated area in layer 7 at Aşağı Pınar (E. Özdoğan, Aşağı Pınar archive). 323
Figure 8.7: The structures 7-2 and 7-3 in the Northeast part of Layer 7 at Aşağı Pınar (Akyol et al. 2022, Fig. 2). 325

Figure 8.8: The stratigraphical information of Ditches I and II (excavation archive). 326
Figure 8.9: Northern ditch H1 (H1-1, H1-2, H1-3) in layer 7 at Aşağı Pınar (Akyol et al. 2022, Fig.4). 327
Figure 8.10: Drawing of ditch H1-1,2,3 and related pits in the Northwest part of the excavated area in Layer 7 at Aşağı Pınar (Aşağı Pınar archive). 328
Figure 8.11: The stratigraphical information of the pits which are related to Ditch I and II (excavation archive). 330
Figure 8.12: The plan of ditches H1-2, H1-3 and the pits in layer 7 at Aşağı Pınar. 333
Figure 8.13: Plan of the northern ditches H1-3, H1-4, and H1-5 in the middle and eastern part of the site in layer 7 at Aşağı Pınar. 336
Figure 8.14: The western part of ditch H2 and related pits in the south of the ditch in layer 7 at Aşağı Pınar. 336
Figure 8.15: Plan of the eastern part of ditch H2 and related pits in layer 7 at Aşağı Pınar. 338
Figure 8.16: The northeastern side of ditch H2 and related pits in layer 7 at Aşağı Pınar. 342
Figure 9.1: The ratio of 1 wheat/barley grain kernel per Neolithic phase at Barcın Höyük. 350
Figure 9.2: The ratio of 2 wheat/barley grain kernels per Neolithic phase at Barcın Höyük. 351
Figure 9.3: The ratio of 3 wheat/barley grain kernels per Neolithic phase at Barcın Höyük. 351
Figure 9.4: The ratio of 4 wheat/barley grain kernels per Neolithic phase at Barcın Höyük. 352
Figure 9.5: The ratio of 5 wheat/barley grain kernels per Neolithic phase at Barcın Höyük. 352
Figure 9.6: The ratio of 1 wheat/barley grain kernel per Neolithic phase at Bahçelievler. 354
Figure 9.7: The ratio of 2 wheat/barley grain kernels per Neolithic phase at Bahçelievler. 354
Figure 9.8: The ratio of 3 wheat/barley grain kernels per Neolithic phase at Bahçelievler. 355
Figure 9.9: The ratio of wheat/barley grain kernels from 1 to 5 in Phase 7 at Aşağı Pınar. 356
Figure 9.10: The presence of 1 grain kernel of einkorn/emmer per Neolithic phase at Barcın Höyük. 357
Figure 9.11: The presence of 2 grain kernels of einkorn/emmer per Neolithic phase at Barcın Höyük. 358
Figure 9.12: The presence of 3 grain kernels of einkorn/emmer per Neolithic phase at Barcın Höyük. 358
Figure 9.13: The presence of 4 grain kernels of einkorn/emmer per Neolithic phase at Barcın Höyük. 359
Figure 9.14: The presence of 5 grain kernels of einkorn/emmer per Neolithic phase at Barcın Höyük. 359
Figure 9.15: The presence of 1 grain kernel of einkorn/emmer per Neolithic phase at Bahçelievler. 360
Figure 9.16: The presence of grain kernels of einkorn/emmer from 1 to 5 in Phase 7 at Aşağı Pınar. 361
Figure 9.17: The grain kernels of hulled wheats in Phase 7 at Aşağı Pınar. 362
Figure 9.18: The presence of 1 grain kernels of hulled/naked wheat per Neolithic phase at Barcın Höyük. 363
Figure 9.19: The presence of 2 grain kernels of hulled/naked wheat per Neolithic phase at Barcın Höyük. 364
Figure 9.20: The presence of 3 grain kernels of hulled/naked wheat per Neolithic phase at Barcın Höyük. 364
Figure 9.21: The presence of 4 grain kernels of hulled/naked wheat per Neolithic phase at Barcın Höyük. 365
Figure 9.22: The presence of 5 grain kernels of hulled/naked wheat per Neolithic phase at Barcın Höyük. 365
Figure 9.23: The presence of 1 grain kernel of hulled/naked wheats per Neolithic phase at Bahçelievler. 367
Figure 9.24: The presence of 2 grain kernels of hulled/naked wheats per Neolithic phase at Bahçelievler. 367
Figure 9.25: The presence of 3 grain kernels of hulled/naked wheats per Neolithic phase at Bahçelievler. 368
Figure 9.26: The presence grain kernels of hulled/naked wheats from 1 to 5 per sample in Phase 7 at Aşağı Pınar. 369
Figure 9.27: The presence of hulled and naked wheats with low and high numbers per sample in Phase 7 at Aşağı Pınar. 369
Figure 9.28: The density of pulses types from 1 to 5 in Phase VIe at Barcın Höyük. 371
Figure 9.29: The density of pulses types from 1 to 5 in Phase VId1 at Barcın Höyük. 371
Figure 9.30: The density of pulses types from 1 to 5 in Phase VId2 at Barcın Höyük. 372
Figure 9.31: The density of pulses types from 1 to 5 in Phase VId3 at Barcın Höyük. 372
Figure 9.32: The density of pulses types from 1 to 5 in Phase VIc at Barcın Höyük. 373
Figure 9.33: The density of pulses types from 1 to 5 in Phase VIb at Barcın Höyük. 373

Figure 9.34: The pulses seeds from minimum to maximum per sample in Phase VIb at Barcın Höyük. 374
Figure 9.35: The density of pulses types from 1 to 5 in Phase VIa at Barcın Höyük. 374
Figure 9.36: The presence of 1 seed per phase at Bahçelievler. 375
Figure 9.37: The presence of pulses types from 1 to 5 in Phase 7 at Aşağı Pınar. 376
Figure 9.38: The presence of pulses types in Phase 7 at Aşağı Pınar. 377
Figure 10.1: Locations and environmental positions of Barcın and Bahçelievler in Yenişehir and Bilecik areas. 382
Figure 10.2: Locations and environmental positions of Hoca Çeşme and Aşağı Pınar in Edirne and Kırklareli areas. 386
Figure 10.3: A summation of Neolithic Sites, which were mentioned as regional and site-specific interpretations of Neolithization. 392
Figure 14.1: Cereals in Phases VIe and VId1 at Barcın Höyük. 558
Figure 14.2: Cereals in Phases VId2 and VId3 at Barcın Höyük. 558
Figure 14.3: Cereals in Phases VIc and VIb at Barcın Höyük. 558
Figure 14.4: Pulses in Phases VIe and VId1 at Barcın Höyük. 559
Figure 14.5: Pulses in Phases VId2 and VId3 at Barcın Höyük. 559
Figure 14.6: Pulses in Phases VIc and VIb at Barcın Höyük. 559
Figure 14.7: Cereals in Phases 6 and 5 at Bahçelievler. 559
Figure 14.8: Cereals in Phase 4 at Bahçelievler. 560
Figure 14.9: Cereals in Phase 7 at Aşağı Pınar. 560
Figure 14.10: Pulses in Phase 7 at Aşağı Pınar. 560

Chapter 1

1. INTRODUCTION

Neolithization primarily reflects the transformation of the way of life from a hunter-gatherer lifestyle to a sedentary and agricultural one during the beginning of the Holocene Period. Even though early agriculture is among the central themes in Neolithic discussions, archaeobotanical remains have traditionally occupied only a small place among archaeological datasets. For this reason, sharing the results of archaeobotanical analyses to make a comparison and evaluation with the existing data remains one of the aims of this research, but the main focus is to try to understand the way in which the Neolithic process plays out in situations of Neolithization where/when the Neolithic lifestyles are carried to new regions. The region that forms the backbone of this thesis is Northwest Türkiye. Northwest Türkiye is not a primary region where Neolithization took place. Rather, it shows a secondary process where Neolithic lifestyles, which had become the norm in Central Anatolia and the Fertile Crescent region, became appropriated. The region plays an important role, especially in the transition of the Neolithic way of life to Europe, and before Europe, the region's own adaptation to the Neolithic lifestyle shows different local characteristics.

After developing in a core or primary region, the Neolithization concept of transforming into agrarian societies is a phenomenon that we see spreading across the world (e.g. de Lagrán 2015; Deguilloux et al. 2012; Dittrich 2017; Eriksson et al. 2013; Goring-Morris and Belfer-Cohen 2011; Kılınç et al. 2017; Kitchel et al. 2022; Kuzmin and Orlova 2000; Leppard 2022; Nikitin et al. 2019; Nishiaki et al. 2022; Özdoğan 2024, 2014, 2011, 2010; Raemaekers 2003; Robb 2013; Seguchi 2014; Sterelny and Watkins 2015; Watkins 2010b; Zvelebil 2001). This research focuses on Southwest Asia and, in particular, on the spread of the Neolithic concept. Recent research for the Fertile Crescent, Anatolia, and Europe shows that the Neolithic way of life, which spread through these regions rather rapidly, was manifested in different ways in different communities. For instance, we find semi-sedentary groups, farmer-herder settlements, settled hunter-gatherers, and farmers, as well as settled agrarian communities. These different reiterations of the Neolithic also emerge between contemporary sites within a region and even between the early and late phases of a single settlement.

Archaeobotany holds an important place in Southwest Asia and remains the main methodology used to understand plant-based diets and subsistence strategies, including the cultivation and domestication stages, as well as the distribution and use of the plants in question. Subsistence as a term refers to how people sustain their basic needs for survival that is commonly used in contexts such as subsistence farming and subsistence economy. In archaeology, archaeologists look at *subsistence* strategies and practices that ancient people used to obtain sources for their needs such as food, water, and shelter. The most common subsistence strategies are hunting and gathering, pastoralism, fishing, agriculture and husbandry depending on their way of life. Research on subsistence helps archaeologists understand how people interacted with their environment, organized their daily life, and adapted to change of living spaces and environment. In this respect, subsistence strategies are one of the main research fields on Neolithization process.

These data enable a fuller picture of plant-human interactions when examining the Neolithization process because interpretation of botanical remains provides important insights into this process of transition and adaptation. Although archaeobotanical studies seem to proceed with a focus mainly on macro-remains, many micro-remain analyses, such as pollen, carbon isotope analysis, phytolith studies, and starch investigations, continue to contribute to the archaeobotanical method.

This Neolithization has been approached from various angles, and the categorization proposed here serves as a general framework to understand how researchers have tackled this concept and the impact of archaeobotanical data on their studies. Time and theoretical approaches have influenced methodologies in archaeobotanical research and shaped interpretations accordingly. While it is not within the scope of this discussion to delve into the intricacies of different approaches, it is evident that detailed archaeobotanical studies at an individual scale have either altered or contributed to general inferences about Neolithization.

1.1. Aims and Aspects

In my thesis, I present an overview of the macro non-charcoal wood archaeobotanical data at hand for Neolithic Northwest Türkiye and thereafter try to address how the Neolithization process took place in the 7th millennium BC. A major aim is to understand the impacts of the plant subsistence choices throughout the Neolithization process and to gain insights on how subsistence choices affected this process in the region through a three-pronged case-study set

based on data from Barcın Höyük, Bahçelievler, Aşağı Pınar, and Hoca Çeşme as a reference site. All four of these Northwest Türkiye sites witnessed the earliest Neolithic occupations in their respective sub-regions. What transformations took place? And what evidence do we have to record this appropriation? Another aim of the study is to go beyond functional reasons but to also explore the social and symbolic reasons for plant uses and the choices of the Neolithic communities. How did their behaviors change with regard to plant use during their adaptation process?

I examine and evaluate the archaeobotanical data of the earliest levels of Barcın Höyük, Bahçelievler, and Aşağı Pınar to understand the lifestyles and specific plant uses of the Neolithic pioneers during the Neolithization Process in Northwest Anatolia. Moreover, I hope to gain some insights into how the subsequent generations of farmers dealt with agricultural products and whether we observe some changes from the earliest incipient levels. In this respect, there are some expectations from this research:

- To bring new interpretations to contribute to the current discussions on the Neolithization process of Northwest Türkiye, which serves as a crossroads between the Neolithization processes of Anatolia and Europe.
- To utilize a range of archaeobotanical studies to achieve an examination of the Neolithization process through case-specific studies and to understand how the Neolithic process was shaped based on each site by looking at the distribution and individual characteristics of each settlement in its own context, and this approach sets a case study for future archaeobotanical studies.
- To gain specific insights into the plant subsistence economies at each of my case study sites and re-evaluate old archaeological inferences for the Neolithic.
- To provide four new hitherto unpublished archaeobotanical datasets from each of these special Neolithic sites in Northwest Türkiye: Barcın Höyük, Bahçelievler, Aşağı Pınar 7, and Hoca Çeşme. These materials will be comparative material for the region, as well as providing an opportunity for comparison with other regions to help in understanding the Neolithization process.
- The research includes new approaches for archaeobotanical samples in the region, such as systematic sampling, investigation of light and heavy material, counting of

the liters of soil, quantitative analyses of the data, and mapping the distribution of the plant remains in GIS.

1.2. Challenges and Limitations

This thesis faced a number of challenges that limited part of the research. Probably the most challenging part was the 2020-2024 Government-based obstacles that imposed restrictions on archaeobotanical samples in university laboratories. As part of these regulations, the Barcın Höyük material had to be brought to the Museum of Anatolian Civilization in Ankara, while the Bahçelievler material was delivered to the Bilecik Museum, making it difficult to reach. Since all analysis on archaeobotanical samples was prohibited, the planned carbon isotope analyses were excluded, thus narrowing the scope of the study.

I had fortunately already completed preliminary investigations on part of the Barcın assemblage within the scope of my MA study, and part of the Aşağı Pınar assemblage was allowed to remain at İstanbul University. I was able to work on the Bahçelievler material on site each season. This situation was not ideal for photographic documentation, morphometric, and intersite comparative analyses. Due to all these difficulties, I had to carry out my work in a piecemeal manner, which made the data collection step quite long. I had to spend time in the Bilecik and Ankara Archaeology Museums to finalize the sorting and re-checking of the samples. Due to insufficient laboratory infrastructure at these locations, I worked with a portable trinocular stereo zoom microscope with a digital camera system to complete the work, and I was usually challenged by the limited stretches of time I was able to access the material. Another limitation regarding the research is that all plans to undertake carbon isotope analyses to gain insights into the relationship between social and ecological dynamics on the crop choices during this Neolithization process could not be carried out due to government restrictions.

Regarding the research material difficulties, the excavated area, preservation status, sampling strategies, and flotation methods of the three key Neolithic sites and Hoca Çeşme, as a reference site I selected for the research, were all different from each other, so I had to develop a site-specific strategy for interpreting the data for each site. Although these differences limited the methods of some of the research questions I was seeking to answer, this study, despite all these challenges and limitations, has become the most detailed macro-archaeobotanical study ever conducted based on plant subsistence for the Neolithic Period of Northwest Türkiye.

1.3. Research Questions

The archaeobotanical dataset from four sites -Barcın, Bahçelievler, Hoca Çeşme, and Aşağı Pınar- from which the data was obtained, offers a wide range of archaeological information that can be compared, allowing us to see the nuances of the Neolithic Period. This unique situation enables me to closely observe possible different scenarios of the Neolithization process. Samples obtained from the earliest occupation phases of all four sites provide a chance to gain insights into how the settlers adapted to their environment and modified their agricultural knowledge. This study also contributes as a methodological study to other interdisciplinary research in archaeology. In this context, I seek answers to the following questions in order to draw the framework of the research:

1) What can we understand about the spread of the Neolithic in each of these four unique sites based on botanical data?
2) Do the plant selection criteria change between the earliest pioneer Neolithic communities and those generations later who live in this context?
3) When establishing Neolithic settlements where farming became the prominent form of subsistence, how much of the local flora was utilized?
4) What can the context in which we find the botanical remains tell us about the settlements in question? Can intra-site insights from the distribution provide information on the settlements and the variability that they display?
5) What subsistence strategies did the inhabitants of each site adhere to, especially when it comes to plant choice?
6) Are there different manifestations of the adaptation process during the Neolithic in Northwest Türkiye?
7) How do we furnish our interpretation of the Neolithization process of Northwest Türkiye with new first-hand archaeobotanical data?

1.4. Chapter Breakdown

This dissertation comprises ten chapters. This chapter includes an introduction to the research subject, aims and aspects, research questions, and the outline of the dissertation.

The second chapter explores the regional diversity and complexity of the transition to agriculture in Anatolia and its surrounding areas for understanding the different/similar subsistence strategies, emphasizing archaeobotanical evidence.

Chapter 3 discusses the complexity and diversity of the Neolithization process in Western Anatolia. One of the subjects in the chapter is to understand the interactions between indigenous people and migrant farmers during the Neolithization process. Another aim is to observe the impacts on the subsistence choices/transformations of the Neolithization process, or how subsistence choices have affected this process, especially within the scope of Northwest Türkiye.

Chapter 4 covers the material and methodology of this dissertation. First, describing the field types, deposition, and preservation conditions in the key sites, and thereafter clarifying the archaeobotanical methods during the research. The general methodological stages of the macro-botanical samples include sampling, flotation or dry sieving, drying, sorting, identification, and the interpretation of the archaeobotanical data based on spatial use and crop ratios in the key sites.

The fifth chapter presents a summary of the different plant groups identified in the macro archaeobotanical assemblages of the key sites and includes information about the origins of crops, characteristics, and growth habits of the plants, as well as their geographic distributions. The chapter also discusses how plant genera and species were distributed across the various archaeological contexts and phases in the sites.

Chapters 6, 7, and 8 address the difficulty of determining how plants brought to a settlement -through harvesting or gathering- were distributed and used on-site in indoor and outdoor spaces based on Late Neolithic phases at Barcın Höyük (Chapter 6), Bahçelievler (Chapter 7), and Aşağı Pınar (Chapter 8). The chapters highlight the challenge of knowing whether plants were processed before or after arriving at the site, and how factors like excavation scope, sampling strategy, and preservation can limit our understanding of the spatial distribution and plant-use phase-by-phase, especially if information about key areas like storage spaces is missing.

Chapter 9 evaluates the frequency of economic plant remains, especially the distribution of cereals and pulses, in three Neolithic key sites: Barcın Höyük, Bahçelievler, and Aşağı Pınar.

The crop ratio analysis focuses on the minimum number (1-5) of grain kernels/seeds per sample, storage values, and diachronic trends in crop preferences over one liter of soil. The aim of this analysis is to look at the proportion of crops from minimum to maximum to understand how much space each crop takes up in the field, how that crop is stored, and how much space (in terms of volume) was needed to store it. The last chapter covers a discussion and conclusion of the dissertation.

Chapter 2

2. THE SPREAD OF FARMING AND PLANT-BASED SUBSISTENCE STRATEGIES IN NEOLITHIC ANATOLIA

This chapter explores the regional diversity and complexity of the transition to agriculture in Anatolia and its surrounding areas, emphasizing archaeobotanical evidence within the scope of human adaptation as an evolutionary response to ecological conditions. While hulled wheats like einkorn and emmer are widespread, the presence and prominence of other crop species vary significantly, particularly in Western Anatolia. In earlier Neolithic periods, a broad spectrum of wild and cultivated plants is observed, indicating that although an "agricultural package" existed, its adoption was shaped by local subsistence strategies.

Early sedentary communities in Southeast Anatolia, such as Hallan Çemi, Körtik Tepe, and Gusir Höyük, maintained a strong reliance on wild resources -nuts, legumes, and grains- demonstrating that the shift to farming was gradual and that plant gathering remained central. The coexistence of wild and domesticated species in Central and Southeast Anatolia suggests that agriculture was not solely introduced from the Levant but was also locally developed, particularly in the Tigris–Euphrates region around 10000-8000 BC. Two models are proposed for this transition: the movement of farming populations or the local adoption of farming practices through contact; current genetic and material evidence favors the latter. Furthermore, some regions like Cyprus may have independently developed agricultural practices. Even in areas lacking direct evidence of domestication, such as Western Anatolia and Southeast Europe, unique local responses to agricultural knowledge emerged, highlighting that the transition from foraging to farming was not uniform but complex, regionally variable, and shaped by existing lifeways.

2.1. Neolithization, Archaeobotany, and Human Behavioral Ecology (HBE)

I would like to argue that the Near East-Anatolia-Europe based archaeobotanical studies focused on examining the Neolithization process can be divided into two main branches. The first branch comprises research focusing on understanding the origins of agriculture (Bar-Yosef and Meadow 1995; Braidwood 1960; Cauvin 2000; Harris 1969; Hawkes 1983; Willcox 2012; Vavilov 1951; Zeder 2011, 2024a, 2024b; Zohary 1999; Zohary, Harlan and Vardi 1969; Zohary and Hopf 2000). Studies in this section, mostly examine the domestication stages of

founder crops such as how the initial domestication conditions were formed, what selection criteria the communities depended on, and how the crop plants were distributed to other regions (e.g., Colledge, Conolly, and Shennan 2004; Coward et al. 2008; Heun et al. 2012; Pinhasi, Fort and Ammerman 2005; Zeder 2024a, 2024b; Zohary and Hopf 1973).[1] For example, the most famous discussion is to understand the phenomenon of conscious or unconscious selection of crop plants. Given that one cannot see domestic traits with the naked eye, such studies are often quite complex and require genomic data (Willcox 2012). During the Neolithic transition period, distinctive plant species were cultivated through a culturally conscious and deliberate selection. In fact, a large portion of the archaeobotanical data is dedicated to understanding the initial steps in domestication and the morphological changes that plants may have undergone. While this research is important to my studies, given that I study a secondary region into which agriculture tended to spread, I benefit minimally from discussions in this arena of archaeobotanical research. Nonetheless, we see the adoption of founder crops in the Fertile Crescent. Such crops eventually travel across broad regions. To understand the Neolithic dispersal experience in Northwest Anatolia through plant subsistence strategies, it is necessary to benefit from the first branch of research on the cultivation stages of the founder plants, their vegetational characteristics, and their transition to other regions.

The second branch, I believe, is research focusing on understanding regional dynamics and ecological criteria on crop diversity, selection, and plant use (e.g., Antolin et al. 2020; Bar-Yosef and Meadow 1995; Bar-Yosef Mayer 2015; Campbell 2010; Decaix and Herrscher 2019; Krauß et al. 2018; Marinova and Krauß 2014; Nashli and Matthews 2013; Ptáková, Šída, and Kovačiková 2021; Zeder 2011). This branch usually deals with issues such as cultivation and domestication, changes in the plant subsistence economy, and ecological conditions such as landscape and climate at a regional scale. Botanical data obtained from the sites in a given region are also comparatively studied. Regional-scale research provides a detailed evaluation of a large number of criteria within the given extent and through comparison with other regions. For example, an indigenous domestication process of founder crops occurred in Cyprus, relatively independent from the Levant and Southeastern Anatolia, contrary to what was previously thought (Peltenburg et al. 2001; Colledge and Conolly 2007; Lucas et al. 2012;

[1] As a recent study, Zeder collects and discusses all previous and recent works together about the agricultural origins in the focus on Eastern Fertile Crescent [see Zeder 2024a, 2024b].

Willcox 2012, 2016; Lucas and Fuller 2020). If we go a little further from Anatolia, in Europe, where the Neolithization process doesn't occur until the 5th-4th millennium BC, we find a direct introduction of crop plants through processes of migration and see no traces of primary domestication processes (Out 2008; Raemaekers 2003). Northwest Anatolia (Northwest Türkiye including Turkish Thrace), the region I focus on in this thesis, also deals with the introduction of plants through a process of relocation from the core areas of Neolithization. We can, however, still identify ways in which humans actively shaped their subsistence economy to fit the local environmental and geographic situation. I intend to study the unique selection criteria for domesticated plants that we find in this region using principles applied within this second branch of archaeobotany.

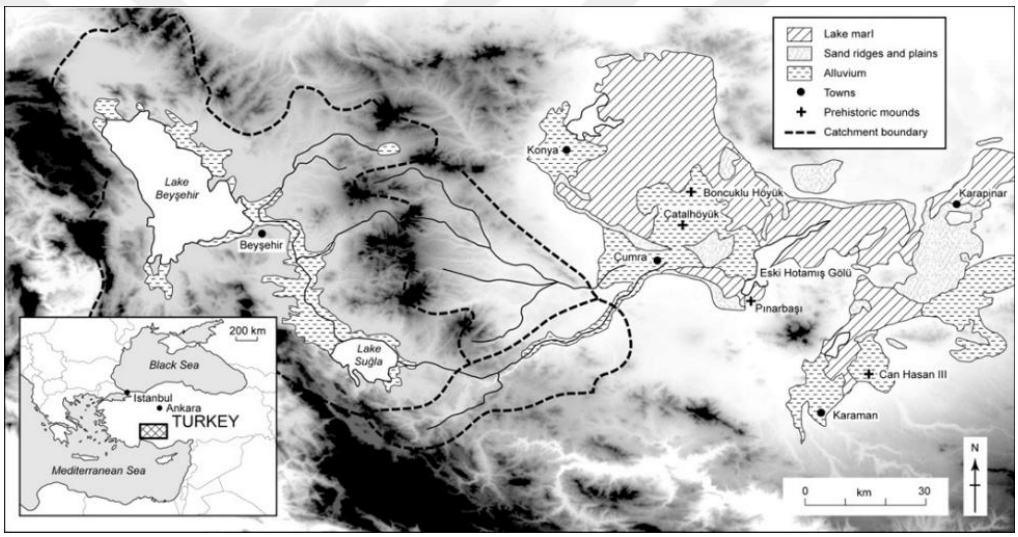


Figure 2.1: The locations in environmental setting of the Epipaleolithic and Neolithic Sites in Central Anatolia (Fairbairn et al. 2014, Fig.1).

This branch also conducts site-oriented research at a micro-scale. This research type examines the adaptation process of a given settlement from the very beginning and contributes to the existing regional discussions or puts forward new discussions using the data obtained (e.g., Bogaard et al. 2017; Ergun 2018; Out 2008; Ramsey et al. 2016). When we look at the archaeobotanical studies in terms of sites, we see that although some settlements show traces of an agrarian lifestyle, some contemporary settlements experienced different processes in their subsistence economies based perhaps on their site-specific preferences. Boncuklu and Pınarbaşı are considered a good example for this. Boncuklu is located in an alluvial area in the Konya plain, and Pınarbaşı is at the end of a rocky outcrop on the ecotone between the Konya Plain to the north and west (Figure 2.1) (Baird et al. 2018; Fairbairn et al. 2014, 802). Despite its

contemporary levels, the inhabitants of Boncuklu adopted a farming and herding lifestyle, while people those at Pınarbaşı, chose a different diet, which included fish, water resources, meat consumption, and plant gathering in its Epipaleolithic levels (8600-8100 cal. BC) and after a hiatus in Late Neolithic levels (6500-6000) with the addition of herding (Fairbairn et al. 2014, 802). Likewise, the later Central Anatolian site of Çatalhöyük shows a combination of farming-herding-gathering subsistence pathways with a broad-spectrum economy (Bogaard et al. 2017; Fairbairn et al. 2002; Fairbairn 2005). As another example of the different processes of Neolithization, in Europe, different settlements, including those with indigenous groups as well as farmer-migrant groups, appear to experience different adaptation processes within a gradual and mosaic way (e.g., Bendrey et al. 2014; Jovanovic et al. 2021; Kotzamani and Livarda 2018; Out 2008). These concepts suggest that each site has its unique specialization when it comes to plant selections, and exploring this variability provides important insights into the spread of the Neolithic.

These possible branch perspectives also include some of the concepts of Human Behavioral Ecology (HBE). In my thesis, I intend to test this spread at the earliest levels of four different sites, each located in different environmental surroundings around the middle of the 7th millennium BC in Northwest Türkiye. This comparison provides a comparative backdrop through which I can collectively look at the plant remains datasets for my thesis.

The grouping made here is not intended to directly determine the framework of archaeobotanical studies, but it examines this framework from a general perspective. I tried to categorize how the researchers handled the concept of Neolithization and decode the kind of contribution and effect the archaeobotanical data had on these studies. Of course, these studies were highly affected by theoretical approaches and methodologies in archaeobotanical studies, and our interpretations have also been shaped by these developments. Without discussing the inputs and outputs of different approaches, clearly detailed archaeobotanical studies at an individual scale have changed or contributed to the general inferences about Neolithization. Archaeobotanical data cannot directly fill a gap in the Neolithization debate, but can connect a missing link in the discussion and enable us to make correlations. I believe that the four comparative first-hand datasets enable me to study this process in a unique and comparative way, which can be included in the second branch. I begin from a site-specific perspective for each of my case studies, but I draw general insights on the process of Neolithization for a large

region and evaluate the distinguishing circumstances that each settlement faced in the initial stages when establishing a Neolithic subsistence economy.

In this respect, I aim to apply the Human Behavioural Ecology (HBE) as a theoretical perspective while trying to understand the Neolithization process through the plant-subsistence strategies, which took place both regionally and, in a site-oriented manner, with all its similarities and differences based on human-plant decisions in Northwest Türkiye. HBE is a research area that is interested in human behavior from an adaptive perspective, and in humans' rapid adaptations to new niches without waiting for the genetic change period compared to other living things (Nettle et al. 2013, 1032-1033). HBE researchers are more interested in the decisions that Hunter-Gatherer groups in the late Pleistocene made and the subsequent emergence of agriculture in the early Holocene. HBE explains the broad-spectrum economy through different responses to the environment by indigenous and migrant people (e.g., Cronk 1991; Hawkes, O'Connell, and Rogers 1997; Laland and Brown 2006; Nettle et al. 2013; Ready and Price 2021; Winterhalder and Kennett 2006; Winterhalder and Smith 2000). I see that the research methods of HBE can also be applied to archaeobotanical research, which I have grouped as branches above. On the other hand, one possible concern is that we do not know much about the indigenous cultures that represent the end of the Pleistocene and the beginning of the Holocene period in the region[2] I am currently studying, and the Neolithic settled-agrarian communities known in the region so far represent the period in the 7th millennium BC. Therefore, it's certainly not possible to examine and compare lifestyle changes and adaptations from this perspective. The important feature of the Late Neolithic settlements I'm examining here is that each represents the earliest settlers of its time period at the site. I'm able to observe the subsistence knowledge that the first settlers brought with them and the relationship they established within the environment where they settled from an archaeobotanical perspective. My aim is to show that, while the four sites share some traces of material culture (mostly traces of the Fikirtepe Culture from 6400/6300 BC onward), they still show different characteristics archaeologically, and their environmental settings are almost distinct.[3] In this respect, I aim to understand, through the available macro-botanical data, whether these new environmental locations were rapidly reflected in their plant subsistence strategies or not, independent of their

[2] Please see Chapter 3 (3.3.2).
[3] Please see Chapter 3 (3.3.3 - 3.3.6).

culture. Three popular and traditional forces of the origins of agriculture are demographic pressure, environmental change, and socioeconomic competition, though the transition of way of life depends on more than a combination of these three forces (Winterhalder and Kennett 2006, 4). For this reason, marginal value[4], opportunity costs[5], and risk-sensitive behavior[6] are the fundamental concepts that HBE is focused on Optimal Foraging Theory/Diet Breadth[7] (Winterhalder and Kennett 2006, 11-20). From this point of view, these research criteria seem to apply to the second branch, which includes human decisions from local and regional perspectives. In light of the first evaluations, it is important that my research questions the optimization, risks, and selection reasons for Neolithic settlers' decisions from site-specific and regional perspectives in the four studied sites. Here, the issue is the condition of settlement organization, plant preservation, and sampling strategy during the research at each of the four sites, since only Barcın has a wide dataset. Nevertheless, the archaeological and archaeobotanical datasets from the other sites suffice to ask site-oriented and regionally relevant questions. The settlers from the three sites studied demonstrate different decisions and strategies regarding plant selection and archaeological data.

Before focusing on my own research area, I would like to take a plant-centered look at subsistence strategies across Anatolia to better understand the regional processes, particularly the origins and spread of agriculture and its relationship with the concept of Neolithization.

2.2. The Beginning and Spread of Farming

The idea that Neolithization spread from the Near East to Anatolia and Europe as a package is widespread. This package typically includes farming and livestock, including founder crops and domesticated animals.[8] However, studies argue that the Neolithic or Farming Package did

[4] Marginal Value refers to the point at which the rate of return from exploiting a resource patch drops below the average rate expected elsewhere, guiding decisions about when to leave for a new patch (Charnov, 1976).
[5] Opportunity Costs represent the benefits forgone when one behavioral option is chosen over another, central to evaluating trade-offs in foraging and other activities (Winterhalder and Smith, 2000).
[6] Risk-Sensitive Behavior describes strategies that account for variability in outcomes, where individuals may prefer either safer or riskier options depending on their current needs and environmental conditions (Winterhalder, 1986).
[7] In the Diet-Breadth Model, the forager faces a quick choice: (a) take the resource they've found, or (b) keep looking in case a better one turns up. If the benefits of searching outweigh the value of the current resource, even after considering the extra time, the forager will skip it—and will keep skipping this type of resource no matter how often it shows up (Winterhalder and Kennett 2006, 14).
[8] In this region, there are eight founder crops (according to some scholars, nine with the inclusion of faba bean): einkorn, emmer, barley, lentil, pea, chickpea, bitter vetch, and flax (Nesbitt 2004; Tanno and Willcox 2006;

not spread directly in its entirety to all regions. In fact, it shows major differences in crop/livestock selection when viewed geographically. For example, Arbuckle et al. reject the Neolithic 'package' idea (which is based on the major four domesticated animals including sheep, goat, cattle, and pig) in their theory on the westward expansion of Neolithic subsistence and are able to show that Neolithic subsistence technologies followed multiple routes and focused on different domesticates. Because Neolithic animal economies are diverse, they argue that livestock did not move as part of a standard agro-pastoral 'package' (Arbuckle et al. 2014). The picture for botanical remains is somewhat less clear. However, Ulaş and Fiorentino declare a similar argument regarding the new glume wheat type (Ulaş and Fiorentino 2021). Referring to Jones et al.'s debate on the origins of cultivated wheat species (2000), they suggest that new glume wheat acted as a founder crop and was restricted in some regions. Tanno and Willcox similarly present a similar debate for the faba bean discovered at Tell el-Kerkh, Syria which later spread to specific regions where the faba bean can in turn also be considered among the founder crops (2006). Thus, all these arguments mentioned above share a similar approach regarding the Neolithic Package, which is that 'the package' did not spread to all regions equally and often included new adds to the package.

In sum, within the 'package' idea, the concept argument was that the domestication of plants and animals began at several sites such as Jerf el-Ahmar, Abu Hureyra, Tell Qarassa, Tell Aswad in the Near East around the 10th-9th millennium BC and spread with the Neolithic way of life to other regions (Willcox 2012). In recent years, many hypotheses about the spread of Neolithic life and domestication have changed with new data from Cyprus, Southeast, and Central Anatolia. Before these studies, many scholars like Bar-Yosef and Meadow (1995) had suggested that there might be a 1,500-year gap between the cultivation of plants and the domestication of animals. Recent studies, however, suggest that both processes occurred at a parallel time (Ibanez et al. 2018; Willcox 2012; Zeder 2011). Ibanez et al. argue that the cultivation of plants and the domestication of animals might have started around the 11th-millennium BC, both in the Western and Eastern wings of the Fertile Crescent (2018). A similar parallel process is accepted for Cyprus as well (Colledge and Conolly 2007; Zeder 2011).

Willcox 2012; Zeder 2011; Zohary et al. 2012). And domesticated animals: sheep, goats, cattle, and pigs (Arbuckle et al. 2014; Zeder 2011).

The old interpretation of the domestication process was mainly on the morphological changes in plants and animals, but Willcox and Zeder argue that the domestication process took a very long time (Willcox 2012; Zeder 2011). It isn't easy to see the domestic traits with the naked eye; therefore, understanding the phenomenon of conscious or unconscious selection is quite complex (Willcox 2012). Cohen suggests that declining health is associated with the emergence of farming economies in prehistory, and the transition to farming probably occurred by necessity rather than by invention and choice (2009). Therefore, morphological change can no longer be considered a principal sign of domestication (Zeder 2011). Nesbitt also thinks that there is no clear evidence for stages of domestication (e.g., Tell-Aswad, Jericho, and Iraq ed-Dubb), and they are not based on precise Levantine PPNA dates (2004). Mainly, the identification of domestic cereals belongs to the discovery of broken cereal chaff. Understanding the domestication of pulses is somewhat more difficult than cereals because of the difficulty of differentiating wild and domestic species. Therefore, this question is still debated (Ibanez et al. 2018). Zeder also mentions the same situation with regards to pulses (2011). In the PPNA, there is a pre-domestication process where cereals were exploited and gathered. Jerf el-Ahmar on the Euphrates valley is an excellent example of high wild cereal exploitation[9] especially when compared to the other seed and fruits (Willcox 2012). Willcox suggests six archaeobotanical lines[10] of evidence that supports the cultivation hypothesis before morphological domestication (2012). The new view is based on the fact that some species were harvested and consumed in their wild form for a very long time before being cultivated. Considering how long it took to acquire a domesticated species, the inhabitants of the PPNA were already in the domestication process.

Generally, researchers suggest that settlements grew in size when communities engaged in agriculture and animal husbandry. Regular supplies of nutrition brought about by surplus production and the resulting population growth resulted in settlement expansions. Campbell

[9] They documented 15,727 remains of charred wild barley, wild rye, and wild einkorn (Wilcox 2012).

[10] First, the decline of some small-seed weeds (Stipa, Panicoid types) and their replacement by cereal grains. Second, seeing species such as rye, two and one-grained einkorn, emmer, chickpea far from their natural habitats. Third, the presence of weeds of cultivation. Fourth, an increase in grain size. Fifth, the location of sites beyond wild cereal habitats. We mainly accept that wild cereals grow locally around the sites, but it is not valid for every site, such as at Zahrat in the Jordan valley or on the Euphrates in northern Syria. Sixth. large-scale cereal exploitation (Willcox 2012).

argues that early mixed farming practices did not directly affect the settlement abandonment at the PPN-PN transition in the early Neolithic site Ain Ghazal (2010). According to the economic strategy at Ain Ghazal, the diet was based on local domestic food resources (50% cereal, 30% pulses, 20% sheep/goat), with a wide range of wild plant foods that they were regularly collecting (Campbell 2010).

Likewise, Nesbitt suggests that there is no explicit/reliable archaeobotanical evidence for plant domestication in the Levantine PPNA (2004). He confirms Willcox's (2002) argument about the independent development of agricultural packages and argues that the quality of the new evidence on subsistence changes and domestication practices in the PPNA can be evaluated with combined recent DNA studies at a regional level (Nesbitt 2004). I agree with Nesbitt about the patterns of the independent development of agricultural stages. Moreover, Willcox criticizes Riehl, Zeidi and Conard's (2013) arguments about the evidence of wild cereal cultivation in the Zagros Mountains of Iran, and he suggests that more evidence is needed to distinguish and date local domestications in this region (2016). Late Pleistocene sites in the Zagros Mountains have ground stones, but as yet there are no documented cereal remains. Wild cereals were used nearly 12,000 years ago in northern Iraq and 13,000 years ago in the north of Syria. The cultivation evidence reaches as far back as 23,000 years ago in the southern Levant. Still, by 14,000 years BP, some houses contained mortars and pestles that were probably used for cereal processing in the early Holocene. It is difficult to understand the differentiation between gathering and cultivation when these Late Pleistocene remains are studied, even though these groups probably knew about cultivation (Willcox 2016). Willcox feels this makes Riehl et al.'s suggestion of early cultivation in the Zagros Mountains problematic given that there is no specific proof.

I hereby make an examination of the Anatolian economic plant range and gathered plants from archaeobotanical studies. The main point of this review is not to list every plant species, but to try to understand the variables of economic plant dispersals between settlements or regions and to show how scholars interpret the 'Neolithic Package' concept in their studies.

In the first section, I look briefly at the diet of hunter-gatherer settlers in the Fertile Crescent to understand the Neolithic transition. In the second section, I consider the interpretations of early cultivation in Cyprus as a close region to Anatolia. The third section contains a discussion of Anatolian regions, including the Southeast, Central Anatolia, the Lakes District, the Aegean Region, Northwest Anatolia, and Eastern Thrace. However, a special

interest is given to West Anatolia (which includes the Aegean Region, Northwest Anatolia, and Eastern Thrace) since it falls within my research topic. In a fourth section, I look at briefly changing the way of life in the diet, especially in Southeastern European communities. Finally, for every region, I discuss the evaluation of the transition towards the Neolithic way of life and the concept of the 'Neolithic Package.' For each of the sections, the main aim is to understand how scholars interpret the transition and adaptation of the Neolithic way of life based on the subsistence strategies between local and migrant groups in the regions. What are the correlates? How does this concept manifest itself? Evaluating different studies from different regions enables me to assess the methodologies of Northwest Anatolia. I hope to gain insights into which regional interpretation better suits the Neolithic adaptation of Northwest Anatolian groups based on subsistence. As a last aim, I hope to document the regional interactions during these cultivation and transition processes.

2.3. A Brief Discussion: Hunter-Gatherer Settlers?

For the Fertile Crescent, Ibanez et al. differentiate the Neolithic transition into three phases: the Late Epipaleolithic (Natufians and Zarzians, 12,300 to 9800 cal. BC), the PPNA (experience with wild plant cultivation and animal management, 9800 to 8600 BC), and the PPNB (the appearance of plant and animal domestication, until 7000 BC) (2018). Willcox mentions a type of cultivation during the Natufian Period, but the evidence is poor. The cereal grain size from this period remains small. Some bigger grains may have a puffy structure due to burning. Therefore, if cultivation did occur, it must have been on a very small scale in the Natufian Period (2012).

The Kebaran Period, which precedes the Natufian, yielded evidence of hunter-gatherers in the coastal plains and Mediterranean woodlands, and parts of Syria's semi-arid steppes and deserts. Kebaran groups moved to seasonal camps, which were mostly identified with semi-circular structures with small rocks and postholes (Akkermans and Schwartz 2003). Does this evidence suggest that the Kebaran people were the first semi-sedentary groups rather than Natufians? Akkermans and Schwartz suggest that the transition was gradual over many generations rather than a sudden break with the past and argue that intensive sedentism began in the Natufian Period despite clear proof of plant cultivation or animal herding (2003). Akkemans and Schwartz identify the Geometric Kebaran groups as 'simple foragers' when compared with Natufian groups (2003). Did researchers reach this conclusion because the

Natufians showed an intensive settled life? Scholars often argue that early human societies were relatively simple, gradually developing greater technological and intellectual complexity as their populations expanded and social structures evolved. I disagree with this terminological approach because the Geometric Kebaran communities benefited from or exploited diverse landscapes between 16,000 and 12,500 cal. BC.

Moreover, the Epipaleolithic is usually evaluated within the concept of the Natufian paradigm, and the Natufian paradigm is explained as sedentary behavior (Baird et al. 2013, 177; Baird et al. 2018). There is less evidence about the Epipaleolithic period in Anatolia, but Pınarbaşı, Öküzini, Beldibi and Direkli caves and rockshelters are essential for documenting the little that we know about this period (Baird et al. 2013). Careful consideration of the Anatolian data suggests some similar links with Natufian culture.

Overall, both at the end of the Epipaleolithic period and at the beginning of the Neolithic period, the stages of cultivation and domestication, which we see as radical changes in human life, proceed in places with similar variables, rather than following a linear path in a single line within a long process.

2.4. Neolithic Subsistence Strategies

2.4.1. Neighboring Region: Early Cultivation in Cyprus

Akrotiri- *Aetokremnos* (10,500 cal. BC), Parekklisha- *Shillourokambos*, Kissonerga-*Mylouthkia*, Krittou Mattou- *Ais Yiorkis*, Ayios Thyconas *Klimonas* Kholetria *–Ortos*, Nissi Beach, Akamas *Aspros,* Tatlısu-Çiftlikdüzü/ Akanthou- *Arkosyko* are the Cypriot-PPNA (9000-8200 cal. BC), and Cypriot-PPNB (8200-5200 cal. BC) sites represent the early occupation and domestication stages in Cyprus.

One of the most important research topics in Cyprus revolves around the colonization process and how the first settlement on the island took place, and how the subsistence economy was developed during the Pre-Pottery Neolithic, what methods they applied to cope with the current ecological and specific stress conditions (Button 2010; Peltenburg et al. 2001; Katsarou-Tzeveleki 2001; Swiny 2001; Knapp 2010; Bar-Yosef Mayer et al. 2015). Another curious point is how early farming communities could adapt to this region (Colledge and Conolly 2007; Lucas et al. 2012; Vigne et al. 2012; Leilani and Fuller 2020). At the same time, subjects such as which products are critical in the food economy, the effects of traditional "Mediterranean"

agriculture in farming activities, and the place of domesticated animals in the subsistence economy also comprise the basis of the research (Croft 2002; Vigne et al. 2014; Leilani and Fuller 2020).

Peltenburg et al. discuss the debated issue on the movement of people to Cyprus (2001). They argue that the founder crops (einkorn wheat, emmer wheat, hulled barley, lentil, bitter vetch, pea, chickpea, and flax) are present in the PPNB in Cyprus as evident at the site of Mylouthkia (2001). 'Ais Yiorkis is a Cypriot-PPNB site and dated to 7500 cal. BC. The results show that two of the three founder cereal crops (einkorn, emmer, barley) originating from the Fertile Crescent are present among the 'Ais Yiorkis samples. Lucas et al. who measured the two-grained einkorn grains, indicate that the results show an increase in grain sizes (2012). This could mean that there was a cultivation process around 7500 cal. BC. There are also very early animal introductions. The domestic status of the pig, cattle, and caprines at Shillourokambos is an example. During EPPNB times, even earlier evidence for domestication probably remains to be located on the mainland (Peltenburg et al. 2001).

The critical argument is that the island was more closely in contact with the coastal Mediterranean outside the Levantine Corridor and the long-distance distribution of farming systems occurred earlier than we thought in northerly regions (Peltenburg et al. 2001). In other words, what is understood from all these arguments is that a domestication process had taken place in Cyprus relatively independent from the Levant and Southeastern Anatolia. In this way, Zohary's (1999) single region and short time-period ideas on the domestication on founder crops approach becomes controversial, and many researchers now refute his view (Peltenburg et al. 2001; Colledge and Conolly 2007; Zeder 2011; Lucas et al. 2012; Willcox 2012, 2016; Lucas and Fuller 2020). The appearance of four of the founder crops of Neolithic agriculture in Cyprus at such an early date has inevitably prompted speculation about the possibility of indigenous domestication (Colledge and Conolly 2007).

The earliest settlers of Cyprus were farmers who followed a mixed subsistence strategy that followed a strategy less focused on cereal production and livestock keeping and took advantage of gathering and hunting managed populations of deer (Lucas and Fuller 2020). The exciting recent discoveries in Cyprus provide a unique perspective on this long period of low-level food production in mainland Fertile Crescent. Ibanez et al. also discuss the evidence from Cyprus on the emergence of agriculture and domestication (2018). Here, Zeder thinks

exploiting these domesticated species in Cyprus is essential and successful, making Cyprus an excellent example of micro-scale domestication. It shows how domestication emerged in one region and then spread (2011). The results prove that farmer colonization starts in Cyprus about 8500 cal. BC (College and Conolly 2007; Lucas et al. 2012). The archaeobotanical data from the earliest levels at Kissonerga Mylouthkia provide evidence on domesticated cereal crops in the Cypro-EPPNB (Lucas et al. 2012; Peltenburg et al. 2001). The appearance of the four of the founder crops of Neolithic farming in Cyprus opened a debate on the possibility of indigenous domestication (College and Conolly 2007). Based on this argument, College and Conolly cite two different views about the spread of agriculture. First, agriculture transferred from one or a few areas with the rapid spread. Second, we can talk about multiple independent domestication events for individual species (2007). My opinion shares sympathies with the second argument.

2.4.2. Anatolia

The Southeast Anatolian Region

Firstly, the Neolithic sites dating to the PPNA and the PPNB, such as Hallan Çemi, Nevali Çori, Çayönü, Göbekli Tepe, recently Karahantepe and Sayburç, Cafer Höyük, Demirköy, Körtik Tepe, Gusir Höyük, Boncuklu Tarla, and Çemka in Southeastern Anatolia, provide more information than originally thought about the subsistence strategies and the beginning of farming in the region. The region also provides data about the transition from sedentary hunter-gatherers to farming communities. On the other hand, when compared with the Levantine Natufian Period, the evidence from Southeast Anatolia is poor. The most typically cited explanation for this lack of data is attributed to the Younger Dryas. These occupations have an extensive network and evidence of domestication and cultivation.

In Hallan Çemi (Batman), in the 10th-millennium cal. BC, a settled community with round stone structures opening to the central point existed, with a subsistence economy consisting mainly of gathering and hunting. Remains of gathered plant group is dominated by sea club-rush (*Bolboschoenus maritimus* type) (32%) and dock/knotgrass (*Rumex/Polygonum*) %27. The other gathered plants, wild almonds, pistacia, lentils, and vetch, are among the most common plant remains. Remarkably, cereal crops were not exploited even though the population was settled, and Rosenberg argues that their subsistence was not based on cereal exploitation (2011a). The clear absence of cereals appears to be consistent with the site's lack of sickle blades on chipped stone tools production (Rosenberg 2011a: 66-67; Willcox and

Savard 2011, 269). On the other hand, Willcox and Savard explain that 39 wild wheat types were identified, and 124 grains of wild barley were documented, suggesting that wild cereals might have been consumed (Willcox and Savard 2011, 269).

In the Demirköy (Batman) site, which coincides with the beginning of the 10th millennium BC, like in Hallan Çemi, there is a dominance of sea club-rush (*Bolboschoenus maritimus* type), and dock/knotgrass (*Rumex/Polygonum*) in the plant assemblage. Wild pulses, nuts, including almonds and pistacia, are the species that were reliably dominant in the food assemblage at Demirköy as in Hallan Çemi. Although small-seeded grasses are also found in the assemblage, they still do not seem to be an essential food source (Rosenberg 2011b, 83; Willcox and Savard 2011, 270).

At Çayönü (Diyarbakır), there are no signs of cultivation in the earliest round-house sub-phase, but this could be a result of sampling strategies. There are few wheat rachis fragments (probably wild einkorn and emmer), wild barley remains, pistacia, sea club-rush (*Bolboschoenus maritimus* type), and a few pulses (van Zeist and Roller 1992; Willcox and Savard 2011, 270). Zeist and Roller evaluate the presence of cereal remains as a more significant component of the diet than at Hallan Çemi and Demirköy (1992). The subsequent phases of Çayönü (rectangular structures) provide a domestic framework. Einkorn, emmer, bitter vetch, lentil, pea, and maybe chickpea and grass pea are documented. Pulses have a more abundant role than cereals during this process (Cappers 2014; Van Zeist and Roller 1992; Willcox and Savard 2011, 270).

Göbekli Tepe's (Şanlıurfa) PPNA-PPNB layers yielded no documented cultivated species in the cereal or pulses groups (10th / 9th millennium BC). Wild einkorn, wild wheat/rye, wild barley, wild lentil, pistacia, almond, goat-grass, hyacinth type, pea family, bedstraw are the identified wild species in Early Neolithic Göbekli Tepe (Neef 2003, 14). The site yielded only 144 identifiable pieces from the samples even though 1950 liters of soil were floated. Neef explains that this situation may be because the conservation conditions were not good, and the charcoal remains were very fragile (Neef 2003, 13). On the other hand, the starch and phytolith analyses on the ground stones in the site show that phytolith analyses prove a significant presence of cereals for all layers at Göbekli Tepe (Dietrich et al. 2019). In addition to Göbeklitepe, as a recent data, Sayburç also provides a similar plant range for EPPNB (Balcı 2024).

Cafer Höyük (Malatya) is dated to about 8300-7500 BC, and the archaeobotanical results include wild and cultivated types of cereals such as einkorn, emmer, barley, rye, and pulses (especially lentils). The dating of the beginning of occupation at this settlement shows that Cafer Höyük was an agricultural village. The fruit trees, such as hackberry and almond, were used for food and fuel (Cauvin et al. 2011, 15; Willcox and Savard 2011, 271). The gatherer way of life also has continued; therefore, probably there is a heterogeneous diet/use of plants in the site.

Körtik Tepe (Diyarbakır), including Epipalaeolithic and Early Neolithic levels (10,400/10,200 to 9250 cal. BC), provides evidence for the crucial period of change from the Younger Dryas to the Early Holocene. Located in the Fertile Crescent, the site represents a settled lifestyle in the upper Tigris region, with a wide range of wild plant data (Rössner et al. 2018, Table 3). Comparing the Körtik Tepe botanical data with the forthcoming Boncuklu Tarla and Çemka results (Balcı and Kodaş 2024) will be helpful when trying to understand the stages of subsistence in the region.

Gusir Höyük (Siirt), PPNA,~11,400–10,900 cal. BP, has a narrow plant resource spectrum, however, presented with the abundance of gathered plants with almond and pistacia, hackberry, and wild pulses with lentil, bitter vetch, vetch/grasspea, *Vicieae, Onobrychis*, and small-seeded cereals. Another wild plant group is dominated by crucifers, carnation, Cyperaceae families (Kabukçu et al. 2021).

Sumaki Höyük (Batman), LPPNB (7310 - 7040 cal. BC), and Early PN (6480 - 6400 cal. BC), have the dominant crop groups as pulses and cereals (lentil, emmer, barley, and flax). Kutlu et al. argue that the archaeobotanical data does not show any proof of agricultural activities for the LPPNB and EPN phases of the site, but one does wonder how this can be possible in that period. When compared with the data from neighboring Çayönü Tepesi and Salat Camii Yanı, they argue that there are similarities between the archaeobotanical remains. Lentil remains an abundant pulse species in the region (Kutlu et al. 2018).

In sum, there is a human-plant relationship on a broad spectrum in crops and gathered plants in this region. In the early levels of most of the sites, a large amount of wild cereal and legumes, and fruits/seeds were remarkably collected from the environment, moreover, there is also intense exploitation of wild plant groups. Nevertheless, there is a lot of evidence for cultivation based on the cereal and pulse species and the farming implements that started to

develop. When I look at the picture from this point of view, I see that the people in these occupations continued their hunter-gatherer lifestyle for a long time, even though they had settled down, and they continued this in a more composite structure despite agricultural practices.

Central Anatolia

In Central Anatolia, there are only a few known early settlements dating to the late Epipaleolithic (Pınarbaşı Rockshelter) and the 9th millennium BC (Boncuklu, Pınarbaşı, Aşıklı, Musular, Balıklı, Canhasan III), while Çatalhöyük remains later than others.

Pınarbaşı presents a continuity of plant gathering practice as a critical subsistence strategy from 9000-8000 cal. BC in Central Anatolia (Fairbairn et al. 2014). The presence of sedentary foragers here was contemporary with early cultivators. The archaeobotanical results of Pınarbaşı differ from the Near East region. Öküzini (Martinoli 2004) yields data that is similar to Pınarbaşı but evidence for nutshell is absent in Pınarbaşı around the 11th-millennium calBP. It is possible to talk about a broad range of plants, including nuts, wild almonds, pistacia, hackberry, wild seeds, and a fragment of lentil (Baird et al. 2018; Fairbairn et al. 2014). There is no evidence of the cultivation or gathering of cereals and legumes at the 10th–9th-millennium Pınarbaşı (Baird et al. 2018; Fairbairn et al. 2014). According to the botanical and carbon and nitrogen stable isotope analyses, plant food diet comes after fish, other water resources, and meat consumption (Baird et al. 2013).

Boncuklu Höyük has shown evidence regarding the cultivation of cereals and legumes and the exploitation of nuts, as in Pınarbaşı (Baird et al. 2018). There are both similarities and differences between these two occupations. The region appears to have been occupied by two different communities with quite distinctive cultural identities, according to the analysis of chronological, material culture, and seasonality evidence. Baird et al. argue that the two communities made contrasting economic choices: the Boncuklu community adopted and sustained low-level crop cultivation and developed animal management; the Pınarbaşı community, however, seems to have rejected both innovations (Baird et al. 2018).

In the Cappadocia region, Aşıklı Höyük (upper level 4) has shown substantial evidence with regards to the cultivation of crops before 8000 cal. BC (Ergun 2018; van Zeist and Roller 1995a). There is also evidence for penned morphologically wild caprines at Aşıklı Höyük

(upper level 4) (Stiner et al. 2014). Cereals at Aşıklı Höyük include wild and domestic forms of einkorn, emmer, and new glume wheat type, naked wheat, hulled two-rowed barley, and naked barley. Emmer is the abundant cereal type at the site. The pulses group includes bitter vetch, lentil, chickpea, and pea (Ergun 2018; van Zeist and Roller 1995a). In other words, the site yields a broad range of gathered wild resources. Hackberry fruits were gathered intensively. In addition, Pistacia/terebinth and almond were among the collected species (Ergun 2018). The practice of gathering subsistence, which was also present at Pınarbaşı, continues at Aşıklı although high exploitation of cereals and pulses begins already in the earliest phases (Ergun 2018).

Çatalhöyük yields a broad spectrum of economic plants. The primary crop selection includes species of einkorn, emmer, naked wheat, barley (naked and hulled), and rye within the cereal group, and lentil, bitter vetch, pea, and chickpea comprises the pulses group (Bogaard et al. 2013b, 2017; Fairbairn et al. 2007, 2002). Gonzalez et al. investigated the microstructure and cell tissue of the cereal-food remains from selected 200 archaeobotanical samples at Neolithic Çatalhöyük (2017). It is possible to talk about 3-4 types of food preparation (baked bread-like, dough, and porridge-like) from cereal and pulses at Çatalhöyük (Gonzales et al. 2017). There is also a broad range of gathered plants such as wild mustard, almond, pistacia, fig, hackberry, sumac, oak stone, juniper, caper, and some tubers (Bogaard et al. 2013b, 97; Fairbairn et al. 2007).

The most challenging aim is to understand what agricultural strategy played a role in Çatalhöyük. The wild seed flora includes a well-defined wetland plant range and dryland species (probably grown on arable land) (Fairbairn et al. 2002).[11] The stable carbon isotope analysis on barley shows that barley (two-row has a higher tolerance to dry conditions than the six-row) is a more durable crop in a dry environment than wheat (Bogaard et al. 2017). Because there is a lack of arable land for the settlement population within 5 km, if we look at the location of Çatalhöyük, they must have used arable lands which had different ecological characteristics in a larger area than was thought. It is clear that there is a diverse repertoire of crops/complex farming system, thus several cultivated species were used together at Çatalhöyük (Bogaard et al. 2017; Fairbairn 2005; Fairbairn et al. 2002).

[11] For more detail, please see table 4, part A-B in Fairbairn et al. 2002.

Overall, the Neolithic elements here represent a combination of farming-herding experiences, and Çatalhöyük is an excellent site for investigating these subsistence pathways (Bogaard et al. 2017). Central Anatolia includes contemporary settlements in some levels and these settlements show different economic choices such as Pınarbaşı and Boncuklu (Baird et al. 2018; Fairbairn et al. 2014). In Aşıklı Höyük, besides cereals and pulses (wild and cultivated types), there is a broad range of gathered wild plant resources (Ergun 2018). All this data suggests that the picture of the Neolithic is diverse, and its interactions need to be reconsidered thanks to new studies and approaches.

The Lakes District

This section is on the Lakes District Neolithic. In the nearby Antalya region, the Epipaleolithic phase is present in Öküzini and Karain caves. The cave sites are not directly located in the Lakes District but I would like to briefly include them in this section as they contain the closest Epipaleolithic data related to this region, and the sites provide a comparison of Epipaleolithic subsistence economies, crucial to understanding the Early Neolithic and the adaptation and continued mixed forager-farmer behaviors in a regional context.

Martinoli draws an excellent environmental and diet outline around the Epipaleolithic Öküzini and Karain cave sites in the Antalya region (2004). The sites also provide a comparative plant range with other contemporary sites such as Pınarbaşı. Without the environmental taxa, thirteen non-wood plant taxa were identified. Some identified plants are small-seeded legumes, seeds, and fruits of *Rumex*, a small shrub, clover-like plants, *Galium*, bur-reed, sedge family, *Scirpus*, grass, and bromegrass[12]. Based on the plant data, Martinoli argues that the recovered plant foods point to late summer and autumn occupation at Öküzini. The faunal data point to late spring and early summer hunting (juvenile ovicaprines and fallow deer) during the Epipaleolithic (2004). This means occupation at the site may have been from late spring through autumn.

For the Lakes District, the archaeobotanical studies are limited compared to some other regions in the Neolithic Period; thus, I follow the two recently published studies de Cupere et al. (2017) and Martinoli and Nesbitt (2003) while considering subsistence strategies of the

[12] The Latin names or common names of plants mentioned are the same as mentioned in the original text.

region. Helbaek (1970) – Hacılar and Nesbitt (1996) – Kuruçay also contain archaeobotanical data partly from Neolithic levels.

The Neolithic and Early Chalcolithic periods (7000-5500 BC) include limited data (Bademağacı ENI levels). Especially, levels dated to pre-6500 BC are debatable because of the size of the exposures and issues arising from the radiocarbon calibration curve. The evidence of the first occupation comes from the Late Neolithic -6500-6100 BC- (de Cupere et al. 2017). Based on Late Neolithic Höyücek -6400-6100 BC- and Hacılar VI (6200-6070) the plant subsistence consists of cereal crops such as emmer, naked wheat, barley, and pulses such as pea(?), lentil, bitter vetch, grass pea, and chickpea. There is only one simple identified as pistacia/terebinth as a gathered plant at Late Neolithic Höyücek. In Hacılar VI, the cereal crops are einkorn, emmer, naked wheat, barley, the pulses are pea, lentil, and bitter vetch, and the gathered plants are Pistacia/terebinth and celtis (de Cupere et al. 2017, Fig.2).

Martinoli and Nesbitt have examined eleven samples collected from the basin/storage bins in a few structures from a burnt destruction level from Höyücek (2003). In the eleven samples, they documented 39,000 plant remains. Identified crops include emmer, naked wheat, lentils, bitter vetch, and chickpea. They also analyzed the wild plant remains (for example, *Triticum boeticum, Medicago, Aegilops*) as crop processing by-products, presumably stored for fodder. All storage contexts come from inside the buildings; only chickpea comes from an exterior context. This chickpea sample includes mostly chickpea seeds rather than a mixed content of types of plants. The status of chickpea is unclear in the pottery Neolithic as it rarely occurs at Neolithic sites. Therefore, the chickpea sample at Höyücek is an important record. They interpret the bitter vetch/lentil/grass pea store data as either fodder or for human consumption after detoxification by leaching and cooking. This follows the common view on legumes in the Neolithic period (Martinoli and Nesbitt 2003).

In this region, we no longer see a composite plant use as in Southeastern or Central Anatolia, but a subsistence economy that is more agrarian. It is clear that there are agricultural practices that have moved into the region, although there is currently no clear evidence of a cultivation process in the region. On the other hand, there are small differences in the economic plant range between the Neolithic occupations, of course also taking into account the preservation conditions of the plants remaining in the sites.

The Aegean Coast of Anatolia

In this section, Ulucak Höyük and Ege Gübre are the only sites which provide some archaeobotanical results as Neolithic occupations. The archaeobotanical data from Girmeler cave, between western Anatolia and the Antalya region, dating to the late 9th and 8th millennia BC (the earliest site in the region), and Çukuriçi in İzmir are still in progress. In fact, Girmeler cave and the earliest levels of Çukuriçi (XIII-XI) can provide earlier information about the human-plant relations and use in this area.

The archaeobotanical data from Ulucak Höyük, dating to the first half of the 7th millennium BC, enables us to better understand the subsistence economy and the relations between humans and the natural environment during the Neolithic Period (layers IV-V-VI). In the earliest Phase VI, einkorn wheat, emmer, hulled and naked barley, naked wheat, and lentil are documented. All of these are cultivated, and they play a fundamental role in the subsistence economy of the community (Çilingiroğlu et al. 2012, 150).

The subsistence data from the site of Ege Gübre IV-III, which dates to the sixth millennium, indicates that agriculture and animal husbandry are the primary subsistence sources (Sağlamtimur and Ozan 2012). The Menemen Plain, with fertile alluvial deposits brought by the Gediz River, is important for the region's agricultural potential. Among the botanical remains, naked wheat, bitter vetch, lentils, and chickpeas were likely obtained from the regional sites; however, no botanical analyses have yet been extensively conducted in Ege Gübre, however, Sağlamtimur and Ozan relate many grinding stones which are found in the excavation area to the agricultural activities (Sağlamtimur and Ozan 2012, 236).

Consequently, it is difficult to comment on plant selection and similarities/differences in crop range without detailed publication of archaeobotanical data, although there is enough data to prove the existence of agriculture in the region.

Northwest Türkiye

Marmara Region

In this region, chronologically Bahçelievler, Keçiçayırı from Bilecik-Eskişehir provinces, Barcın Höyük, Aktopraklık, Menteşe, and Ilıpınar from Bursa province, Pendik, Fikirtepe, Yenikapı, and Yarımburgaz Neolithic levels from İstanbul province present the Neolithic way of life, however archaeobotanical data are not available from all excavations.

When we examine the range of agricultural products in the settlements in the region, we see that the crop selection is quite similar. However, there are also notable differences. There are three settlements in Northwest Anatolia, Barcın Höyük (Balcı 2018; Balcı et al. 2019; Balcı et al. 2022), Bahçelievler (Balcı et al. 2022), Keçiçayırı (only four samples, analyzed by Balcı), Ilıpınar (van Zeist et al. 1995b; Cappers 2008, 2014) and Aktopraklık (Karul, 2017), whose botanical results we know for certain. The archaeobotanical data from Pendik and Yenikapı Neolithic sites have also been studied recently (Ulaş 2020).

In Eskişehir/Bilecik province, the archaeobotanical data has been obtained from Keçiçayırı and Bahçelievler. At Keçiçayırı, emmer, einkorn, naked wheat, hulled barley, wild barley are among the cereal crops. Five pulse fragments, one bitter vetch seed, and a half of a piece of pistacia/terebinth (?) have been documented from only four samples during a study that I conducted in the summer of 2020. The seed preservation at Bahçelievler, where many samples yielded hardly any remains, is remarkably low. In Phases 6 and 5, the cereals include barley – naked/hulled, bread/hard wheat, and einkorn wheat, which is represented by a single grain. Likewise, a mere two seeds of lentils have been identified for Phase 6 at Bahçelievler. Though minimal, Phase 6 also yielded evidence of gathering with two fruits of *Pistacia* ssp, and 77 fruits from five different samples from the courtyard areas suggesting a much larger emphasis on gathering. The gathered plant remains also include two seeds of *Vitis* ssp. (grape) (Balcı et al. 2022).

In Bursa province, the archaeobotanical data has been obtained from Barcın, Aktopraklık, and Ilıpınar sites. At Barcın Höyük, in Phase VIe, investigations yielded economic plants from the cereals, pulses, and some of the gathered plants. The cereal group consists of einkorn, emmer, naked wheat, and six-row barley–hulled. Among the pulses, lentil, pea, and bitter vetch were identified. In this phase, excavations yielded only 15 pulse fragments, while flax was represented by a mere seven seed fragments. In summary, barley (hulled), einkorn and emmer wheat (hulled), bread/hard wheat (naked), lentil, bitter vetch, pea, and flax represent the primary economic plants from the earliest phase VIe at Barcın. In Phase VId1, in contrast, we find a greater variety. In sum, in addition to the assemblage present in Phase VIe, in this phase, we begin to see convincing quantities of lentils and flax along with chickpeas, hazelnuts, and bramble, indicating an increase in the diversity of the economic plant species (Balcı 2018; Balcı et al. 2019; Balcı et al. 2022). At Aktopraklık C, for now, we know the presence of six-row

barley, emmer, lentil, bitter vetch, and flax (Karul 2017). However, preliminary data shows the presence of domesticated species. The isotopic analyses conducted by Budd et al. suggest that the inhabitants' diet was based on domestic animal proteins rather than plant proteins according to stable isotope analysis on human bones (2013, 2018). At Ilıpınar, there are 24 samples from the earliest phase X and 20 samples from the overlying phase IX. According to the data, barley, emmer, small-sized wheat, einkorn, lentil, bitter vetch, grass pea, pea, flax, fig, and bramble were identified as economic plant species in the two earliest phases. In this comparison, one pistacia fruit is present only in the earliest level of Ilıpınar (Phase X) (Cappers 2008).

In Istanbul province, the archaeobotanical data has been obtained from Pendik (Asian side), and Yenikapı (European side) sites. At Pendik, a small amount of plant remains has been recovered, although a total number of 1340 liters of soil samples were analyzed (Ulaş 2020, 30). According to the limited data, only one emmer grain, one barley grain as cereal, one-seeded of grass pea, and one-seeded of pea as pulses, seven seeded of flax, and two fruitlets of bramble were identified within the economic plant data. Other identified plant remains are included in the wild plant group (Ulaş 2020, 30-31). At Yenikapı, there is a higher variety in the economic plant range despite the lesser quantity of soil samples (about 250 liters of soil) than Pendik. The cereal group includes emmer, einkorn, bread/hard wheat, and a related species to the bread/hard wheat has been documented; new glume wheat type, *T. spelta*, *T. compactum* as a different picture than the general regional crop range (Ulaş 2020, 32). The pulse group includes lentil, chickpea, grass pea, bitter vetch, pea, and faba bean (*Vicia faba* var. *minor*) and as a gathered plant, fig, grape, and bramble have been documented (Ulaş 2020, 32-33).

When we look at the general crop selection in the region, the most dominant economic plant species come from the cereal and pulses groups. Among the cereals, hulled barley, einkorn, emmer, and bread/hard wheat are presented. Among the pulses, there are lentils, bitter vetch, chickpea, and pea species for the early stages of Late Neolithic. Another crop plant is flax. In addition to the cultivated species, hazelnut, pistacia (documented at Bahçelievler and Aktopraklık), and a very small amount of bramble, grape, and fig (?) are among the fruits collected from the environment and consumed. From this point of view, settlers in the region knew and practiced agriculture and knew their environment, but they applied the local adaptations for subsistence with more individual behavior on some small scales in the region. In addition, it has been shown that a high amount of nutrition comes from meat and dairy

products, although it is generally thought that a large percentage of these communities' diet was based on economic plants (mostly cereal), because they were also intensive farmers. We know this especially from the carbon and nitrogen isotope analyzes made on bone collagen on individuals in Aktopraklık and Barcın from the work of Budd et al. (2013, 2018, 2020). Fish consumption also plays a role at some sites, but it is mostly a supplementary food in the diet. For this reason, our archaeological interpretation will remain incomplete and perhaps inaccurate at some point, unless multi-dimensional research is carried out in each settlement.

Turkish Thrace

This region is represented by the sites of Hoca Çeşme (south of Edirne), Aşağı Pınar, and Kanlıgeçit (Kırklareli) with their Late Neolithic and Chalcolithic layers. There are only 14 samples from Hoca Çeşme (studied by Balcı, in progress), and many samples from different levels of Aşağı Pınar (Balcı and Neef, in press).

At Hoca Çeşme, the only identified pulse species are two-row barley (abundant species), naked wheat, einkorn, emmer in the cereal group, lentil, and pea. As gathered plant remains, only 1.5 nutshell remains are documented. The wild plant taxa are also poorly represented.

At Aşağı Pınar, from the earliest Phases 7 and 6 (5950-5750/5700 BC), a preliminary assessment indicates cereals being the most common, followed by pulses. The cereals include emmer, einkorn, bread/hard wheat, and barley. Emmer wheat is an abundant species based on the number of remains. Among pulses, the following have been identified: lentil, grass pea, pea, and bitter vetch; no chickpea has yet been identified; lentil is the abundant species. Among collected species, two bramble fruitlets and plum as 'endocarp' are of interest. The highly scarce presence of wild plants such as gromwell (*Lithospermum* sp.), blueweed (*Echium vulgare*), and bedstraw (*Galium*) strongly implies that seeds have been well sorted somewhere beyond the site. Future assessments and contexts are apt to receive an exciting picture of harvesting practices. It is possible to surmise that the Aşağı Pınar community had arrived with a broad spectrum of domestic species.

The settlements in Thrace bear similarities with both Anatolian and Northern Thrace settlements in terms of archaeological remains. For this reason, especially when examining the archaeobotanical data of this region, it is necessary to conduct research regardless of geographical borders to compare both crop selection and morphological characteristics of both

sides. For example, the Hoca Çeşme remains are more similar to the settlement of Makri in Greece (Esftratiou and Garcia 1998) when compared to the Marmara Region. On the other hand, Aşağı Pınar shares similarities in the crop range with the Yenikapı (İstanbul) plant data, but it is important to be sure about the contemporary levels of the sites to determine if it is a common observation of a wide range of plant data in the later levels of the Late Neolithic and Chalcolithic sites compared to the earliest levels.

2.4.3. Neighboring Region: Southeast Europe

This section consists of a kind of literature review about what scholars think about the subsistence strategies of the Southeastern European Neolithic sites and how they interpret the Neolithic Package and Neolithic transition based on the archaeobotanical and carbon isotopes data.

Marinova et al. investigate data on a wide range of wild plant resources (mostly hazel and elderberry) that the Mesolithic/ Early Neolithic people potentially used in South-East Europe and suggest unchanged availability of the local resources and continuity of the subsistence strategy on gathering more than a millennium (2013). I think they give an excellent overview of the usage of wild plant taxa during the Late Mesolithic and Early Neolithic in South-East Europe and prove continuity in the subsistence strategy among foragers and sedentary people.

Kotzamani and Livarda also provide new and complementary archaeobotanical data for Greece between the Mesolithic and the Early Neolithic (around 7000-6000 BCE), and they compare the data with some sites from Macedonia as well. For the Mesolithic archaeobotanical dataset, the data comes from Franchthi Cave, Cyclops Islands (Youra), and the open site of Maroulas (Kythnos). Franchthi Cave yielded wild barley, oat, lentil, some fruits, nuts (almond and pistacia), pear, caper, and various Leguminosae taxa. Theopetra shows an abundance of wild pulses species in comparison to wild cereals. This pulse group includes pea, bitter vetch, grass pea, and lentil (Kotzamani and Livarda 2018). The Early Neolithic indicates a broader range of crops than the Mesolithic stage since einkorn and emmer, barley, lentil, and various fruits and nuts gathered from the wild were found in Greece (Kotzamani and Livarda 2018).

Marinova and Krauß (2014) investigate the archaeobotanical samples (macro) from four Early Neolithic sites (Koprivets, Orlovets, Dzhulyunitsa, Samovodene) in Northeast Bulgaria

between 6100-4800 cal. BC. During the Early Neolithic, the main crops in this region were first hulled barley, einkorn, and rare emmer. Therefore, the range is slightly different from Southeastern Bulgaria, where einkorn and emmer (hulled wheat) are the main crops in SE Bulgaria. Other crops are lentil, pea, grass pea, and flax. They also identified a broad spectrum of gathered plants. The collected plant species represent the use of environmental resources. The most abundant species are cornelian cherry and plums; other species include hazel, raspberry, and elderberry. The gathered plant species signal an open-forest landscape, likely caused by human activities (Marinova and Krauß 2014). Marinova et al. (2013) mention a similar land use for the Mesolithic/ Early Neolithic in South-East Europe, as mentioned above. There is no chickpea in the dataset because it is presented in the Early (to the middle) Neolithic (5900–5400 cal. BC) and Late Chalcolithic sites in the Balkans; therefore, they discuss the spread of chickpea in the light of these connections with the adjacent regions (Greece and north-western Anatolia) (Marinova and Popova 2008). Marinova and Valamoti (2014) also suggest that chickpea shares a relationship with Anatolia. In Greece, chickpea is represented only from Otzaki (around 6000 cal. BC). This evidence relates to the Bulgarian Early Neolithic finds of chickpea. And the chickpea remains from western Anatolia come from the early Chalcolithic of Ilıpınar, which dates to 5630–5407 cal. BC (Marinova and Popova 2008). In fact, with the recent studies, we can confirm the presence of chickpeas at Barcın around 6500 cal. BC in Northwest Anatolia.

Popova, and Marinova compare the botanical data from Slatino, Vaksevo, Topolnica, Kamenska Čuka, Kovačevo, Bălgarčevo, Gălăbnik, Drenkovo-Ploshteko in the Struma valley (Bulgaria) from the Neolithic Period to the Late Bronze Age (2007). According to the results, the hulled wheat is mainly cultivated (einkorn and emmer). Their results show barley and a wide range of pulses (lentil and bitter vetch are abundant) simultaneously (Popova and Marinova 2007). When Kovačevo and Gălăbnik, two contemporary relatively early Neolithic sites in the region, only 132 km apart, are compared, grass pea is found at Kovačevo, but it is not present at Gălăbnik but millet is. Therefore, both sites show differences in crop selection despite being contemporary (Popova and Marinova 2007). With this spectrum, the data shares similarities with NW Anatolia.

Marinova and Valamoti also evaluate massive archaeobotanical data to understand the crop diversity and cultural choices from the Early Neolithic to the Final Bronze Age (around

7000-1000 BC) in Northern Greece (about 6500-3500/3200 BC) and Bulgaria (around 6200-4900 BC) (2014). The crop range in Greece includes hulled wheat (emmer and einkorn), two-row and six-row hulled barley, naked barley, lentil, pea, bitter vetch, grass pea (a unique addition to Southeastern Europe crop diversity), and chickpea. These species are present in Bulgaria as well. They argue that barley and lentil species had wild progenitors in the Mesolithic period, and that people had practiced harvesting and cultivating them. Despite some local differences, it is possible to talk about a similar crop package for both regions at the beginning of the Neolithic (Marinova and Valamoti 2014).

Cristiani et al. investigate the human dental calculus (9 individuals) from Vlasac and Lepenski Vir in the Danube region and argue that there is evidence of the processing of plant foods, including domesticated species that might have been common in the Late Mesolithic transmission of the "Neolithic package" (2016). This process might occur multiple times with an interaction between foragers and farmers (Cristiani et al. 2016). Jovanovic et al. suggest a slightly contrary argument to Cristiani et al. (2016) and suggest that Mesolithic foragers kept continuing aquatic resources and eudicot plants, despite the presence of cereals (81 individuals from five sites in the Danube Gorges dating between 9100 to 5500 cal. BC) (2021). Therefore, migrant farmers adopted the local diet (based on aquatic resources) although they brought cultivated cereals. Given these results, they suggest a mosaic cultural interaction within regional economic continuity rather than an idea based on the influence of the Neolithic package and way of life (Jovanovic et al. 2021). The noteworthy thing is that these two similar methodological studies suggest contrasting arguments for the same region, even though they are just five years apart. Could one of the reasons for this disparity be the number of samples analyzed, or is the difference caused by the theoretical/methodological approach? The dataset from Greece also shows a much more heterogeneous and complex process than the idea of the 'Neolithic package' from the east (Kotzamani and Livarda 2018). Gaastra et al. combine both datasets by exploring the Neolithic food economy along the maritime and inland streams of Neolithization in the western Balkans and neighboring regions (Croatia, Bosnia, and Herzegovina, Serbia, southern Hungary, western Romania, and eastern Italy) (2019). They say that every region has individual choices and patterns, and they argue that the inhabitants needed time to adapt their experiences to food production (Gaastra, Vareilles, and Linden 2019).

2.5. Conclusion

In general, hulled wheat (einkorn or emmer) are mainly present at all sites, but other species show differences if we evaluate the data especially in the Western part of Anatolia. Overall, we can also say that there is a broad spectrum in the earlier periods. On the other hand, there seems to be an agricultural package, but the agricultural knowledge transferred to each region appears to show differences based on the locally existing subsistence strategies.

It is clearly understood that Hallan Çemi, located on the Tigris Basin, housed one of the first settled societies where grain consumption had no major importance. The significance of this point derives from the fact that it is often argued that grain consumption plays a central role in accelerating the transition from dynamic hunter-gatherer economies to sedentary and food-producing economies. Gusir Höyük and Körtik Tepe are also good examples of this idea. Pınarbaşı, Göbekli Tepe, Nevali Çori, Hallan Çemi, and Körtik Tepe are communities that maintained a hunter-gatherer lifestyle and consumed wild grains and legumes, including nuts. In addition, we see that some nuts, such as peanuts, wild pistacia, hackberry, pistacia, and almonds, were mainly collected and used in early settlements, especially in Southeast and Central Anatolia. It is understood that a hunter-gatherer diet, rather than agricultural products, continues despite the fact that they have been settled for a long time, when we look at the Southeast Anatolian Early Neolithic sites. This continuation of plant gathering remains a robust practice, even though the adoption of the transition to agriculture emerged at some sites (e.g., Gusir Höyük, Kabukçu et al. 2021).

In addition to the cultivated plants in Southeast and Central Anatolia, the existence of wild forms of these species shows that the transition to agriculture did not originate entirely from the Levant but was influenced by settlements located in the Tigris and Euphrates Basins. According to Baird et al., there are two possibilities for cultivation and herding in this process. First, it is possible that migrant farmers may have come to the region, settled, and transferred their agricultural knowledge (the demic diffusion model). Secondly, the indigenous people may have adopted the farming practices after interacting with farmers. The material culture and aDNA evidence supports the second possibility (Baird et al. 2018**)**.

Moreover, opinions that the 'transition to agriculture' process developed independently in some regions (such as Cyprus) are gaining support (Lucas et al. 2012; Peltenburg et al. 2001). On the other hand, even if there are no direct domestication/cultivation stages in some regions

such as Western Anatolia, and Southeast Europe (e.g. Balcı et al. 2022, Gaastra, Vareilles, and Linden 2019; Kotzamani and Livarda 2018), we can see that each region adds some unique interpretations to the transition of agricultural practices and that this process takes place in a more complex and heterogeneous structure. In other words, this process is not a direct transition from a hunter-gatherer way of life to a farming community.

It can be helpful to try to understand how each settlement applies and interprets this different way of subsistence strategies in their diet. I believe it will refresh our knowledge to find the archaeological correlates associated with archaeobotanical and archaeobiological evidence, and this evidence can present various opinions. It is clear that the environmental conditions affected the subsistence; on the other hand, people reacted with innovations to these conditions.

Chapter 3

3. THE NEOLITHIZATION OF WESTERN ANATOLIA

In this chapter, one of the aims is to understand the interactions between indigenous people and migrant farmers during the Neolithization process with the help of archaeological data. Another aim is to understand the impacts on the subsistence choices/transformations of the Neolithization process, or how subsistence choices have affected this process in the region. First, I look at Northwest Türkiye in detail. This section mainly includes an overview of the research areas, sites' locations, geography, and landscape as an introduction. After that, I mention the stratigraphy and chronology of the sites, and I present an overview of the architectural characteristics based on similarities and differences in the region. I also present an understanding of material culture with the pottery assemblages, lithic industries, and other small artifacts based on the nature of interactions between the sites in Northwest Türkiye. At the end of this section, I look at the subsistence economy, focusing on fauna and marine food data. This part does not contain plant information because I evaluate plant data in the second chapter in the plant subsistence strategies section. This chapter provides a brief evaluation of archaeological data by looking at how the Neolithization process is interpreted in the neighboring regions in Western Anatolia and whether there are any associations with Northwest Anatolia. In this context, briefly, the Lakes District and the Aegean Coast of Anatolia are discussed in one section, while Eastern Thrace and Southeast Europe are discussed separately, and finally, I try to discuss all these combined archaeological data and interpretations for an understanding of the Neolithization process in Northwest Anatolia.

3.1. A Critical Review of Neolithic / Neolithization Concepts

Neolithization primarily reflects changing the ways of life from a hunter-gatherer to a sedentary and agricultural lifestyle during the beginning of the Holocene Period. The emergence of Neolithic is characterized by sedentism, networks and long-distance exchange, farming, herding, etc. (Childe 1950; Braidwood 1960). Even though V. Gordon Childe's (1950) identification of this phase as a revolution based on climatic factors is now considered to be outdated, we still categorize the Neolithic Period as applying different ways of life than in the preceding Paleolithic or Epipaleolithic/Mesolithic period; we draw the line between these phases because a sudden transition is far from possible.

In this respect, the most common questions start with “where?” “when?” “how?” and “why?” At present, our understanding suggests that after the first sedentary communities appeared in the Neolithic, the inhabitants built bigger houses/villages and domesticated plants and animals in a general sense. Moreover, most ideas about adaption to settled life and agriculture suggest that people chose to settle, cultivate plants, and domesticate animals in line with changes that the climate was undergoing with the Younger Dryas, for example, and the broad-spectrum mentalities (Watkins 2010a, 2010b; Zeder 2011). Cohen argues that this lifestyle change was initially possible because of climate conditions and the difficulties of maintaining storage facilities while being mobile (2009). Settling may have meant that one would have needed to care about food supply, place of residence, and safety and need to discover new ways of communicating with other groups. Consequently, settling down would impact a more extensive network of groups. Fertility and nutrition supposedly increased with sedentism and agriculture, even though there is no proof that hunter-foragers struggled for food. Agriculture simply may have provided safety and guaranteed shelter in the Holocene. In fact, by cultivating and domesticating plants and animals, they have consequently become vulnerable to physical stress and infectious diseases (Masood 2020). Still, the paradox is that increasing fertility yielded a rise in mortality, and the new nutrition style created new diseases and infections (Cohen 2009).

These conflicting theories suggest the challenges in understanding this complex picture when addressing all the dynamics of the changing ways of life in the Near East, even Cyprus, Anatolia, and Europe during the post-Pleistocene and the beginning of the Holocene period. In this study, I present an overview of the Neolithization of Western Anatolia by focusing on Northwest Anatolia to try to address how the sharing of information and materials between regions led to the establishment of the 'Neolithic ways of life,' also known as Neolithization. Many different models, ideas, and routes concerning the Neolithization processes have been put forth by Reingruber (2011), Lüning (2007), Özdoğan (2007b), and Guilaine (2007) among others. Lüning’s model, for example, states that the diffusion started from the Eastern Mediterranean and then continued to Europe through Cyprus. Özdoğan, on the other hand, suggests a robust expansion throughout Anatolia. At the same time, Guilaine believes the expansion occurred in defined areas, uses calibrated dates to show the boundaries between neighboring regions, and believes that material culture differs from region to region. For the Coastal Aegean (6500–6000 cal. BC), there are debates about whether those who took on a

Neolithic lifestyle were initially highly mobile with genes extending into the Mesolithic. While Reingruber does not suggest an autochthonous Neolithization model, she thinks that the mobility of prehistoric people had regional and supra-regional networks (2011).

3.2. The Neolithization of Western Anatolia

3.2.1. Lakes District and Aegean Coast of Anatolia

The exact processes involved with the Neolithization of the Lakes District region are still a matter of debate. Baradiz (in the Lake District), and Öküzini, Beldibi, Belbaşı, Karain, and Çarkini, located in the Antalya region not far from the Lakes District, represent the Mesolithic/Epipaleolithic sites of the region (around 17,000-12,000 BCE, see Albrecht 1988; Albrecht et al. 1992; Bostancı 1967, 1962; Otte et al. 1995; Yalçınkaya et al. 1993).

Hacılar, Kuruçay, Höyücek, Bademağacı, Suberde and Erbaba are among the long-lived Neolithic communities in the Lakes District (around 7000-6000 BCE, see Duru 2013, 2008). Although the spread of the Neolithic beyond the Anatolian Plateau is well known to be after the turn of the seventh millennium BC (Weninger et al. 2014), Duru uses a traditional identification method for dating sites according to the contexts and architectural finds and suggests that the earliest date goes to 8200 BC in Aceramic (?) Neolithic in Hacılar (Duru 2008, 18-19). E. Özdoğan, however, evaluates some early levels of the region under the earliest stages as Initial Neolithic to before 6500 BC and the Middle-Late Neolithic to 6500–6200 BC (2015, 35-37); on the other hand, the 'middle' word is not preferred by many scholars for Western Anatolian chronology (Çevik and Abay 2016; Duru 2008, 2013; Erdoğu 2017, 2014; Horejs et al. 2015; Takaoğlu 2014; Thissen 2010). Hacılar V-IV and Bademağacı EN I 8 represent the earliest stages of the region in Early Neolithic I (Duru 2008; Mellaart 1961). Thissen provides a chronological data based on the C14, stratigraphy, and pottery from Hacılar, Kuruçay, Höyücek, Bademağacı, and Karain in SW Turkey and compares these sites with Ulucak from Central-West Anatolia (Thissen 2010). The comparative data from Ulucak shows no significant hiatus between these regions. The emergence of Neolithic sites in the other regions started at the end of the PPNB period. On the other hand, the evidence from Neolithic sequences between 7000-6000 cal. BC changed the ideas in Southeast Anatolian societies. As a result, the main argument of Thissen is that the Lakes District and the West of Anatolia developed in a distinct line autonomously from Central and Southeast Anatolia (2010).

On the Aegean Coast of Anatolia, the Epipaleolithic (Kocaman 11,000-10,000 cal. BC) and Mesolithic/Early Neolithic (Kayadibi 9000-7000 cal. BC) evidence is represented by the Karaburun survey (Çilingiroğlu et al. 2016; Çilingiroğlu and Dinçer 2018; Çilingiroğlu et al. 2018; Çilingiroğlu et al. 2020; Horejs 2019). For the Mesolithic, the region is characterized by mobile and seasonally based foragers with high maritime voyages in the Aegean Sea by mobile groups occupying sites (multi-seasonally, also year-round) with strong connections (Horejs 2019). Horejs suggests similarities and differences in the subsistence strategies, environmental conditions, technologies, raw materials, etc., between the Mesolithic and the Pre-Neolithic times in the Coastal Aegean (2019).

The Aceramic/ Pre-Pottery Neolithic is represented with Girmeler cave, Fethiye (9th-8th millennium BC) (Takaoğlu 2014), and Çalca Mevkii, Çanakkale (around early 7th millennium BC) (Özdoğan and Gatsov 1998). The Girmeler Cave consists of two long parallel galleries. The 9th-millennium occupation of Girmeler is also contemporary with Aşıklı, Pınarbaşı, and Boncuklu from Central Anatolia. This stage includes sedentism and intensive hunting and gathering (Takaoğlu 2014). There are architectural similarities with Central Anatolian sites, but material culture and subsistence economy show some differences.[13] The late 8th-millennium BC occupation of Girmeler shows connections with Hacılar and Bademağacı (a similar link is Terrazzo floor), and Ulucak (red-plastered floor) as well, and sedentism developed along entirely different paths in Southwest Turkey despite the parallel connections (Takaoğlu 2014).

The Initial/Early Neolithic is represented with Çukuriçi XIII and Ulucak VI with an absent/few potsherds, plastered floors as pioneer sites for the Neolithization process in the region around 6800- 6600/6500 cal. BC (Çevik and Abay 2016; Çilingiroğlu et al. 2012; Horejs 2019; Horejs et al. 2015). Erdoğu considers the Uğurlu VI (4-2) levels as Pre-ceramic because of the absence of pottery (not recorded yet); they also found white colored ash floors, limited pebble stone floor, and a small piece of red lime plastered floor, with a short period beginning around 6800 cal. BC (2017, 79). However, I think the data and findings suit the Initial/Early Neolithic, in my opinion. There is a need to clarify the complex networks on regional and

[13] The architecture remains consistent with the round structures with mud-brick walls and a central hearth (Aşıklı and Boncuklu) or sunken curvilinear buildings with wattle and daub superstructures (Pınarbaşı). Despite the similarities with the Konya Plain, there are some differences in the subsistence economy and material culture of Girmeler. Cattle, sheep, and goats are absent at Girmeler Cave. The plant data is not documented yet. Microliths are absent; flake-based technology is dominant, but Central Anatolia has obsidian and microliths (Takaoğlu 2014, 113-114).

interregional levels for the coastal Aegean around 7000 cal. BC (Çilingiroğlu 2005; Horejs 2016). Here, we can add the pioneer levels (7-6) of Ekşi Höyük (6780-6600 cal. BC, Denizli, Çal) which is identified with rectangular buildings and red-plastered surfaces as recent evidence (Dedeoğlu et al. 2019).

We can argue that the Neolithic way of life did not spread from just one core area. These people must have travelled via multiple routes and means depending on the location using maritime paths from the Eastern Mediterranean (e.g., Çukuriçi) and inland paths (e.g., Ulucak) from the Anatolian mainland around 6700 cal. BC. They would have brought with them the knowledge of growing plants and herding animals (Çevik and Abay 2016; Çilingiroğlu and Çakırlar 2013; Horejs et a. 2015). According to archaeological data, Çukuriçi Höyük presents a model of Neolithization for this region around 7000-6600/6500 cal. BC. The newcomers of Çukuriçi XIII show nautical kinship with obsidian sources, marine food economy, etc., with a package of maritime abilities and information on distant obsidian sources by Holocene societies in the region (Horejs et al. 2015). Ulucak VI, with its red plaster floors, probably came from Inner-West Anatolia, Cappadocia, and the Levant as a cultural and, perhaps, ritual practice. This transfer may represent the origins of the Ulucak community (Çilingiroğlu and Çakırlar 2013). The main question is, what happened with the local foragers? They suggest that we might think of several ways of transition of people, animals, and plant species.

Ulucak V(a-f), Çukuriçi XII-X, Uğurlu V, Ege Gübre IV, Yeşilova III (8-7) also represent the Early/Late Neolithic stages and include a sudden increase of pottery, and typical assemblages; on the other hand, Horejs evaluates these phases in Late Neolithic stage (2016, 147-148). The Late Neolithic is represented with Ulucak IV (a-k), Çukuriçi X-VIII, Uğurlu IV, Ege Gübre III (a-b), Yeşilova III (7-1), Dedecik-Heybelitepe A and Ekşi Höyük (5-3) in the region around 6500-5900/5800 cal. BC (Çevik and Abay 2016; Çilingiroğlu et al. 2012; Dedeoğlu et al. 2019; Derin 2008; 2012; Erdoğu 2017, 2014; Horejs 2016; Horejs et al. 2015; Lichter and Meriç 2007, 2012; Sağlamtimur 2012; Takaoğlu 2014). Hoca Çeşme (south of Edirne, Enez) is also a contemporary site in this stage and close to the Aegean region, but I cite it in the Eastern Thrace section.

Western Anatolia has a unique position because it is open to all kinds of interactions by the sea and the cultural variables coming from the Islands. For instance, Çevik and Abay emphasize that Ulucak VI has strong connections with Aceramic Knossos and Bademağacı in

the Lake District's region rather than Central Anatolia (2016). The obsidian of the Aegean region -e.g., obsidian is the primary source in the tool industry at Çukuriçi levels X-VIII (Milic and Horejs 2017, 31)- comes mainly from Melos (Dedemegaki and Adamas) rather than from Central Anatolian material from Göllü Dağ and Nenezi Dağ as well (Milić 2014, 287-289). In the sites of the region, there are similarities and differences in material culture, trade, architecture style, etc., between the Neolithic occupations. Neolithic/pre-Neolithic groups might have used several kinds of networks (land, maritime, river) to migrate to Anatolia, Aegean, and Eastern Mediterranean; therefore, we should consider that some Neolithic assemblages, plants, and animals could have been brought and carried by people from one site to another (Çevik and Abay 2016; Çilingiroğlu and Çakırlar 2013; Horejs 2019, 2016). Architectural details and settlement structures reflect broad diversity rather than similarity. Çukuriçi, Ulucak, Ege Gübre, and Yeşilova show differences in some respects in terms of their chronology, building technology, and the spatial organization within and around houses and areas of activity. The architectural contrast between these sites parallels the rectangular and round structures mostly grouped around one or more central courtyards (Horejs 2016, 153). On the other hand, Horejs emphasizes that round or circular house structures are absent in the Aegean and West and Central Anatolia as traditional; hence the strong suggestion is about an influence from the Eastern Mediterranean via maritime routes (2016, 154). Consequently, the scholars propose complex networks on regional and interregional levels in the center of the coastal Aegean around 7000 BC (Çevik and Abay 2016; Çilingiroğlu and Çakırlar 2013; Horejs 2016, 2019; Milic 2014; Milic and Horejs 2017).

As a result, the Early Neolithic stages of the region is represented with the lack of pottery but with a full subsistence package. Two types of settlement organizations are identified as oval and rectangular plans with a central courtyard. The lithic industry interactions (e.g. obsidian comes from Melos rather than Anatolia), the relations of the pottery assemblages and other portable findings, etc. via Anatolia, Greece, and Europe support inland and maritime routes theories; in addition to the genetic studies also support this colonization model in the region (Hofmanova et al. 2016).

3.2.2. Northwestern Anatolia

Marmara Region

How this process of expansion took place in Northwest Anatolia remains an important question, given that this region was among the first territories that the Neolithic pioneers encountered. Barcın and Aktopraklık C have for a long time given the earliest date 6600 cal. BC but Bahçelievler recently yielded new evidence that the earliest Phase 8 can be dated to 7032-6694 BC (Karul 2017; Kolankaya-Bostancı and Fidan 2021; Özbal and Gerritsen 2019). Many of the actors in this region were migrant farmers, and settlements show a transition to a settled Neolithic way of life. A significant question regarding the Neolithization of this region is whether the Neolithic societies in and around the Bosphorus incorporated the earlier Mesolithic foragers of the region. While hypotheses have been offered in support of such a suggestion, the evidence at hand is far from concrete (M. Özdoğan, 2013a, 2014).

Despite all material cultural similarities, differences primarily in architectural styles have led to theories regarding the presence and continuity of local pre-Neolithic communities (Düring 2013; Özbal and Gerritsen 2019). While such a mosaic model in the Neolithization process is well known and recorded in Europe, Northwest Anatolia faces a general lack of data regarding Mesolithic lifeways except Ağaçlı (Özdoğan 2024; Gatsov 2001; Gatsov and Özdoğan 1994; Özdoğan and Gatsov 1998). Southeast Anatolia and Central Anatolia fall within the core regions of the Neolithic and fall beyond the scope of this essay, which focuses on the Neolithization of the spread of Neolithic lifestyles. Recent DNA studies have shown that the earliest inhabitants of West Anatolia and the first migrants in Europe belong to the same gene pool (Kılınç et al. 2016). The earlier farmers demographically resembled foragers, but they expanded to Europe after regional heterogeneity (Kılınç et al. 2016). The most recent research suggests that the expansion of Neolithic cultures across Western Eurasia followed different pathways, ranging from the simple adoption of new practices to interactions and genetic mixing between incoming farming groups and local foragers, to episodes of rapid migration and dispersal. Moreover, the cultural similarities observed among settlements were not primarily the result of large-scale movements (as indicated by genetic evidence), but instead arose from more subtle, background mobility (Koptekin et al. 2025). Archaeological evidence also points to interactions between Central and Northwestern Anatolia and the Balkans around 7000-6000 BC (Hodder 2014, 18). The archaeological data can be comparable with the sites in Northwest

Anatolia that we already know had some similar links with Barcın Höyük from Northwest Anatolia (Özbal and Gerritsen 2019) and Ulucak from Western Anatolia (Çevik and Abay 2016).

Turkish Thrace

Hoca Çeşme (south of Edirne, Enez) and Kırklareli Project (Aşağı Pınar and Kanlıgeçit sites) represent the Late Neolithic and Chalcolithic layers of Eastern Thrace. Middle-Late Neolithic (6600/6500–6200 BC) is only represented with Hoca Çeşme IV-III, Late Neolithic (6200-5900 BC) is represented with Aşağı Pınar (Phases 8 and 7) and Hoca Çeşme III in Eastern Thrace (E. Özdoğan 2015; M. Özdoğan 2013a). Karul and Bertram compare the data with neighboring regions that the early layers from Hoca Çeşme can be dated older than Karanovo I and Greece (2005). Hoca Çeşme phases IV and III are older than the beginning of the classical Sesklo and contemporary with the Pre- /Proto-Sesklo period (Karul and Bertram 2005). Eastern Thrace is the closest region to Anatolia, but there are no documented Early Neolithic sites. Krauß et al. explain this unprecedented situation as an adaptation to the strict cold weather conditions in the Balkans before moving further to the north. After this adaptation process, the Neolithic way of life in the neighboring regions of Thrace should be applied (2018). They argue that the 14C-data shows that this adaptation process matches the RCC (Rapid Climate Change) (6550-6050 cal. BC). The region is also a narrow zone of Northern Marmara.

Hoca Çeşme phases IV-III consist of round, wattle, and daub structures with semi-subterranean floors (E. Özdoğan 2015; M. Özdoğan 2013). Hoca Çeşme has similar links in material culture with the sites of the Marmara region (Karul and Bertram 2005; E. Özdoğan 2015; M. Özdoğan 2013a). The site defines Anatolian and Southeast European prehistory. The pottery assemblage is comparable with the sites of Fikirtepe, Pendik, and Yarımburgaz, especially tubular handles, S-curved and wide-opened vessels (Karul and Betram 2005, 127; Özdoğan 2013a, 180). The bone tools (mostly spoon and spatula) are similar to these sites (Özdoğan 2013a, 182). The burnished redware pottery from phases III and IV of Hoca Çeşme is typologically close to Central Anatolian, but it is difficult to make a direct connection. Hoca Çeşme has no painted pottery, but the forms show similarity with Kuruçay (mostly layers 11-13) (Karul and Bertram 2005, 127). The architectural similarities between Hoca Çeşme and Ege Gübre in the coastal Aegean (Sağlamtimur 2012). We are reminded of the round-plan buildings from NW Anatolia at sites such as Pendik, Fikirtepe, Aktopraklık and Bahçelievler as well. On

the other hand, still, its subsistence economy seems closer to the east of Europe, such as Makri, Greece (e.g. Efstratiou and Garcia 1998). Hoca Çeşme locates between Eastern Thrace, the North of the Aegean, and Northwest Anatolia. Hence, it is crucial to understand its relations.

Aşağı Pınar provides an entire sequence of the Neolithic period in the Balkans between 6200 – 5000 cal. BC. The cultural layers are divided into nine horizons. The earliest Layer 8 represents the Monochrome Phase in the Balkans with the pottery assemblage. Layer 7 represents the so-called Karanovo I phase of Bulgaria. Aşağı Pınar shows more Balkan character than the Marmara Region, so much so that E. Özdoğan clarifies this as a cultural boundary (a virtual boundary) which continued from the 6th to the beginning of the 5th millennium BC between the Bosphorus and Kırklareli region because of these dissimilarities. The transition layers 5 – 6 present the Starčevo Vinča transition in the western and central Balkans (E. Özdoğan 2011). As the earliest stages of Aşağı Pınar are in preparation for publication, we do not have detailed information for Layers 8 and 7 at present. However, Layer 8 is estimated to date to around 6200-6000 BC while Layer 7 dates to 5950-5750 cal. BC (Özdoğan 2013a). Phase 8 includes huge ditches and some architectural remains. There are pit-like dwellings, and one of them is 8m in size and yields multiple floors. In Layer 7, there is a multi-roomed complex, rectangular rooms separated by shared walls, and there is red plastering in the renewal phases of the structures (Özdoğan 2013a, 186).

E. Özdoğan investigates Layer 6 (Karanovo I) in considerable detail. This phase does not represent the earliest stage of the site, but I would like to mention the settlement pattern briefly. In the excavated area, an alignment of rectangular rooms adjoining each other contains wattle and daub material and relatively large wooden post-holes (2011, 214). She mentions that ovens, fireplaces, working areas, or processing tools were not documented in the open spaces. So, she argues that all activities might be indoors, and some activities were probably conducted within the entresol of the upper floor (E. Özdoğan 2011, 219).

With its settlement features, Aşağı Pınar goes beyond some of the frameworks we are accustomed to in Anatolia. It differs especially in settlement organization. E. Özdoğan claims that there is a kind of boundary between Turkish Thrace and the Marmara Region, and that settlement organizations and cultural characteristics mostly show dissimilarity (2011, also see M. Özdoğan 2019). New studies to be conducted between these two regions may shed more light on these questions.

Neighboring Region: Southeast Europe

The Neolithization processes in Europe consist of two types of lifestyles, which developed as established Neolithic habits from the outset, and others fused to a hunter-gatherer lifestyle with agriculture (Gronenborn 2007; Robb 2013; Zvelebil 2001). Recent studies on modes of subsistence also illustrate a heterogeneous and complex process of mosaic adaptations and challenge the outdated idea of the spread of the 'Neolithic package' (Jovanovic et al. 2021; Kotzamani and Livarda 2018; Marchi et al. 2020).

Gronenborn claims that the hunter-gatherer groups probably adopted the new way of life and combined them into their lifestyle for a long time (2007). According to Zvelebil, we can understand the Neolithic communities in their social and historical context (2001). The social context of the farming transition in Europe might have its structure and agency. He accepts the dispersal of domestication and Neolithization as fixed to each other. Early farmer groups probably were not completely isolated. It might be a kind of hybridization process, for example, as the Danube Gorges yielded individuals from Vlasac (Marchi et al. 2020). Hofmanová et al. investigate the paleogenomics data on the Neolithic individuals from northern Greece (Franchthi Cave, Knossos, Mauropigi, Paliambela, and Revenia) and northwestern Turkey (Menteşe, Barcın, and Aktopraklık C, Çukuriçi and Ulucak) -these sites are considered coeval Neolithic (6600–6500 cal. BCE) simultaneously- and propose that it is possible to adapt and mobilize indigenous and forager groups from one region to another (2016). I can conclude that most of the researchers share the same idea that the along process of Neolithization of Europe includes a complex interaction between the indigenous people and migrant farmers.

3.3. Research Area: Northwest Türkiye

3.3.1. Environmental Setting

Anatolia is a region marked by significant environmental diversity rather than uniformity. Broadly, its landscapes can be grouped into two main physical zones: (1) a central, elevated mountainous region characterized by a semi-arid Mediterranean climate, and (2) coastal and near-coastal zones that are generally defined by humid to semi-humid Mediterranean climatic conditions (Figure 3.1) (Clare and Weninger 2014, 2). The central mountainous zone is flanked by two major orogenic belts -the Black Sea Mountains in the north and the Taurus Mountains in the south- both of which extend across much of modern Türkiye.



Figure 3.1: The locations of case-study sites in Northwest Türkiye.

Anatolia's climate is shaped by the interplay of tropical air masses from the south and west and polar air currents from the north, leading to dry summers and peak precipitation during winter months. During summer, stable, hot, and arid conditions prevail under the influence of continental tropical air masses from the east. In contrast, winter brings moisture-laden air via Mediterranean depressions originating from the south and west (Atlantic). Moreover, frigid Siberian air fronts from the north can result in extreme cold, with harsh frosts and temperatures dropping below -10°C (Clare and Weninger 2014, 3).

Topography

Northwest Türkiye exhibits considerable environmental diversity. Northwest of Edirne-Kırklareli -Aşağı Pınar and Hoca Çeşme are located here- to the Çatalca region represent Ergene region, from Çatalca-İstanbul to İzmit represent Çatalca-Kocaeli region, and from the Bursa to Bilecik represent southeastern Marmara region -Barcın and Bahçelievler are located here- in recent time and all these regions represent the Marmara Region (Figures 3.1, 3.2). Both areas are dissected by north–south oriented valleys, with rivers draining either into the Sea of Marmara or the Black Sea, indicating the presence of active fluvial systems on both sides (Erinç 1977, 9).

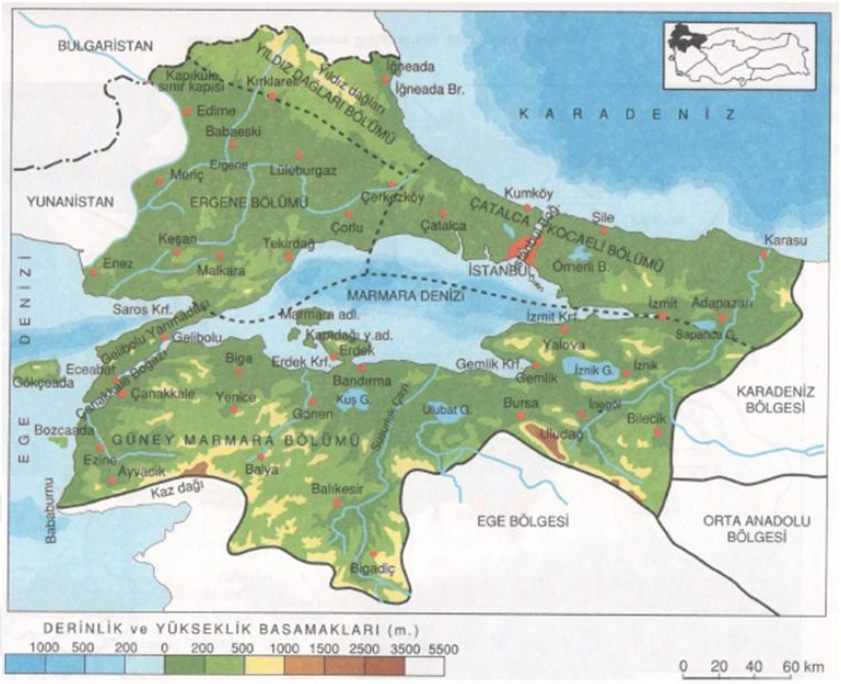


Figure 3.2: Marmara Region (Atalay and Mortan 1997, 83).

This geographically dynamic area broadly covers Eastern and Southern Marmara but also extends into the Eskişehir region. Located in the northwestern part of Central Anatolia, this zone encompasses the Porsuk Valley -stretching northwest to southeast between the Sündiken and Sivrihisar Mountains- and the surrounding uplands (Atalay and Mortan 1997, 386). It forms a crucial natural corridor between the Marmara and Aegean zones and Central Anatolia.

Özdoğan emphasizes that the topography and vegetation on both sides of the Bosphorus stand out distinctly from the broader regional patterns (2007a, 407). The eastern Kocaeli Peninsula, in particular, exemplifies these Bosphorus-specific features, and notably, its western limit lies not at the strait itself but along the Büyükçekmece–Terkos line.

The Bosphorus acts as a conduit between the Black Sea and the inland Sea of Marmara, which today functions as a key ecological and navigational system. While it supports rich aquatic resources and facilitates maritime connectivity, the Marmara system is extremely sensitive to global climate dynamics and sea-level fluctuations. In different climatic phases, it has alternated between being part of a vast freshwater network stretching toward the Aral Sea and integrating with the saline environment of the Aegean. These environmental shifts led to dramatic sea-level changes and coastal reconfigurations- such as the emergence of landforms

in front of the Kapıdağ Peninsula and tectonic reshaping between İzmit and Avşa (Özdoğan 2007a, 408).

Climate

The region's climate and vegetation are shaped by a combination of topography, proximity to marine environments, and geographical positioning. Coastal lowlands benefit from a temperate climate influenced by both Mediterranean and Black Sea systems. Atmospheric air masses play a significant role in determining precipitation levels, temperature fluctuations, and fog development. Temperature is a key factor in plant life cycles. Extremely low temperatures can lead to water freezing, rendering it unavailable to plants and impairing vital physiological functions (Güngördü 1999, 6). While autumn frosts typically pose minimal threat, spring frosts can be detrimental, especially during the budding stage. Along the coastal belt, average annual temperatures range between 12–14°C (e.g., Çanakkale 14.9°C, Istanbul 14°C). However, temperatures decline with elevation, dropping below 4°C at 2000 meters. Southern slopes tend to be 1–2°C warmer than their northern counterparts due to solar exposure (Atalay and Mortan 2011, 142).

Precipitation in the region varies between 400 and 1500 mm annually. The highest rainfall occurs on the north-facing slopes of mountainous areas and along the Black Sea coast. In contrast, some low-lying depressions receive less than 600 mm. Precipitation is primarily concentrated between autumn and early summer, though sporadic summer showers also occur. The region can be broadly categorized into three rainfall zones: high precipitation areas (above 1000 mm, such as Uludağ, Kazdağ, and Samanlı), moderately wet zones (700–1000 mm), and arid interior basins receiving less than 600 mm, including the Ergene Basin and plains like İnegöl and Yenişehir. Rainfall levels show significant interannual variability; in some years, totals may exceed the average by 30–90%, whereas in drier years, precipitation can fall 30–45% below average (Güngördü 1999, 17). This variability is largely driven by intense frontal rainfall events.

Although coastal zones receive higher precipitation, short-term declines rarely lead to drought. In contrast, decreased rainfall in interior areas can have a pronounced negative impact on agricultural productivity (Atalay and Mortan 2011, 144).

Vegetation

While natural conditions suggest the entire region should be forested, forests cover only about one-third. Climate, elevation, slope direction, and human impact shape vegetation patterns. In South Marmara, broad-leaved forests dominate lower slopes, while conifers grow at higher elevations. The richest forests are in Kazdağ, Uludağ-Domaniç, and Samanlı Mountains (Atalay and Mortan 2011, 153).

Vegetation changes with ecology. The Gemlik Gulf and north slopes of the Samanlı Mountains have the best-developed maquis (Mediterranean scrub). Maquis also grows where pine forests (*Pinus pinea, Pinus nigra*) were destroyed. Around Lake İznik, different oak types grow alongside dense maquis (Atalay and Mortan 2011, 154). Red pine forests are widespread around Yenişehir up to 400–500 m. Humid forests thrive on the north-facing mountain slopes. These include pseudomaquis at lower levels, then beech, fir, and mountain meadows at higher elevations. These forests stretch across Yıldız Mountains, the north of Çatalca-Kocaeli, Samanlı and Katırlı-Avlan ranges, Kapıdağ Peninsula, and Uludağ-Domaniç. Pseudomaquis replace destroyed humid forests, especially in valleys affected by sea air and lower mountain slopes. Typical species include beech, chestnut, linden, and sessile oak (Atalay and Mortan 2011, 155–159).

The Beginning of the Holocene

Various data types help trace past climate changes, such as lake levels, cave deposits, marine sediments, glacier fluctuations, and archaeological remains (Roberts 2014, 67). One of the major discoveries in recent paleoclimate studies is the identification of recurring cold anomalies from the Glacial period to the Holocene, linked to rapid climate changes (Clare and Weninger 2014, 4).

The region's environment during the Late Glacial offered localized data. In Central Anatolia, steppe vegetation began to shift into meadow grassland. In moister areas like the north and northwest, trees like birch, oak, pine, and juniper dominated since 11,000 BCE (Roberts 2014). The Younger Dryas is well-documented in regional data, including lake sediments (e.g., Van, Eski Acıgöl), caves, and marine cores.

Yenişehir Plain, at ~200 m elevation, is surrounded by hills up to 900 m and Uludağ's 2500 m slopes. It connects to İznik in the north and to İnegöl, Bilecik, and Bursa in other

directions. The Kocasu River flows from SW to NE, joining the Sakarya River. The northern area, where Barcın Höyük is located, was marshy until a drainage system was dug in the mid-20th century. In the 1980s, pollen researchers Bottema and Woldring (1995) conducted studies near the Yenişehir Plain, reconstructing a generalized Holocene vegetation history from 10,000–6,500 cal. BCE, open deciduous forests were dominated. High *Centaurea* values indicate disturbed ground, while aquatic plants suggest stagnant water conditions. During the Neolithic, the region featured oak-dominated forests on hills and mountain slopes. Other trees included fir, pine, alder, hornbeam, hazel, beech, cedar, linden, and elm shape the surrounding area (Bottema and Woldring 2001).

3.3.2. Background Information

Archaeologically, Northwest Türkiye consists of the Yenişehir Plain, the foothills overlooking Lake Ulubat, the Bilecik region, the İstanbul district, and Turkish Thrace area. The Epipalaeolithic/Mesolithic culture is mainly associated with a microlithic industry (geometric tools, surface scatters, and bullet cores) known from Ağaçlı, Paşaalanı, Gümüşdere-Kilyos (European side), and Tekmezar, Mürsellibaba, Domalı, Alaçalı, Doğançalı and Kefken (Asian side) along the Blacksea Coast, İbo'nun Rampası and Göztepe (Yalova) in Marmara coastlines (Esin 1992; Gatsov and Özdoğan 1994; Harmankaya, Tanındı and Özbaşaran 1997; Karul 2011; Özbal and Gerritsen 2019; M. Özdoğan and Gatsov 1998; Runnels and M. Özdoğan 2001). These sites should reflect the local characteristic of the Epipaleolithic/Mesolithic lifestyle, diet, etc., before the Neolithization process of the region. On the other hand, our knowledge of these sites mainly consists of limited data obtained from survey finds and is called as Ağaçlı Culture (Özdoğan 2024). Minor amounts of hunting, gathering, and fishing are also evident across the communities of the Neolithic and Chalcolithic in the region; however, evidence for agriculture and animal husbandry is most prevalent. Bahçelievler (Efe et al. 2015; Fidan 2020), Keçiçayırı (Efe, Gatsov and Nedelcheva 2012; Sarı and Akyol 2019), and Demircihüyük/Demircihöyük sites in the Eskişehir/Bilecik region (Korfmann 1983; Seheer 1987), and Barcın (Gerritsen and Özbal 2016; Özbal and Gerritsen 2019), Menteşe (Roodenberg et al. 2003; Roodenberg and Alparslan Roodenberg 2013, 2007), Aktopraklık (Karul 2011, 2017; Karul and Avcı 2011), Ilıpınar (Roodenberg 1995, 1999a, 2008a) sites in Bursa province and Pendik (Kansu 1963; Kızıltan 2013b; Pasinli et al. 1994; Özdoğan 2013a-b, Özdoğan 1983b), Fikirtepe (Bittel 1960, 1971; Özdoğan 1979), Yenikapı (Kızıltan and Polat 2013a), and Yarımburgaz (Özdoğan 1983a,

2013a) in İstanbul province, Hoca Çeşme and Aşağı Pınar in Turkish Thrace (E. Özdoğan 2022; 2015; M. Özdoğan 2013a) represent the Neolithic and Chalcolithic levels of the region as excavated sites.

There is clearer evidence after 6600 cal. BC about sedentism and lifestyles in this region and the so-called pioneering pre-Fikirtepe stage between 6600-6400 BC, and this stage can be represented with Keçiçayırı, Cıbırada, Demircihöyük in Eskişehir province, and Barcın Höyük VIe-VId1 in Bursa province (Efe, Gatsov and Nedelcheva 2012; Özbal and Gerritsen 2019, 186-189; Sarı and Akyol 2019; Seeher 1987, 2011). The Barcın Höyük Neolithic phases are separated into five stages, from the uppermost VIa to the undermost VIe, and the Neolithic layers are dated to between 6600-6000 cal. BC. Therefore, it provides an uninterrupted sequence of the Neolithic of the region (Gerritsen, Özbal, and Thissen 2013a, 2013b; Gerritsen and Özbal 2016, 200; Özbal and Gerritsen 2019, 186). As recent evidence suggests, Bahçelievler Phase 6 is dated to 6600-6500 BC, and Phase 5 must be dated after 6500 BC (Fidan 2020 36; Kolankaya-Bostancı and Fidan 2021, 96) which compares with Phases VIe and VId1 at Barcın Höyük. In addition, the earliest levels of Aktopraklık C (6400 BC) (Karul 2011, 2017) and the earliest layers of Menteşe Basal lower (6400 BC) (Roodenberg 1999b, 22; Roodenberg et al. 2003, 37) could be evaluated in this stage. E. Özdoğan proposes the next stage after the Initial Neolithic as Middle-Late Neolithic between 6500-6200 BC, and Pendik, Fikirtepe, Aktopraklık C, Menteşe (basal-middle), and Barcın Höyük VId-VIc are evaluated within the so-called Archaic phases of Fikirtepe (2015, 40-42; M. Özdoğan 1983b). There is a notable similarity in the pottery assemblages (pre-Fikirtepe wares) that Keçiçayırı, and Demircihöyük Ware A potteries are just like the Barcın Höyük VIe and Fikirtepe type wares start around 6300 BC; therefore, this process is divided into two stages: pioneer pre-Fikirtepe sites mentioned above and the Fikirtepe Phase (Özbal and Gerritsen 2019).

Barcın Höyük VIc, VIb, and VIa, Aktopraklık C, Menteşe Basal-Middle and Upper, Pendik, Fikirtepe, Yenikapı, and Ilıpınar earlier levels reflect a more similar material culture between the neighbors in the region that is called ‘Fikirtepe Culture/Fikirtepe Phase’ around 6300-6000 BC (Karul 2011; Özbal and Gerritsen 2019; Özdoğan 2024; 2013). Fikirtepe is mainly defined by two stages, “Archaic Fikirtepe" and "Classical Fikirtepe," and could be dated approximately 6400/6300 and 5800 BC (Özdoğan 2013, 173). The only absolute dates come from Yenikapı 6000-5920 cal. BC for İstanbul Province (Kızıltan and Polat 2013, 129), the

earlier levels of İstanbul sites are identified with the comparative archaeological data with the other sites which have absolute dates such as Menteşe, Ilıpınar, Aktopraklık, Barcın in Bursa region (Karul 2011, 2017; Karul and Avcı 2011; Özbal and Gerritsen 2019; Roodenberg and Schier 2001; Roodenberg et al. 2003). E. Özdoğan identifies this stage as Late Neolithic (6200-5900 BC) with Fikirtepe, Pendik, Yenikapı, Aktopraklık, Ilıpınar X-IX, Menteşe (upper), and Barcın VIb-a layers within Fikirtepe culture as well (2015, 46).

For all the above-mentioned sites, we see two types of architectural features in the east part of the Northwest Anatolian Region: round/oval and rectangular planned buildings. For example, while some sites, like Barcın, Menteşe, Ilıpınar X-IX, and Aktopraklık B (Chalcolithic), show evidence for rectangular architecture, others, including Aktopraklık C, Keçiçayırı, Bahçelievler, Fikirtepe yield evidence for round semi-subterranean structures (Fidan 2020; Gerritsen and Özbal 2016; Karul 2010, 2011b; Karul and Avcı 2011; Özbal and Gerritsen 2019; Roodenberg 2008a-b; Roodenberg et al. 2003; Sarı and Akyol 2019). Both round and rectangular buildings have been discovered and excavated at Yenikapı and Pendik, while Yarımburgaz stands as a slightly later cave settlement (Kızıltan and Polat 2013; Özdoğan 2013b; Pasinli et al. 1994).

Turkish Thrace is the closest and a narrow zone of Northern Marmara. Hoca Çeşme IV-III represents the earliest levels of Middle-Late Neolithic (6600/6500–6200 BC), and Late Neolithic (6200-5900 BC) is represented with Aşağı Pınar (Phases 8 and 7) and Hoca Çeşme III (E. Özdoğan 2015; M. Özdoğan 2013). Aşağı Pınar provides an entire sequence of the Neolithic period in the Balkans between 6200 – 5000 cal. BC (E. Özdoğan 2016) and shows a Balkan character rather than Anatolian (E. Özdoğan 2011; M. Özdoğan 2013).

Northwest Anatolia is important because it reflects the spread of the Neolithic. The region contains local communities and migrant cultural groups with a bilateral adaptation process. Sites show a direct agrarian lifestyle rather than a domestication process, but some elements still reflect Epipalaeolithic/Mesolithic traditions. In comparison, there are cultural connections with the Konya Plain (Çatalhöyük VI–IV), and Barcın VIe-Ve/d, Aktopraklık C, even Bahçelievler 8-6, but there are differences in architecture (oval/round plans at Bahçelievler and Aktopraklık C), and in small findings. In addition, the indigenous people of Neolithic Central Anatolia and the first migrants in Europe should be in the same gene pool (Kılınç et al. 2016). Likewise, Hodder also points out there could be interactions between Central and

Northwestern Anatolia and the Balkans around 7000-6000 BC (2014, 18). The aDNA studies also show that Neolithic communities of West Anatolia and the first farmer pioneers of Europe should be in the same gene pool (Hofmanova et al. 2016; Lazaridis et al. 2016; Mathieson et al. 2015; Mathieson et al. 2018). In this context, understanding the Neolithization process of Northwest Anatolia also means that it can contribute to studies on the Neolithization process of Anatolia and Europe.

On the other hand, there are some distinct differences between the east and west part of Northwest Anatolia. With its settlement features, Aşağı Pınar goes beyond some of the frameworks we are accustomed to in Anatolia. It differs especially in settlement organization and cultural characteristics in that it shows more of a Balkan character than that of the Marmara Region, which is represented as the Fikirtepe Culture. E. Özdoğan claims that there are variations between Turkish Thrace and the Marmara Region, and that settlement organizations and cultural characteristics often show dissimilarity, especially from the 6th to the beginning of the 5th millennium BC (2011, also see M. Özdoğan 2019). The earliest Phase 8 (the Monochrome Phase in the Balkans) is dated around 6200-6000 BC and has huge ditches (the reasons for the ditches are not so clear), restricted architectural remains, pit-like dwellings, and multiple floors. Phase 7 (Karanovo I Phase of Bulgaria) is dated to 5950-5750 cal. BC (M. Özdoğan 2013a), and huge ditches continue. We also see a multi-roomed complex with rectangular rooms separated by shared walls. The transition layers 6 – 5 present the Starčevo Vinča transition in the western and central Balkans (E. Özdoğan 2011). From this point of view, many differences are observed between Aşağı Pınar and Fikirtepe Culture sites, which existed in the Marmara Region at the same time. For these reasons, examining the process in the early occupation phases of three different sites, which show some cultural and settlement organization differences in the region, will enable us to better understand the Neolithization process.

3.3.3. The Stratigraphy and Chronology

The Epipalaeolithic/Mesolithic period for this region is known for debates on differences and variation between hunter-gatherer mobility or semi-sedentary / sedentary societies and the transition to agriculture and husbandry. This period is known in this region especially at sites like Ağaçlı, Domalı, and Gümüşdere with the lithic findings such as geometric tools and bullet cores in a microlithic tradition (Gatsov and Özdoğan 1994; Runnels and Özdoğan 2001), except

Paşaalanı, Tekmezar, Mürsellibaba, Alaçalı, Doğançalı, Kefken, İbo'nun Rampası, and Göztepe (Esin 1992; Gatsov and Özdoğan 1994; Harmankaya et al. 1997; Karul 2011; Özbal and Gerritsen 2019; Özdoğan 1990, 1985, 1984; Özdoğan and Gatsov 1998; Runnels and Özdoğan 2001). On the other hand, the absolute dates for the later levels of this process only come from Yarımburgaz Levels 7b (8550-8290 cal. BC), 7a (7460-6690 cal. BC), 6 (6590-6430 cal. BC) (Özbal and Gerritsen 2019, 184; Özdoğan, Yutaka and Özbaşaran-Dede 1991, 82; Thissen-Reingruber 2017, 128).

We know some of the sites from the Epipaleolithic/Mesolithic, mainly around the coastal edge of İstanbul (Marmara and the Black Sea). On the other hand, the Early and Middle Neolithic information of İstanbul province is still unknown. Özdoğan explains that describing the coastline of the Neolithic period is rather difficult because of the rising of the Bosphorus after that period. In addition, the so-called 'Princes Islands' might still have been connected with the mainland in the Neolithic period, and the coastal Neolithic settlements, primarily based on a fishery subsistence economy, are now under the waters of the Bosphorus (2007a, 2013a). Besides that, Çalca (Çanakkale) and Musluçeşme (Bandırma) -south of the Marmara Sea- (E. Özdoğan et al. 2020; Özdoğan and Gatsov 1998) and Keçiçayırı (Efe et al. 2012; Sarı and Akyol 2019) (Eskişehir province) represent the early levels of Neolithic in the region, but we have limited data. E. Özdoğan proposes the sites of Çalca (Çanakkale), Musluçeşme (Bandırma), and Keçiçayırı as the earliest sites -the Initial Neolithic, earlier than 6500 BC- in the region. In addition, Barcın Höyük, the earliest Phase VIe, would be included in this stage with its rare pottery remains (2015, 36). Özbal and Gerritsen suggest this stage could also be represented at Keçiçayırı, Çalca, Musluçeşme, and Küçükçekmece (European side of İstanbul) (2019, 185-186) based on comparative limited lithic data (Aydıngün 2009; Özdoğan and Gatsov 1998). As the most recent data, we might add to this stage the earliest levels of Bahçelievler (Bilecik), dated to the first half of the seventh millennium BC based on preliminary studies and radiocarbon dates (Fidan 2020). The Neolithic layers are separated into seven phases from Phase 8 to Phase 2. The earliest Phase 8 is dated to 7000-6700 BC, and Phase 7 is dated to 6800-6600 BC at Bahçelievler (Fidan 2020, 36; Kolankaya-Bostancı and Fidan 2021, 96). Before 6600 BC, the presence of pottery is clear but not abundant like later phases after 6600/6500 BC both in Bahçelievler and Barcın.

There is clearer evidence after 6600 cal. BC about sedentism and lifestyles in this region and the so-called pioneering pre-Fikirtepe stage between 6600-6400 BC, and this stage can be represented with Keçiçayırı, Cıbırada, Demircihöyük in Eskişehir province, and Barcın Höyük VIe-VId1 in Bursa province (Efe et al. 2012; Özbal and Gerritsen 2019, 186-189; Sarı and Akyol 2019; Seeher 2011, 1987). The Barcın Höyük Neolithic phases are separated into five, from the uppermost VIa to the undermost VIe, and the Neolithic layers are dated to between 6600-6000 cal. BC. Therefore, it provides an uninterrupted sequence of the Neolithic of the region (Gerritsen, Özbal and Thissen 2013a, 2013b; Gerritsen and Özbal 2016, 200; Özbal 2019, 186). As recent evidence, Bahçelievler Phase 6 is dated to 6600-6500 BC, and Phase 5 must be dated after 6500 BC (Fidan 2020, 36; Kolankaya-Bostancı and Fidan 2021, 96), which compares with phases VIe and VId1 at Barcın Höyük. In addition, the earliest levels of Aktopraklık C (6400 BC) (Karul 2011, 2017) and the earliest layers of Menteşe Basal lower (6400 BC) (Roodenberg, 1999b, 22; Roodenberg et al. 2003, 37) could be evaluated in this stage. E. Özdoğan proposes the next stage after the Initial Neolithic as Middle-Late Neolithic between 6500-6200 BC and Pendik, Fikirtepe, Aktopraklık C, Menteşe (basal-middle), and Barcın Höyük VId-VIc are evaluated within the so-called Archaic phases of Fikirtepe (2015, 40-42; M. Özdoğan 1983b, 1979). There is a notable similarity in the pottery assemblages (pre-Fikirtepe wares) that Keçiçayırı, and Demircihöyük Ware A potteries are just like the Barcın Höyük VIe (Özbal and Gerritsen 2019). Fikirtepe, type wares start around 6300 BC. Therefore, they separate this process into two stages: pioneer pre-Fikirtepe sites mentioned above and the Fikirtepe Phase.

Barcın Höyük VIc, VIb, and VIa, Aktopraklık C, Menteşe Basal-Middle and Upper, Pendik, Fikirtepe, Yenikapı, and Ilıpınar earlier levels reflect a more similar material culture between the neighbors in the region that we call ‘Fikirtepe Culture/Fikirtepe Phase’ around 6300-6000 BC (Karul 2011; Özbal and Gerritsen 2019; Özdoğan 2013a). Fikirtepe is mainly defined by two stages, “Archaic Fikirtepe" and "Classical Fikirtepe" and could be dated approximately 6400/6300 and 5800 BC (Özdoğan 2013, 173). The only absolute dates come from Yenikapı 6000-5920 cal. BC for İstanbul Province (Kızıltan and Polat 2013, 129), the earlier levels of İstanbul sites are identified with the comparative archaeological data with the other sites which have absolute dates such as Menteşe, Ilıpınar, Aktopraklık, and Barcın in Bursa region (Karul 2011, 2017; Karul and Avcı 2011; Özbal and Gerritsen 2019; Özdoğan 2013; Roodenberg et al. 2003). E. Özdoğan identifies this stage as Late Neolithic (6200-5900

BC) with Fikirtepe, Pendik, Yenikapı, Aktopraklık, Ilıpınar X-IX, Menteşe (upper), and Barcın VIb-a layers within Fikirtepe culture as well (2015, 46).

In sum, the Epipaleolithic/Mesolithic and pre-Pottery/Aceramic lifestyles are less clearly evident than the pottery phases, which start approximately 6700/6600 with Bahçelievler (Fidan 2020; Kolankaya-Bostancı and Fidan 2021) and Barcın (Gerritsen and Özbal 2016; Özbal and Gerritsen 2019) because of the restricted data in Northwest Anatolia. The Epipaleolithic/Mesolithic characteristics of the region are known from mostly lithic assemblages from survey studies (Gatsov and Özdoğan 1994; Özdoğan and Gatsov 1998; Runnels and Özdoğan 2001). The pre-Pottery/Aceramic levels can be represented with Keçiçayırı, Çalca, Musluçeşme, and Küçükçekmece (European side of İstanbul) and Bahçelievler 8-7 (?). On the other hand, this stage is clarified especially based on the lithic industry (Gatsov and Nedelcheva 2016; Gatsov and Özdoğan 1994; E. Özdoğan et al. 2020; M. Özdoğan and Gatsov 1998; Sarı and Akyol 2019). The pre-Fikirtepe stage (between 6600-6400 BC) represented with Keçiçayırı, Cıbırada, Demircihöyük in Eskişehir province, and Barcın Höyük VIe-VId1 in Bursa province (Efe et al. 2011; Özbal and Gerritsen 2019, 186-189; Sarı and Akyol 2019; Seeher 1987, 2011). Bahçelievler 6-5 may be added this stage as well (Fidan 2020; Kolankaya-Bostancı and Fidan 2021). After this stage, especially around 6300-5900/5800, the sites in the region show more familiar characteristics from Fikirtepe Culture, which is identified by Archaic and Classical levels of Fikirtepe (Fidan 2020; Karul 2011; Kızıltan and Polat 2013; Özbal and Gerritsen 2019; Özdoğan 2013; Roodenberg and Alpaslan 2013; Roodenberg et al. 2003).

3.3.4. The Architecture

This section evaluates the architectural similarities and differences between the neighboring Neolithic sites in Northwest Anatolia. Architectural styles may provide during the Neolithization process in Northwest Türkiye, I mainly concentrate on the earliest architectural characteristics of the Neolithic sites.

There is variability regarding the architecture across the sites; for example, while some sites, like Barcın, Menteşe, Ilıpınar X-IX, Aktopraklık B (Chalcolithic), Aşağı Pınar 7-6, show evidence for rectangular and mostly wattle and daub technique architecture, others, including Keçiçayırı, Bahçelievler, Aktopraklık C, Fikirtepe, Hoca Çeşme (IV-III) yield evidence for round semi-subterranean structures (Fidan 2020; Gerritsen and Özbal 2016; Karul 2011, 2010,

2000, 1994; Karul ve Avcı 2011; Özbal and Gerritsen 2019; Roodenberg 2008; Roodenberg et al. 2003; Sarı and Akyol 2019). Both round and rectangular buildings have been discovered and excavated at Yenikapı and Pendik, while Yarımburgaz stands as a slightly later cave settlement (Kızıltan and Polat 2013; Özdoğan 2013; Pasinli et al. 1993).

The emergence of round and rectangular structures in different settlements close to each other shows that the architectural transformation did not proceed linearly.[14] Özbal and Gerritsen comment that we see the rounded semi-subterranean structures in the later occupations, even Chalcolithic (2019). Pendik and Fikirtepe have excellent examples of round structures (Pasinli et al. 1993). Bahçelievler (Phases 8-5) also proves the recent results (Fidan 2020) that phases 6 and 5 are contemporary with the earliest levels VIe and VId1 at Barcın. The buildings of the Neolithic layers of Keçiçayırı were built directly onto the bedrock, a structure with a round or oval plan around 60cm in depth and 5m in diameter, overlain by these walls was the only architectural remains of the Neolithic Period to be found (Efe et al. 2012, 228; Sarı and Akyol 2019, 144, Fig.9). Efe et al. explain these remains as a row of stones that could surround a roundhouse was unearthed (2012, 228). A stone architecture represents Keçiçayırı with round structures dug into the bedrock, such as Pendik or Aktopraklık. (Sarı and Akyol 2019, 149-150). Sarı and Akyol argue that Keçiçayırı showed that Neolithic communities, chiefly situated on plains or coastlines could also be settled in mountainous or foothill areas (2019). Evidence for such upland sites is usually present at Chalcolithic period sites such as Orman Fidanlığı, Kanlıtaş, and Keskaya. and Keçiçayırı pulls this model earlier (Sarı and Akyol 2019, 150). Bahçelievler is represented by oval/round structures (around 3-5 meters), and the walls (some of the wall's thickness is about 50 cm) of these structures are constructed by mudbrick or mud and found post-holes, but not all of them in phases 8-3. The post-holes were located in half of the structures to strengthen the material, and pebbles surrounded some of the post-holes, but this is not regular for all buildings (Fidan 2020, 36). There are workshop and courtyard areas between the structures, and most of the assemblages come from the courtyard areas.[15] On the other hand, most stone tools come from inside the buildings, some from courtyard areas (Kolankaya-Bostancı and Fidan 2021, 102). Unlike the different layers, in Phase 2, roundhouses

[14]The traditional thought was that hunter-gatherer groups built round structures as they were easier to build as they settled, while architecture turned into rectangular structures as the Neolithic way of life progressed.
[15] Private conversation with E. Fidan.

are replaced by rectangular houses (Kolankaya-Bostancı and Fidan 2021, 96). Both sites are inland sites in Eskişehir/Bilecik region.

Unlike Keçiçayırı and Bahçelievler, at Barcın Höyük, there are consecutive rectangular houses in the east-west direction unearthed in the northern part of the excavated area in phases VIe (6600-6500 cal. BC) and VId1 (6500-6400 cal. BC) at Barcın (Yenişehir plain, Bursa). Four houses (21, 2b, 2a, 19), slightly smaller and facing south, were built in phase VId1 on buildings 24 and 25 which are representing phase VIe (Gerritsen, Özbal and Thissen 2013a, 96; 2013b, 57-59; Gerritsen and Özbal 2016, van den Bos 2021, 168). In both phases, there are courtyards on the north and predominantly south sides of these houses for daily activities such as cooking, food processing, etc. (Gerritsen et al. 2013a, 95). There are post holes in the foundations of the buildings. However, there are some differences in both phases. While the post holes are more extensive in VIe, this size becomes considerably smaller in VId1 (van den Bos 2021, 168-170).

Menteşe (Yenişehir plain, Bursa) also has an identical architecture to Barcın Höyük (Gerritsen and Özbal, 2016). Pise or mud slabs, wattle, and daub/wickerwork techniques were used. In this layer, three buildings were found, and they are around 5x5 m as square/rectangle plans with one room in yellow plaster (Roodenberg et al. 2003, 21). The buildings were built close to each other, and there are one-room, rectangular-plan structures surrounded by courtyards in Menteşe Höyük (Roodenberg et al., 2003). The architecture of Aktopraklık (near Ulubat Lake, Bursa) consists of simple huts 3-6 m in diameter with semi-subterranean floors (30 cm deep) in a circular plan. These buildings are not in regular order and are surrounded by courtyards (Karul 2011). The architecture is especially similar with Pendik, Fikirtepe, and Bahçelievler (Fidan 2020; Karul 2011; Özdoğan 2013). The Pendik site is represented by oval and round-shaped dwellings/wattle-daub architecture, which are around 3 to 6 in diameter and 50-80 cm in-depth and is also found in rectangular buildings. The pits had been dug into the hard-virgin soil and included large flat stones on the floor. To protect the floor from the soil's moisture, wooden material was placed on these stones and plastered thereafter (Harmankaya 1983). The architecture of Pendik shows similarity with Fikirtepe and yielded round and oval wattle and daub huts with semi-sunken floors (Özdoğan 2013a). Fikirtepe architectural findings are wattle and daub circular huts, a workshop area, a hearth, and various architectural remains in the form of a pit. During the excavations, 13 shelters, which were thought to be dwellings,

were unearthed, and five of them were preserved in excellent condition. Shelters are generally 2,5 - 5 m in diameter, mostly buried in the virgin soil by 20 cm, pit-bottomed, irregularly shaped structures, and its roof cover was formed by a wattle and daub skeleton with mud. Most of the burials were buried under the floors in the huts in flexed position (Özdoğan 2013a, 173).

The Yenikapı architecture is represented by a rectangular plan with rounded corners and a row of stones along an ancient water channel in the north-south direction. In this area, they found more than 300 footprints belonging to the Neolithic inhabitants (Kızıltan and Polat 2013, 116-117). The unique preservation in the watery-muddy soil led to the preservation of even wooden materials (Kızıltan and Polat 2013). On the eastern side of the streambed, the stumps of 198 trees were found (Kızıltan and Polat 2013, 118-122). It was determined that the branches were braided, plastered with mud, and attached to the post-holes, with the bottoms covered with river stones. It was emphasized that this architectural style bears a resemblance to the structures at Aşağı Pınar (Gökçay 2007).

In the Neolithic levels of Ilıpınar X-IX, rectangular-planned structures, with their walls made of mud plaster, were built over the drainage ditch filled in this phase. In addition to the mud plaster technique, we can talk about the existence of post-hole architectural tradition here (Roodenberg 2008a, 2, see fig.2.4). The architecture of the last phase of Ilıpınar X consists of plan III houses, which were preserved together with all their interior fillings, and presents one of the good examples of post-hole architecture (Roodenberg 2008a).

In burial tradition, individuals were buried under the floors inside the houses or courtyard areas in the flexed position. For example, at Barcın, excavations revealed that adults and young individuals are primarily buried in courtyard areas, and babies and children are buried in the flexed position inside the house (Gerritsen, and Özbal 2013). At Ilıpınar, most of the burials belong to infants or children, and they do not have a standard burial position; on the other hand, the adults were buried on their right side in a recumbent flexed position at Ilıpınar (Alparslan-Roodenberg 2008). In the physical anthropological studies conducted by Alparslan Roodenberg, traces of advanced joint disorders and anemia were found in human remains. The intense wear observed on the teeth suggests that the nutrition system is mainly based on grain consumption (2008). In addition, ‘burial gifts’ are typical. For example, Menteşe yielded burial goods including bone tools, beads, and pots (Roodenberg et al. 2003, 34). Necklaces were typically placed in baby burials, while pots and cattle bones were in those of adults (22).

To summarize in general, we see two types of architectural features in the Northwest Anatolian Region: round/oval and rectangular planned buildings. Although the architectural elements of these structures show some differences within themselves, two traditional building types can be considered for the region. Some researchers have suggested that the oval/round structures may represent a continuation of the local Epipaleolithic/Mesolithic occupation culture in the region (e.g., Ağaçlı), while the rectangular architectural tradition is believed to have been brought over from Central Anatolia (e.g., Çatalhöyük). In both types of settlement organizations, the buildings share central courtyards in the sites. We see a similar observation for the Western Coast of the Aegean Region (see 2.1 for details).

3.3.5. Material Culture

In this section, I consider the material culture to understand the connections, variability, changeability, and traditions between the sites in Northwest Anatolia. The data about material culture is better known from pre-Fikirtepe and Fikirtepe Culture stages in the sites. The pottery assemblages, lithic industry, and bone tools are the main groups of comparative material culture implements in the region; however, every site can show individual differences. In a general sense, all sites need to be investigated on a micro-scale (E. Özdoğan 2016), although many links reflect similarities (M. Özdoğan 2013, 2014). Gerritsen and Özbal suggest that coastal and inland settlements were culturally connected by their identical portable material culture, including lithics, pottery, and bone implements, although there are some differences in architecture (2016, 206). For example, with regards to material culture, Aktopraklık shows similarities with the Yenikapı, Ilıpınar, Menteşe, Barcın, and even Keçiçayırı sites (Avcı 2010; Karul 2019, 2011; Karul and Avcı 2011; Sarı and Akyol 2019) despite these sites having different settlement organizations.

The resemblances in material culture are more apparent during the Fikirtepe Culture stage than in the earlier stages in the region (Özbal and Gerritsen 2019). Fikirtepe has an abundance of chipped stone tools, celts, sling missiles, animal figurines, and bone tools such as spoons, spatulas, awls, bone harpoons, horn hammers, and other artifacts. Clay objects and ground stones are poor (Özdoğan 2013, 174). At Pendik, pottery, artifacts such as bone tools, and the faunal remains (sheep, goats, cattle, pigs, and hunting animals, use of shells and fish) are almost identical to those of Fikirtepe (Harmankaya 1983; Özdoğan 2013a). Özdoğan argued that whatever we know for Pendik, we can imagine the same for Fikirtepe or vice versa,

especially for the Archaic Fikirtepe layers.[16] Pendik finds were defined as "Archaic Fikirtepe" and constituted the lowest known phase of Fikirtepe culture (Özdogan 2013a, 173). Thus, some current levels are included in Fikirtepe Culture (Özdoğan 2013a, 174). On the other hand, Pendik has a wider variety of bone and horn tools compared to Fikirtepe. Usually, medium and small-sized chipped stone tools are made of flint, though obsidian is not rare (Harmankaya 1983). Moreover, Pendik shows similarity in assemblages with Ilıpınar (Level X), Aktopraklık, Barcın, Menteşe, and Demircihöyük, even Bahçelievler at some point. Özdoğan argues that the Fikirtepe culture featured simple ovoid huts of wattle and daub with semi-subterranean floors, black burnished pottery, efficiently rectangular box-like vessels, and bone spoons that looked more 'Balkanic' than Anatolian (Özdoğan 2013a; 2019). We know the rectangular four-legged vessel known as 'Fikirtepe box' is found across several sites in that region, including Ilıpınar, Pendik, Barcın, Aktopraklık, and Bahçelievler (Figure 3.3).



Figure 3.3: Rectangular box from Barcın's Phase VIc which is typical for Fikirtepe sites in the Marmara Region (Özbal and Gerritsen 2019, Fig.10).

As an early site in the region, Keçiçayırı pottery assemblages consist of red slipped, dark-faced, and coarse wares groups in bowls, jars, and lids forms (Sarı and Akyol 2019, 145-146). In pottery production, there are similarities and differences between Çatalhöyük, Demircihöyük, Barcın Höyük, and Aktopraklık (Sarı and Akyol 2019, 147-149). Early observations of the earliest phases 8 and 7 (7000-6600 BC) at Bahçelievler have a light brown, thick-walled, straight rims with an inverted profile. The pottery only appears in small amounts.[17] These phases in chronological evaluation coincide with the Initial Neolithic (E.

[16] Private online conversation with Mehmet Özdoğan (April 2020).

[17] Private online conversation with Erkan Fidan (22.04.20).

Özdoğan 2015) or the Aceramic stage (Özbal and Gerritsen 2019) in the regional chronology. Still, with the presence of the pottery, it is difficult to say that there is an Aceramic phase at Bahçelievler. A similar situation is presented in Phase Vie at Barcın Höyük. There is limited data of the pottery assemblage in VIe, especially in the earliest phase levels. The presence of pottery assemblages increases in Phase VId1. In comparison, Gerritsen et al. mention changes in the pottery assemblage typology among the phases (2013a). In Phase VIe, closed holemouth jars, deep bowls, antisplash rims, lug handle types with micaceous clay to which powdered green and black schist ingredients are represented and share similarities with Keçiçayırı and Demircihöyük Ware A (Özbal and Gerritsen 2019, 187-188, Seheer 1987). A unique pottery is a four-legged box with a low rectangular-sectioned knob handle, apparently a pioneer of the later "Fikirtepe style rectangular boxes" or "Fikirtepe-style cult boxes" (Gerritsen et al. 2013a, 98). Sarı and Akyol also suggest a parallel with Keçiçayırı, as mentioned above (2019). In Phase VId, calcite-tempered wares dominate, and wall thicknesses become thinner than before. Light grey, pink, brown, and reddish pale brown are the common colors, and the shape range includes cups, holemouth pots, bowls, and S-shaped pots with two lug handles (Gerritsen et al. 2013a, 98).

Especially in the layers of the settlements dated to 6400/6300 BC, materials similar to Fikirtepe appear. First, to briefly talk about Fikirtepe Pottery, the dominant colors in Fikirtepe pottery are characterized by dark tones, or dark gray and brown. However, the number of dull reddish, buff and black-colored pieces is noticeable. The so-called cult tables are also represented by rectangular vessels on short feet (Özdoğan 2013, 173). Of course, this group of similar materials got this name because many settlements were excavated after Fikirtepe. Hence, Fikirtepe cultural items started to be seen in Phase 6 which is contemporary with Barcın VIe (6600-6500 cal. BC) at Bahçelievler (Kolankaya and Bostancı 2021). These Fikirtepe cultural items have become dominant in Phase 5, continued in Phases 4 and 3. The pottery of Bahçelievler in these phases has a richer understanding of motifs than Fikirtepe, and then it gradually turns towards dark colors. Unlike the other layers, round houses are replaced by rectangular houses in the second layer, and some changes are seen in the material (Fidan 2020, 37; Kolankaya and Bostancı 2021, 96). From this perspective, three possibilities emerge. Firstly, the average earliest phase of Fikirtepe is estimated as 6400/6300 by analogy with other settlements such as Menteşe, Pendik, Aktopraklık, Barcın, etc. (Özdogan 2013). Second, Bahçelievler has yielded the most recent and the earliest data. The possibility of a pioneer site

in the Eskişehir/Bilecik region transitioning towards the Fikirtepe culture and the İstanbul Region exists.

The Menteşe pottery assemblage also shows similarities with Fikirtepe, with its light-colored, dark gray, and black-colored surfaces and its mineral temper. Calcite and quartz, schist, and unidentified ingredients are used, in addition to plant materials used in small amounts (Roodenberg et al. 2003, 29). Aktopraklık C pottery culture consists of four main ware groups, including red wares, dark-faced wares, light-colored wares, and coarse wares, respectively, and at the same time, each group was subdivided within itself (Avcı 2010, 145). The pottery assemblages are black, brown, or light brown with sometimes oversized handles. S-profile oval bowls are standard, jugs (some of them narrowing), and cult tables, especially represented in the Archaic Fikirtepe Phase (Karul 2011, 60; Karul and Avcı 2011). As a later occupation than other sites in the region, Ilıpınar pottery assemblage of Phases X and IX is represented in the Fikirtepe Culture group and consists of sand-tempered wares (some of them are calcite and chaff-tempered). Phase X includes various shades of grey, cream, and brown in three main groups: closed/narrow forms, open forms, and unique forms (Thissen 2001). "S" curved and slightly spherical bodies similar to layer X are seen together in bowl types, such as angular vessels, lids, and miniature vessels (2001).

Lichter argues that the western part of Anatolia provides evidence to understand the Neolithization of Europe through the pottery assemblage interactions between the regions (Northwest, Aegean coast, Lake District) (2002). In this sense, the pottery assemblages could be divided into three groups during the Late Neolithic and Early Chalcolithic periods:1- the incised and impressed pottery of the Northwest and the Marmara Region, 2- the painted pottery of inland Southwestern Anatolia, and 3- the undecorated, red-slipped wares of Western Anatolia (Lichter 2002, 166). Based on Thissen, Lichter suggests that the Neolithization of Northwest Anatolia seems to have its roots in Central Anatolia and proposes that the Neolithic in Europe might have come to Western Anatolia from the Lakes District. Comparing Lichter's interpretation with those by Turan Efe, Nikos Efstratiou, Hijlke Buitenhuis, and Mehmet Özdoğan, who provide some relevant comments on that topic. Efe suggests that a transition from the Konya region to the Marmara region depends on the evidence from Keçiçayırı. Efstratiou refrains from explaining the Neolithization process based on stylistic similarities or singular technological traits. He proposes that the Neolithic transition occurred in the east of

Greece. Buitenhuis mentions the zoological data from Ilıpınar X, including a full package of sheep, goats, pigs, and dogs (Buitenhuis 2008). He also proposes that this package has probably been transplanted from Central Anatolia. Özdoğan criticizes the border of the regions and argues that the architecture of Filipina is foreign to Central Anatolia, as is Hoca Çeşme. Consequently, he proposes that there must be a Pre-Pottery substratum in some areas, and some of the sites should be in the highlands, not only in the lowlands.

The lithic assemblages are the leading group of comparative data in understanding the pioneer groups' interactions in Northwest Anatolia. Bullet cores, blades, and bladelets in chipped stone assemblages are the most common types of lithic tools in the region. Bullet cores have a wide regional distribution and appeared around the 7^{th}-6^{th} millennium BC (Gatsov and Nedelcheva 2011, 2016).

Keçiçayırı lithic tools are identified with chipped discs, retouched blades, and end-scrapers (Sarı and Akyol 2019, 144). There are some connections and similarities between the lithic industry and the Pottery Neolithic in the interior of Northwest Anatolia, Central Anatolia, and the Levant (Gatsov and Nedelcheva 2011, Efe et al. 2012). The Bahçelievler lithic industry also shows interactions as local and imported raw materials with 91% chipped stone, 9% obsidian (Kolankaya-Bostancı and Fidan 2021, 94). The lithic assemblages consist of scrapers, conical or bullet-shaped cores in blade and bladelet production, borers, and transverse arrowheads. This data shares identical links with the other sites in Northwest Anatolia (Kolankaya-Bostancı and Fidan 2021, 94-95). They argue that most of the blades/bladelets had been used for farming activities. They support their argument with the width measurement of the silica sheen on the lateral edges of blades found in Bahçelievler, which is between 0.3-0.58 cm, so the settlers must have used these tools as a composite tool for cutting ears of cereals by attaching them to a handle (105-106). The Barcın lithic industry displays strong technological and typological similarities with Menteşe, Fikirtepe, and Ilıpınar, Keçiçayırı, and new evidence at Bahçelievler (Gatsov and Nedelcheva 2011, 2016; Gerritsen et al. 2013a, 98; Kolankaya-Bostancı and Fidan 2021, 94-95). Single-platform cores clarify lithic assemblages; bullet-shaped cores, blades, and bladelets are the most common category after increasing. Retouched tools, flat circular and semi-circular end scrapers, macro and micro end scrapers, drills, trapezoidal arrowheads, and blade perforators (Gatsov and Nedelcheva 2011, 93; 2016; Gerritsen et al. 2013a, 98). The blade industry at Menteşe Höyük is predominant, as in other

regional sites mentioned above, and prismatic cores; in addition, tools on flakes are also encountered. The main tool types in the settlement are backed blades, scrapers, and drils (Gatsov 2003, 154). The lithic industry at Aktopraklık also mainly consists of bullet cores, prismatic cores, and blade/bladelets. The lithic industry is similar to that at other sites located in NW (Karul 2011, 60). At Ilıpınar, flint constitutes 95%, and obsidian 5% of the stone tool industry. Most chipped stone tools consist of front scrapers, drills, notched tools, straightened blades, and flakes. It has been discovered that blades are used on organic materials (wood, bone, plant, reed, leather, etc.) (Gatsov, 2001). There are similar results regarding the percentage of flint and obsidian and the use of blades in organic materials in Bahçelievler as well (Kolankaya-Bostancı and Fidan 2021).

Bone implements have an especially abundant distribution in the region. For example, Barcın Höyük provides a good range of bone tools and represents a regional similarity, especially in the later levels (Gerritsen et al. 2013a). Different sizes of spoons (oval, round, and poplar leaf-shaped bowls), awls, pins, spatulas, belt hooks, and fishing hooks were found in several contexts, such as surfaces, pits, platforms, and in some burials as a gift (especially young-adult or children/baby burials) (Erdalkıran 2015). Awls and pins are abundant, and the spoons are standard bone tools at Barcın (Özbal and Gerritsen 2019, 99). These bone implements show similarities with the regional material culture such as at Menteşe (Roodenberg et al. 2003, 34), Bahçelievler (Azeri 2023), Aktopraklık (Karul 2011, 60-61), and Ilıpınar (Roodenberg 2008a; 2008b). Bone implements have several daily use functions, and some are related to preparing food, cooking, mixing meal/milk/dairy by-products such as spoons and spatulas, hooks for fishing, etc.

To summarize in general, despite the differences, especially in the architecture, the pottery assemblages, lithic industry, and bone tools are the main groups of comparative material culture implements in the region, and the pottery culture is defined primarily to pre-Fikirtepe and Fikirtepe Culture stages in the sites. The portable findings share a cultural connection between the regional sites and the Central Anatolian region, as well as Western Anatolia and the Eastern Balkans, despite different types of settlement organizations that I discussed above in the architecture section (3.3.3). This similarity has increased especially after the Fikirtepe Culture stages.

3.3.6. Subsistence Economy

This section briefly evaluates the type of subsistence practices in the NW sites. The plant data is discussed in the second chapter in further detail; hence I mention here only its role in the subsistence economy in the region. The diet shows a mixed subsistence economy with farming, herding, hunting (mostly small-game), gathering, marine foods (fishing, collecting mollusk) at both coastal and inland settlements around the second half of the 7th millennium BC in Northwest Anatolia (Arbuckle et al. 2014; Balcı 2018; Balcı et al. 2019; Boessneck and von den Driesch 1979; Budd et al. 2013; Budd et al. 2018; Buitenhuis 2008; Cappers 2014, 2008; Çakırlar 2015, 2013; Galik 2014, 2013; Gourichon and Helmer 2008; İzdal Çaydan 2018; Karul 2017, 2011; Kızıltan and Polat 2013a, 2013b; Kolankaya-Bostancı and Fidan 2021; Özdoğan 1983b; Sarı, in press.; Schroedter and Nelle 2015; Thissen et al. 2010; Ulaş 2020; Würtenberger 2012).

In general view, a terrestrial diet has abundance rather than an aquatic and wild game subsistence, especially at Barcın, Basal Menteşe, Aktopraklık C, Ilıpınar X, and Bahçelievler as inland settlements with a wide range of economic plants; the species can change depending on the site but overall, barley, einkorn, emmer, bread/hard wheat, lentil, pea, chickpea, bitter vetch, grass pea, flax, bramble, hazelnut, terebinth, fig, and domesticated animals; cattle, sheep, goat, and later pig. However, the percentages change from site to site and layer to layer (Balcı et al. 2019; Buitenhuis 2008; Budd et al. 2013; Budd et al. 2018; Budd et al. 2020; Cappers 2008; Galik 2013; Gourichon and Helmer 2008; İzdal-Çaydan 2018; Karul 2017; Kolankaya-Bostancı and Fidan 2021; Sarı, in press). At Menteşe, in the faunal remains, identified domestic animals are cattle (abundant in the lower phase of Phase 3), sheep (increase in the upper layers), goats, a small number of pigs, and dogs; among the wild animal species, it consists of red deer, fallow deer, wild boar, wild horse, rabbit, wild cat, fox, and skunk. Various bird species and turtle bones are also among the identified species (Gourichon and Helmer 2008, 435). In this context, Gourichon and Helmer state that the lower Phase 3 of Menteşe shows a similar structure to Fikirtepe. The ratio between domestic species in the upper phase of Level 3 is mostly in Ilıpınar phases X and IX indicated to be close (2008).

In addition, the strong suggestion about the type of diet for coastal sites, especially Pendik and Fikirtepe, was based on the intensity of hunting and marine foods compared to domestic activities around İstanbul province. This has been interpreted as a continuation of

Mesolithic subsistence (Çilingiroğlu 2005; Düring 2011; Özdoğan 1983b, 2010, 2011). Yenikapı is also a coastal site, but Kızıltan and Polat argue that Yenikapı presents a different settlement picture than the fisher and hunter communities in Fikirtepe and Pendik (2013). The use of the environment offers domesticated plants; wheat, barley, pulses, gathered plants and animals; cattle, sheep, goats, and wild grasses and animals such as deer, wild goats, and fish for consumption and utilization (Kızıltan and Polat 2013, 126; Ulaş 2020). In contrast, Pendik shows agricultural implications rather than only one type of subsistence economy, but the plant remains are very limited compared to Yenikapı; hence Ulaş's view about the limited data supports the hypothesis that fishing activities depend on the artifacts (Özdoğan 1983b; 2020, 36)[18]. Fikirtepe has no collected archaeobotanical samples; however, the subsistence economy is based on hunting, open-sea fishing, collecting mollusk, and dairy products (Boessneck and von den Driesch 1979; Evershed et al. 2008; Özdoğan 2013b; Röhrs and Herre 1961). On the other hand, Çakırlar argues that there is no reason to think about a lesser role of animal husbandry around İstanbul province depending on the NISP abundance of the domestic animals from Pendik, Fikirtepe, Yenikapı than a hunter and fisher subsistence (2013, 66-67, see a comparative chart of NISP in Fig. 3). In addition, Aktopraklık C is considered a semi coastal/inland site because of its location near Ulubat Lake and its oval/round huts architecture, which shares similarities with Fikirtepe and Pendik (Karul 2011; Karul and Avcı 2011). The previous view was that marine foods had importance in the diet like coastal settlements Fikirtepe and Pendik (Karul 2019; Karul and Avcı 2011). On the other hand, a terrestrial diet based on meat consumption showed abundance rather than an agricultural or fishing diet with the recent Carbon and Nitrogen isotopes analyses on human bones at Aktopraklık (Budd et al. 2013; Budd et al. 2018).

The subsistence economy has two factors that stand out in the subsistence economy compared to other regions. One of them is about the presence of pigs in the region. Arbuckle et al. mention that domesticated pigs are not documented in Northwest Anatolia until 6000 cal. BC (2014, 4-5). There is no evidence of domesticated pigs and cattle in Central Anatolia around

[18] "*This is also the conclusion of Vedat Onar, who studied the animal bones from the later layers (Byzantine) of the Yenikapi site. He said that large fish and even dolphins that would have been butchered on site or nearby were over-represented in the assemblage, while sardines/hamsi are underrepresented unless they are found in containers (which is the case with shipwreck YK 35). And animal bones in the harbor could be refuse or got there naturally*." (mentioned by M. Jones, who is one of the Dissertation Committee Members in this thesis, 13.08.25).

8000-year BC. On the other hand, the pig was present in the Coastal Aegean before NW Anatolia; arguing for multiple distinctive impulses that characterized the spread of farming across Turkey (Arbuckle et al. 2014, 7-8). This evidence makes discussible the Neolithic Package idea at the same time. Another exciting thing is lipid residues. Barcın Höyük indicates the first use of by-products of milk during all levels of the site. That kind of nutrition is dominant in Northwest Anatolia and then in southeastern Europe (Arbuckle et al. 2014; Budd et al. 2020; Özbal et al. 2024; Thissen et al. 2010). In addition, we find dissimilarities in founder crops across sites, but I discuss these differences in the second chapter. It is possible to talk about a transition of farming and husbandry practices in the region, but the 'Neolithic Package' preferences show complexity in the sites.

In the region, the sites are almost separated into two types of occupations: coastal and inland settlements, with oval/round huts and rectangular architecture. The common and traditional view has been that coastal sites used more hunted foods and marine foods in their diet, but evidence shows that this is not such a simple equation, and that hunting and marine foods can support a diet. When we look at all the data provided, there are many gaps in the subsistence economy picture with limited data caused by several reasons, such as multiple sampling inadequacies, preservation conditions, and methodologies of the excavations. Consequently, the archaeobotanical and zooarchaeological studies are scarce, and the exact diet of the communities is not always clear based only on macro remains (both zoological and botanical) investigations; hence, we should support our questions with several analyses and interpretations of other archaeological findings with different approaches when the data is limited.

3.4. Discussion

For Northwest Anatolia M. Özdoğan suggests the sites as a group of Fikirtepe cultures in and around the Bosphorus after 6400/6300 BC (2013, 2014). However, the data now show that the sites in NW Anatolia show many differences in material culture, architecture, and several regional connections as indigenous and migrant communities. While Fikirtepe finally has carbon dates, and similar assemblages to the pottery in phases X-IX at Ilıpınar (E. Özdoğan 2016). While the new studies support some of M. Özdoğan's approaches, they have also drawn a different framework. E. Özdoğan criticizes that those cultural differences might be evaluated at a micro and local level, although there are some similarities. She does not suggest an exact

process of Neolithization for every region, which should enable the summarizing of local developments with supra-regional perspectives (E. Özdoğan 2016). The aDNA studies can help to understand the mobility of the groups, but Barcın Höyük, at present, is the only site in Northwestern Anatolia that provides comparative gene data with Europe (Marchi et al. 2020; E. Özdoğan 2016).

The region contains local communities and migrant cultural groups with a bilateral adaptation process, and some elements still reflect Epipalaeolithic/Mesolithic traditions (see sections 3.1-3.2.). Düring describes this situation as the Neolithic of Central Anatolia, and the missing data of hunter-gatherers in Northwest Anatolia can help clarify the spread of Neolithic in Anatolia (2013). In comparison, there are cultural connections with the Konya Plain (Çatalhöyük VI–IV), and Barcın VIe-Ve/d, Aktopraklık C, even Bahçelievler 8-6 but there are differences in architecture (oval/round plans at Bahçelievler and Aktopraklık), and in small objects. In addition, the indigenous people of Neolithic Central Anatolia and the first migrants in Europe should be in the same gene pool (Kılınç et al. 2016). Likewise, Hodder too points out there could be interactions between Central and Northwestern Anatolia and the Balkans around 7000-6000 BC (2014, 18).

The adaptation process of migrant groups in the region could be observed in limited sites. Barcın has uninterrupted sequences of Neolithic layers in the region and provides a nice observation of the earliest levels. The scarcity of all archaeological materials, including pottery, in the earliest layers and the increase and broad range assemblage in VId1, suggest that the inhabitants of Barcın adapted better to this region and developed new relationships as time passed (Gerritsen and Özbal 2016; Özbal and Gerritsen 2019). In addition, understanding the diet of local and migrant groups according to macro archaeological remains/findings is difficult. Aktopraklık is a semi-coastal settlement rather than an inland settlement such as Ilıpınar, Menteşe, and Barcın. Its population likely preferred to benefit from sea products due to its location and is also engaged in agriculture and shows similarity with Ege Gübre and Yeşilova on the coastal Aegean of Anatolia, Hoca Çeşme and the northern Aegean coast, and Fikirtepe, Pendik and Yenikapı settlements on the Marmara coast (Karul and Avcı, 2011; Karul 2011; Avcı 2010). In this sense, when we look at the overall data of Aktopraklık, it seems such a combined manifestation of local and migrant prints in their culture. In addition, we can see this behavior in other regional sites. On the other hand, marine foods have no important place in the

diet by comparison with domestic animal consumption at Aktopraklık, even Pendik and Fikirtepe (see more details section 3.3.5., Budd et al. 2013; Budd et al. 2017; Çakırlar 2015, 2013). Settlements shaped their subsistence strategies based on their ecological niche diversity or determined their settlement locations based on their known subsistence strategies. People, especially in the early layers, attempted to maintain crop diversity that required different ecological tolerances, and specialized in small- and large-scale gathering, fishing and hunting, and dairy production in addition to meat consumption. This may suggest that communities in the region employed strategies such as risk diversification and minimization (high-return and low-risk crops), niche construction (fishing, collecting mollusk, dairy product, etc.), and diversification of regional resources (gathering). As a concluding remark, most of the sites in Northwest Anatolia have current levels between 6600-6000 BC and yield evidence for what appears to be the earliest Neolithic inhabitants in their respective sub-regions and local developments. This, in turn, may furnish our interpretation of the Neolithization process of Northwest Anatolia. Thanks to new studies and approaches, the picture of the Neolithic way of life and its relations will undergo more change. Now, we are far from the idea of direct transitioning of the Neolithic way of life from a central zone to Europe.

Chapter 4

4. MATERIALS AND METHODS

The general methodological stages of the macro-botanical samples includes sampling, flotation – manual or tank system- or dry sieving, drying, sorting, identification, and interpretation. Obtaining archaeobotanical samples goes through many stages, starting from the depositional process at the archaeological site to sampling strategy, flotation/dry sieving, subsampling in the laboratory, identification, and interpretation of the spatial data, and more.[19] The most important point here is that the sampling process that begins in the field must continue through the various stages to reach the maximum recovery approach.

4.1. Field

The deposition process and preservation of organic remains differ across natural environments and cultural use, and plant materials are not equally represented at every site. Environmental and cultural factors may contribute to the introduction of intrusive materials, the mixing of deposits, or the loss of delicate plant remains (Pearsall 2016, 36). Likewise, cultural aspects - including site function, processing practices, and discard behaviors - shape the archaeobotanical record. Additionally, the sampling methods and analytical procedures adopted by paleoethnobotanists/archaeobotanists can further influence the dataset (Miksicek 1987, 212). The methods used by excavation directors and the initiative of sampling by the archaeologists are other important impact which influence the botanical dataset.

[19] This chapter covers the activities I did for my Ph.D. research during 2020 - 2024. These activities primarily consisted of the fieldwork and laboratory studies I conducted between May-June 2020, June 2021, and June 2022 from Bahçelievler and preparing the archaeobotanical samples, sorting, analyzing, and presenting the data from Bahçelievler and Aşağı Pınar in 2020-2024. The first preliminary investigations on Barcın Höyük samples were conducted for MA Research between 2016-2018. Studies planned for doctoral research have been put on hold in the museums from 2020 to 2024 due to government restrictions imposed on archaeobotanical samples. Because of the restrictions, a permit application was made in January for the lab work scheduled to be carried out in Ankara for the Barcın Höyük and Bilecik samples and for the final checking and photographing of the Bahçelievler samples and the updating of the Excel data. The study on the Aşağı Pınar samples continued in Istanbul during this period.

4.1.1. Deposition and Preservation

There are several types of preservation for the plant remains. These are charring, waterlogging, mineralization, drying, and freezing. These preservation types are related with the environment of the settlements such as open-sites, caves, frozen and waterlogged sites that elevation, regional and climatical differences are the main impacts (Miksicek 1987, 214). Charring and mineralization are the most common preservation types at open-sites in Anatolia, and also in several regions (Fritz and Nesbitt 2014). The botanical assemblages in this study include charred plant remains, and there is also mineralization on some types of the plant remains.

Charring could occur for several reasons, such as accidental or conscious fire-cooking, burning trash, roasting, heating, etc., and this is the most abundant type of preservation. For example, after consuming the seeds of nuts, nutshells can be used as supplementary fuel, or toasting of seeds and grains can be used as an insect repellent during crops storage. Likewise, for hulled wheats, it is easier to remove glumes before de-hulling or pounding (Miksicek 1987, 220). In such cooking or processing activities, seeds and fruits can burn accidentally. My macro-botanical assemblages consist of 95% charred, 1% mineralized, and 4% possibly modern remains in four of the sites.

Mineralization which might give information about special taphonomic conditions when the soil contain phosphate (PO_4^{3-}) or calcium (Ca) in the form of coprolite or dung, or when some seeds/fruits contain calcium within their structure and become mineralized while charring as a blue-gray or white color. For instance, there are fruitlet of blueweed (*Echium vulgare*) or gromwell (*Lithospermum* sp.) in my assemblages that were recovered as white/bluish/greyish color as a result of mineralization (see Chapter 5.6.5). Fossilization through casting or mineral replacement can also occur with silicates, carbonates, gypsum, or calcite. Fruits that naturally contain high levels of calcium carbonate in their fruit walls such as hackberry (*Celtis* sp.) or certain sedges like razorgrass (*Scleria* sp.) can persist for many years without undergoing carbonization (Miksicek 1987, 218). I documented a very small shell piece of hackberry fruit which is white in color at Bahçelievler (see Chapter 5.5.7)

The frequently burnt contexts at Barcın Höyük facilitated excellent preservation of plant remains and substantial amounts of wood charcoal. There is no particular context in which we find a high percentage of plant remains in Barcın Höyük, except a single burnt store of lentils from structure 2a in level VId1 that yielded around 28,000 seeds. However, no special wild

plant storage/group was found among the samples. A large part of the wild plants consists of field grass/weeds, and we found them generally with cereals or pulses as a mixture except pyrotechnic features that wild plants were abundant compared to the crop remains. Generally, the archaeobotanical samples were collected in different contexts with the order of the density of plant remains per liter; layers, surfaces, platforms (Phase VId1), pyrotechnic features, pits, postholes, and burials. Along with that, during the investigation and interpretation of the data, possible rodent activities were also considered[20].

The samples from Bahçelievler were taken from surfaces, courtyards, hearths, and burials, yielding great variability in the number of archaeobotanical samples for each phase compared to a limited excavated area. The preservation of the recovered wood and non-wood charcoal remains at Bahçelievler was notably poorer than those recovered at Barcın Höyük, probably due to the lack of burnt deposits and sampling strategy, but it may also reflect the circumstances of plant use at the site or all/any combination of these reasons. Most cereal remains were fragmented, making species identification difficult, and wood charcoal remains were extremely limited. The deposition of Bahçelievler were better preserved in Phases 6 and 5 (6600-6400 BC) which locates in between Phases 8-7 and 4-2 in the stratigraphy, the archaeobotanical dataset was higher in these phases too. The latest Neolithic Phases 2-3 were very close to the recent surface, and the earliest Phases 8-7 were unearthed in very restricted areas, especially Phase 8.

In Aşağı Pınar, the samples were collected in Phase 7, which is only included in this research, especially are represented by two ditches (Ditch H1-1 and H1-2, Ditch H2). The depositional character of ditches includes layers of chalk, burned mudbrick, charcoal, clay, and soil material; both were sometimes re-dug and enlarged. The ditches stratigraphy is divided to some depositional levels such as E (bottom fill), D (bottom-middle fill), etc. The preservation of the botanical remains is good and mostly comes from the ditches compared to the structures. There are also several archaeological materials such as bone tools, stone tools, figurines, decorated sherds have been documented from the ditches.

[20] "*In the higher levels, there was a lot of rodent activity, digging through especially Chalcolithic layers and still also in VIa and VIb. This was much less so in the earlier Neolithic levels (VIe-VIc), but a characteristic of the Neolithic levels was that all deposits were quite thin (the whole vertical buildup of VIe to VIc is about 1 meter), and that there was a lot of disturbance from later Neolithic levels into older Neolithic levels*" (Online conversation with Fokke Gerritsen, 24.09.25).

4.1.2. Sampling

Sampling method representativeness related to the sites' space, period, and archaeological contexts which are sampled. In this research, around 1000 archaeobotanical samples have been investigated but the Neolithic levels of four sites have been considered in the qualitative and quantitative analyses during the study (Figure 4.1).

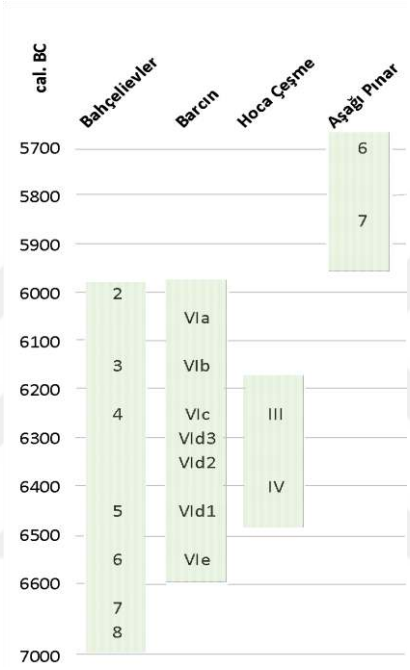


Figure 4.1: Neolithic Phases of case-study sites.

Barcın Höyük

Barcın Höyük has mostly a systematic sampling strategy (especially in the earliest phases) that was applied to the site during the excavations; the samples were taken from different units such as a layer, surface, pit, ditch trench, pyrotechnic feature, post-holes, and burial. On the other hand, the liters of soil of the samples were between 2 and 8-10 liters of soil, depending on the context volume. A total of 653 to 1841 liters of soil from Phase VIe to Early/Middle Bronze Age between 2007-2015 seasons (Table 4.1) (see in detail Tables 11.1-11.8). 631 samples (1746 liters of soil) out of 653 samples belong to the Neolithic Phases VIe-VIa.

Table 4.1: The total number of archaeobotanical samples and soil volumes per phase at Barcın Höyük.

Barcın Höyük Sample numbers according to the phases	**Period**	**Late Neolithic 6600-6000 cal. BC**							**Chalcolithic and Bronze Age**			
	Phases	**VIe**	**VId1**	**VId2**	**VId3**	**VIc**	**VIb**	**VIa**	**MC**	**LC**	**EB AII**	**E/M BA**
	Samples	176	194	39	44	63	108	7	5	4	8	5
	Liter of soil	449	614	107	104	174	275	23	17	21	35	22

Bahçelievler

At Bahçelievler, A total number of 144 archaeobotanical samples corresponding to 685 liters of soil sampled from the Neolithic phases during the 2019, 2020, and 2021 seasons were analyzed at Bahçelievler (Table 4.2). The samples come from Phases 8-2 of the site. 12 samples from Phase 8, 20 samples from Phase 7, 40 samples from Phase 6, 25 samples from Phase 5, 13 samples from 4a-4b, 8 samples from Phase 3, 10 samples from Phase 2, and 13 samples from unknown contexts.

Table 4.2: The total number of archaeobotanical samples and soil volumes per phase at Bahçelievler.

Bahçelievler Sample numbers according to the phases	**Period**	**Late Neolithic (around 7000-6000 BC)**							
	Phases	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**Unknown**
	Samples	10	20	42	26	14	8	11	13
	Liter of soil	40	84	242	118	58	30	42	71

The liters of the samples differ according to the context volume. The samples were taken from surfaces, courtyards, hearths, and burials, yielding significant variability in the number of archaeobotanical samples for each phase compared to a limited excavated area (see in detail Tables 11.9-11.15).

Aşağı Pınar

In Aşağı Pınar, the research concentrates on Phase 7. Phase 8 is the earliest level of the site, but there is insufficient data from this phase. The preliminary analysis covers the 134 samples from 21 trenches and different contexts from structures, ditches, pits, etc., at Phase 7 that were collected during several excavation seasons until 2019 (see in detail Tables 11.16, 11.17). The sampling was more selective in the earlier seasons of the excavation than in the last seasons. A higher number of samples were collected in the last seasons, 2017-2019, of the excavation (Table 4.3).

Table 4.3: The total number of archaeobotanical samples and soil volumes per phase at Aşağı Pınar.

Aşağı Pınar Sample numbers according to the phases	**Period**	**Late Neolithic Layer 7 (5950-5700 cal. BC)**							
	Phases	**7**	**7 mixed ?**	**6**	**6/5**	**5**	**4**	**4/3**	**Unknown**
	Samples	134	19	3	7	5	2	2	27
	Liter of soil	1075	145	18	48	36	14	12	160

Hoca Çeşme

Fourteen archaeobotanical samples were processed by flotation during the excavation seasons 1992, 1993. Samples were taken from trenches 13N, 14N, 15M, 15N 16M, 16N, 17N, 17M. The samples were collected from several features, such as pits, shell pits, hearths, surfaces (Table 4.4).

Table 4.4: Investigated archaeobotanical samples at Late Neolithic Hoca Çeşme.

Flotation No	**Trench**	**Unit and Sample No**			**Context**	**Date**
1	15M	2.11		-124	Hearth	7/3/1993
2	15M	2.11	4-5/6-C	-102	Hearth (near of skull)	6/24/1993
3	15M	1.7.	4-3/a-b	-74	Pit	6/19/1993
4	15M	3.13	4/d-e	-99		6/22/1993
5	15N	5.33		-115	Surface	6/28/1993
6	15 N	5.32		-114		6/28/1993
7	17M	7.23	2-3/D-E	-177		6/30/1993
8	14N	4.18	4/a-b	-120	Pit	7/2/1992
9	16N	17.58	1.5-3/a-b	-192		6/25/1992
10	16M	12.43	1-2/a-b		Pit	6/30/1993
11	13N	3.26.35	2-3/a	-190		4/25/1993
12	17N	5.36	1.e	-134		6/24/1992
13	14N	2.8	4/c	-100		6/26/1992
14	14N	4.20	5/a-b	-125	Pit	7/2/1992

4.2. Sample preparation

Various types of flotation systems are used today but all of them belong to two major types: manual (tub, bucket) and continuous-flow machines (Watson 1976). In my experience over the years, there is no big difference in the recovered of preserved remains in both flotation systems if the technician/specialist is experienced and working carefully as mentioned by Miksicek (Miksicek 1987, 237). While the manual system is more physically demanding for the person than the tank system, which uses a recirculating water pump to provide a standard water flow. However, choosing between these two systems can vary depending on the specialist and excavation leader's preferences, volume of the samples, as well as logistical and environmental conditions (budget, water and electricity sources, place of flotation system, etc.).

The collected samples at Barcın Höyük (2013-2015) and Bahçelievler (2020-2023) sites were floated in water, not more than two liters at a time, by means of manual flotation in rectangular buckets. Chiffon fabric material was used for the light material, and a 1 mm mesh was used to collect and dry the heavy material during the flotation stages (Figure 4.2). All sample volumes have been recorded with a measuring cup, and notes were taken, such as the type of soil, overflowing situations in the fabric during the flotation.



Figure 4.2: Manual flotation stages at Bahçelievler.

All samples from Aşağı Pınar were floated with the manual system in plastic round buckets and dried in chiffon fabric materials by a team member before I took over the responsibility of the samples from the earliest phases, when the excavations ended in 2019. The light material was separated during the flotation, and the heavy material was not separated. The

liters of soil are not documented, but the estimated liters of soil could be a minimum of more than 1400 liters[21].

The dried light and heavy materials were placed in different plastic bags in different boxes and moved out from their zipped plastic bags and shifted through steel test sieves of 0.24<0.5<1.0<2.0<3.0 mm during the hand sorting (Pearsall 2016, 103), and the botanical remains were placed to eppendorf/falcon tubes at Bahçelievler, Barcın Höyük, and Aşağı Pınar according to their taxa.

4.3. Documentation

4.3.1. Laboratory

Barcın Höyük

The archaeobotanical samples were studied in several places, including the Barcın Höyük Excavation House in Yenişehir, Bursa, the Netherlands Institute in Turkey in Istanbul, the Koç University Archaeology Laboratory in Istanbul under the supervision of Prof. Dr. R. Cappers. The plant photographs were taken in several locations.

The first group of photos of botanical remains was taken at the Koç University Archaeology Laboratory with a Zeiss *stereo zoom* microscope with a camera. The second group (91 plant photographs) was taken by a Leica M125 C stereomicroscope with a motor focus system, with a microscope camera Leica MC190 HD, and the software LAS 4.13.0 at the Archaeology Institute of Groningen. The third group of photos (92 photos) was taken by a stereo zoom microscope between 0.7x-4.5x with a 10MP microscope camera at the Museum of Anatolian Civilizations (Figure 4.3).

All samples (242 from 2007-2011 and 459 from 2013-2015 seasons) were combined in a single dataset, and sample ID information, including the phase and context information, was updated with the current excavation database.

[21] Most of the samples were collected to a flexible yellow round bucket (12 liters), this bucket is recently used by the archaeologists in the excavation for carrying the excavated soil, so the average sample volumes were around 8-12 liters (Conversation with E. Özdoğan in person, 2020).



Figure 4.3: Working on Barcın Höyük assemblage at the Museum of Anatolian Civilizations in Ankara.

Bahçelievler

The samples come from Phases 8-2 of the site. 12 samples from Phase 8, 20 samples from Phase 7, 40 samples from Phase 6, 25 samples from Phase 5, 13 samples from 4a-4b, 8 samples from Phase 3, 10 samples from Phase 2, and 13 samples from unknown contexts. I checked all the light fractions (material) of the 145 samples (around 700 liters of soil) three times for the correct identification. Re-investigation was crucial for the unidentified remains and for the identified ones.



Figure 4.4: Working on the Bahçelievler assemblage in the Bilecik Museum.

The samples were checked by firstly checking the label information, then removing the remains from the tubes and examining them under a 0.7x-4.5x zoom stereo microscope. I could not sort the heavy material during the excavation seasons because of the restricted time. I sorted 145 samples as heavy material at an intense pace, with the last checking in the Bilecik Museum (Figure 4.4), since the preservation of plant remains in Bahçelievler is generally low. It was important to check the heavy material because there are pistacia shells in the samples, and especially the nutshells can often be found embedded in the heavy material in archaeobotanical samples.

Aşağı Pınar

The samples before 2013 were investigated by Prof. Reinder Neef at Aşağı Pınar, Ahmetçe, and at the Deutsche Archaeological Institute in Berlin. The samples after 2013 were studied by me at Istanbul University Rıdvan Çelikel Archaeology Museum under a trinocular stereo zoom 0.67x-4.5x microscope and plant catalogs were used to aid with the determination of genus and species for identification during 2020-2023 as a part of doctoral research (Figure 4.4). Photography of plant remains is finalized in two parts. Twenty photographs were taken in the museum as a first group, and a second group 48 photographs were taken in the laboratory of the Prehistory Department at Istanbul University with a trinocular stereo zoom 0.67x-4.5x microscope and 10Mp Camera (Figure 4.5).



Figure 4.5: Working on the Aşağı Pınar assemblage at Istanbul University Rıdvan Çelikel Archaeology Museum.



Figure 4.6: Working on the Aşağı Pınar assemblage at the laboratory of the Prehistory Department at Istanbul University.

Included in this thesis and analyzed by me are 170 archaeobotanical samples, of which 134 were dated to Phase 7 in Aşağı Pınar. In addition, 77 samples, which are dated to Phase 7 and Phase 7 mixed, studied by Prof. Neef and his assistant, were added to the data pool. In Istanbul, sorting charcoal remains under 1mm in size and re-checking the sorted parts for the correct identification has been done on 121 samples. Some of the contexts have documented a higher quantity of plant remains.

During the last check, I especially looked at barley grains for the identification of hulled or naked, and hulled wheat rachis nodes. These details are important to understand the crop ratios, the capacity of the field, the storage value, and crop processing. For instance, you need more space for storage, more time, and labor for processing the hulled grains compared to the naked ones. On the other hand, storing grains with their chaff is safer than in naked form because of humidity and insects. Such properties on crops can explain the crop-choice strategies. I executed this investigation on all the case sites.

4.3.2. Identification and Terminology

During the identification process, several atlases and online sources[22] especially Flora of Turkey (edit. by P.H. Davis 1965), Digital Atlas of Economic Plants and Digital Atlas of Economic Plants in Archaeology (by Cappers 2022, 2016, 2012), and Near Eastern Wild Grass Seeds (by M. Nesbitt 2006) and online sources Digital Atlas of Economic Plants, Kew Index, Catalog of Life, and G. Willcox Page were used for the determination of genus and species (Figure 4.7) (Bojnansky and Fargasova 2007; Cappers, Bekker and Jans 2012; Cappers and Bekker 2013; 2021; Cappers, Bekker and Fennema 2023; Cappers et al. 2016; Cappers et al. 2023; Davis 1965; Neef, Cappers and Bekker 2012; Nesbitt 2006).

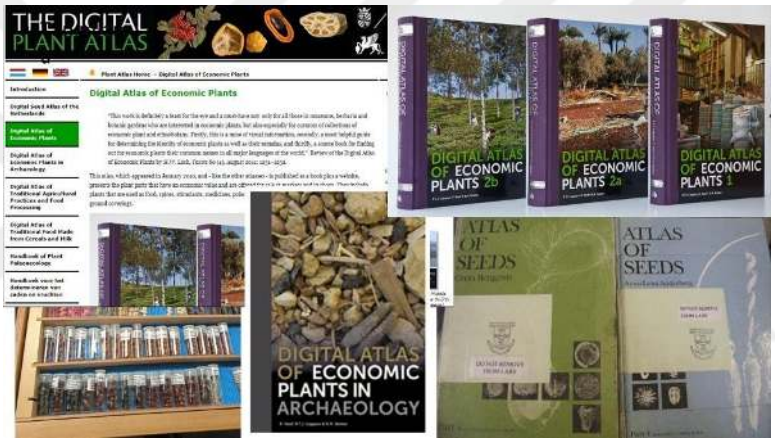


Figure 4.7: Several plant catalog sources were used in the research.

The samples were analyzed in the microscope environment in three stages (1st and 2nd control) were recorded in a way to create a database in the Excel program (Figure 4.8). The remains were classified into six main groups, namely, (1) Cereals (2) Pulses, (3) Fiber-Nuts-Gathered Plants, (4) Wild Plants, (5) Other Remains, and (6) Animal Remains (fishbone, rodent, dung, etc.) (see Chapter 13, Appendix III). For the identification and names of plant parts and terminology, I consulted to the revised version of 'A Manual for the Identification of Plant Seeds and Fruits (e.g. Figure 4.9) (Cappers and Bekker 2021), which included the latest update on the identification of plant parts, and to the online source Kew Index for confirming accepted scientific names in taxonomic order.

[22] Digital Atlas of Plants (https://www.plantatlas.eu/); Kew Index (https://powo.science.kew.org/); Catalog of Life (https://www.catalogueoflife.org/); G. Willcox Page (https://www.willcoxpages.fr/archaeobotanical%20images/index1.htm).

	A	B	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW
		Phase	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe
		BH NO	46313	46314	45952	46247	46249	46304	45767	45766	45758	45760	45480	45671	45673	45670
		Trench	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10
		Locus	423	423	423	423	423	423	418	417	416	412	407	404	403	402
		Lot														
		subphasing	VIe1	VIe1	VIe1	VIe1	VIe1	VIe1	VIe1	VIe1	VIe1	VIe2	VIe1	VIe2	VIe2	VIe2
		interpretation	e underneath loc 364.						Pyro. Feat	Possible ri	Layer unde	not finishe	Goes unde	t both don	Not relate	Not relate
		str												24	24	24
		Context	rface	surface	surface	surface	surface	surface	pyrotechn	pyrotechn	layer	ditch_tren	pyrotechn	post_hole	post_hole	post_hole
0		Year	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
1		GIA number														
2		liter of soil	1	1	2	1.5	1	1	4	4	4	3.2	3.5	3.25	4	3.25
3	Plant Names	Plant parts														
4	Cereals															
5	Hordeum/Triticum	fragmented GK	2	1		2	1	1	4	1	1	5	5	3	1	
6	Hordeum vulgare	floret/fruit										3				
7	Hordeum vulgare ssp. vulgare	fruit											1			
8	Hordeum vulgare ssp. vulgare	floret									0.5					
9	Hordeum vulgare	RN														
0	T. monococcum ssp. monococcum	fruit			0.5							2.5				
1	T. cf. monococcum	fruit														
2	T. monococcum/dicoccum	fruit					0.5									
3	T.monoc2grained/dicoccum	fruit														
4	T. turgidum ssp. dicoccum	fruit			6	1						2		1	1.5	1
5	T. turgidum ssp. dicoccum	rachillate spikel														
6	T. monococcum ssp.monococcum	RN														
7	T. monococcum/dicoccum	RN	3	1.5	2.5		1.5		5			15				
8	T. turgidum ssp. dicoccum	RN-twisted														
9	T. turgidum ssp. dicoccum	RN														

Figure 4.8: The Excel data from Barcın Höyük.

During the identification of cereal by-products, I used the term ‘rachis node’ as per instead of spikelet fork (Figure 4.9) (Cappers and Bekker 2021). As I understand from different studies that people use the word “spikelet forks” if they think rachis nodes and glume bases may be attached to the hulled wheat rachis nodes. This situation changes according to the condition of fragmentation.

Subfamily	Tribe	Genus	Dispersal unit		Threshing unit	
			Hulled	Naked	Hulled	Naked
Bambusoideae	Oryzeae	Oryza	floret		floret	
Pooideae	Aveneae	Avena	(rachillate) floret		floret	fruit
	Triticeae	Hordeum	rachillate triplet			
		Triticum	rachillate spikelet		rachillate spikelet	
		Secale				
Chloridoideae	Eragrostideae	Eragrostis	floret	fruit		
		Eleusine				fruit & seed
Panicoideae	Paniceae	Echinochloa	spikelet		floret	
		Panicum				
		Brachiaria				
		Setaria				
		Paspalum			spikelet	
		Digitaria				
		Cenchrus				
	Andropogoneae	Sorghum	pedicellate spikelet		pedicellate spikelet	fruit

Figure 4.9: Three-level classification of domesticated grasses (Poaceae) (Cappers and Bekker 2021, 296).

I personally think we can use the term “rachis node” for spikelet forks or glume bases, unless we identify the fragments separately according to the part of the remains. To use the term spikelet fork for the complete part may be correct as well, but in some ways, it remains insufficient. The emmer/einkorn rachis nodes usually include complete or broken rachis,

internode-rachis node, and the lower part of the glume bases. For this reason, at least for the moment, I prefer to use the term rachis node in my data.

During the identification, some questions emerged, especially about barley grains, einkorn/emmer rachis nodes, and unidentified wild plants. I re-checked the barley remains to be sure about their identification as hulled (floret) or naked (fruit), and the einkorn and emmer rachis nodes for understanding the capacity of the harvest, de-hulling process, and to calculate the storage value for every site (Figure 4.8).

Table 4.5: The list of Latin names of economic plants and identified plant parts in the assemblage.

Plant Latin Names	**Plant parts**
Cereals	
Hordeum/Triticum	fragmented grain kernels
Hordeum vulgare	floret/fruit
Hordeum vulgare ssp. *vulgare*	floret
Hordeum vulgare ssp. vulgare	fruit
Hordeum vulgare	rachis node
T. monococcum ssp. *monococcum*	fruit /proposed by Cappers: rachillate spikelet
T. cf. *monococcum*	fruit /proposed by Cappers: rachillate spikelet
T. monococcum /dicoccum	fruit /proposed by Cappers: rachillate spikelet
T.monoc 2grained/*dicoccum*	fruit /proposed by Cappers: rachillate spikelet
T. turgidum ssp. *dicoccum*	fruit /proposed by Cappers: rachillate spikelet
T. turgidum ssp. *dicoccum*	rachillate spikelet
T. monococcum ssp.*monococcum*	rachis node
T. monococcum/dicoccum	rachis node
T. monococcum/dicoccum	glume pieces
T. turgidum ssp. dicoccum	rachis-twisted
T. turgidum ssp. dicoccum	rachis node
Triticum	fruit
T. aestivum/durum	fruit
T. aestivum/durum	rachis
Triticum	rachis
Pulses	
Cicer arietinum	seed
Cicer/Lathyrus	seed
Lathyrus sativus	seed
Lens culinaris	seed
cf. *Lens*	seed
Pisum sativum	seed
Vicia ervilia	seed
cf. *Vicia*	seed
Vicia faba	seed
Fabaceae	seed
Nuts-Fiber Plants-Gathered Plants	
Linum usitatissimum	seed
Celtis australis	fruit (endocarp)
Cornus mas	fruit (endocarp)
Corylus avellana	fruit
Ficus sp.	fruit
Pistacia cf. terebinthus	fruit
Rubus fruticosus	fruitlet (endocarp)
Quercus	seed
Vitis sp.	seed

Table 4.6: The list of Latin names of wild plant taxa and identified plant parts in the assemblage.

Plant Latin Names	Plant parts	Plant Latin Names	Plant parts
Wild Plants		**Wild Plants**	
Aegilops	fruit	*Nepta-Ocimum*	fruit
Aethusa cynapium	seed/fruit	Lamiaceae	fruit/seed
Adonis	fruitlet	Lepidium	seed
Amaranthaceae	seed	*Lithospermum* cf. *arvense*	fruitlet
Amaranthus sp.	seed	*Lithospermum tenuiflorum*	fruitlet
Androsace maxima	seed/fruit	cf. *Lolium*	fruit
Apiaceae	fruitlet	Malvaceae	fruitlet
Asteraceae	fruit	cf. *Malva*	fruitlet
Astragalus	seed	*Medicago*	fruit
Atriplex patula	seed/fruit	*Onobrychis*	fruit
Avena	fruit	Papaveraceae	seed
Bolboschoemum cf. *glaucus*	fruit	*Papaver*	seed
Bolboschoemum cf. *maritimus*	fruit	*Persicaria* cf. *maculosa*	fruit
Boraginaceae	fruitlet	*Persicaria tinctoria*	fruit
Brassicaceae	seed	*Phalaris*	fruit/floret
Bromus	fruit	cf. *Plantago*	seed
Bromus sterilis	fruit	Poaceae	floret/rachillate spikelet
Carex	fruit	Poaceae	RN
Carex cf. *divulsa*	fruit	Poaceae	Spike piece
Caryophyllaceae	seed/fruit	Poaceae	culm
cf. *cephalaria*	seed/fruit	Polygonaceae	fruit
Chenopodium cf. *album*	fruit	*Polygonum*	fruit
Chenopodium cf. *polyspermum*	fruit	Rosaceae	fruit
Chrozophora tinctoria	fruit	*Rumex*	fruit
Convolvulus	seed	*Sambucus nigra?*	fruit
Fallopia convolvulus	fruit	*Setaria pumila*	floret
Cyperaceae	fruit	*Silene*	seed
Cyperus cf.	fruit	cf. *solanum*	seed
cf. *datura*	seed	*Solanum nigrum*	seed
Digitaria sp.	spikelet	*Spergula arvensis*	seed
Ecballium	seed	*Steleria media*	seed
Echium vulgare	fruitlet	*Tilia platyphilos*	fruit
Fabaceae	seed	Thymeleaeceae	fruit
Fallopia	fruit	*T. monococcum* ssp. *aegilopoides*	floret
cf. *ficus*	fruit	*Triticum*	culm
Fumaria densiflora	fruit	*Trifolium*	fruit
Fumaria officinalis	fruit	cf. *Trigonella*	seed/fruit
Galium	fruitlet	Type 1-asteraceae? Recent?	seed/fruit
Galium aparine	fruitlet	Type 2	fruit
Geranium	seed	Type 3 Cyperaceae?	seed/fruit
Heliotropium	fruitlet	*Veronica*	seed
Hippocrepis	fruitlet	Vitaceae	seed/fruit/fruitlet
Hordeum cf. *spontaneum*	fruit	Unidentified	seed/fruit

I re-counted the emmer/einkorn rachis nodes again and looked at the twisted rachis nodes of emmer wheat (the top grain in the spike) within the rachis nodes. Finding a twisted rachis node of emmer wheat was important because it is usually difficult to identify the rachis nodes as einkorn or emmer. The plant names and plant part lists were updated depending on the

revised terminology about identification of plant parts by Prof. Cappers (2021) (Tables 4.3, 4.4).

4.3.3. Counting of Plant Remains

In the archaeobotanical samples, I used fully quantitative descriptions (Jones 1991, 65). Counting of the plant remains is complicated because of fragmentation issues (Bates and Arteaga 2024). I used MNI (minimum number of individuals) while counting the plant remains as much as possible using diagnostic anatomical regions of cereal grains (apical and embryo ends), pulse seeds (embryo ends) and 'chaff' components (rachis nodes, glume bases) (Table 4.5) (Bogaard et al. 2017, 6; Bates and Arteaga 2024, 686). Fragmented cereals and pulses, and wood charcoals were recorded first with their weights but after that, re-counted again with an estimated count for per single grain/seed if the diagnostic anatomical regions were lost. This was done to estimate the quantity in the GIS map and other frequency calculations. The macrofossil abundances were investigated using frequency calculations.

Table 4.7: The calculation method of the plant remains in the data for all case sites.

Cereals crops	**Calculation**	**Naming**
Grains	1=1n, 0.5=1n (if it is identifiable)	Taxonomic name
Grains fragmented	2 half pieces=1n 4 quarters=1n	*Hordeum/Triticum*
Rachis nodes of hulled wheat	1 rachis node with glumes/without glumes=1n 2 half rachis nodes (broken)= 1n 2 glume base=1n 1 half rachis node + 1 glume base= 1n	*T. monococcum / dicoccum*
By-product	2 glume pieces without base=not entered to calculation in the ratios, just saved in the excel Other pieces such as awn, culm, etc. saved in data data but not included in analyses	*T. monococcum / dicoccum* (if identifiable) or only *Triticum*
Rachis nodes of barley	1 rachis=1n	Taxonomic name
Rachis nodes of naked wheat	1 rachis=1n	Taxonomic name
Pulses crops		
Seed	1 seed=1 0.5=1 (if it is identifiable)	Taxonomic name

Seeds fragmented	2 half pieces=1n 4 quarters=1n	Fabaceae (domest.)
Nutshells		
Fruits/seeds	1 completed fruit/fruitshell=1n 0.5=1n (if it is identifiable) 2 half=1n	Taxonomic name
Fruits/seeds fragm.	Counting of small pieces=fruit equivalent=1n Some pieces recorded as 0.25, 0.30 according to their sizes if there is no more pieces in a sample but considered as 1n while interpreting the presence.	Taxonomic name (if it is identifiable such as *Pistacia* or *Corylus*)
Wild Plants	1 seed/fruit=1n 0.5=1 (if it is identifiable) 2 half seed/fruit=1n	Taxonomic name Taxonomic name (if it is identifiable)

4.4. Evaluation of the Data

In the research, I focused on some of the main topics such as the definition of subsistence, farming strategies, crop selection criteria (e.g., availability, ecological and economic criteria, and cultural identity), crop ratios, and the development of labor. There are many analytical methods to evaluate the archaeobotanical data that archaeobotanists refer to (Bates and Arteaga 2024; Pearsall 2016; Marston 2014; Smith 2014; Jones et al. 1999; Jones 1991, 1987).

One of the important points to consider when evaluating botanical data on a context basis is that more samples come from some context or structures as a result of firing and similar activities, and therefore, an equal number of botanical samples could not be taken from all over the site. In Barcın Höyük, there is an increase in the archaeological material during the transition from Phase VIe to VId1, and an increase in the number of plant remains, maybe due to more burnt contexts.

During the evaluation of the data, I tried to apply some quantitative methods to answer these questions;

What can the context in which we find the botanical remains tell us about the settlements in question? Can intra-site insights from the distribution provide information on the settlements and the variability that they display?

Does the plant selection criteria change between the earliest pioneer Neolithic communities and those generations later who live in this context? & What subsistence strategies did the inhabitants of each site adhere to, especially when it comes to plant choice?

During the evaluation of dataset from four sites in the thesis, I tried to follow order from simple to complex quantitative methods:

- Chapter 5 includes qualitative presentation, absolute count of per taxa, relative and absolute frequency and ubiquity per phase.
- Chapter 6 (includes spatial distribution of total counts with density of liter of soils in GIS, and frequency values with the number of plants remains per liter per context type, per phase
- Chapters 7 and 8 include absolute counts of plant groups/taxa per context according to contextual relations for spatial distribution.
- Chapter 9 analyzes the ubiquity of crops in small numbers (1 up to 5) for settlement noise

4.4.1. Identity and Monograph of Plant Dataset and Ubiquity of Taxa

One aim of this study was to present four new archaeobotanical datasets (except for Barcın Höyük, which was already preliminarily published as my MA, Balcı 2018) in detail from important Neolithic sites in northwest Türkiye: Barcın Höyük, Bahçelievler, Aşağı Pınar 7, and Hoca Çeşme. These datasets can be used to compare sites within the region and with other areas, helping us better understand the Neolithization process.

In this respect, I tried to provide an overview of the main plant groups found in the archaeobotanical remains from key sites (Barcın, Bahçelievler, Hoca Çeşme, and Aşağı Pınar) (Chapter 5). It covers the origins of cultivated plants, gathered plants, and wild plants, and their features and growth habits, and their geographic spread for qualitative presentation of the plant data (Pearsall 2016, 146). It also looks at how different taxa appeared in the archaeological contexts and phases of these sites with the use of absolute count (see Chapter 13, Appendix III), sample by sample in Excel for sharing all the data with other people who wants to compare with their data and later relative and absolute frequency and ubiquity per phase (Marston 2014, 164-165). The sections on plant families, genera, and species are designed to give clear, concise information about human–plant–environment relationships, including the spread of crops,

vegetation patterns, and farming practices such as field choice, harvesting, and food processing among the first Neolithic settlers.

4.4.2. Distribution of Plant Remains

A key question in archaeobotanical research is how plant materials -deliberately brought to settlements through activities such as harvesting and gathering- were spatially distributed within the site. This issue is particularly complex, as it remains unclear whether plant-based foodstuffs were transported to the site following external processing or in their unprocessed form. Additional variables further complicate this inquiry, including the excavation's sampling strategy and the limited areas explored, which may overlook storage zones altogether.

The archaeobotanical assemblage provides a valuable case for examining the spatial distribution of plant remains across indoor and outdoor spaces from the key sites. Each settlement is assessed based on its own contextual and stratigraphic data, and no uniform methodology is applied across all sites. This subject focuses on spatial plant distributions and is addressed in the Barcın Höyük (Chapter 6), Bahçelievler (Chapter 7), and Aşağı Pınar (Chapter 8) sections below. The plant distribution at Barcın Höyük was mapped on a *Geographical Information System* (GIS) program.[23] The distribution according to the context and plant use is examined in detail in Chapter 6.

4.4.3. Crop Ratios

In this quantitative method, I preferred to examine the ubiquity of economic plant remains - primarily cereals and pulses- that show how often a taxon/or specific plant groups, such as hulled wheats versus naked wheats, occurred across a set of samples at three Neolithic sites: Barcın Höyük, Bahçelievler, and Aşağı Pınar. The analysis centers on grain kernel and seed counts per sample, potential storage indicators, and diachronic shifts in crop preferences.

In a slightly different way from the prevalence analyses used in archaeobotanical studies and my opinion is that using multivariate quantitative methods can help to understand the multiple data of more sites rather than one (Pearsall 2016, 148; Marston 2014, 168; Jones 1991, 63), so here, I wanted to use a new statistical analysis in addition to abundance and frequency calculations in the previous chapters (5, 6, 7, 8). For the ubiquity of crops in Chapter 9, I first

[23] The last GIS maps of the spatial distribution of plant remains in Barcın Höyük created by Assist. Prof. F. Gerritsen.

conducted a table study showing the number of samples in which a taxon was found in the tables, and the number of samples where it was found, where it was numbered 5 or lower. The aim here was to understand the statistical significance of a taxon's frequency in small numbers.

Samples under 1 liter were not taken as the basis for the crop ratio evaluations, and the average liter range of the samples is between 2 and 5 liters per sample. The frequency of presence between 1–5 remains per sample can be interpreted according to the following categories (Figure 4.10).

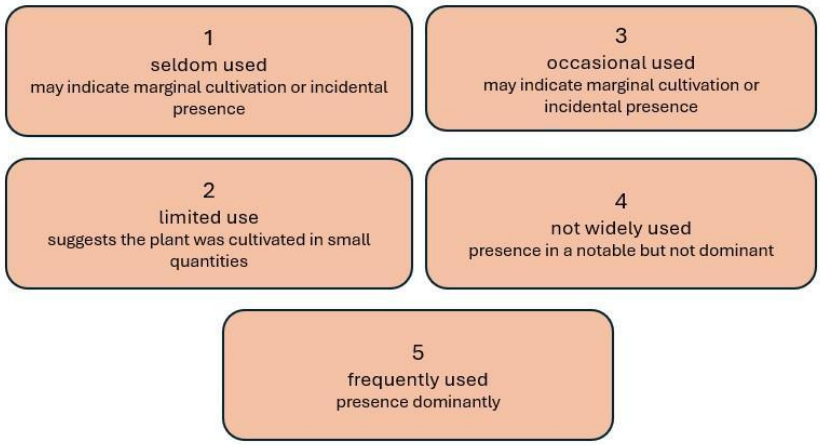


Figure 4.10: Suggested interpretation of relative frequency of small numbers of plant remains per sample (minimum numbers of seeds/fruits from 1 to 5).

A consistent count of one grain per sample may suggest the plant was rarely used at the site, potentially acquired through minor exchange networks or used as a supplementary resource if the value is small. Alternatively, it may reflect incidental introduction -perhaps with fuel or unintentional deposition. A low frequency of 4–5 grains could indicate minimal or absent large-scale processing, or that processing zones were not sampled. Conversely, high frequencies in this range may imply frequent processing or storage activities. These interpretations must also consider variables such as sampling strategy, preservation conditions, and depositional processes.

Large quantities of plant remains in specific samples often point to their use in storage or on-site processing. Nonetheless, smaller quantities tend to offer more reliable indicators of routine plant usage. The more regularly a plant was brought to and processed at a settlement, the higher the likelihood of its recurring presence in the archaeobotanical assemblage.

To reduce the impact of settlement noise, only small quantities of economic plant remains are considered. Evaluating the proportion of crops -from minimal to maximal counts- can help address research questions such as the extent of land allocated to each crop, their storage strategies, and the volume required for storage. Principal product counts are based on grain kernels for cereals and seeds for pulses. By-products, which mainly derive from cereals and appear as rachis nodes, provide evidence of processing stages like threshing and de-husking. Due to their delicate structure, pulse by-products rarely survive in the archaeobotanical record.

Apart from interpreting the data I obtained in a spatial context, for the adaptation process which forms the basis of my research topic, I also tried to understand how the first settlers who came to all three sites behaved during the Neolithization process. As with many studies conducted on plant remains, different theoretical aspects are used to try to understand the plant-human relationship, depending on the period and context in which the data are found. The settlements I studied in northwestern Turkey show the characteristics of the earliest settlers in their environments. Despite differences in methodological and sampling strategies, we can gain insights into the adaptation to the environment and traditions practiced through the macro-botanical data obtained. For this reason, in my study, I propose to evaluate the plant-human relationship during the Neolithization process in the region from the perspective of human-behavioral ecology.

Chapter 5

5. SUBFOSSIL PLANT DIVERSITY IN THE KEY SITES

This chapter presents a summary of the different plant groups identified in the macro-archaeobotanical assemblages of the key-sites (Barcın, Bahçelievler, Hoca Çeşme, and Aşağı Pınar) that includes information about the origins of cultivated plants, characteristics, and growth habits of the plants, as well as their geographic distributions. The chapter also discusses how plant genera and species were distributed across the various archaeological contexts and phases in the sites.

5.1. Plant Identity

Examining the subfossil plant remains through their morphological and contextual features, as well as the behavioral and ecological interactions between human-plant and plant-plant relationships, constitutes a critical foundation for the topics to be examined in the following chapters. For this reason, the informative sections on plant families, genera, and /species offer concise, accessible details that give the reader a general understanding of environment-plant-human relationships. This includes discussions on the spread of the crops, vegetational patterns, and agricultural practices such as field choice-harvest-food processing stages within the context of the first Neolithic settlers' adaptation to the environment.

Apart from the wild plants group, I prefer to write the generally accepted common English names of the plant species and types rather than Latin, as I have recorded almost all of the founder crops, or the first cultivated plants at Barcın Höyük, Bahçelievler, Hoca Çeşme, and Aşağı Pınar after the first mentioning of both accepted Latin and common names.

Compared to the sites of Barcın Höyük and Aşağı Pınar, Bahçelievler yielded a lower level of preservation, and thus, a low number of remains were obtained. Also, a limited number of areas were studied for each phase. Hoca Çeşme also has a narrow range of crop plants owing to a group of botanical samples, agricultural strategies, or both. The ubiquity and relative abundance of every taxon is also clarified while documenting the plant remains per site during the chapter.

5.2. Cereals

Cereals (the Poaceae family) have been the principal crops of the Old World for around 12,000-10,000 years since their initial domestication. The progenitor's species of these founder crops are wild barley (*Hordeum vulgare* ssp. *spontaneum*), wild einkorn (*Triticum monococcum* ssp. *boeoiticum*), and wild emmer (*Triticum turgidum* ssp. *dicoccoides*). Wheat, barley, rice, and maize are among the well-known cereal crops from diverse regions, and these crops faced serious challenges due to climate change and human impacts over time. The domestication process of the founder crops was mentioned in Chapter 3.[24] This section will therefore focus on the characteristics and environmental requirements of a subset of these cereals from Southwest Asia from the case-study sites. The word 'cereal' is derived from the Latin word 'Cerealis', meaning 'grain', and cereals are fruits (caryopsis) that consist of an endosperm, bran, and germ (embryo) (Figure 5.1) (Ahmad et al. 2024, 609).

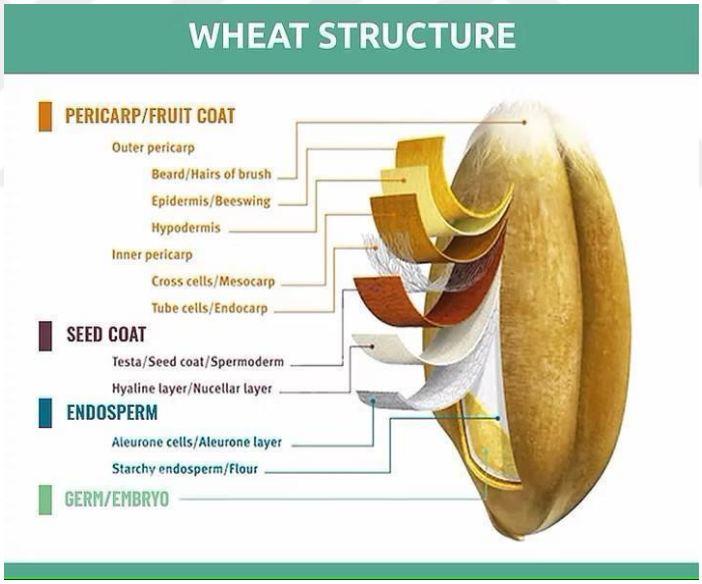


Figure 5.1: The structure of cereal grain (online source).[25]

Cereals have become an integral part of the global diet, being utilized as food, fodder, and as a fuel source. They account for over 60% of the world's agricultural products and occupy more than 70% of the total harvested land area in the world. These grains are rich in vitamins, proteins, minerals, fibre, and energy, making them crucial for human health, and contribute a significant share of the food production (Charalampopoulos et al., 2002, 132).

[24] Please look at the book of Zohary et al., 2012 for the domestication of plants.

[25] https://www.ukflourmillers.org/wheatstructure

Table 5.1: The cereal species only represent the documented species in the botanical assemblages in the research.[26]

The taxonomy of major crops in the cereal family (Poaceae)						
Species	**Common name**	**Subfamily**	**Tribe**	**Chromosome number**	**Genome**	**Ploidy level**
Hordeum vulgare ssp. dictichon L.	Two-row barley	Poideae	Triticeae	2n=2x=14	VVii	diploid
Hordeum vulgare ssp. vulgare L.	Six-row barley	Poideae	Triticeae	2n=2x=14	vvII	diploid
Triticum monococcum ssp. *monococcum* L.	Einkorn wheat	Poideae	Triticeae	2n=2x=14	AA	diploid
Triticum turgidum ssp. *dicoccum* (Schrank) Thell.)	Emmer wheat	Poideae	Triticeae	2n=4x=28	BBAA	tetraploid
Triticum turgidum Desf. var. *durum*	Hard wheat	Poideae	Triticeae	2n=4x=28	AABB	tetraploid
Triticum aestivum L.	Bread wheat	Poideae	Triticeae	2n=6x=42	BBAADD	hexaploid

The most common cereal types found in Southwest Asia and Anatolia during the Late Neolithic Period include einkorn (*Triticum monococcum* ssp. *monococcum* L.), emmer (*Triticum turgidum* ssp. *dicoccum* (Schrank) Thell.), two-row barley (*Hordeum vulgare* ssp. *distichon*), six-row (*Hordeum vulgare* ssp. vulgare L.), bread/hard wheat (*Triticum aestivum* L./*Triticum turgidum* Desf. var. *durum*) (Table 5.1). These cereal species have continued to be among the most prevalent crops worldwide, with bread-hard wheat and barley types remaining the most frequent cereal crops in the world. These species are present in the early levels of case sites archaeobotanical assemblages.

5.2.1. Barley

Barley (*Hordeum vulgare* L.) is one of the oldest domesticated crops, with its 2-row wild progenitor (*Hordeum vulgare* ssp. *spontaneum* (C. Koch) Thell.) having been cultivated around

[26] The table is created with the reference of Bennett and Smith 1976; Cappers and Neef 2021; Dolezˇel et al. 2007, 52; Özkan et al. 2011; Zohary, Hopf and Weiss 2012.

12.000-10.000 BC in the Fertile Crescent. It has a more expansive environment and distribution compared to wheat, owing to its better adaptability to harsh environmental conditions such as salinity, alkalinity, drought, and marginal lands (Al-Abdallat et al. 2017, 2; Saroei et al. 2017, 295; Sarkar et al. 2014, 650; Zohary et al. 2012, 52).

Barley (*Hordeum*) includes around 40 species, and *Hordeum vulgare* is closely associated with the development of agriculture. In this respect, the most common subspecies found in archaeological assemblages are wild barley (*Hordeum vulgare* ssp. *spontaneum* (C. Koch) Thell., 2-row hulled/naked barley (*Hordeum vulgare* ssp. *distichon* (L.) Alef.), and 6-row hulled/naked barley (*Hordeum vulgare* ssp. *vulgare* L.). Wild barley is always hulled, 2-row is mostly hulled (threshing unit: floret), and 6-row barley can either be hulled (threshing unit: floret) or naked (threshing unit: fruit) depending on the morphological characteristics. The preference for the hulled or naked types of barley is related to the kind of yield (Cappers and Neef 2012, 273; Zohary et al. 2012, 52). Barley is also an important crop for food preparation, fodder for domestic animals, and beer production. Generally, naked barley is mainly used for food, and hulled barley is used for feeding animals and beer production (Zohary et al. 2012, 52). This 2-row barley is more primitive than 6-row barley and probably originates from the wild form of barley (*Hordeum vulgare* ssp. *spontaneum*). 6-row barley provides more yield than 2-row barley in agriculture. Naked type of 6-row barley also provides higher yield and needs less labor compared to hulled type during the processing stages. Naked barley grains are always a bit thicker than hulled grains because the glumes are not completely attached to the grain and it can grow more flexible compared to hulled type same as hulled wheat and naked wheat. In this respect, these kinds of characteristics of the types can specify the decision strategies about processing stages, storage, labor efficiency, yield-maximization, etc.

Two-row Barley

In the botanical assemblage, two-row barley (*Hordeum vulgare* ssp. *distichon* (L.) Alef.) is represented with 31 florets identified in 11 out of 134 samples in Phase 7 at Aşağı Pınar, especially from the pits that are related to the ditches H1 and H2. Additionally, 15 florets of two-row barley were found at Barcın Höyük in Phases VId1 and VIb though with some level of uncertainty. There is no documented two-row barley at Bahçelievler and Hoca Çeşme.

Six-row Barley

Barcın Höyük

Six-row barley (*Hordeum vulgare* ssp. *vulgare* L.) as hulled (floret) or naked (fruit) shows a frequent presence in the case-study sites. In particular, hulled six-row barley is the predominant type at Barcın Höyük. Hulled barley grains are present in every level of Barcın Höyük (see same chapter 5.9.1.)



Figure 5.2: Six-row barley floret (BH46515) in phase VId1 at Barcın Höyük (photo: H. Balcı).

In phase VIe, 47 florets were recorded from 22 out of 176 samples (449 liters). An additional 16 grains were documented as fruits/florets because their outer pericarp (common use seed coat) are poorly preserved, which makes it unclear whether they are hulled or naked from 11 samples. There are two fruits as naked barley in the documentation, but it is not enough to confirm whether they belong to the naked type of six-row barley due to the preservation issues grain size.



Figure 5.3: Six-row barley floret (frontal-dorsal) (BH5639) in phase VIb at Barcın Höyük (photo: H. Balcı).

In phase VId1, 174 florets from 55 out of 194 samples (614 liters) have been documented. As in phase VIe, the hulled type of barley is the common type. The other documented grains are fruits/florets (29) and fruits (7), but these remains are poorly preserved. The barley grains appear to have been de-hulled based-on their morphological traits, and the rachis nodes have little value (11 rachis nodes) in the assemblages, with no documented rachis node in VIe.

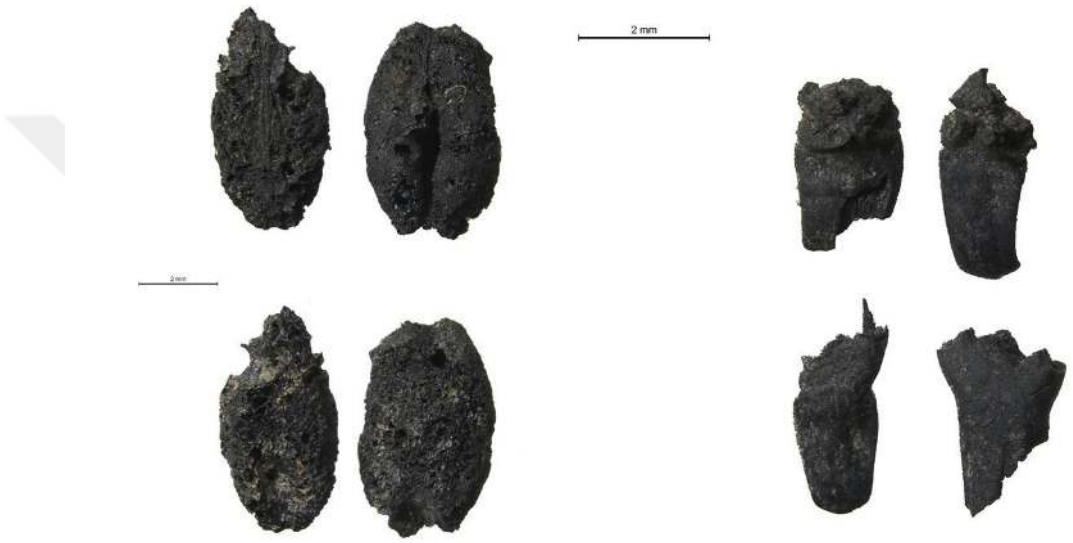


Figure 5.4: Six-row barley florets (BH12679) and barley rachis nodes (BH12397) in phase VIb at Barcın Höyük (photo: H. Balcı).

In phase VId2, florets of barley show presence with 15 grains in 10 out of 39 samples, with one fruit and three fruits/florets. In VId3, there were seven florets from three out of 44 samples, three fruits from one sample, and six fruits/florets from one sample, all associated with pyrotechnic features with the cereal and pulse remains together. In VIc, 14 florets were recorded in 10 out of 63 samples (174 liters), and three florets/fruits were found in two samples. In VIb, 15 florets from nine out of 108 samples (275 liters), one fruit from one sample, and 12 florets/fruits from seven samples were recorded (Figures 5.3, 5.4). In VIa, there is only one floret from a sample inside a pit out of seven samples (23 liters), generally from pit contexts in this level. The hulled barley shows a presence in Middle-Late Chalcolithic, even Bronze Age levels in a restricted group of samples at Barcın Höyük. Barley grains do not occur as pure assemblages or storage value within the samples over the levels.

Bahçelievler

There is no documented barley in the earliest phases, 8 (10 samples, 20 liters) and 7 (20 samples, 84 liters) at Bahçelievler. Only one grain of barley, which is not utterly identifiable as hulled/naked two/six-row barley (*Hordeum vulgare* ssp. *distichon/vulgare*?) has been documented from a surface in the structure (B2, 9/2, 11.75 liters) in level 7b.



Figure 5.5: Six/two-row barley grains (left: B3-24.16) in Phase 5, (right: B3-27.2) in Phase 6 at Bahçelievler (photo: H. Balcı).

In Phase 6, two florets of barley have been documented in one sample out of 42 samples. One grain is documented as hulled/naked in one sample from a courtyard area (B3, 38/1, 8,30 liters). In Phase 5, five barley grains are documented in three out of 26 samples. Four of them are hulled barley from inside of pottery in a courtyard area (B3, 17/13, 6,75 liters), and one grain is documented as fruit/floret, which comes from the courtyard area again (B3, 13/7, 4,75 liters) (Figure 5.5). In Phase 4b, only half of the barley grain has been documented in one out of 14 samples from a surface outside the structure (B4, 13/1, 7 liters). There are no documented barley remains in later Phases 3 and 2.

Hoca Çeşme

Naked 6-row barley shows a strong presence only in Hoca Çeşme (Figure 5.6). 575 barley grains and 15 rachis nodes have been documented in four out of 14 samples. 572 out of 575 grains have been found in a pyrotechnic feature (15M, 2.11, 124), which also contains a high number of bread/hard wheat grains (471), fragmented wheat/barley grains (1970) -these

remains probably belonged to the barley and bread/hard wheat grains-, lentil, pea, blueweed have been documented. In this sample, some animal remains, such as fragmented animal bone pieces (63), a fish vertebra (1), teeth (probably two mouse teeth), and shells, have also been documented. When we look at the fruit and seed sizes and very low by-product remains this assemblage might be fine-sieve product (Bogaard, Jones and Charles 2005, 506).



Figure 5.6: Six-row barley (naked) grain (14N-12.8) and rachis node (15M-2.11) at Hoca Çeşme (photo: H. Balcı).

Aşağı Pınar

In Aşağı Pınar, both 2-row (*Hordeum vulgare* ssp. *distichon*) and 6-row barley (*Hordeum vulgare* ssp. *vulgare*) are probably present. In archaeological remains, it is sometimes not easy to identify the type of barley (Figure 5.7). However, most of the barley grains in the Aşağı Pınar assemblage inevitably look like hulled and multiple-row barley. This means that 6-row barley appears to be more prominent than 2-row barley at Aşağı Pınar. Phase 7 at Aşağı Pınar represents the primary archaeobotanical assemblage in this study.

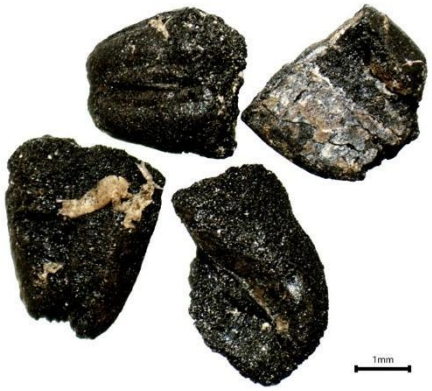


Figure 5.7: Six-row barley fragmented grains (8K-285-A025) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

In Phase 7, 463 florets of six-row barley have been documented in 37 out of 134 samples. There are some storage values between the barley remains. For example, 150 florets were counted from a ditch (H1-1, H1-2; 6M, 81, B1), and this sample contains some other economic plant remains such as emmer and fragmented wheat/barley, grass pea, etc. Another high value (57 grains) comes from the ditch H1-2 (6N, 144, fill D). This sample also includes the high value of some other economic plants. Another 51 barley grains come from ditch H2 (7U, 262, fill D). This sample also includes other economic plants such as emmer, einkorn, and grass pea. There is only one possible documented rachis node in the assemblage, which can belong to 6/2 row barley. The lack of by-product and fruit/seed sizes in storage values may reflect a fine-sieve product as Hoca Çeşme (Bogaard 2005, 507). Most of the barley remains are presented with different economic and wild plants in the samples. No clear sample has been found where barley is only documented. In later levels, barley shows a rare presence in the samples.

5.2.2. Hulled wheats

Einkorn wheat (*Triticum monococcum* ssp. *monococcum* L.) and emmer wheat (*Triticum turgidum* ssp. *dicoccum* (Schrank) Thell.) are the earliest domesticated and principal hulled wheat within the founder crops like barley in the Near East around cal. 10.000 BC. Their progenitors are wild einkorn (*Triticum monococcum* ssp. *aegilopoides* (Link) Thell.) and wild emmer (*Triticum dicoccum* ssp. *dicoccoides* (Körn ex Asch. & Graebn.)). We know einkorn and emmer wheat were first domesticated in the Fertile Crescent, but the discussions on specific areas are still ongoing (Cappers and Neef 2021; Pourkheirandish et al. 2018).

Einkorn Wheat

Einkorn wheat (*Triticum monococcum* ssp. *monococcum* L.) is a diploid, annual, and hulled grain crop (Table 5.1). It has two types: 1-grained and 2-grained (Zohary et al. 2012, 34). Einkorn was strongly presented in south-eastern Turkey in an archaeological context, and the modern wild origins of domesticated einkorn wheat can still be found around the volcanic mountain ranges Kartal-Karadağ and Karacadağ in south-eastern Turkey.

Some of the first documented archaeological sites where einkorn was cultivated are Tell Qaramel (Willcox and Herveux, 2013), Abu-Hureyra, and Mureybet in Syria (Zohary et al. 2012, 36), Hallan Çemi, Nevali Çori, Can Hasan III, Çayönü, Cafer Höyük, and Gusir Höyük in southeastern Anatolia. We see the 2-grained einkorn form predominantly in the Fertile

Crescent Neolithic sites (Özkan et al. 2011; Zohary et al. 2012, 36-37) while 1-grained einkorn has been documented at European sites (Kreuz and Boenke 2002). Cultivated einkorn still exists in western Türkiye, Caucasia, the Balkan region, Switzerland, Germany, and Spain. Although einkorn wheat has a lower yield than other wheat types, it is also a wheat type that is more resistant to poor soil conditions than other varieties (Zohary et al. 2012, 34).

Barcın Höyük

Einkorn wheat is among the most frequent hulled wheat in the Barcın botanical assemblage. In Phase VIe, 67 fruits were found in 30 of the 176 samples (449 liters) examined. These remains are not entirely well preserved, but the preserved part of the grains were able to be identified as morphological. There is no such high value for einkorn; the findings are few, varying between 1 and 10 grains. The samples are mixed with crops and weed remains in the assemblages.



Figure 5.8: Einkorn grains (BH41101) in VId1 at Barcın Höyük (Balcı 2018).

In VId1, 148 fruits were documented from 47 out of the 194 samples collected. In some of the mixed contamination samples, fragmented grains are grouped as einkorn/emmer (*T. monococcum/dicoccum*), counted as 128 grains in total from 14 samples (Figure 5.8). In VId2, only nine grains of einkorn have been documented from 3 of the 39 samples collected. In VId3, only six einkorn grains from 5 of the 44 samples have been recorded. In VIc, only three einkorn grains have been documented from 2 of the 63 samples. In VIb, 7 grains were found in 3 of the

108 samples collected. In VIa, only half of a single hulled wheat grain was identified as einkorn/emmer. For the later phases, one grain in Middle Chalcolithic, one in Late Chalcolithic, and 3 in EBA III were documented.

Bahçelievler

No documented einkorn remains were found in the earliest two phases, 8 and 7, at Bahçelievler. In Phase 6, only one grain of einkorn was recorded in one of the 42 samples from a courtyard surface (B3, 38/1, 8.30 liters) (Figure 5.9). In Phase 5, two-halves of einkorn grains were documented in two of 26 samples. One of the half grain was collected from inside the structure (B3, 16/2. 4 liters), and another half of the grain is from a courtyard surface (B3, 17/4, 4,75). There is no documented einkorn in the later Phases 4, 3, and 2.



Figure 5.9: Einkorn grain (B3-C3-13.3) in Phase 6, and einkorn/emmer rachis node (B5-8.5) in Phase 2 at Bahçelievler (photo: H. Balcı).

Hoca Çeşme

In the Hoca Çeşme assemblage, einkorn grains have no substantial evidence as naked barley or naked wheat. Only 13 einkorn grains have been documented, with 257 rachis nodes in one sample (15N, 5.32, 114).

Aşağı Pınar

180 grains of einkorn were documented from 39 of the 134 samples from Phase 7. Einkorn grains occurred mainly together with emmer wheat grains. In general, einkorn was represented in only small numbers in the samples (Figure 5.10). Only two samples in the assemblage have some storage value. One of the samples included 50 einkorn grains from ditch H2 (trench 7U, unit 262, ditch level D). This sample also documented around 100 emmer grains, fragmented wheat remains, hulled barley, grass peas, lentils, and a few identified wild plant species such as *Chenopodium*, *Digitaria, Polygonum*, etc. The other sample yielding einkorn is from ditch H2-1 (trench 6N, unit 144, ditch level D) and this sample documented 53 einkorn grains with 102 emmer grains, 175 einkorn/emmer rachis nodes, 105 fragmented wheat/barley, 50 grass peas, 12 lentils, around 40 pulses fragments as economic plants.



Figure 5.10: Einkorn grain (6M-120-A80) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

A few identified arable weeds such as *Digitaria, Fumaria, Galium*, *Linum* cf. *bienne*, Poaceae, etc. were also documented. The relationship between economic plants and weeds will be discussed in the wild plants section of the chapter; however, we see an equal value between einkorn and emmer grains, at 50%, in both samples. The number of einkorn grains is half of emmer grains because einkorn has one fruit, and emmer has two fruits on one spikelet, which is mentioned below. For example, in a fertile spike of einkorn, there will be around 12-13 grains in a spike, and in a fertile emmer spike, there will be 24-25 grains in total. In the emmer spike, only the top of the spike includes one grain, which is similar to the einkorn grain as morphologically in the spikelet.

19 archaeobotanical samples were clarified as Phase 7 mixed in the assemblage. Especially 7 of the 19 samples included a significant amount of cereal remains from ditch H2

(trench 8L, units 61/62, 68, 71, 75, fill B1). In total, 1426 einkorn grains have been documented in these samples. There was also a large number of emmer grains, which will be mentioned in the emmer section.

Emmer Wheat

Emmer wheat (*Triticum turgidum* ssp. *dicoccum*) is a tetraploid-hulled, non-shattering wheat that contains two grains in one spikelet (Table 5.1). Only the top spikelet of the ear is represented with 1 grain and shows similarity with single-grain einkorn wheat. The rachis nodes are broken from the weakest part of the ear as a result of de-hulling (other used term: de-husking), the same as in einkorn. Emmer wheat is also a primitive species of *Triticum turgidum* wheat (Zohary et al. 2012, 39). The wild form of emmer (*Triticum dicoccum* ssp. *dicoccoides*) is widely distributed in Türkiye, Iraq, Jordan, and Iran today. The diversity of wild emmer wheat is frequency found in the Jordan Valley (Zohary et al. 2012, 42; Özkan et al. 2011, 13).

Wild einkorn and emmer are strong species and can grow in several environmental conditions, such as cold and humid climate (e.g., Karacadağ in southeastern Turkey) or in warm and dry weather (e.g., Israel) and in a variety of soil structures such as volcanic, terra rosa, hard limestone, etc., showing that these varieties can grow in different regions (Özkan et al. 2011, 14). Emmer is one of the principal wheat varieties found in the Old World in the Neolithic, and we see its presence in the Mediterranean region, southwest Asia, and in parts of Europe in the Bronze Age (Zohary et al. 2012, 40). On the other hand, the wild progenitor of Emmer has the most restricted geographic distribution compared to the other two Neolithic cereal crops, Einkorn and Barley, which grow more widely (Zohary et al. 2012, 45).

Barcın Höyük

Emmer wheat is the most frequent type of hulled wheat found in Barcın assemblages. In VIe, 116 emmer grains have been documented in total from 47 out of 176 samples (Figure 5.11). In VId1, 324 emmer grains come from 71 out of 194 samples. In VId2, 144 emmer grains are found in nine out of 39 samples. One sample from a layer at the M11 trench (locus 490) includes 96 emmer grains within 144 grains as storage value. In VId3, seven grains are documented from four out of 44 samples.

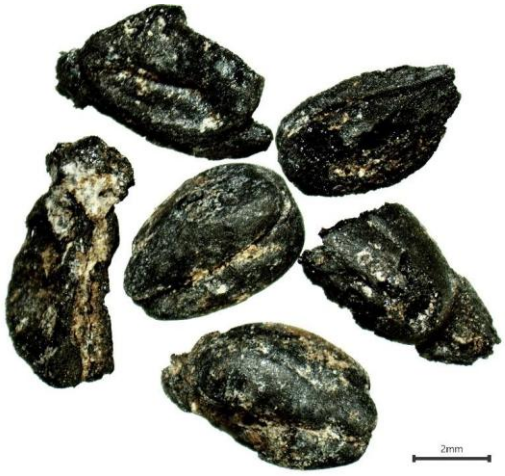


Figure 5.11: Emmer grains (BH46359) in VIe at Barcın Höyük (photo: H. Balcı).

In VIc, 10 grains are documented from 6 out of 63 samples. In VIb, 46 fruits are documented from 22 out of 108 samples (Figure 5.11). No documented emmer grain or rachis node were found in phase VIa, which includes six different pits (Trench L12) and one layer (Trench M11) as contextual.

Two emmer grains are documented in one out of three samples from a pit (Trench L11) from the Middle Chalcolithic. Seven grains are documented from three out of four samples from the Late Chalcolithic. 25 grains are documented in five out of eight samples from four different pits from the Early Bronze Age II.



Figure 5.12: Einkorn/emmer rachis nodes (BH5639) in VIb at Barcın Höyük (photo: H. Balcı).

The ubiquity of emmer remains is abundant compared to einkorn wheat. Being classified as “abundant” is not evaluated by the total number of grains in the assemblages. “Abundance” is considered as the frequency of the presence (Bates and Arteaga 2024; Marston 2014).

Bahçelievler

Bahçelievler has a generally low density of crop grains, as previously mentioned. The preserved remains are primarily fragmented. There can be many reasons for this fragmentation, such as preservation, deposition, restricted excavated area, and use of plants inside the site.



Figure 5.13: Emmer grains (left: A3-3.1) in Phase 8, and (right: B3-C3-12.3) in Phase 6 at Bahçelievler (photo: H. Balcı).

In Phase 8, only one emmer grain was documented inside a pit-dwelling structure (A3, 3/1, 2.75 liters) in one out of 10 samples (Figure 5.13). There are no documented emmer grains in Phase 7, but 8 grains of emmer were recorded in 2 out of 42 samples in Phase 6 (Figure 5.13). In this phase, the fragmented wheat/barley remains show higher quantities than in the first two phases. Seven emmer grains come from a sample taken from 10 cm above a burial of skeletons 3 and 4 in a burial pit. In this sample, there are also fragmented grains of wheat/barley (39) and five fruits of terebinth. This finding will also be discussed in Chapter 6.

In Phase 5, five grains of emmer were documented in three out of 26 samples. Four grains come from a courtyard surface (B3, 13/7, 4.75 liters). This sample generally includes a high percentage of plant remains such as fragmented wheat/barley (56), bread/hard wheat (10), lentil (2), terebinth (103), Chenopodiaceae (1), Polygonaceae (1), etc. The other two half of the

grains have been documented in a pot from a courtyard area (B3, 17/13, 6.75 liters) and an inside of the structure (B3, 16/3, 2.45 liters).

No documented emmer grains exist in the later Phases 4, 3, and 2. Only two grains of emmer have been documented from a context where the phase is unclear (B3, 35/3-4, 21.5 liters).

Hoca Çeşme

Emmer wheat shows its presence with eight grains in five out of 14 samples in the botanical assemblage.

Aşağı Pınar

1027 emmer grains were documented in 87 out of 134 samples in Phase 7 at Aşağı Pınar. The quantity of emmer grains is generally from one to 15 fruits in the samples except for a high number of remains in a few samples. The samples that contain a high volume of emmer grains also show the presence of einkorn wheat, except for two samples. 65 emmer grains and 14 rachis nodes were documented from ditch H2 (trench 8L, unit 74, fill D). One bramble fruitlet and one seed of bitter vetch were also identified in this sample. Another two samples were taken from two different pits related to ditch H2. 180 emmer grains were documented with 14 rachis nodes in pit H2-c (trench 8K, unit 295, fill 4), and 152 emmer grains were documented with eight rachis nodes in pit H2-d (trench 8K, unit 302, fill 4) (Figure 5.14).



Figure 5.14: Emmer grains (8K-302) and einkorn/emmer rachis nodes (6V-311) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

Emmer grains have been documented in nine out of 19 samples in Phase 7 mixed. Especially 7 of 19 samples include a high amount of cereal remains from ditch H2 (trench 8L, units 61/62, 68, 71, 75, fill B1). This sample is discussed in the einkorn section. 2610 emmer grains from units 61, 62, 5365 emmer grains from unit 68, 11372 emmer grains from unit 71, and 125 emmer grains from unit 75 have been counted in these samples.

Why New Glume Wheat (NGW) is not presented?

In the assemblage, New Glume Wheat (NGW) was not documented in any case-sites in the assemblage. While Hoca Çeşme neighbors of Makri in Greece where NGW is documented, but this sites dates to the mid of 6th millennium BC which is late than Hoca Çeşme, Barcın and Bahçelievler, also lacking NGW neighbor Yenikapı (Marmara Region) and are close to Çatalhöyük (Central Anatolia) where NGW has been documented (Ulaş and Fiorentino 2021; Bogaard et al. 2017; Jones, Valamoti and Charles 2000). I am certain NGW grain or rachis are absent at Barcın Höyük, Bahçelievler, and Aşağı Pınar, but Hoca Çeşme rachis nodes identified as einkorn/emmer rachis nodes deserve to be re-checked. The presence and non-presence of NGW in different Neolithic sites continues to be a complex situation.

5.2.3. Naked wheat

Naked wheats are especially identifiable with their rachis fragments and appear around the 9th millennium BP in some middle PPNB sites in southeast Asia (Zohary et al. 2012, 45). Bread wheat appears after the domestication of emmer wheat, and these two types of wheat are genetically related. The best-known species are hard/durum wheat (*Triticum turgidum* ssp. *durum* (Desf.) Husn.) and bread wheat (*Triticum aestivum* ssp. *aestivum* L.). In archaeobotanical assemblages, bread and hard wheat grains morphologically look similar, especially when burnt or carbonized. For this reason, the researchers who work on archaeobotany generally consider the naked wheat grains together as bread/hard wheat (*Triticum aestivum/durum*) during the identification.

Zohary et al. mention that *Triticum turgidum* species should be earlier than bread wheat (*Triticum aestivum*) and that hard wheat (*Triticum turgidum* ssp. *durum)* comes from emmer wheat (*T. turgidum* ssp. *dicoccum*). Some specialists claim that the naked wheats which were found around middle-late PPNB samples in the Fertile Crescent, seem like hard wheat (4x) forms rather than 6x bread wheat (2012, 45). On the other hand, another argument is about the possible early presence of bread wheat based on rachis fragments in Hacılar III and Cafer Höyük

in PPNB around 9500-8500 BP by Nesbitt (2002). Naked wheat remains show high distribution in the Late Neolithic, Chalcolithic, and Bronze Ages, but identifying the differences between bread and hard wheat is not straightforward (Zohary et al. 2012, 46).

I preferred to document the naked grains as bread/hard wheat in my assemblages, stating that my case sites are dated to 7000 BC as the earliest, and there were not enough rachis remains and distinct morphological characters in the assemblages to compare which one is bread or durum wheat. Durum/hard wheat is a tetraploid, and it is the most common naked/free-threshing type, which was domesticated from hulled emmer wheat as *Triticum turgidum* species (Table 5.1). Durum rachis forms are generally hard and irregular fragments because of the threshing stages. The threshing breaks the spikelet from their glume bases and makes the grain free (Zohary et al. 2012, 40).

Some species are hulled in hexaploid *T. aestivum* wheat, such as spelt wheat and macha wheat. Other species are all naked, and bread wheat (*Triticum aestivum* ssp. *aestivum*) is an example of this type. It is the most common species in wheat production, with several varieties cultivated today. All types of wheat are hexaploid, inter-fertile and share the same genome (Table 5.1) (Zohary et al. 2012, 47-48). There is no wild progenitor of bread wheat compared to diploid and tetraploid wheat, and it is derived as a third genome from tetraploid domesticated *T. turgidum* species and diploid *Aegilops tauschii* Coss. wild (Zohary et al. 2012, 47).

Bread/Hard Wheat

The Latin name of bread/hard wheat (*Triticum aestivum* ssp. *aestivum/turgidum* ssp. *durum*) is generally used with a shorter version as "*T. aestivum/durum*" and considered together for the identification in the archaeobotanical literature, as previously mentioned.

Barcın Höyük

In archaeobotanical data, clarifying bread and hard wheat show a stable and relatively increasing presence during the occupational layers of Barcın Höyük. In phase VIe, 32 grains are documented in 12 out of 176 samples (Figure 5.15). In VId1, 357 grains were recorded in 36 out of 194 samples. In this phase, 357 grains are included as a high volume in some samples, such as 115 grains from a collapse sample (BH35700, M10, loc.357). Only five rachis nodes were identified. In VId2, 39 grains have been found in 7 out of 39 samples. In VId3, five grains are documented in four out of 44 samples. At this level, the cereal remains show less evidence;

for example, only seven grains of emmer, six grains of einkorn, etc. were recovered much less than what was found at the other earlier levels.



Figure 5.15: Bread/hard wheat grains (BH46359) from frontal and dorsal sides in VIe at Barcın Höyük (photo: H. Balcı).



Figure 5.16: Bread/hard wheat grains (BH9592) from frontal and dorsal sides in VIb at Barcın Höyük (photo: H. Balcı).

In VIc, 18 grains were documented from seven out of 63 samples. In VIb, 38 grains were documented in 19 out of 108 samples (Figure 5.2). Only two rachis nodes of bread/hard wheat have been recorded.

In the Middle-Chalcolithic phase, two grains from a pit (L11, loc.209) and one grain from a layer (M10, loc.62) in Late Chalcolithic have been documented. 19 grains from four out of eight samples in EBA II, and one grain were identified in LBA.

Bahçelievler

Bread/hard wheat is the most frequent type of cereal crop as from Phase 6. In the earliest phases 8 and 7, there are no documented bread/hard wheat grains. In Phase 6, ten grains have been documented in six out of 42 samples from both indoor and outdoor areas (Figure 5.17).

In Phase 5, 19 grains were documented in six out of 26 samples. Most of the remains were documented in courtyard areas. 10 of 19 grains are presented in a courtyard surface sample that contains more other remains, as mentioned in the emmer section (B3, 13/7, 4.75 liters). In Phase 4, four grains were documented in three out of 14 samples. Phase 4 is divided into two levels, 4a and 4b, and these documented grains were recovered in level 4b. After level 4b, no documented bread/hard wheat remains were found.



Figure 5.17: Bread/hard wheat grain (B3-59.1) in Phase 6 at Bahçelievler (photo: H. Balcı).

Hoca Çeşme

Bread/hard wheat is represented with 472 grains in two samples (Figure 5.18). 471 grains were recorded in a sample that contains a storage value where naked barley was also documented (pyrotechnic feature, 15M, 2.11). One grain was documented in a different sample (15M, 3.13, 4/d-e), located closer to the pyrotechnic feature.



Figure 5.18: Bread/hard wheat grain and rachis (15M-2.11) at Hoca Çeşme (photo: H. Balcı).

As mentioned in the barley section, fragmented wheat/barley was calculated in the intensive sample to be around 1970 grains. Some of these remains may belong to hulled barley, while others probably belong to bread/hard wheat.

Aşağı Pınar

179 grains of bread/hard wheat have been documented in 41 out of 134 samples. Only eight rachis nodes have been documented in three samples (Figure 5.19). There is no regular presence of bread/hard wheat with emmer and einkorn. However, it occurs mainly with emmer wheat rather than einkorn in the samples.



Figure 5.19: Bread/hard wheat grain (6V-308) and rachis (8K-285-A025) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

Bread/hard wheat grains were primarily obtained from two pit units in ditch H1. 22 grains in pit H1-1e (trench 6M, unit 111, seven samples, fill 4) and 68 grains in pit H1-1e (trench

6M, unit 111, four samples, fill 4) have been documented. There is also a high value of fragmented remains of wheat/barley/pulses, seeds of pulses, and wild plants in these samples.

5.2.4. Unidentified wheats (Triticum sp.)

Small-sized naked wheat

This species has only been recorded at Barcın Höyük. The form of this type looks like between einkorn/emmer and bread/hard wheat types but the grains are clearly naked so it is difficult to identify them as a kind of small einkorn grain. 33 grains are documented from five out of 176 samples in phase VIe and 90 grains from 21 out of 194 samples at Barcın Höyük. The frequency of this form increased in layer VId1 (Figure 5.20). 25 grains come from a surface (M10, loc. 496) in VIe, and 50 grains come from a platform bench ledge in VId1 (M10, loc. 427) as a high quantity in the sample.



Figure 5.20: Small-sized naked wheat grains in phase VId1 at Barcın Höyük (Balcı 2018).

This indeterminate form has been found in VId2 with seven grains from a surface (L13, loc. 146) in a single sample out of 39 samples. Half of the grain is documented from a surface (BH39770, L12, loc. 427) in a single sample out of 44 samples in VId3. Five grains in four samples out of 63 in phase VIc, and nine grains in five samples out of 108 have been documented in phase VIb. In VIa, 1 and 7 grains in EBA II in one sample have been documented.

When we look at the occurrence of this indeterminate type in the samples, it is probably a type of cereal that came from the field mixed with the main crop. The fact that it is found in two samples in higher numbers compared to the other samples in the VIe and VId1 phases may be related to the presence of densely cultivated wheat remains in the same samples. It is also highly probable that it is a form that emerged from the occasional mixed growth of emmer and bread/hard wheat in the field together for a while. For example, the type of *Triticum parvicoccum* is very identical to small-sized naked wheat, and its origin comes from emmer wheat (Figure 5.20) (Kislev 1980). It is possible to observe that this form almost disappeared in later periods.

Other unidentified wheat species



Figure 5.21: Unidentified wheat (*Triticum*, possibly emmer) grains (BH2040) in EBA II at Barcın Höyük (photo: H. Balcı).



Figure 5.22: Unidentified wheat (*Triticum*) grains (BH12677) in VIc at Barcın Höyük (photo: H. Balcı).

5.2.5. *An Overview of Cereal by-products*

Hulled wheat (einkorn & emmer)

In Hoca Çeşme the major presence of *T. monococcum/dicoccum* is represented with rachis nodes (mentioned as spikelet bases by Jones et al. 2000, 134) the by-products of de-husking.

The by-product remains (rachis nodes and very less glume pieces without the bases) could belong to a fine-sieve by-product at Barcın Höyük, Aşağı Pınar, and Hoca Çeşme where by-product remains are more observable compared to Bahçelievler (Bogaard et al. 2005, 506; Jones 1991, 75). The number of by-products remains are also mentioned below as summarized in same chapter at subsections 5.9.1-5.9.4). The high quantity of rachis nodes compared to other by-product pieces (glumes, awns, culms, etc.) shows that hulled wheat have been stored as rachillate spikelet/floret in the sites.

Barley (hulled & naked)

Barley rachis nodes show a higher presence based on naked wheat, but it is much less compared to hulled wheat. Most of the hulled barley grains in the assemblage represent a de-hulled process so nearly absence of rachis nodes is understandable. Probably barley is brought to the site

Naked wheat (bread/hard wheat)

Bread/hard wheat by-product is nearly absent at every site, which probably represents a fine-sieve product (Bogaard et al. 2005, 506; Jones 1991, 75). Bread/hard wheat grains are probably brought to the site after winnowing.

5.3. Pulses

The pulses/legume (Fabaceae) family is a widespread flowering plant family, with over 760 genera and 20,000 species worldwide. This family is very important, like the Poaceae family, where both families are prevalent in agriculture.

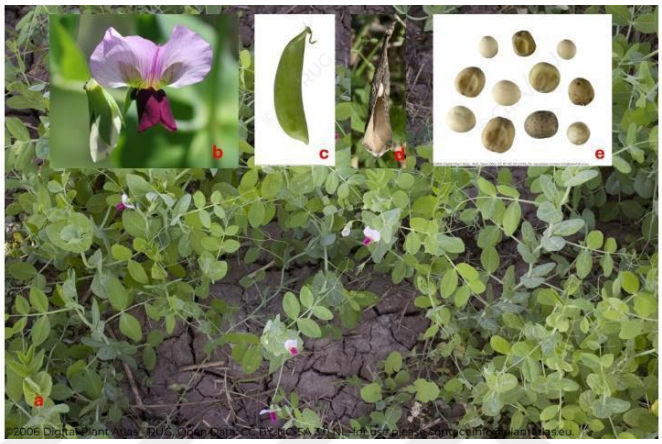


Figure 5.23: General vegetational parts of *Pisum sativum*: (a) entire flowering plant, (b) flower, (c) fresh fruit, (d) dehiscent fruit and seed, e) seeds (edited by H. Balcı from online sources).[27]

The origin of pulse species, cultivated as a founder crop, comes from Southwest Asia and the Mediterranean basin. The first cultivated pulses are known as lentil (*Lens culinaris* Medik. ssp. *culinaris*), pea (*Pisum sativum* L.), bitter vetch (*Vicia ervilia* (L.) Willd.), chickpea (*Cicer arietinum* L. ssp. *arietinum*), grass pea (*Lathyrus sativus* L.), and faba bean (*Vicia faba* L.) (Table 5.5) (Ladizinsky 1987; Tanno and Willcox 2006; Zeder 2011; Zohary et al. 2012).

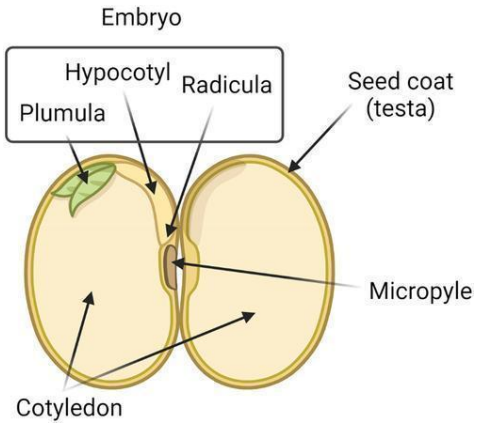


Figure 5.24: The main structure of a legume seed (Sharifi et al. 2024).

[27] Images a, c, d, e (https://www.plantatlas.eu/item/classification/1843); Image b (https://www.inaturalist.org/taxa/54522-Pisum-sativum)

The characteristics of domestication traits on pulses are less observable than on principal cereals as morphological (please refer to Chapter 3 for more detail) (Tanno and Willcox 2006). The structure of a legume seed consists of the testa (seed coat), cotyledon, and embryo (Figures 5.23, 5.24).

Table 5.2: The classification of pulse species.[28]

Classification of Pulses (Fabaceae)					
Subfamily	**Tribe**	**Genus**	**Domesticated**	**Chromosome**	**Ploidy level**
Caesalpinioideae					
Mimosoideae					
Papilionoideae	Cicereae	Cicer	Cicer arietinum L. ssp. arietinum	2n=2x=16	diploid
	Fabeae	Vicia	Vicia ervilia (L.) Willd. Vicia faba L. Vicia sativa L.	2n=2x=14 2n=2x=12	diploid
		Lens	Lens culinaris Medik. ssp. culinaris	2n=2x=14	diploid
		Lathyrus	Lathyrus sativus L.	2n=2x=14	
		Pisum	Pisum sativum L.	2n=2x=14	diploid

Pulses were one of the most common food element groups after cereals in most parts of the world in the past, and even today they are still popular foods. The fact that legume species contain mainly protein and cereal grains contain primarily starch ensures that the two groups support each other in supplying nutritional value (Zohary et al. 2012, 75).

In wild legumes, the seed coat is thick, affecting the time it takes for the seed to enter dormancy (Ladizinsky 1987, 61-62). Dormancy is very important for the seeds to synchronize with the environment as time periodically (Penfield 2017). At the same time, the fruit (capsule, pod) bursts at some point in wild legumes and falls to the ground. In cultivated species, the capsule of the legume is separated from the seed by threshing stages (Figure 5.23).

[28] The table is updated and adapted from Cappers and Neef 2021, 216-222; Zohary et al. 2012, 75-99.

5.3.1. Bitter vetch

Bitter vetch (*Vicia ervilia* (L.) Willd.) is one of the most common species first domesticated in the pulses group. It is an annual diploid, self-pollinated plant (Table 5.2). The species is represented with beaded pods and angular seeds (Figure 5.23) (Zohary et al. 2012, 92). Today, bitter vetch (*Vicia ervilia*) is only produced as animal feed; however, in the Neolithic Period, people must have grown it for nourishment. Zeist et al. (1995) state that bitter vetch seeds are toxic/harmful to human beings, but they can be removed from the seedcoat by steeping the seeds in water before cooking them. The name 'bitter' comes from its bitter and toxic taste (Zohary et al. 2012; 91). Bitter vetch seeds have recently been used for fodder worldwide, primarily grown in Türkiye, the Mediterranean basin, and southwest Asia (Zohary et al. 2012, 92; Mikic 2016, 747). *Vicia* species also grow and spread as arable weeds along with some crops (Mikic 2016, 746). The earliest usage of wild legumes is around 65,000-48,000 cal. BP at Kebara Cave, Israel (Lev et al. 2005), and 46,000 BP in Shanidar Cave, Iraq (Henry et al., 2011; Zohary et al. 2012; Mikic 2016). The first domestication prints occur around the 10^{th}-9^{th} millennia BP in the Near East and Southeastern Türkiye (Tanno and Willcox 2006; Zeder 2011; Fuller, Asouti and Purugganan 2012; Zohary et al. 2012).

Barcın Höyük

Bitter vetch generally shows a stable presence in all Neolithic levels of Barcın Höyük. Very few remains were only present in the earliest Phase of Barcın Höyük (VIe). In this phase, only eight seeds have been documented in eight out of 176 samples in VIe. 89 seeds in total are documented in 30 out of 194 samples in later Phase VId1 (Figure 5.25).

Thirteen seeds in eight out of 39 samples in VId2, and 33 seeds in three of 44 samples in VId3. In phase VId3, 30 seeds of bitter vetch have been found in a sample from a pyrotechnic feature in str18 (BH38221, L12, loc. 409) that includes a high volume of fragmented pulses, chenopod, and some cereal remains as well. In VIc, 11 seeds of bitter vetch were found with low numbers in 10 of 63 samples.



Figure 5.25: Bitter vetch seed from different sides (BH36876) in VId1 at Barcın Höyük (photo: H. Balcı).



Figure 5.26: Bitter vetch seed from different sides (BH5639) in phase VIb at Barcın Höyük (photo: H. Balcı).

In VIb, 153 seeds were documented in 25 of 108 samples. Most high remains come from Trench L11, pits, and surfaces (Figure 5.26). There are no documented remains of bitter vetch in phases VIa, Middle, and Late Chalcolithic. Bitter vetch shows presence with 15 seeds in four samples (n:8) in EBA II pits and three seeds from two samples (n:5) in phases EBA/MBA.

Bahçelievler

No bitter vetch remains have been recovered in the earliest two phases. We see bitter vetch with two seeds in Phase 6. 1 seed comes from inside of the pit-dwelling structure (B3, 74/5, 2 liters), and one seed comes from another structure where the sample was collected from the south of the structure (C3, 32/1, 12.50 liters).



Figure 5.27: Bitter vetch seeds (B4-5.2) in Phase 3 at Bahçelievler (photo: H. Balcı).

After Phase 6, there are no documented bitter vetch seeds in phases 5 and 4. Bitter vetch has been documented in phases 3 and 2 with two seeds. One seed comes from a courtyard (B4, 5/2, 3 liters) in Phase 3, and one seed of bitter vetch comes from inside the structure (B5, 14/1, 4 liters) (Figure 5.27).

Hoca Çeşme

There is no documented bitter vetch in the Hoca Çeşme assemblage.

Aşağı Pınar

17 seeds of bitter vetch have been documented in 12 of 134 samples in Phase 7 at Aşağı Pınar. There is no high value in the samples where the remains are presented. Bitter vetch shows presence mostly with lentil seeds or alone within the pulses group in the samples (Figure 5.28).



Figure 5.28: Bitter vetch seeds (6M-111-A71) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

In the samples that are identified as Phase 7 mixed (?), there is a lower quantity in the pulses compared to cereal remains, and only one bitter vetch seed has been documented from

ditch H2 (trench 8L, unit 71, B1) within 10,980 hulled wheat grains. After this level, bitter vetch has been documented in 5b with half of a seed.

5.3.2. Chickpea

The wild species of chickpea is *Cicer reticulatum* Ladiz. and the cultivated species of chickpea is *Cicer arietinum* L. ssp. *arietinum*. It is a diploid, interfertile, annual, self-pollinated plant (Table 5.2). The pods contain one or two seeds. There is a wide range in size, color, and shape of chickpea seeds, and they are adapted to subtropical or Mediterranean-type climates and grow in the moisture stored in the soil after the rainy season. Today, we see the agriculture of chickpeas around the world, especially in western Asia and the Mediterranean region (Zohary et al. 2012, 87). Chickpea is one of the first cultivated legume species in southwest Asia; conversely, it is one of the least common pulse species compared to lentils and peas in the Neolithic levels. We know that there are documented seeds in Çayönü, Nevali Çori, and Aşıklı Höyük as early evidence around the 9th millennium BP in Türkiye (chapter 3). There is also early evidence from Syria, Jordan, and Israel around the 10th-9th millennium BP (Tanno and Willcox 2006; Zohary et al. 2012). Chickpeas are a frequent pulse species at Bronze Age levels in Türkiye.

Barcın Höyük

There is no documented chickpea in the earliest phase VIe at Barcın Höyük. Seven seeds have been documented in five of 194 samples in phase VId1 (Figure 5.29).



Figure 5.29: Chickpea seeds (BH36239) in VId1 at Barcın Höyük (Balcı 2018).

There are no remains in VId2 and VId3. One seed of chickpea in VIc and two seeds in VIb were documented. In later levels, there is no documented seed either.

Only one questionable seed has been documented as *Cicer* cf. in phase EBA II. On the other hand, in phase Late Chalcolithic, there are three seed fragments from a layer (BH2579, M11, loc.12. 5 liters) identified as chickpea/grass pea (*Cicer/Lathyrus*) in the data, but this find might be *Cicer* because there is no documented remains of grass pea in any phase at Barcın Höyük.

Bahçelievler

At Bahçelievler, only half of the seed is identified as potentially chickpea in Phase 4a (B3, 66/1, 4,24). There is no documented chickpea in the rest of the samples.

Hoca Çeşme

There is no documented chickpea in the Hoca Çeşme assemblage.

Aşağı Pınar

Chickpea is the rarest type of pulses at Aşağı Pınar. There are only 1.5 seeds documented in Phase 7. When we look at the overall pulses remains, it is possible to say that these remains might possibly be grass peas. One documented chickpea seed was presented with 45 grass pea seeds in the sample from ditch H1-2 (6N, 146, D).

5.3.3. Faba bean

Faba bean (*Vicia faba* L.) is another species that belongs to the principal pulses group in early agriculture in southwest Asia. Faba bean is a diploid, nearly self-pollinated, annual pulse crop (Table 5.2), and it likes warm, summer-dry environments such as a Mediterranean-type climate. It has the largest seed size compared to other principal pulses and contains a 2-25% protein content (Zohary et al. 2012, 89-90). There are a few seeds in a pod, but the number of seeds in a pod might change according to the species, environmental, and soil conditions. We know the earliest evidence from Iraq, Jordan, and Syria around ca. 13,000-11,000 BP that the domestication is not clear (Colledge 2001; Tanno and Willcox 2006; Willcox et al. 2008). We see faba bean remains as frequent evidence in later periods, such as the Bronze Age and the Iron Age, in the archaeological sites, especially in the western part of Türkiye.

Faba bean, like chickpea, is another rare species in the case sites. Only at Barcın Höyük is a single seed documented in phase VIc, and another single seed is documented in phase EBA II (Figure 5.30).

There is no documented faba bean at Bahçelievler, Hoca Çeşme, or Aşağı Pınar.

5.3.4. Grass pea

The possible wild species of grass pea is *Lathyrus cicera* L., and the cultivated grass pea species in Latin is *Lathyrus sativus* L. appears in the eastern Mediterranean, Aegean, and southwest Asia regions. The species is a diploid, annual, and self-pollinated plant. It has a climbing character, and the seeds have a smooth shape with pressed sides compared to pea or bitter vetch (Zohary et al. 2012, 95). Grass peas have also recently been grown for human food and livestock fodder, much as bitter vetch, especially in Asia and East Africa. The seeds of grass peas also contain a kind of toxic substance, and it causes a condition called 'Lathyrism' when people consume it for a long time as primary food. People can remove only 70% of the toxic substance by boiling for one hour (Zohary et al. 2012, 95). The plant likes moist soils but is also able to grow in different soil conditions.



Figure 5.30: Grass pea/faba bean seed fragments (BH2579) in Late Chalcolithic at Barcın Höyük (photo: H. Balcı).

This species is represented at Aşağı Pınar assemblages as a later site than Barcın Höyük and Bahçelievler. Generally, faba beans and grass peas are presented later than the Neolithic in the western part of Anatolia (Chapter 3/2), even in the Near East (Mahler-Slasky and Kislev

2010). It is possible to say that grass peas started to appear more in the region around 6000 BC; besides, the average domestication period of grass peas might be around 6000 BC (Kislev 1989). Kislev suggests that if you have grass with fewer than 100 seeds of pulses in a site, you should consider the species that you identified as Lathyrus sativus could be wild or an escaped species of *L. sativus* and *L. cicera* (Kislev 1989, 263-264). For the Aşağı Pınar site, periodically and quantitatively, there is no issue with the presence of grass peas as a crop before 6000 BC, which is mention below for Phase 7 (5950 cal. BC). In Kislev's study, the early dispersal of grass pea (*Lathyrus sativus*) spread from Greece around 6000 BC (Kislev 1989, 267). Zohary et al. mention the earliest evidence with over 800 seeds from Gritille (Final PPNB, 8500-7500 cal. BP) in southeast Türkiye and 200 seeds from Prodromus (ca. 8000 BP) in Thessaly and some early evidence in Bulgaria (2012, 96). There are more examples of the presence of grass peas as Early Neolithic I-II evidence for the Bulgaria region (Marinova 2007) and in Greece (Valamoti 2004), but Aşağı Pınar seems earlier. It is crucial to look at all recent studies to be sure. This examination is discussed in Chapter 8.

There is no documented grass pea in any phase at Barcın Höyük nor at Bahçelievler. Only three fragments of seeds are identified as grass pea/faba bean in a sample (BH2579, layer) from the phase Late Chalcolithic at Barcın Höyük (Figure 5.30). There is no documented grass pea at the Hoca Çeşme assemblage either.

Aşağı Pınar

Grass pea is the most presented pulse type in Phase 7 at Aşağı Pınar, compared to the other case sites (Figure 5.31). 181 grass pea seeds have been documented in 31 of 134 samples. In a few samples, a high number of seeds of grass peas were found. A sample from ditch H1-1 contains 39 seeds of grass pea (6M, unit 81, B1). This sample also includes a storage value for cereal remains, especially hulled barley and emmer grains.



Figure 5.31: Grass pea seed (8K-284-A024) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

Another sample comes from ditch H1-2 with 45 grass pea seeds (6N, unit 144, D). This sample also contains einkorn and emmer grains, lentil seeds, fragmented pulses remains. *Digitaria* sp., and *Linum* cf. *bienne*. The rest of the samples mostly contain values between 1-10 seeds, except for two samples with 17 and 18 seeds of grass peas.

5.3.5. Lentil

The presence of lentils begins around the Epipaleolithic-PPNA period, around 11,000-10,000 cal. BC in the Fertile Crescent, and it is one of the most widespread legume types in the Old World (Zohary 1972; Zohary et al. 2012). Lentil is an annual, diploid, and self-pollinated plant. The wild name of lentils is *Lens culinaris* Medik. ssp. *orientalis* (Boiss.) Ponert. The genetic research shows an intensive collection of *orientalis* by PPNA hunter-gatherers, who possibly were trying to cultivate it in gardens or fields near their temporary or sedentary villages (Liber et al. 2021, 12). According to genetic research, the consumption of wild lentils was more intensive in southern Türkiye/Syria and the southern Levant rather than in southeastern Türkiye (Liber et al. 2021, 12-13). However, the lentil remains are almost the most recovered pulse species in the archaeobotanical assemblages compared to other pulse species. Lentils have a valuable place in nutrition. It is still among the most nutritious grains in the economic plants, with about 25% protein, which can replace meat and widely used around the Mediterranean and southwest Asia (Zohary et al. 2012, 77). The domesticated type of lentil is named *Lens culinaris* ssp. *culinaris* Medik. The start of the domestication of lentils is still unclear (Liber et al. 2021). Lentil remains mostly show a widespread presence in the botanical assemblages compared to other pulse types. One of the reasons for this is the size of the lentil seeds that easily fall from the sieve that people use to separate the field crops from the weeds. The other reason can be the

valuable situation of lentil seeds, such as environmental needs, storage quality, preparing stages, etc.

Barcın Höyük

As I mentioned above, the remains of pulses are low in the earliest levels of Barcın Höyük. Only nine seeds of lentil have been documented in 10 of 176 phase VIe. 28,158 seeds have been documented in 35 of 194 samples in phase VId1. 28080 seeds of lentil are a storage value. 20080 seeds have been counted from a basin bin sample in structure 2a (BH36876, L10, loc. 147, 5.5 liters), and 8000 seeds of lentil have been found from a layer sample as a collapse which was related to another basin bin sample as contextual in structure 2a (BH36852, L10, loc. 185, 3.25 liter) (Figures 5.32, 5.33). When subtracting these two high numbers from the total number (28158 seeds), 78 seeds were obtained from 33 samples. Regarding frequency of occurrence, the presence of lentils in layer VId1 increases and is more widespread than in VIe. 12 seeds have been documented from 6 of 39 samples in VId2. In VId3, 107 lentil seeds have been documented in total from 4 of 44 samples, but 101 of 107 seeds are documented in one sample from an 'other' context (BH36877, L10, loc.145). This sample is generally a clear sample that does not contain any other plant remains.



Figure 5.32: Lentil seeds (BH36876) in phase VId1 at Barcın Höyük (photo: H. Balcı).



Figure 5.33: Lentil seeds (BH36876) from storage in phase VId1 at Barcın Höyük (photo: H. Balcı).



Figure 5.34: Lentil seed (BH10058) in phase VIa at Barcın Höyük (photo: H. Balcı).

In phase VIc, only three lentil seeds have been documented in 2 out of 63 samples. Two seeds with some other cereal remains in a pit (BH28376, M11, loc.327, 4 liters), and one seed in a layer (BH11895, M10, loc. 215, 10 liters) were found. In phase VIb, 17 lentil seeds were found in 11 of 108 samples. In phase VIa, four lentil seeds were found in 4 out of 7 samples (Figure 5.34).

There is no documented lentil in Middle Chalcolithic. In Late Chalcolithic, eight lentil seeds have been documented in layer contexts in M11 (loc. 12, 5 liters) and M10 (loc. 62, 5 liters). In phase Early Bronze Age II, 10 lentil seeds have been documented in 5 of 8 samples from the pits in different trenches M10, M11, and L12. There are no documented lentils in the Early/Middle Bronze Age.

The lentil (*Lens culinaris*) species grown in Barcın must have been red lentils. It shows the same characteristics in terms of shape and with the slight germination process of the embryo in red lentils.

Bahçelievler

Lentil is the most frequent type compared to other species of pulses at Bahçelievler. No lentil remains were found in Layer 8. 11 lentil seeds were documented in 4 of 20 samples in Phase 7. In Phase 7, one seed comes from a hearth (B2, 29/3, 5.25) (Table 5.7). One seed is documented in the courtyard surface (C2, 20/4, 4.2 liters). 10 seeds of lentils have been documented in 2 samples from the inside of the structure (C2, 19/2-22/5, 8.75 liters).



Figure 5.35: Lentil seeds (C2-22.3) in Phase 6 at Bahçelievler (photo: H. Balcı).

In Phase 6, 10 lentil seeds were documented in 5 out of 42 samples. Eight seeds were documented from the indoor area (C2, 22/2-3, 6; 34/7, 1.50 liter) (Figure 5.35). In later phases 5-2, lentil remains decrease to a very low quantity. Two seeds from a courtyard surface (B3, 13/7, 4.75 liters), one seed from a pit in the structure (B3, 66/1, 4.25 liters), no documented seed in Phase 3, and one seed from a layer in the structure (B5, 8/4, 4.25).

Hoca Çeşme

Lentil is one of two species (lentil and pea) that are presented in pulses at the Hoca Çeşme site (Figure 5.36). 47 seeds of lentil have been documented in 8 out of 14 samples. 37 of 47 seeds are from the same context (pyrotechnic feature, 15M, 2.11), and 10 seeds are from 6 different contexts, primarily pits.



Figure 5.36: Lentil seed (15M-2.11) at Hoca Çeşme (photo: H. Balcı).

Pulses do not have as many assets as cereals, but the fact that lentil seeds are seen in 8 out of 14 samples indicates that they are not an economically rare plant in the site statistically.

Aşağı Pınar

Lentil is the most frequent species compared to other species of pulses, as in Barcın and Bahçelievler sites. In Phase 7, 408 lentil seeds were documented in 76 of 134 samples in Phase 7 (Figure 5.37).



Figure 5.37: Lentil seeds (8K-285-A025) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

In general, the samples contain a low amount of remains, between one and 10 seeds, except for a few samples. In three samples, a higher number than 20 lentil seeds were documented. Fifty-seven seeds of lentil from the east of the ditch H1-1 (6M, unit 117, fill D), 28 seeds of lentil from a pit which is related to ditch H1-1 (6M, unit 111, fill 4, H1-1e), and 22

seeds of lentil from another pit which is related to ditch H2 (7U, unit 268, fill 4, H2-v) have been documented.

Lentil remains are mostly presented -exceptionally high numbers- with fragmented pulses, cereals, or hulled wheat rachis nodes instead of bigger complete grains in the samples, which means these remains are probably trash part of the crops after sieving or hand selection, which I mentioned above.

5.3.6. Pea

Pea is one of the first domesticated legumes around the 10th millennium BP, accompanied by cereal cultivation simultaneously (Zohary and Hopf 1973; Kislev and Bar-Yosef 1988; Tanno and Willcox 2006). The wild form of pea is '*Pisum sativum* L. ssp. *elatius* (Steven ex M. Bieb) Asch. & Graebn. var. *pumilio* Meikle.' The domesticated form of pea is '*Pisum sativum* L.' Around 6000 BC, peas became an essential protein source and widespread pulses in Europe (Ljuština and Mikić 2010). Pea is an annual, diploid, self-pollinated legume species that is mostly an interfertile plant (Table 5.2) (Zohary et al. 2012, 82). A few seeds are in one pod/capsule of the pea plant, like the faba bean. Pea is adapted to warm and cool climate conditions and is present primarily in southwest Asia, the Mediterranean region, Europe, India, and Ethiopia. Peas are an agricultural product that can meet the vital protein needs of people (%22) in these regions (Zohary et al. 2012, 82). The cultivated seed of a pea has smooth seed coats with a round and more oversized shape than bitter vetch or lentil. The wild type has a rough seed coat structure (Zohary and Hopf 1973). This may be why pea remains are generally not well preserved, unlike grass peas, lentils, or bitter vetch, if we compare them in assemblages. The outside of the seed is more fragile than the other domesticated pulse seeds. On the other hand, pea has an advantage over bitter vetch or grass pea because it does not contain any toxic substance or taste like bitter vetch or grass pea (Savage and Deo 1989, 66).

Barcın Höyük

Pea is the third abundant species of pulses at Barcın Höyük quantitatively and in distribution. On the other hand, the earliest phase VIe generally shows poor evidence for the pulses. Only one pea seed has been found from 1 out of 176 samples on a surface (BH45640, M10, loc. 515, 3.25 liter) (Figure 5.38).



Figure 5.38: Pea seed (BH45640) in Phase VIe at Barcın Höyük (photo: H. Balcı).

In Phase VId1, 14 pea seeds were documented in seven out of 194 samples. Peas have no storage value, unlike bitter vetch species on the site. In this phase, pea seeds are generally presented with lentils, and bitter vetch remains are present. In phase VId2, there are no documented pea seeds. In Phase VId3, only five seeds of pea have been documented in a pyrotechnic feature in structure 18 (BH38221, L12, loc. 409, 8 liters) in one out of 44 samples. In this sample, 31 seeds of bitter vetch and 43 fragmented seeds of Fabaceae are documented, which can probably represent pea fragments. Cereal fragments and some wild plant species are also present in this sample.

In Phase VIc, one pea seed has been documented in 1 out of 63 samples from a red surface (BH36446, L12, loc. 379, 4 liters). In phase VIb, one pea seed was found again in one sample out of 108 from a pit (BH27567, L11S, loc. 453, 4 liters). There is no documented pea in later phases in VIa, Middle and Late Chalcolithic, and Early Bronze Age II.

Bahçelievler

In general, there is no documented pea at the Bahçelievler site. Only one seed was documented as a pea[29] from a structure (B2, 27/2, 3.50) in Phase 7.

Hoca Çeşme

Pea is another pulse species identified in the Hoca Çeşme site (Figure 5.39). 57 seeds were recorded in 3 out of 14 samples. 42 seeds have been documented in one sample (pyrotechnic

[29] With a question mark.

feature, 15M, 2.11) where most of the remains were obtained. In this context, fragmented pulses were also found (12 seeds of lentil/pea).



Figure 5.39: Pea seed (15M-12.11) at Hoca Çeşme (photo: H. Balcı).

Aşağı Pınar

Pea is the second most abundant species of pulses according to ubiquity, and 147 have been documented in 36 of 134 samples in Phase 7 at Aşağı Pınar. The samples generally contain a low amount of remains, between one to 10 seeds, except for three. These three samples were collected from pit H1-1e. 30 seeds in unit 111 and 32 in unit 120 have been found in pit H1-1e. These samples also include some other pulses and cereal remains. Pea seeds have a more rounded shape compared to grass pea or bitter vetch seeds (Figure 5.40).

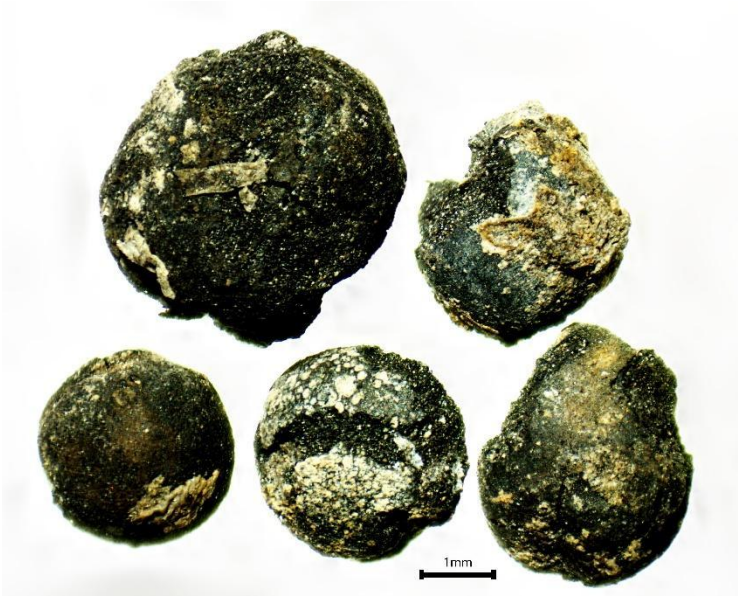


Figure 5.40: Pea seeds (6M-134-A47) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

5.4. Oily-Fibre Plants

5.4.1. Flax

Flax belongs to the Linaceae family, and cultivated flax (*Linum usitatissimum* L.) is one of the most essential oily and fibre plants worldwide. The type is related to pale flax, such as the wild species *Linum usitatissimum* ssp. *bienne*. This species is a diploid (2n=2x=30 chromosomes) and self-pollinated annual plant (Zohary et al. 2012, 100-101). Flax seeds are smooth, slightly elongated, oval-shaped, and grow in an oval capsule (Figure 5.41). This species is also one of the principal crops cultivated around the 10th-9th millennium BP in the Old World. Flax has a wide usage area with its seeds and plants. Seeds are used to make oil or directly as a food source for human diet/animal fodder, and the plant part is used to produce textiles (see Jhala and Hall 2010, 4304-4305). The plant may also be the oldest type for making clothes or other textile materials.

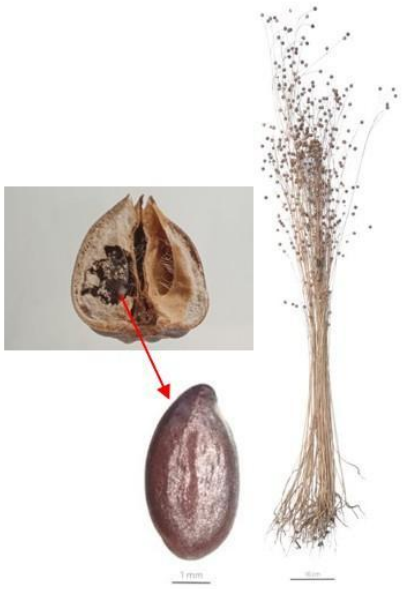


Figure 5.41: General vegetative parts of flax plant (edited from online source).[30]

Flax appears around 9000 BC in the Levant and Southeastern-Central Anatolia, and after 6000 BC in the Mediterranean Basin and southern Europe (Valamoti 2011; Zohary et al. 2012; Harris 2014); therefore, the presence of flax/linseed around 6600 BC in Northwest

[30] https://www.plantatlas.eu/item/classification

Anatolia, and 6200 BC in Eastern Thrace completes a very crucial hole about the distribution and usage of flax after the core area where flax was domesticated with this doctoral research.

Barcın Höyük

Six seeds of flax in 2 out of 176 samples in VIe . In one of the samples, four mineralized seeds have been recovered from a layer of ash and sand (BH44708, loc.355, L10) between two white surfaces in structure 24 in VIe2 (Figure 5.43). In the same sample, 39 fruits of mineralized (possibly) *Atriplex* sp. have been documented. Mineralization can be occurred naturally if the soil contains high phosphate, this situation can be seen in coprolite or dung (Miksicek 1987, 218).

29 seeds of flax in 11 out of 194 samples in VId1 (Figure 5.42). Two flax seeds in 2 out of 39 samples in phase VId2. Both flax seeds come from a pyrotechnic feature in L10 (BH38316, BH38116, loc. 161, 2.5 liters).



Figure 5.42: Flax seeds in phase VId1 at Barcın Höyük (edited from Balcı 2018).

There is no documented flax in phase VId3. In phase VIc, five seeds of flax are documented from two out of 63 samples. A half seed comes from Trench L12, and four seeds of flax come from a pyrotechnic feature in Trench L11N (BH36376, loc. 536, 0.5 liter). There is no documented flax in phases VIb, VIa, Middle Chalcolithic, and Bronze Age. Only one seed of flax has been documented in one layer sample in M10 in the Late Chalcolithic levels.



Figure 5.43: Mineralized flax seeds (BH44708) in phase VIe at Barcın Höyük (photo: H. Balcı).

We see a stable presence of flax in almost all phases at Barcın Höyük. Although it has a stable existence, the fact that flax seeds are rarely available in the recovered assemblages suggests that flax may have been grown for its fiber, primarily for textile weaving. The plant stem needs to be harvested before it dries completely to use the flax fiber. This stage coincides with the time when the seeds are not fully mature (see Chapter 10).

Aşağı Pınar

In Aşağı Pınar, there are only 19 documented seeds of *Linum* cf. *bienne* as wild flax from two out of 134 samples. 16 seeds have been documented from a sample that contains a high percentage of cereals, pulses, and wild plant remains in ditch H1-2 (6N, unit 144, fill D). The other three seeds have been documented in ditch H2 (7U, unit 262, fill D). This sample also contains a wide variety of economic and wild plants. These seeds probably came from the other wild plants in the field. There is no continuity in different contexts.

There are no recovered flax remains in the archaeobotanical assemblages of Bahçelievler and Hoca Çeşme.

5.5. Gathered Plants - Deciduous Forests/Shrubs

We know from the different studies that gathered plants and wood and branches of some of them were used as fuel or as architectural elements except their fruits/nuts such as oak, hazelnut, pistacia, etc. in the Epipaleolithic/Neolithic occupations (e.g. Rosenberg 2008; Valamoti 2015;

Antolin and Jacomet 2015; Alcolea et al. 2017; Kotzamani and Livarda 2018; Marinova and Ntinou 2018).

5.5.1. Acorn (Quercus sp.)

Oaks (*Quercus* sp.) (Fagaceae family) are essential elements in the humid vegetation, especially in the Mediterranean woodlands, and they have been used for fuel, architectural material, or food since the Late Pleistocene. It belongs to the Fagaceae family, and it has over 400 species. Wood and acorns of oak were used by Epipaleolithic/Mesolithic hunter-gatherers in Asia, Europe, and in the Mediterranean Basin (Mason 2000; Rosenberg 2008; Antolin and Jacomet 2015; Barlow and Heck 2016; An, Tang and An 2022; Wang and Jiang 2022).[31] While the oak tree is used as fuel or an architectural element, or used in things, the acorns (hard-shell fruits (pericarp) and inside the seed (two cotyledons) are very similar to the cereals, being high in carbohydrates and other nutrients, making them an energy source as a food in the past economies (Mason 2000; Rosenberg 2008).

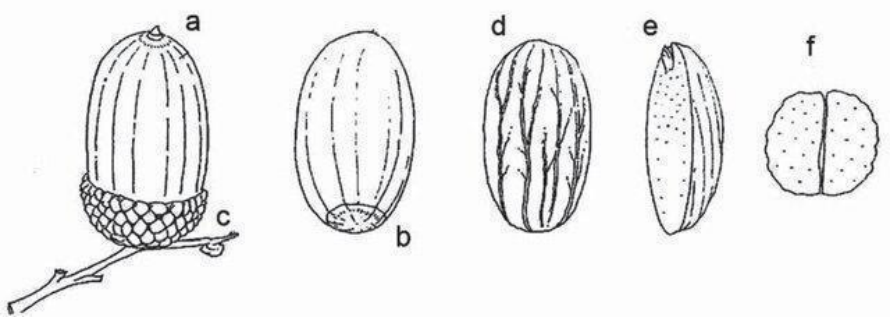


Figure 5.44: The morphology of acorn: a) apex; b) pale area at the base of the fruit; c) cupule; d) seed (two cotyledons); e) half of the seed (one cotyledon) showing the embryo; f) transversal section shows two cotyledons (Primavera and Fiorentino 2013, Fig.2).

Acorns can be stored for a long time in a year, especially in winter, as a food resource, and the seeds can be ground as flour, but there could be some processing stages before consuming the seeds/flour because of the tannic acid (see for more detail Rosenberg 2008, 171-172). The season when acorns ripen is in the fall, and we can collect the acorns that have fallen from the ground or shake the tree to make them fall. In the archaeobotanical assemblages, we can find mostly the seed part (cotyledon) (Figure 5.44, d-e); in addition to that, the pale area of the fruit (pericarp) (Figure 5.44b) can also be found in archaeological sites (Figure 5.44).

[31] Oaks have a wide species range around the world and can grow up to 4000 meter and we can see the different species in Middle East and Southwest Asia, in Europe, in Mexico and North America today (Rosenberg 2008).

Acorn remains are not common in this assemblage, but still, oak shows presence with small pieces of acorns. Two seeds of oak have been documented from a pyrotechnic feature in structure 18 (BH38227, L12, loc. 409, 8 liters) at Barcın Höyük. This sample also contains four emmer grains, four lentils, and one hazelnut fruit, which is mentioned in its section. Besides, the sample contains a high percentage of wood charcoal. The remains are fragmented instead of whole seed, and it is not known that the kernels were completely ripe. The seeds might have come with the oak branches for fuel, and there are charcoal remains, some of which look like oak wood in the sample.

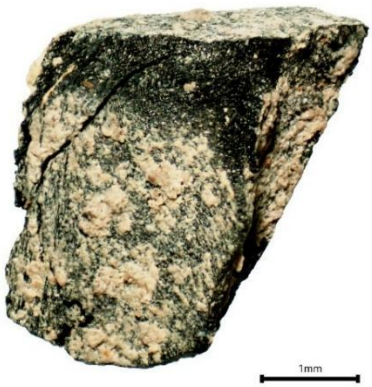


Figure 5.45: Acorn (a piece of cotyledon, B3-68.3) in Phase 6 at Bahçelievler (photo: H. Balcı).

In Bahçelievler, small fragments of acorn seeds are documented in Phase 6 (0.3 pieces) (Figure 5.45) and Phase 3 (0.4 pieces) from courtyard areas. However, I would like to refrain from definitively identifying with such a small number of pieces.

There is no documented acorn remains in Hoca Çeşme and Aşağı Pınar assemblages.

5.5.2. Bramble (Rubus fruitcosus)

Bramble (*Rubus fruticosus* agg.) is a diverse genus (over 800) that belongs to flowering plants in the Rosaceae family (Huang et al. 2023). Bramble has culinary fruits containing a fruitlet, a small drupe covered with a juicy mesocarp (Figure 5.46) (Cappers and Bekker 2021, 343).

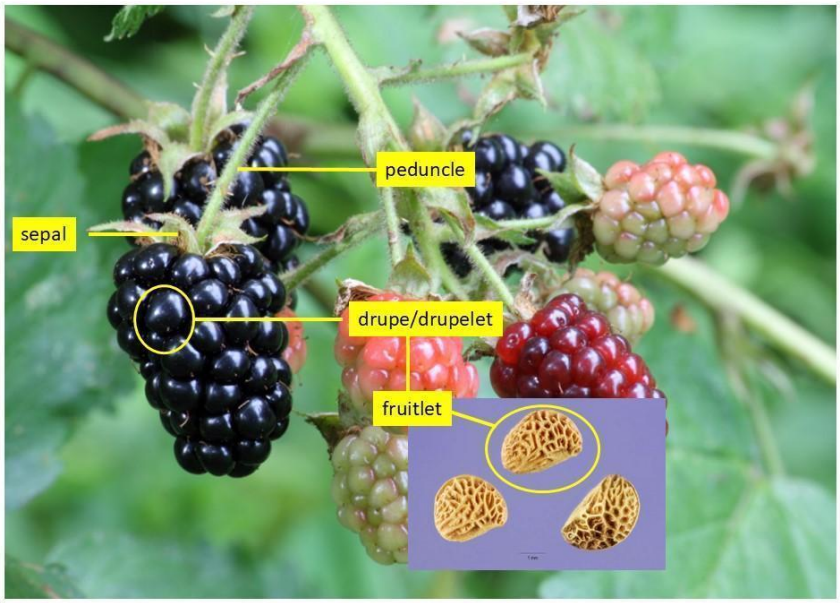


Figure 5.46: General morphology of bramble (edited by H. Balcı from online sources).[32]

Most of the species of *Rubus* are polyploid (more than two chromosomes), but some species have a change in ploidy from diploid (2n=2x=14 chromosomes) to tetraploid.[33] The plants grow as shrubs, and their stems are mostly covered with prickles. Bramble species mostly like humid environments, and the harvest season of *Rubus* species changes according to the region in the world. Still, in Türkiye, summer and fall are the harvest times of bramble. The vegetation area is vast, but the Black Sea and Northwest regions in Türkiye are the homeland of *Rubus* sp. in nature.[34]

In the archaeobotanical assemblages, we find bramble fruitlets that were fossilized. Nonetheless, bramble fruitlets are not common in archaeological records because when

[32] https://www.wikiwand.com/en/articles/Blackberry
https://keyserver.lucidcentral.org/weeds/data/media/Html/rubus_fruticosus_sp__agg.htm

[33] https://en.wikipedia.org/wiki/Rubus

[34] As a personal observation: although brambles are widespread in many areas, in areas that do not receive much sunlight and have high humidity, their fruits often start to rot or become wormy before they ripen. Brambles that mostly grow in these areas are not suitable for consumption. In these areas, the bramble bush grows and spreads more strongly rather than its fruits. Bramble bushes, whose fruits are mostly delicious and healthy, are found in relatively open areas, sunny and airy places. Today, we can often come across them on the roadsides in rural areas. In places where there is excessive light and a relatively continental climate, bramble grows, but their fruits are very small, drier, and often sour in taste.

consumed by humans or animals, the fruitlet is also eaten with multiple fruits unless there is a unique preservation situation. Since brambles are generally consumed fresh in-season without being dried and are not stored for months, they are mostly eaten within the settlement or in the surrounding environment and passed out of the body with feces. Sometimes, we can find only a few fruitlets in an assemblage, which includes more than 500 hundred samples if we are lucky. And even the few fruitlets covered with juicy mesocarp found do not make up a single bramble. For example, the number of fruitlet endocarps for someone who eats five brambles would be c. 300–350. Post-depositional dispersal might dilute the number concentrated in feces.

In the assemblages, we see bramble fruitlets at Barcın Höyük and Aşağı Pınar. There are no documented bramble remains at Bahçelievler and Hoca Çeşme.



Figure 5.47: Bramble fruitlets (a: BH36371) in Phase VIc at Barcın Höyük, and (b: 8K-285-A025) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

In Barcın Höyük, there is documented only half of the fruitlet of bramble from a pyrotechnic feature in VId1 (BH42430, L12, loc.483). There are no documented remains in VId2, but one fruitlet of bramble has been identified from a pyrotechnic feature in str 18 (BH38221, L12, loc.409) in phase VId3. In phase VIc, one fruitlet was also documented from a surface (BH36371, L11N, loc.535) (Figure 5.47a).

In Aşağı Pınar, eight fruitlets of bramble have been documented from 7 out of 134 samples at Phase 7 (Figure 5.47b). The fruitlets have been seen in ditch H1, H2, and pit as contextually. This means the presence of bramble is not a coincidence in the site.

5.5.3. Cornelian cherry (Cornus mas)

Cornelian cherry (*Cornus mas* L.) belongs to the dogwood (Cornaceae) family, and it grows primarily in southwest Asia and South-East Europe (Marinova et al. 2013; Tolar et al. 2021). The plant of cornelian cherry is a shrub or small tree with yellow leaves and reddish oval fruits. *Cornus* species were common in gathered plants in the Neolithic, even in European Mesolithic sites. Cornelian berry fruits are not consumed directly as food. Still, according to ethnographic data, they are mostly consumed either mixed with other wild fruits, as jam/marmalade or syrup/juice or as a bitter drink (Tolar et al. 2021, 347). Cornelian cherry has antioxidant properties (Ersoy, Bağcı and Gök, 2011), as does bramble.

In the botanical assemblages, only two fruits/endocarps (fruit stones) of *Cornus mas* have been documented in a pit sample (7U, 238, pit H2-t) at Aşağı Pınar.

5.5.4. Fig (Ficus carica)

Cultivated fig (*Ficus carica* L.) belongs to the Moraceae family, and it is one of the first essential species that represents the beginning of horticulture in the Mediterranean region and southwest Asia since the Neolithic period (Zohary and Spiegel-Roy 1975; Zohary et al. 2012, 126).

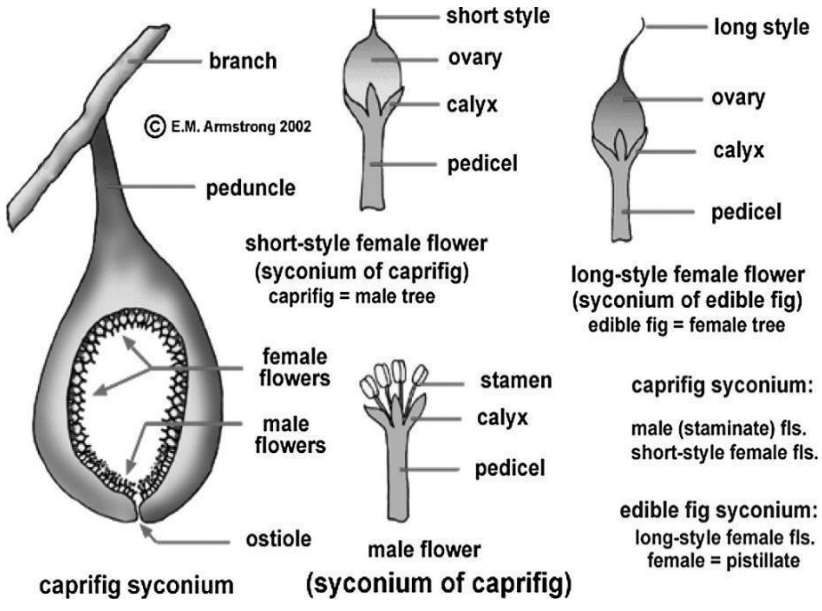


Figure 5.48: Floral morphology of fig (Stover et al. 2007, 1084; from Armstrong, 2006).

The genus *Ficus* sp. includes many species, and we find nearly wild figs in the Neolithic assemblages. It is possible to talk about the horticulture tradition in the Bronze Age and later periods in which cultivated figs appeared, especially with olive and grapevine in the Levant, southern Anatolia, and the Aegean (Zohary et al. 2012, 130).

Fig is a perennial, diploid (2n=2x=26), and cross-pollinated tree. There is a need for female and male trees to be pollinated. The fleshy, sweet, large fruit is called 'syconia,' unique to the genus *Ficu*s, and people eat this part. It is possible to find this part as dried or charred in the archaeobotanical assemblages, but we mostly see the actual fruits, which are small druplets or what we call 'seeds';[35] These parts develop in a female flower inside the syconium (see Figure 5.48) (Stover et al. 2007, 1083; Zohary et al. 2012, 128).



Figure 5.49: Mineralized fig fruits (a: BH10372, b: BH8039) in phase VIa and M/L Bronze Age at Barcın Höyük, (photo: H. Balcı).

[35] Like bramble fruitlets, discovering fig fruits in the archaeological record is more of a matter of chance than some type of plant remains (such as grains). The reason for this is that the fleshy fruit of the fig is consumed fresh or dried, not the true fruit, and when consumed, it mixes with the feces of the living being, such as a human or animal that eats it and is removed from the environment where it was found. If the fig is not stored somewhere in domestic areas- and even if it is stored, there must be suitable conditions for it to be preserved by carbonization - it is very unlikely to find many seeds together in a dense mass. There are hundreds of seeds in just one fig. From a botanical perspective, fig seeds are defined as fruits, and when interpreted within this botanical assemblage, the definition of 'fruit' refers to fig seeds.



Figure 5.50: Fig fruit (BH7083) in phase VIb at Barcın Höyük, (photo: H. Balcı).

There are only documented four fruits of fig in total (Figure 5.50) at Barcın Höyük. Three are in phase VIb, and one fruit is from the Middle/Late Bronze Age as mineralized (Figure 5.49).

There are no documented fig remains at Bahçelievler, Aşağı Pınar, or Hoca Çeşme.

5.5.5. Grape (Vitis sp.)

Grape/grapevine is one of the most known gathered fruits in prehistoric sites and also a common fruit that represents the beginning of horticulture, especially with fig, olive, pomegranate, etc., in the Bronze Age in the Old World (Zohary et al. 2012, 121).

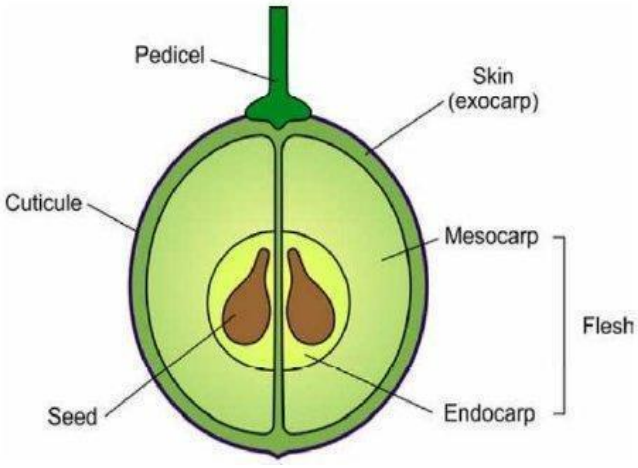


Figure 5.51: Morphology of grapes (de Noronha 2010, fig.1).

The genus *Vitis* sp. has more than 60 species; all species are diploid and self-pollinated (Figure 5.51). *Vitis* sp. belongs to the Vitaceae family, and *Vitis vinifera* L. is accepted as a domesticated species.

In Bahçelievler, two grape seeds are documented from 2 out of 26 samples in Phase 5. Both of the grape remains come from a courtyard surface (Figure 5.52).



Figure 5.52: Grape seed (B3-13.7, magnification:10x) in Phase 5 at Bahçelievler (photo: H. Balcı).

In Aşağı Pınar, only two seeds of the grape show possible presence from two samples (6N, 144, H1-2, D; 7U, 287, H2, E). Both samples contain a wide variety of economic and wild plant remains.

5.5.6. Hazelnut (Corylus avellana)

European hazelnut (*Corylus avellana* L.) comes from the genus *Corylus* L. in the Betulaceae family. The hazelnut trees grow as small trees or shrubs and are generally located in deciduous oak–beech forests in the north of Türkiye, Europe, Caucasia, and some parts of Iran (Zohary et al. 2012, 151). The hazel nuts are around 10-25 mm in size, the fruit is covered with an involucre, round seeds are tasty, and you can collect easily from the field surface or tree branches. Hazel seeds are tasty and do not contain any toxic substances compared to pistacia or almond nuts. Hazelnut has many different usage areas. Its relatively young branches can be used for making baskets, its wood and branches can be used as architectural elements or fuel, its seeds can be used as food/oil, and its fruit parts (shells) can be used as fuel. For this reason,

hazelnuts have been widely grown and used in places where vegetation allows them to grow from the Neolithic to the present day.

In archaeobotanical materials, the preserved part is mostly fruits (nut shells) because the seeds are probably disappearing or are consumed. Hazelnut (*Corylus avellana*) is represented chiefly at Barcın Höyük in the research material. The recovered hazelnut remains are fruits (shells) (Figure 5.53).



Figure 5.53: Hazelnut shells from frontal and dorsal sides (fruit fragments, BH41698) in phase VId1 at Barcın Höyük (photo: H. Balcı).



Figure 5.54: Hazelnut shells from frontal, dorsal and side views (fruit fragments, BH17700) in phase VIe at Barcın Höyük (photo: H. Balcı).

In Barcın Höyük, we do not see hazelnuts regularly and densely in every phase, like cereals or pulses. Of course, there may be many reasons, such as ecological factors, usage differences and locations in the site, and rodent effects. In Phase VIe, only 2.2 hazelnut fruits from two out of 176 samples were documented (Figure 5.54). In phase VId1, hazelnut remains are more spread out, albeit in smaller pieces. 15 fruits of hazelnut have been documented from 19 out of 194 samples. One hazelnut fruit has been documented out of 39 samples in Phase VId2.

In phase VId3, hazelnut remains were particularly concentrated in the red surface (locus 378) in str 10 (Trench M11). Since the samples from which these hazelnut remains came were noticed with the naked eye while working on the floor of the place and collected with a trowel in the form of small amounts of soil, they were not floated and do not have a high liter. 133 hazelnut fruits have been documented in this phase. 115 fruits are from the red surface in str 10, and 10 are from a wall sample in the same area (BH33869, M11, loc.367). In Phase VIc, only 0.2 pieces of hazelnut fruit have been documented in one sample. In phase VIb, one hazelnut fruit was found in a surface sample in L11 (loc.343). There are no recovered hazelnut remains in later phases at Barcın Höyük.

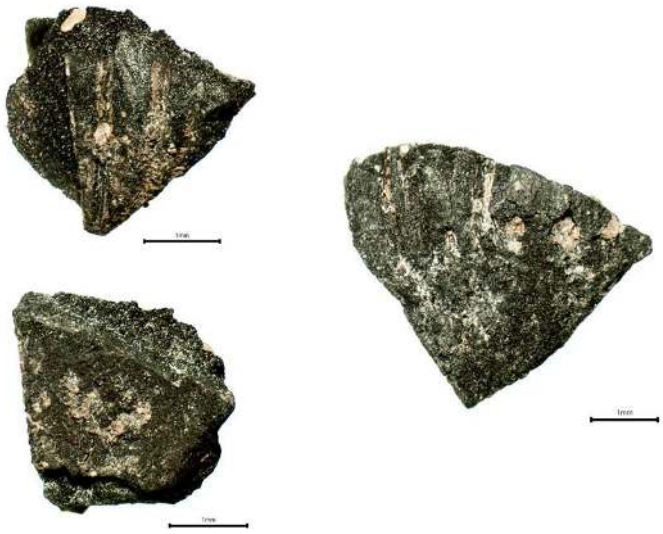


Figure 5.55: Hazelnut shells from frontal, dorsal and side views (fruit fragments, left: B2-29.11) in Phase 7 and (right: B3-16.2) Phase 5 at Bahçelievler (photo: H. Balcı).

In Bahçelievler, there are small pieces thought to be hazelnut fruits (shells). However, no whole or nearly whole hazelnut remains have been identified. There is no remain in Phase 8. In Phase 7, only 0.3 pieces of hazelnut fruits from a hearth area are documented (B2, 29/11, 4 liters). In Phase 6, there are 0.5 and 0.3 pieces of hazelnut shell from two out of 42 samples. In Phase 5, 0.7 pieces of hazelnut shells are documented from two samples in a structure (trench B3) (Figure 5.55).

There is no documented hazelnut remains in the Aşağı Pınar assemblage.

5.5.7. Hackberry (Celtis sp.)

Hackberry (*Celtis* sp.) belongs to the hemp (Cannabaceae) family, and it shows a broad and cosmopolitan distribution, especially in the Mediterranean basin. It is a deciduous tree, and the size of the tree can reach around 10-25 meters. It has small, dryish, sweet drupes. The genus *Celtis* has been known since the Lower Pleistocene sites in Europe (Martínez-Varea et al. 2023, 10-14).

In general, hackberry is more represented in Upper Paleolithic, Epi-paleolithic, and Neolithic sites in South (e.g., Öküzini, Karain B), Central (e.g., Pınarbaşı, Aşıklı Höyük, Çatalhöyük), and Southeastern Anatolia (e.g. Körtük Tepe, Nevali Çori, Çayönü, Boncuklu Tarla) (Fairbairn et al. 2002; Martinoli 2004; Kabukçu 2017; Ergun 2018; Rössner et al. 2018; Balcı and Kodaş 2024). The economic plant range according to the regions in Anatolia is already mentioned in Chapter 3.

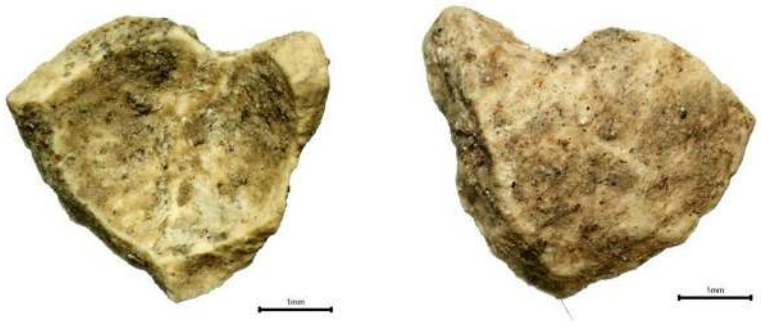


Figure 5.56: Hackberry shells from frontal and dorsal views (C3-33.1) in Phase 6b at Bahçelievler (photo: H. Balcı).

For this region, especially for Late Neolithic sites in Northwest Anatolia, hackberry is not a familiar species. In Bahçelievler, only a tiny piece of fruit (endocarp) which is potentially hackberry shell is documented in Phase 6 (C3, 33/1, 8,6) (Figure 5.56).

There is another Epipaleolithic-Neolithic site, Gedikkaya Cave in İnhisar, Bilecik, where a high number of hackberry assemblage (+1000 endocarps/shells) with a high number of bird bones under a human skull piece in a room corner in the Neolithic levels (around 6590 cal. BC) that I identified the hackberry remains by Sarı's request from a floated archaeobotanical sample (Sarı 2024, 21).

Martínez-Varea et al. (2023) published a detailed research paper about the genus Celtis, including Europe, Anatolia, and some parts of the Levant from Upper Pleistocene to Bronze Age sites. There is no evidence in Northwest Anatolia, which is located between Central Anatolia, Lake District, and Balkans, in the map and comparative table (2023, 12-13). There must be no documented hackberry species in the northwestern part of Anatolia and Eastern Thrace from the Neolithic sites, and this small piece is new evidence dated to around 6600 BC at Bahçelievler and thousands of hackberries at Gedikkaya (around 6500-6600 BC).

There are no documented hackberry remains at Barcın Höyük, Aşağı Pınar, or Hoca Çeşme.

5.5.8. Plum/Almond (Prunus L./Amygdalus L.)

The species of the genus *Prunus* L., which include almonds, plums, cherries, apricots, etc., belong to the rose (Rosaceae) family and are mainly native to the Balkans and Türkiye (Zohary et al. 2012, 141). The chromosome forms change according to the diploid, tetraploid, or hexaploid species. The domesticated species appear as horticulture evidence after the Bronze Age period, especially in the Roman period in Türkiye, Balkans, and Europe (Zohary et al. 2012, 141). Some fruit stone (endocarp) fragments, which are called 'fruit' botanically in the identification, cannot be identifiable if there are no more significant reference pieces in archaeobotanical assemblages that we sometimes consider as wild plum/almond (*Prunus* L./*Amygdalus* L.).

In Aşağı Pınar, only two fruits of *Prunus* sp. have been documented from two different pits (8K, unit 307, H2-a, fill 4; 7N, unit 205, H1-2a, fill 4). These shell remains are fragmented, and the identification is not completely clear. There are also around 4.5 fruit/endocarp remains

for which the genus is not precise as identified as 'Nutshell indeed.' in the assemblage; for this reason, the identification may change according to further studies in the botanical assemblage.

There are no documented remains at Barcın Höyük, Bahçelievler, or Hoca Çeşme.

5.5.9. Pistacia/Terebinth (Pistacia sp./Pistacia terebinthus)

Pistacia/terebinth (*Pistacia* sp./*Pistacia terebinthus*) belongs to the cashew (Anacardiaceae) family and is native to Southwest Asia. Pistacia is a deciduous shrub genus, and the plant consists of a small tree or large shrub according to the vegetational regions. Different species of Pistacia originated in Southwest Asia, and it is difficult to identify the exact species of Pistacia in the archaeobotanical assemblages.



Figure 5.57: Terebinth/pistacia fruits (left: B3-51.1-2021, right: B3-13.7-2020) in Phase 5 at Bahçelievler (photo: H. Balcı).

There are various products from different parts of the tree/bush of Pistacia species, such as resin, oil, food as a snack or supportive ingredient, fuel, and fodder traditionally (Rousou et al. 2021, 624). In the botanical assemblages, we find fruits or wood charcoal of *pistacia*. Finding evidence of resin or oil from residue analyses on archaeological materials is also possible.

Pistacia is perhaps one of the first species to come to the fore in the Bahçelievler Neolithic site. Excluding the first two phases of Bahçelievler, pistacia is most prevalent in phases 6, 5, and 4, where most plant remains were obtained.

In Phase 6, five fruits of terebinth have been documented in one out of 42 samples from a burial around 10 cm on top of skeletons 3 and 5. In Phase 5, 109 fruits of terebinth have been documented in 5 out of 26 samples from the courtyard areas (Figure 5.57). One hundred and

three out of 109 fruits of pistacia are recovered in one sample from the courtyard and carries storage value (B3, 13/7, 4.75 liters). In Phase 4, 1,5 fruits of pistacia have been recovered in three out of 14 samples from the courtyard areas in trenches B3 and B4. The type of *Pistacia* at Bahçelievler might belong to the species *Pistacia terebinthus/atlantica* depending on Rousou et al.'s (2021, 630) morphological study on six *Pistacia* species (Figure 5.58).

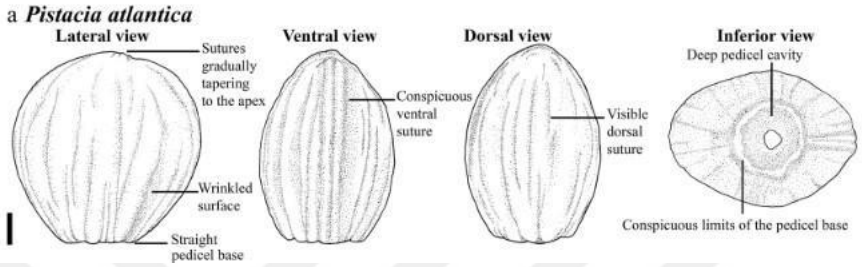


Figure 5.58: General morphology of Pistacia atlantica (scale: 1mm) from different views (Rousou et al.'s 2021, Fig.4, 630).

There is no documented pistacia at Barcın Höyük, Aşağı Pınar and Hoca Çeşme.

5.6. Wild Plants

5.6.1. Adoxaceae

Sambucus sp.

One seed/fruit of elder (*Sambucus* sp.) has been identified in the ditch H1-1 (fill D, 6L, unit 74) in Phase 7 at Aşağı Pınar (Figure 5.59). This sample also contains a few weeds, a lentil seed, hulled wheat rachis nodes, and fragmented grains.



Figure 5.59: Elder (*Sambucus* sp.) seed/fruit in Phase 7 at Aşağı Pınar (photo: H. Balcı).

5.6.2. Amaranthaceae

The Amaranth (Amaranthaceae) family is a widespread weed family worldwide and contains more than 160 genera and 2000 species. The parent order of the amaranth family is Caryophyllales. According to the species, the plant appears as an annual or perennial weed, shrub, vine, or tree, and sometimes as a succulent.

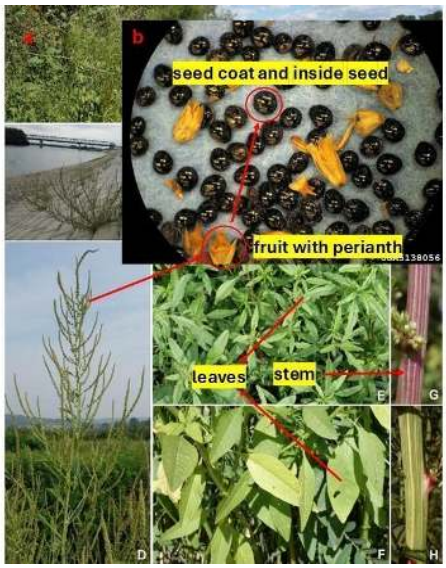


Figure 5.60: An example of the general morphology of the Amaranthaceae family.[36]

The representative genus of the family is *Amaranthus* L. The fruits are utricle with a persistent perianth, such as a capsule, and the seeds have a thick or woody seed coat (Xu and Deng 2017, 245).

In the archaeobotanical assemblages, we mostly find seeds with seed coats (Figure 5.60). *Amaranthus* L. species are maybe the most common species that probably move to the site by insects or wind, and they appear as modern weeds in the samples with the archaeobotanical remains.

The goosefoot (Chenopodiaceae) family is familiar with the Amaranthaceae family, and the Amaranthus and Chenopodium genera seeds can be similar in the charred botanical remains if you do not look carefully.

[36] This figure is edited from Rimac et al. 2020, figure 2 (image a), and https://gobotany.nativeplanttrust.org/species/amaranthus/retroflexus/ (image b).

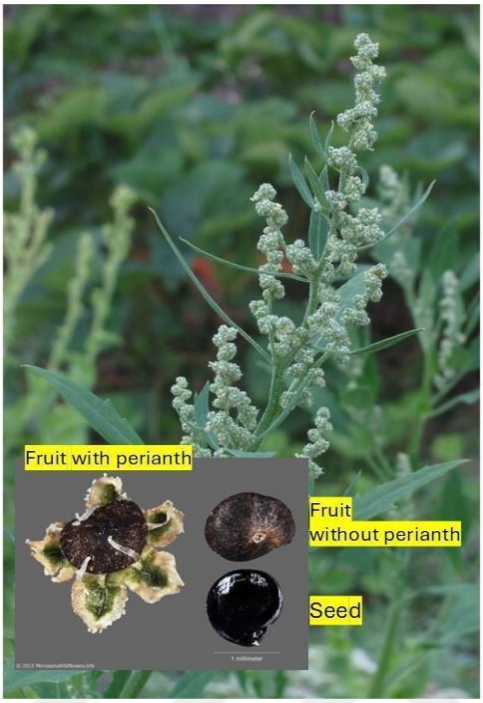


Figure 5.61: A general morphology of *Chenopodium album* (edited by H. Balcı from online sources).[37]

Goosefoot (Chenopodioideae) is one of the most common widespread plant families in the world, and it is a subfamily of the Amaranthaceae family. It is also an abundant family with its species, especially *Chenopodium* sp., in the archaeobotanical assemblages (Figure 6.61). Recently, it has also had widespread distribution around the world. This family is related to the Amaranthaceae family in order. The plants grow usually as annual or perennial, primarily halophytic plants, rarely shrubs or small trees. The flowers are bisexual or unisexual (Kühn et al. 1993, 253). The seeds are covered with fruit, and the fruit is covered with a perianth (Cappers and Bekker 2013, 20).

26 fruits/seeds are identified to the goosefoot family in 14 out of 134 samples in Phase 7 at Aşağı Pınar. The seeds are counted between 1-5 in the samples and are mostly presented with some other weeds and crop remains.

One fruit from a courtyard sample (B3, 13/7) containing some other economic plants and a few weed species has been recorded for the Chenopodiaceae family in Phase 5 at Bahçelievler.

[37] https://en.wikipedia.org/wiki/Chenopodium_album; https://www.minnesotawildflowers.info/flower/lambs-quarters

Amaranthus sp.

Six seeds of amaranth (*Amaranthus* sp.) have been documented in 2 out of 176 samples in phase VIe at Barcın Höyük. Five of six seeds come from a pyrotechnic feature (L10, loc. 418, BH45767). In VId1, 42 seeds in 5 out of 194 samples have been recorded. Ten seeds come from the platform bench (M10, loc. 427, 411) and 28 from a basin bin (L11, loc.579, BH39281). In later levels of Barcın Höyük, *Amaranthus* shows evidence between 1 to 5 seeds.

At Aşağı Pınar, 13 seeds of *Amaranth/Chenopodium* have been recorded in 6 out of 134 samples in Phase 7. The remains are documented from ditches H1-2 and H2 and related pits with ditch H2 at the site. The samples mostly contain a mixture of weeds, cereal remains, and cereal by-products.

Only one seed of Amaranth was identified in the courtyard surface (B3, 9/6) in Phase 4b at Bahçelievler.

Atriplex sp.

14 fruits of saltbush/orache (*Atriplex* sp.) have been documented in Bahçelievler which are probably recent. One fruit from a skeleton area (B3, 34/1) in Phase 6, two fruits from the courtyard (B3, 21/1), two fruits from inside the building (B3, 24/2) in Phase 5, one fruit from inside of str 2 (B3, 6/1) in Phase 4a, four fruits from another structure (B3, 4/4) in Phase 3, and four fruits from unknown phases were found at Bahçelievler.

Chenopodium cf. album

95 fruits/seeds of the Goosefoot plant have been documented in 19 out of 176 samples in VIe at Barcın Höyük. The seeds were found generally in this phase's pyrotechnic features or surfaces. 121 fruits have been recorded in 10 out of 194 samples in VId1. In this phase, we also see the fruits in basin bin contexts. Goosefoot remains in samples are not alone but with other small-sized weeds and cereals-pulses remains.

In VId2, the plant gets lower in quantity but still shows presence with nine fruits from different contexts such as surface, layer, and pyrotechnic features in 5 out of 39 samples. In VId3, 18 fruits have been documented in 4 out of 44 samples. 13 of the fruits come with pulses and cereal remains from a pyrotechnic feature in str 18 (BH38221, L12, loc. 209), and the other small amount of the fruits come from a burial, surface and another pyrotechnic feature.



Figure 5.62: A group of Chenopodium fruits/seeds (left: BH6612) in phase VIb and (right: BH11893) in phase VIc at Barcın Höyük (photo: H. Balcı).

396 fruits/seeds have been documented in 10 out of 63 samples in VIc (Figure 5.62). In two samples collected from the same surface (M10, loc.208), 379 goosefoot fruits were recorded. The striking part is that only goosefoot fruits were obtained from these two samples -but in the same context. The fact that one seed of cf. *Solanum* and one seed of *Amaranthus* sp. – which looks modern- were found in the samples, suggesting that an insect may have been carried. On the other hand, the fact that the plant came from other primary contexts, albeit in small numbers, mixed with economic plants proves its archaeological existence at this stage.

Twenty-four fruits/seeds have been documented from different contexts in 11 out of 108 samples in VIb. There is no documented goosefoot in VIa and Middle Chalcolithic layers, but the samples are also low. One fruit from a surface (BH5709, L12, loc. 82) in Late Chalcolithic and two fruits from a pit in (BH6557, BH6564, L12, loc. 107) in EBA II have also been documented. Most cereal by-products (especially rachis nodes) and some wild plant remains were recorded in this pit.

Forty-nine fruits/seeds of goosefoot have been recorded at Bahçelievler (Figure 5.63). Goosefoot remains are the most frequent wild plant species, and goosefoot fruits are seen in

almost all of the phases on the site. Eight fruits from the inside of the structure in Phase 8, 23 fruits from the inside of the structure (B2, 9/2; B2, 29/4), a pyrotechnic feature (B2, 29/11), and a burnt area from the structure (B2, 31/1) in Phase 7.



Figure 5.63: A group of *Chenopodium* fruits/seeds (left: B4-13.1) in Phase 4b and (right: B2-29.4) in Phase 7 at Bahçelievler (photo: H. Balcı).

Six fruits in Phase 5, five of them are from courtyard near to the pot finding (B3, 17/3), and one fruit from inside of the structure (B3, 24/13) were recorded. Seven fruits from outside the structure (B4, 13/1) in Phase 4b and four from the courtyard (B4, 5/3) in Phase 3 have been documented at Bahçelievler. It was observed that the seedcoats look partly preserved on some seeds (Figure 5.63, right side) and this situation questions whether the remains are old at Barcın (Figure 5.62) and Aşağı Pınar (Figure 5.64). After breaking one or two seeds for testing, I noticed that the inside was looking charred. However, the species of *Chenopodium* tend to easily mix into the contexts with the help of insects. On the other hand, the *Chenopodium* remains have been documented in several primary contexts which I mentioned above.

Only three fruits of Goosefoot have been documented from the pits in 3 out of 14 samples at Hoca Çeşme.

Eighty-one fruits of goosefoot have been documented in 21 out of 134 samples in Phase 7 at Aşağı Pınar (Figure 5.64). Except for 81 fruits, 70 fruits that are identified as modern were documented in a pit sample (H1-1a, fill 4, 6L, unit 83) in Phase 7. Goosefoot fruits are mostly presented with several weed species and crops remains in the samples.



Figure 5.64: A group of *Chenopodium* fruits/seeds (AP17, 6M, 134.39) in Layer 7 at Aşağı Pınar (photo: H. Balcı).

In Phase 6 (only three samples), 212 fruits of goosefoot have been documented with a group of fragmented cereals and awn pieces from a pit sample in structure 6.6 (8K, unit 205).

Chenopodium cf. polyspermum / Lipandra polysperma

This species has been identified only at Barcın Höyük with eight fruits from layers or surfaces in 7 out of 108 samples in VIb (Figure 5.65), two fruits from a pit in EBA II, and one from a pit dated to the Bronze Age.



Figure 5.65: *Chenopodium polyspermum* fruit/seed (frontal-dorsal, BH12397) in phase VIb at Barcın Höyük (photo: H. Balcı).

5.6.3. Asteraceae

The typical characteristics of the aster/sunflower (Asteraceae) family are compound flower heads (capitula). These flower heads carry hundreds of tiny/small florets (ray and tabular), which are covered with bracts, and the seeds grow from the ovary in the floret (Figure 5.66).

The family has more than 20,000 species, and the representative genus is *Aster* L. (it has more than 500 species), this family is more identifiable than some other plant families thanks to their compound flowers. The name 'aster' comes from the meaning 'star' in Greek because of the flower head of the plant. The most known types are daisy, sunflower, dandelion, lettuce, artichoke, and chicory in the aster family (Rolnik and Olas 2021, 2).

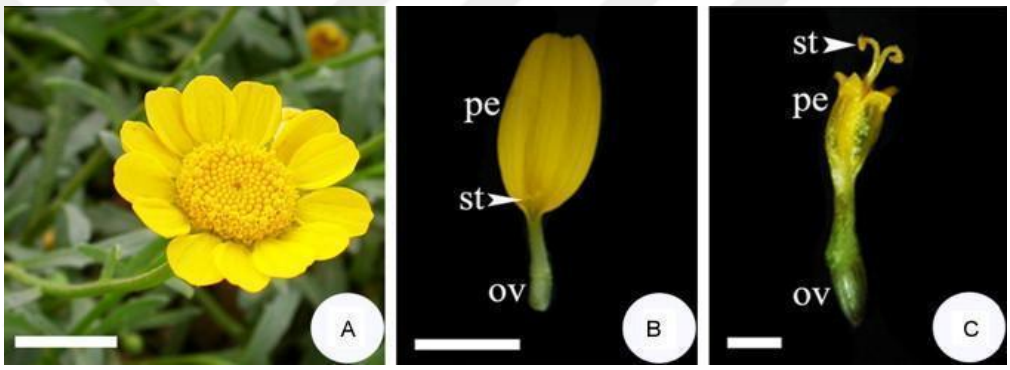


Figure 5.66: An example of the general morphology of the Asteraceae flower (a: a flower, b: a ray floret, c: a tubular floret, ov: ovary, pe: petal, st: stigma) (image: Deng et al. 2010, Fig. 1).

The species of this family are mostly herbaceous or biennial and can also be annual, perennial, shrub, vine, or trees, depending on ecological habitats throughout the world. Plants belonging to the aster family have many uses, both traditional and modern, such as tea, medicine, oil, food, and fodder (Achika et al. 2014; Konovalov 2014; Garcia-Oliveira et al. 2021; Rolnik and Olas 2021). In archaeobotanical records, the floret or fruit/seed parts of the plant can be found, and since there are many varieties of wild species, it is always difficult to identify by species.



Figure 5.67: Type of fruit/seed (B2-29) in Asteraceae family in Phase 7 at Bahçelievler (photo: H. Balcı).

In the archaeobotanical assemblage, 30 unidentified seeds/fruits recorded as Type 1 that are familiar to the Asteraceae family from a surface (BH40168, M10, loc.391) in VId1 at Barcın Höyük.

Two seeds/fruits were also identified to the Asteraceae family from two different courtyard surfaces (B2-29) in Phase 7 and (B3, 13/7) in Phase 5 at Bahçelievler (Figure 5.67). This sample also contains a high number of fragmented cereals (60), pistacia fruits (71), lentils (2), grape seed (1), goosefoot (1), and buckweed family (1).

5.6.4. Apiaceae

The parsley (Apiaceae) family is known as celery or carrot. The family's representative genus is *Apium* L., and most species are annual or biennial plants. This family is also known as the Umbelliferae family, and it is known as one of the most prominent angiosperm plant families throughout the world. The family includes over 300 genera and 2500 species (Kalsoom et al., 2021). Some of the species have toxic or poisonous characteristics. Apiaceae flowers include fruitlets (typically a schizocarp) covered with mericarps (fruitlet, one-seeded carpels). There is only one seed in each fruitlet (mericarp) (Figure 5.68). The fruitlets (mericarps) in the samples are primarily modern or subfossil.



Figure 5.68: A general structure of Apiaceae fruitlets (edited by H.Balcı from internet sources).[38]

Apiaceae remains are not common in the assemblages as archaeological. We may find them, but they are primarily from modern vegetation. Only one fruitlet has been identified to the Apiaceae family from a surface (L13, loc.145, BH11650) in phase VIb at Barcın Höyük as modern.

Aethusa cynapium

Poison parsley (*Aethusa cynapium*) is a widespread species that has toxic effects. Six fruitlets (recent?) have been recorded from a pyrotechnic feature in str 18 (BH38221, L12, loc. 409) in VId3. In this sample, some species considered recent, such as *Solanum* sp. and *Fumaria officinalis*, have also been documented. On the other hand, the sample contains many subfossil remains.

5.6.5. Boraginaceae

The borage (Boraginaceae) family is among the most common arable weeds and crops, especially cereals. The family has over 1500 species among over 100 genera (Cohen 2014). Most of the plants are inflorescence and have bisexual flowers. The pollination is mostly hymenopterans (e.g., bees), most of the species have hairy leaves, and the fruit includes fruitlets (Figure 5.69).

[38](a) https://www.plantatlas.eu/item/classification/4546; (b) https://www.gneet.com/biology/b22/474.html

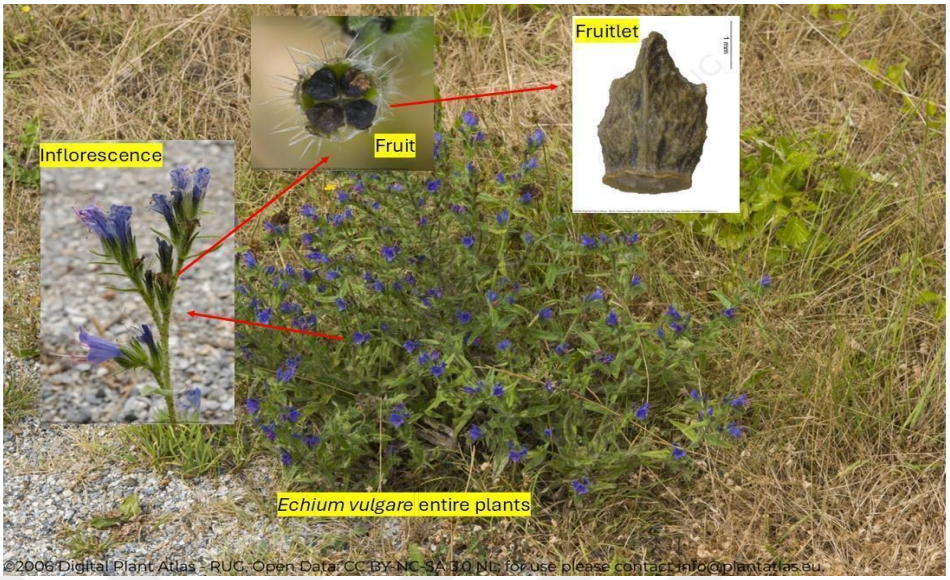


Figure 5.69: An example of the general morphology of the Boraginaceae family from Echium vulgare species (edited by H. Balcı from online source).[39]

In the archaeobotanical assemblages, we mostly find the fruitlet part of the plant as preserved. The subfossil remains are usually white or grayish/blue because of the high percentage of calcium content, which becomes mineralized when the fruitlet is burnt or carbonized instead of charcoal (Figures 5.71, 5.72, 5.73).

One fruitlet, identified in the Borage family, has been recorded in a basin bin (BH46325, L11, loc. 635) in phase VIe at Barcın Höyük. 12 fruitlets have been documented, mostly platform benches or surfaces, in five out of 194 samples in phase VId1. Two fruitlets from a surface sample (BH41643, L12, loc. 461) in phase VId2, two fruitlets from a surface sample (BH37661, L11, loc. 558) in phase VId3, five fruitlets in five samples in phase VIc, and two fruitlets from a pit sample (BH27567, L11S, loc. 453) in phase VIb have been documented.

One fruitlet has been identified inside a structure (B3, 4/4) only in Phase 3 at Bahçelievler.

At Aşağı Pınar, one fruitlet in ditch H1-4 (7S, unit 130, fill C) in Phase 7, and one fruitlet in ditch H2 (6V, unit 311, fill E) in phase seven mixed are identified in Boraginaceae family (Figure 5.70).

[39] https://www.plantatlas.eu/item/classification/560



Figure 5.70: A fruitlet of Boraginaceae family in Layer 7 at Aşağı Pınar (photo: H. Balcı).

Anchusa arvensis

Only one bugloss fruitlet (*Anchusa arvensis*) has been documented in a pit (H1-1d, 6M, unit 115, 4, analy. no. 67) in Phase 7 at Aşağı Pınar (Figure 5.71).



Figure 5.71: The fruitlet of Anchusa arvensis in Layer 7 at Aşağı Pınar (photo: H. Balcı).

Echium vulgare

Six fruitlets of blueweed/bugloss have been documented in five out of 176 samples in phase VIe at Barcın Höyük (Figure 5.72). 13 fruitlets have been recorded in five out of 194 samples in VId1. The remains come mostly from surface samples with cereal grains.



Figure 5.72: *Echium vulgare* fruitlet from side view (BH45341) in phase VIe at Barcın Höyük (photo: H. Balcı).

One fruitlet in VId2, three fruitlets from two samples in VId3, 16 fruitlets with cereal remains from 1 pit sample in VIc, and three fruitlets from a pit sample in VIb have also been documented at Barcın Höyük.



Figure 5.73: *Echium vulgare* fruitlet from frontal view (15M-2.11) in phase VIe at Hoca Çeşme (photo: H. Balcı).

Sixteen fruitlets of blueweed have been documented in a pyrotechnic feature, which contains a high amount of cereal remains at Hoca Çeşme (Figure 5.73).



Figure 5.74: *Echium vulgare* fruitlets (6L-77) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

One hundred and thirty-seven fruitlets of blueweed have been documented in 19 out of 134 samples in Phase 7 at Aşağı Pınar (Figure 5.74). Most of the remains are between 1 to 10 (mostly 1-3) except two samples (1 sample from pit H1-1d, fill 4 with 17 fruitlets; 1 sample from ditch H1-1(east), fill E with 92 fruitlets). The sample from H1-1d contains possible recent evidence, and the sample from ditch H1-1(east) also contains cereal fragments as subfossil remains. Blueweed fruitlets, including cereal remains, are presented in the samples. There is no documented blueweed in the later levels.

Heliotropium L.

The genus Heliotrope (*Heliotropium* L.) belongs to the Heliotropiaceae, which is considered a subfamily Heliotropioideae under the Boraginaceae family, and it is the type of genus of the Heliotropioideae subfamily. It is a flowering and cosmopolitan genus (over 300 species), and it contains toxic substances, especially to dogs, cats, and humans.[40]

The genus is only identified in Barcın Höyük. One fruitlet from a surface (BH11893, M10, loc. 208) in VIc. These 11 fruitlets are probably recent, from a layer (BH12385, M10, loc. 168), five fruitlets from the pyrotechnic feature (BH8472, M10, loc. 133) in total in VIb, seven fruitlets from a surface sample (BH5709, L12, loc. 82) in Late Chalcolithic have been documented at Barcın Höyük.

Lithospermum arvense L. / synonym of Buglosseides arvensis L.

[40] en.wikipedia.org/wiki/Heliotropium

There is no documented field gromwell (*Lithospermum arvense* L.) in phase VIe at Barcın Höyük. 152 fruitlets have been documented in 8 out of 194 samples in VId1 (Table 5.12, Figure 5.75). In this assemblage, 127 fruitlets were recorded in a 'layer' sample (BH41358, M10, loc. 438) that contains only these remains. May it have a previous insect action, or did the gromwell plant stay in the soil before fossilization?

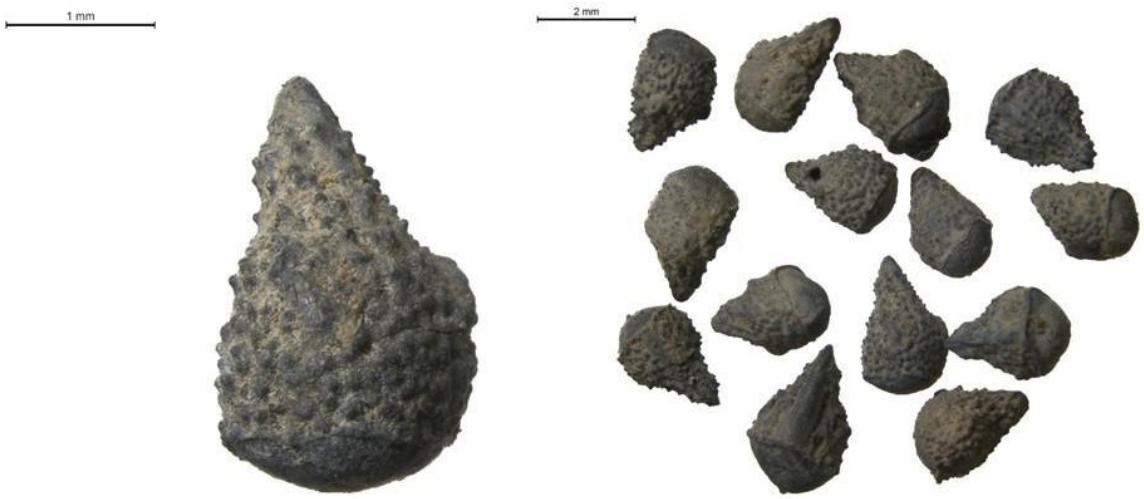


Figure 5.75: *Lithospermum* cf. *arvense* fruitlets (BH5908) in phase VIe at Barcın Höyük (photo: H. Balcı).

The other small number of fruitlets (mostly between 1 to 6) come from surfaces or pyrotechnic features (L12, loc. 459, 462, 465, 468, 483, 485, 497) in a specific location as a courtyard area.

In VId3, only two fruitlets have been documented with cereal and pulses remains from a pyrotechnic feature (BH38221, L12, str. 18, loc. 409). In VIc, 24 fruitlets have been documented in one pit sample with 16 fruitlets of blueweed and cereal remains (BH28376, M11, loc. 327). In VIb, six fruitlets have been documented from surfaces in 4 out of 108 samples. There is no documented gromwell in later levels of Barcın Höyük.

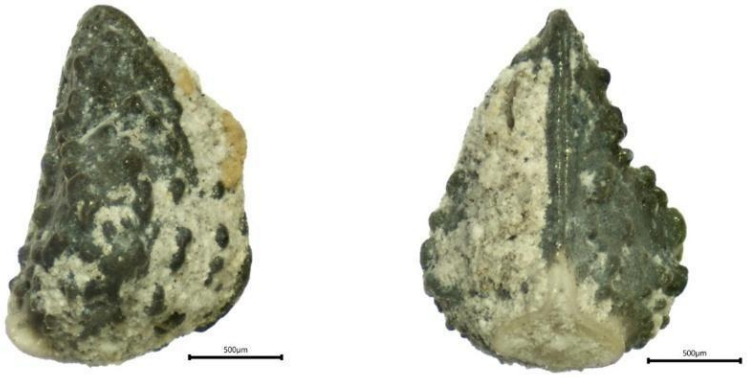


Figure 5.76: *Lithospermum* cf. *arvense* fruitlet from side and dorsal views (14N-12.8) at Hoca Çeşme (photo: H. Balcı).

Two gromwell fruits have been documented in one sample (14N, 2.8, 4/c) at Hoca Çeşme (Figure 5.76).

54 fruitlets of gromwell have been documented in 17 out of 134 samples in Phase 7 at Aşağı Pınar (Figure 5.77). Except for one sample with 12 fruitlets (H1-1e, fill 4, 6M, unit 120), most of the remains are counted between 1 to 10 fruitlets in the samples.

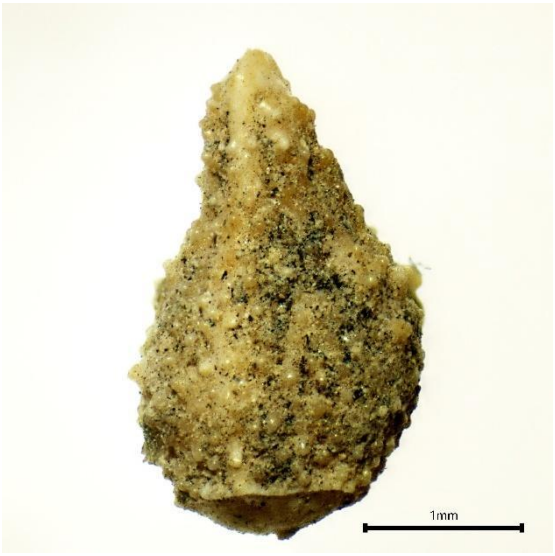


Figure 5.77: *Lithospermum* cf. *arvense* fruitlet (6M-134.39) in Layer 7 at Aşağı Pınar (photo: H. Balcı).

Gromwell remains are usually presented with blueweed remains and cereal remains in the botanical assemblage. This is a common phenomenon encountered in most of the botanical

assemblages. These arable weeds are carried to the site with the crops, especially in the cereal fields. 39 fruitlets have been documented in 5 samples, but the samples' periods are unknown.

Lithospermum tenuiflorum L.f.

Four fruitlets from 2 samples which are 3 of them from a collapse (BH2547, L11, loc. 212), the other fruitlet is from layer (BH2862, L11, 218) in VIb, and three fruitlets with cereal remains from a pit sample (BH2174, M11, loc. 3) have been documented in EBA II.

5.6.7. Brassicaceae

The Mustard (Brassicaceae) family is a large angiosperm and flowering family known as the cabbage or crucifers family. This family is one of the most known plant families in the world. Most species are annual or perennial herbaceous plants; leaves are simple, and flowers are mostly yellow, pink, or white. The seeds are in different-sized and shaped pods (flat/round fruits) depending on the genus (Figure 5.78). Yellow flowers are especially prevalent in this family. The family contains over 350 genera and 4000 species worldwide, and the crucifer vegetables belong to this family, such as cabbage, broccoli, kale, etc. *Brassica* sp., *Erysimum* sp., *Lepidium* sp., *Alyssum* sp. are some of the most widespread genera in the family.



Figure 5.78: A general diversity of fruits (pods) within the Brassicaceae family (Łangowski et al. 2016, Fig.4).

In the archaeobotanical assemblages, we mostly find the seeds as subfossils and rarely as fruit (pod) and seed. Most of the Brassicaceae seeds have been documented at Barcın Höyük in the case sites.

Twenty-four seeds of Brassicaceae in four out of 176 samples have been documented in phase VIe at Barcın Höyük. Seven seeds from a surface (BH45080, L10, loc. 389), two seeds from another surface (BH44856, L10, loc. 374), 15 seeds with some other cereal by-product and chenopods for example from a layer (BH44683, BH44683, L10, loc. 355) (Figure 5.79).

Here is the thing: the remains are mostly more minor in size than the mesh of 1mm. The remains can be a kind of mesh trash, and it is challenging to identify the species without a huge Brassicaceae family reference collection.



Figure 5.79: Brassicaceae seeds (BH45080) in phase VIe at Barcın Höyük (photo: H. Balcı).

Five seeds have also been documented in out of 194 samples in VId1. Four of the seeds come from the basin bin, collapse, and platform bench in the L10 area, as in VId1. The other seed comes from a wall context in M10. One seed from a surface in L10 (loc. 199) has been documented in VId2 at Barcın Höyük.

One seed has been documented to the Brassicaceae family from a courtyard (B3, 9/6) in Phase 4b at Bahçelievler.

Thirty-seven mineralized fruits/perianths with seeds (?) have been documented in a sample (pit, 14N, 4.20, 5/a-b) at Hoca Çeşme (Figure 5.80).



Figure 5.80: Brassicaceae fruits/perianths with seeds (16M-12.20) at Hoca Çeşme (photo: H. Balcı).

Nine seeds were identified to the Brassicaceae family in 6 out of 134 samples in Phase 7 at Aşağı Pınar. The seeds are presented with various field plants; crop remains are present in most samples. In later levels, only 10 seeds were documented in a storage pit sample (6V, unit 125, analy. no.199) and a few cereal grains in Phase 4.

5.6.6. Caprifoliaceae

The honeysuckle (Caprifoliaceae) family has flowering plants, and most are shrubs or vines. There are some ornament species, such as honeysuckle, which grows in house gardens for its smell and decoration in this family.[41]

cf. Cephalaria

Three seeds/fruits have been documented in a surface (BH46373, L10, loc. 389) in VIe. 1 seed/fruit of *Cephalaria* has been documented in a pit (BH7249, L11, loc. 263) in VIc at Barcın Höyük.

5.6.7. Caryophyllaceae

The pink/carnation (Caryophyllaceae) family consists of herbaceous annual or perennial herbs with over 80 genera and 2000 species (Bittrich 1993, 207). We know this family from *Dianthus* sp. (pinks, carnations) and *Silene* sp. (campions, firepink). The family members mostly like

[41] https://en.wikipedia.org/wiki/Caprifoliaceae

temperate climates, and the Mediterranean region includes most species.[42] The family members have bisexual terminal small, simple flowers, and the fruits (utricle) contain one seed, as in achene, or several seeds in a capsule (Bittrich 1993, 206-207). In the archaeobotanical assemblages, the seeds are mostly presented.

One seed was identified to the Caryophyllaceae family from a courtyard sample (B3, 15/9) in Phase 5 at Bahçelievler.

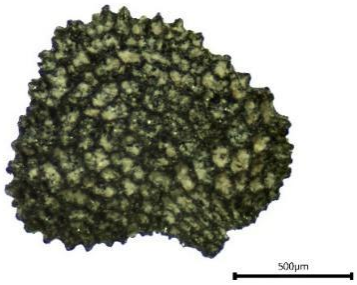


Figure 5.81: Unidentified seed from the Caryophyllaceae cf. Solanaceae family (14N-12.8) at Hoca Çeşme (photo: H. Balcı).

One seed was identified to the Caryophyllaceae family in Hoca Çeçme (14N, 12.8) (Figure 5.81).

cf. Silene

One seed of campion (*Silene* sp.) or *Portulaca* sp. (?) has been recorded from a surface (BH46326, L11, loc.637) in VIe at Barcın Höyük.

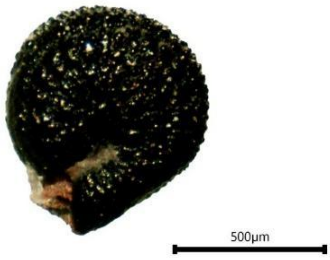


Figure 5.82: Silene cf. Portulaca (?) seed (B2-29.4) in Phase 7 at Bahçelievler (photo: H. Balcı).

[42] https://en.wikipedia.org/wiki/Caryophyllaceae

One seed of *Silene* (?) has been recorded from a courtyard area (B2-29.4) in Phase 7 at Bahçelievler (Figure 5.82).

Two seeds have been recorded from a pit (H2-c, fill 4, 8K, unit 284) in Phase 7 at Aşağı Pınar (Figure 5.83).



Figure 5.83: *Silene* (?) seed from the Caryophyllaceae family (8K-284-A024) at Aşağı Pınar (photo: H. Balcı).

Spergula arvensis

One seed has been documented in a layer (BH7214, L11, loc.264) in VIb at Barcın Höyük (Figure 5.84).



Figure 5.84: *Spergula arvensis* seed (BH7214) in phase VIb at Aşağı Pınar (photo: H. Balcı).

Stellaria media

One seed from a surface (BH12678/778?, M10, loc. 2201) in VIb, and one seed in a pit (BH12536, L14, loc. 117) in the Middle Bronze Age (Figure 5.85).



Figure 5.85: *Steleria media* seed (BH12536) in the Middle Bronze Age at Barcın Höyük (photo: H. Balcı).

5.6.8. Convolvulaceae

The bindweed/morning glories (Convolvulaceae) herbaceous vines represent the family, and we can see some species as shrubs, herbs, or trees in the family. The family has 57 genera and over 1900 species worldwide (Simões et al. 2024, 267). The species are annual, perennial, widespread, and cosmopolitan, but most can be found in the tropics. *Convolvulus* is especially widespread in the Mediterranean basin.

The species have different uses with different plant parts, such as medicinal, ornamental, foodstuff, or hallucinogenic properties (Yadav et al. 2018, 105). This plant family stands out most in the flora because of its funnel/bell-shaped flowers and hedge/volubilate/climbing character. For some of the species, the leaves and tuberous roots are edible. Sweet potato is especially the most well-known species of edible tuberous root, for example.

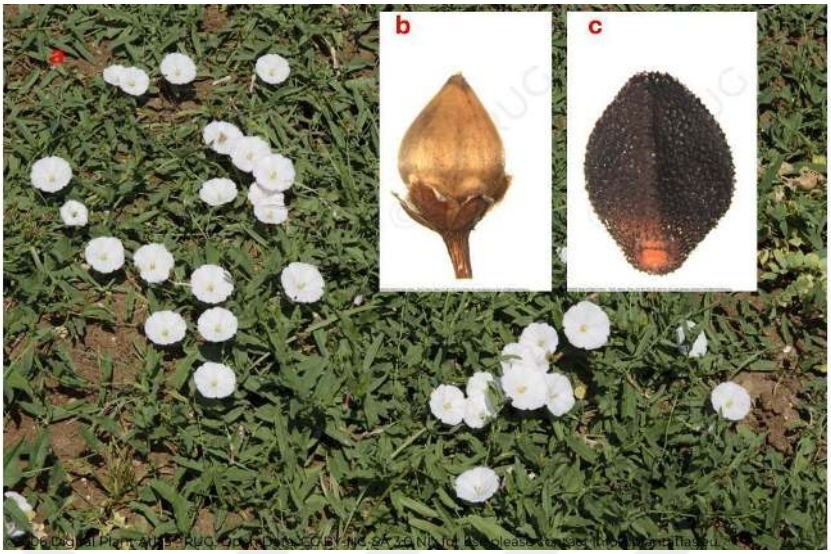


Figure 5.86: The general morphology of *Convolvulus arvensis* plant: (a) entire plant, (b) fruit with perianth, (c) seed (edited by H. Balcı from online source).[43]

The distribution of the genera shows variability according to climate regions; for example, water spinach (*Ipomoea aquatica*) is a semi-aquatic and tropical plant that you can use as a vegetable for its green tender shoots.[44] On the other hand, the most representative genus of the family is bindweed (*Convolvulus* L.), which gives the name to its family. The seeds of *Convolvulus* grow within a fruit with a perianth (Figure 5.86), and mostly we find the seed part of the plant in the archaeobotanical assemblages.

Convolvulus sp.

We see bindweed in the farm fields as arable weed recently and in the past vegetation. In the case sites, bindweed is only documented at Barcın Höyük, especially with the pulses. The seeds that are documented at Barcın Höyük assemblage might be field bindweed (*Convolvulus arvensis*). The morphological characters are also similar to the seeds of *C. arvensis* (Figure 5.86).

There are no documented bindweed seeds in phase VIe at Barcın Höyük, but 222 bindweed seeds have been documented in 5 out of 194 samples in VId1. The total number is high, but most of the seeds came from two samples that are related to each other. 208 out of 222 seeds have been documented in lentil storage (L10, BH36876, loc.147 -basin bin-;

[43] https://www.plantatlas.eu/item/classification/465

[44] https://en.wikipedia.org/wiki/Convolvulaceae

BH36852, loc.185 – layer-). Two seeds have been documented in one sample in VId3, and there are no obtained data in later levels about bindweed at Barcın Höyük.



Figure 5.87: *Convolvulus arvensis* seeds (BH36876) in phase VId1 at Barcın Höyük (photo: H. Balcı).

5.6.9. Cyperaceae

The Sedge (Cyperaceae) family is the third largest family in monocotyledonous gramineous flowering plants. In contrast, the Poaceae family is the first and most prominent family with features similar to those of the Cyperaceae. The sedge family members may look like grasses from the Poaceae family; conversely, both families have different morphological characteristics (Goetghebeur 1998, 141; Cappers and Bekker 2013, 109; Saing 2023, 381). The sedge family is also one of the most frequent plant families in the archaeobotanical assemblages. The family comprises over 90 genera and 4400 species around the world (Cappers and Bekker 2013, 109). The representative genus of the sedge family is *Cyperus* sp. The name of the genus comes from 'Kyperas' in Greek, and 'sedge' in English means 'sword-man' whose leaves are linear and have parallel venation. The sedge family is widespread, but it especially likes wetland areas with acidic soil rich in humus (Saing 2023, 381).

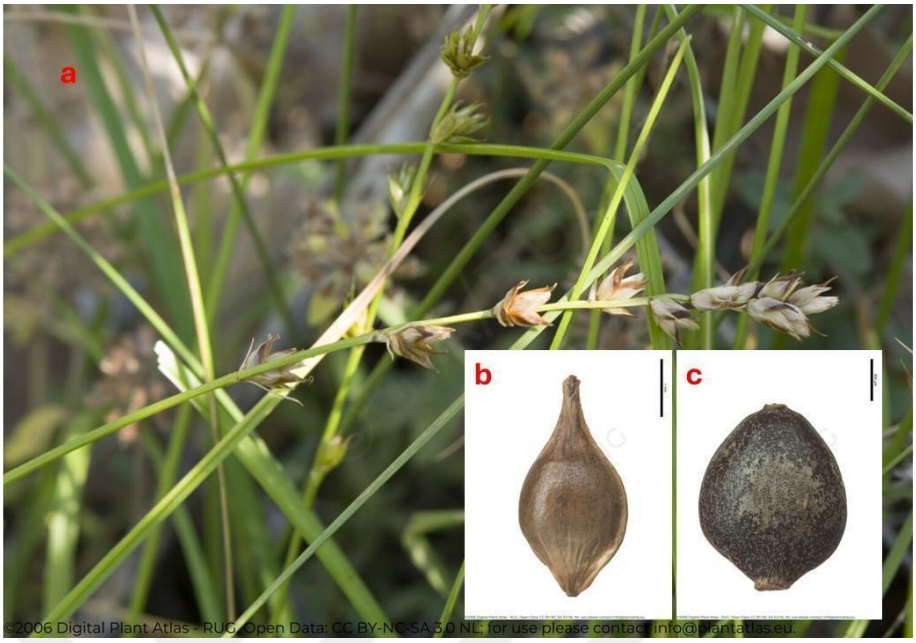


Figure 5.88: The general morphology of *Carex divulsa*: (a) infructescence, (b) utricle, (c) fruit (edited by H. Balcı from online source).[45]

According to the species, the flowers and fruits are located on a spike or a composite spike, a raceme, a panicle, or a capitulum. The flowers can be unisexual or bisexual. Male flowers are narrower than female and bisexual flowers, which include fruits (Cappers and Bekker 2013, 109-111). The species show some morphological differences, such as the number of carpels (mostly 2 or 3), bristles, a straightforward style, and the presence of utricle, etc., in different genera, on the other hand, the fruits (also known as achene) of the sedges contain only one seed (not fused with the fruit). They can be identified by their number of bracts, bristles, straightforward style, and utricle, which cover the fruit (Figure 5.88) (Cappers and Bekker 2013, 112). In archaeobotanical assemblages, we find fruits that contain seeds inside if they are preserved as subfossils. We see some of the members of this family in only Barcın Höyük and Aşağı Pınar.

There are no documented remains from this family in Bahçelievler or Hoca Çeşme sites.

The fruits that are not identified as species but as the sedge family have been documented in the *Cyperaceae* family in the botanical data.

[45] https://www.plantatlas.eu/item/classification/1683

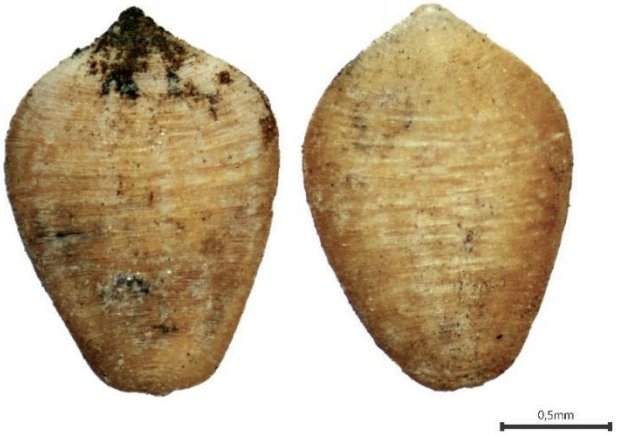


Figure 5.89: Indeterminate Cyperaceae fruits from a surface in phase VId3 at Barcın Höyük (photo: H. Balcı).

One fruit has been documented with cereal remains and wild plants from a collapse (B35700, M10, loc. 357) in VId1. Two fruits have been identified from a surface (BH8899, L13, loc.123), and possible Cyperaceae fruits from a surface (BH39107) in the Cyperaceae family in VId3 at Barcın Höyük (Figure 5.89). In this sample, two fruits of sea clubrush (*Bolboschoemum* cf. *maritimus*), mentioned below, have been recorded. Three fruits from three samples from a surface, a layer, and a pit in Trench L11 area in VIb. These samples mostly contain poor evidence.



Figure 5.90: Unidentified type of Cyperaceae fruit (14N-12.8) at Hoca Çeşme (photo: H. Balcı).

One fruit has been documented from Hoca Çeşme site (14N, 12.8) (Figure 5.90).

Thirty-eight fruits from two out of 134 samples have been documented in Phase 7 at Aşağı Pınar. 37 fruits come from ditch H1-2 (fill D, 6N, unit 146) with a few cereal grains and hulled wheat rachis nodes in the sample.

Another unidentified type of Cyperaceae family has been documented with one hundred and seven fruits/seeds in str2a in phase VId1 (50 from a platform bench ledge in str2a (BH41698, M10, loc. 411), 50 from a layer in str-2a (BH40800, M10, loc. 408), 7 from a surface (BH36632, M10, loc. 408) (Figure 5.91) at Barcın Höyük. The fruit parts have mostly lost their seeds making identification difficult.

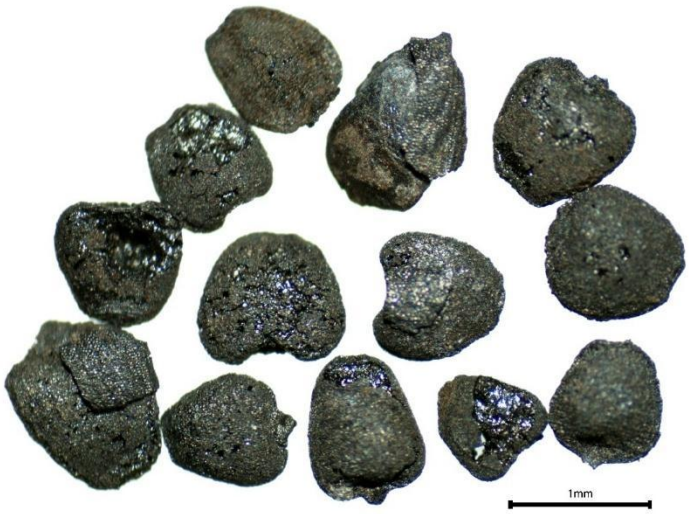


Figure 5.91: Cypreaceae fruits/seeds (BH40800, *Scirpus maritimus*?) in phase VId1 at Barcın Höyük (photo: H. Balcı).

Two fruits of sea club rush have been identified with one emmer, one bread/hard wheat, and one hulled barley grain from a surface (BH8899, L13, loc.123) in VId3 at Barcın Höyük. One fruit with some cereals and wild plant remains has been found in a layer (BH9592, M11, loc.117) in VIb. Only two fruits in the Late Chalcolithic have been found with some crop remains in a sample from layer (BH2344, M10, loc.62).

Bolboschoenus cf. glaucus (Lam.)

Clubrush (*Bolboschoenus* sp.) is a freshwater plant that grows in dense stands along rivers or in moist depressions. This type is only represented at Barcın Höyük assemblage.



Figure 5.92: *Bolboschoenus* cf. *glaucus* fruit (BH6612) in phase VIb at Barcın Höyük (photo: H. Balcı).

No documented clubrush remains in the earliest phase VIe at Barcın Höyük. In later phase VId1, 11 fruits have been recorded in 3 out of 194 samples. Nine fruits with cereal remains from a collapse (BH35700, M10, loc. 357), one fruit from a surface (M10, BH36632, loc. 391), and one fruit from another surface (L11, BH44509, loc. 619) have been documented in this phase.

Clubrush remains show a presence with cereal remains compared to pulses. After VId1, we see Clubrush again in VIb with eight fruits in two samples) (Figure 5.92). Seven fruits come from a pyrotechnic feature (BH5908, M10, loc. 118). In this sample, fragmented cereals, a few emmer grains and rachis nodes, a few pulses, and some of the wild plants such as *Buglosseides arvensis*, *Chenopodium* cf. *album*, *Lepidium* sp., and *Rumex* sp. have been documented. The sample assemblage looks like a mixture, maybe a trash part of a crop assemblage or fuel material.

Carex sp./ Carex cf. divulsa

In VId1, four fruits of *Carex* sp. in two samples were recorded. One fruit of *Carex* sp. and 29 fruits of *Carex* cf. *divulsa* have been documented with a high amount of cereal remains and a wide variety of wild plant species in a collapse sample (BH35700, M10, loc. 357) in VId1 at Barcın Höyük. Three fruits of *Carex* sp. have been found from a surface (BH36632, M10, loc. 391). There is no documented *Carex* species in the earliest and later phases after VId1 at Barcın Höyük.



Figure 5.93: Fruits of *Carex* sp. (6M-134.42) in Layer 7 at Aşağı Pınar (photo: H. Balcı).

Six fruits of *Carex* sp. have been documented in 3 out of 134 samples in Phase 7 at Aşağı Pınar (Figure 5.93). The species is generally presented with other wild plant species, and crop remains are present in the samples. The exact identification between some species of Cyperaceae and Polygonaceae families can be confusing in charred fruits and seeds, so these fruit remains may potentially be identified as *Carex* sp.

Cyperus cf.

One fruit of *Cyperus* cf. has been documented from a rich sample that contains other species from the Cyperaceae family mentioned above in a collapse (BH35700, M10, loc. 357) in VId1 at Barcın Höyük.

5.6.10. Euphorbiaceae

Chrozophora tinctoria

This type was recorded with two fruits only from a pyrotechnic feature (BH31295, L10, loc.146) in VIc at Barcın Höyük.

5.6.11. Fabaceae

The characteristics of the pulses/legumes (Fabaceae) family are also discussed (please see section 5.3. Pulses in this chapter). The family was named after the genus *Faba*, but recently, the *Faba* genus has been accepted in the *Vicia* genus.



Figure 5.94: An example of the plant parts of a legume from hairy vetch (*Vicia villosa*) (edited by H. Balcı from an online source).[46]

Legumes have dehiscent fruits, and the seeds are attached to the fruit, which is called a pod or capsule (Figure 5.94) (Cappers and Bekker 2021, 197, 200). Legume species can grow in fields with cereals and pulses crops. It is also possible to come across different species in different habitats and climate conditions.

We can come across many legume seeds in archaeobotanical samples. Making direct species identification on these remains is not always possible because the legume family is extensive (over 20,000 species). On the other hand, they are recorded in the Legume family because their morphological features match. However, it is impossible to identify direct species; some remains can be identified down to their genus, such as *Astragalus* sp. and *Hippocrepis* sp. L., *Medicago* sp., *Onobrychis* sp., *Trifolium* sp., and *Vicia* sp. are the most well-known legume weeds from the fields.

One hundred and forty-five seeds have been documented in 31 out of 134 samples as wild legumes in Phase 7 at Aşağı Pınar. These remains are mainly presented as trash material in the samples, and it is difficult to identify their species because the Fabaceae family is an

[46] https://www.inaturalist.org/taxa/57317-Vicia-villosa/browse_photos

extensive plant family like the Poaceae family. Some of them are not well preserved, and for some, there is a need for a comparative plant collection.

Astragalus sp.

Three recent seeds of *Astragalus* sp. have been documented from a pit (BH2031, BH2040, M10, loc. 54) in EBA II at Barcın Höyük. Another six recent seeds documented as *Astragalus/Trigonella* (BH11515) in phase VIb at Barcın Höyük (Figure 5.95).



Figure 5.95: *Astragalus/Trigonella* seeds in phase VIb at Barcın Höyük (photo: H. Balcı).

Hippocrepis sp. L.

One fruitlet of *Hippocrepis* sp. has been documented with a small number of cereals, pulses, and a few wild plant species in a pyrotechnic feature (BH34896, L10, loc. 161) in Phase VId2. One fruitlet from a surface (BH35765, L12, loc. 390) in VIc, and four seeds from a surface (BH12679, M10, loc. 220) in VIb have been documented at Barcın Höyük.

Medicago sp.

Two fruits of *Medicago* sp. have been documented from a pyrotechnic feature (BH34896, L10, loc. 161) and a surface (BH11839, L13, loc. 146) in VId2 at Barcın Höyük. One fruit has also been documented with a small number of cereals, pulses, and wild plant species from a layer sample (BH7214, L11, loc. 264) in phase VIb (Figure 5.96).



Figure 5.96: *Medicago* sp. seed (BH7214) in Phase VIb at Barcın Höyük (photo: H. Balcı).

Six fruits of *Medicago* sp. have been recorded in 3 out of 134 samples in Phase 7 at Aşağı Pınar (Figure 5.97). In addition, 76 fruits were recorded as recent in two samples (H1-1B, fill 2a, 6L, unit 77; H1-1d, fill 4, 6M, unit 103). Both samples contain other wild plant species which are also considered as recent.



Figure 5.97: *Medicago* sp. seed (8K-285-A025) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

Onobrychis sp.

One fruit of cf. *Onobrychis* in a layer (BH12385, M10, loc. 168) in VIb, and one fruit have been documented with a small amount of cereal, pulses, and wild plant species in a pit (BH6557, L12, loc. 107) in EBA II at Barcın Höyük (Figure 5.98).



Figure 5.98: *Onobrychis* fruit (BH12385) in Phase VIb at Barcın Höyük (photo: H. Balcı).

Trifolium sp.

Two fruits of clover (*Trifolium* sp.), which are probably recent, have been documented in a layer (BH12385, M10, loc. 168) in VIb at Barcın Höyük.



Figure 5.99: The seed of *Trifolium* sp. in Layer 7 at Aşağı Pınar (photo: H. Balcı).

Forty-eight seeds (recent) have been documented in one sample from a pit (H1-1b, fill 2a, 6L, unit 77) in Phase 7 at Aşağı Pınar (Figure 5.99). In this sample, there are also identified Brassicaceae (1), *Chenopodium* sp. (70), *Fumaria* sp. (12), *and Medicago* (71), which are considered recent either.

Vicia sp.

Twenty-six seeds of *Vicia* sp. have been documented in 3 out of 134 samples in Phase 7 at Aşağı Pınar. Twenty-three of the seeds were found in one sample (H1-2, fill F, 6N, unit 147) with Fabaceae (22), *Digitaria* (1), *Galium* (2), *Hordeum spontaneum* (2), Rumex (1), *Lens culinaris* (11), *T. dicoccum* (15), *T. dicoccum* RN (5), and fragmented cereals (30) remains.

5.6.12. Geraniaceae

The crane's-bill (Geraniaceae) family is a small family according to some other large families. The family has five genera and over 700 species, and the type of genus is *Geranium* L. of the family. The flowers and fruits are individual or grouped two or more together. The genus *Geranium* has dehiscent fruitlets (Cappers and Bekker 2021, 217).

Geranium sp.

1 seed of *Geranium* sp. has been documented with a high number of crop remains and wild plant species from a collapse (BH35700, M10, loc. 357) in VId1 at Barcın Höyük.

5.6.13. Lamiaceae

The mint (Lamiaceae) family is well known for culinary herbs such as aromatic and medicinal plants such as mint, rosemary, savory, thyme, lavender, bee balm, salvia, catmint, etc.[47] The family consists of flowering plants, and the plants are mostly herbaceous perennials, annuals, and partly shrubs or trees. The family has a cosmopolitan character, and it has over 230 genera and 6500 species. The family name comes from the genus Dead-nettles (*Lamium* L.), and it is also referred to as Labiatae.

The flowers are mostly multiple and tubular shaped and are characteristic in that most flowers consist of a 3-toothed upper lip and a 2-toothed lower lip (Cappers and Bekker 2013, 157). The fruits ripen in the calyx when the corolla drops off after flowering. The fruits in this family are mostly schizocarp, and each fruit includes four seeds that are split into four fruitlets (1-seeded mericarps) (Cappers and Bekker 2013, 157). Furthermore, this schizocarp fruit character occurs in the Polygonaceae family. In the archaeobotanical assemblages, mostly the fruitlets, and rarely fruits, are found as subfossil remains.

[47] https://en.wikipedia.org/wiki/Lamiaceae

Two fruits/fruitlets have been identified to the Lamiaceae family documented from a pit in ditch H2 (H2-c, fill 4, 8K, unit 285) in Phase 7 at Aşağı Pınar.

Nepeta cf. Ocimum

There is a group of fruitlets at Barcın Höyük, which were identified as catmint (*Nepeta*) cf. basil (*Ocimum*).

137 fruitlets of *Nepeta* cf. *Ocimum* has been identified in two out of 194 samples in VId1 at Barcın Höyük (Table 5.13). 127 of these remains come from a collapse that contains a high number of crop remains and wild plant species (BH35700, M10, loc. 357), which are also mentioned in many other species sections. The other 10 fruitlets come from a layer (BH40800, M10, loc. 408) that is also related to the previous sample above in the 2a structure in VId1.

5.6.14. Malvaceae

The mallow (Malvaceae) family consists of 245 genera and 5370 species as wild and economic plants, and there are also several subfamilies under this family. There are several uses, such as food, aromatic oil, fibres, drug, etc., from different parts of the plants (please see Cappers and Bekker 2021, 245). The mallow (*Malva sylvestris*), cotton (*Gossypium* L.), cacao tree (*Theobroma cacao*), and okra (*Abelmoschus esculentus*) are the most known members of this family.



Figure 5.100: An example of the Malvaceae family from *Malva sylvestris*: (a) entire plant with flower, (b) fruit with perianth, (c) fruit, (d) fruitlet, (e) seed (edited by H. Balcı from online sources).[48]

[48] (a) https://www.inaturalist.org/taxa/56162-Malva-sylvestris; (b, c, d, e) https://www.plantatlas.eu/item/classification/923

This family is a flowering family, and most of the species are herbaceous plants or shrubs, but there are also trees or vines (lianas) in some parts of vegetation. The plant's seed dispersal is separated into a few different types, such as simple (e.g., *Gossypium, Hibiscus*), multiple, and compound fruits (e.g., *Tilia* sp.), depending on the genera (please see Cappers and Bekker 2021, 248). In the archaeobotanical samples, we mostly find fruitlets or seeds, rarely fruits and fruit with the perianth (Figure 5.100).

Nine fruitlets were identified to the Malvaceae family in 7 out of 134 samples in Phase 7 at Aşağı Pınar (Figure 5.101). Most of the remains were documented from ditch H2 and a related pit H2-c.

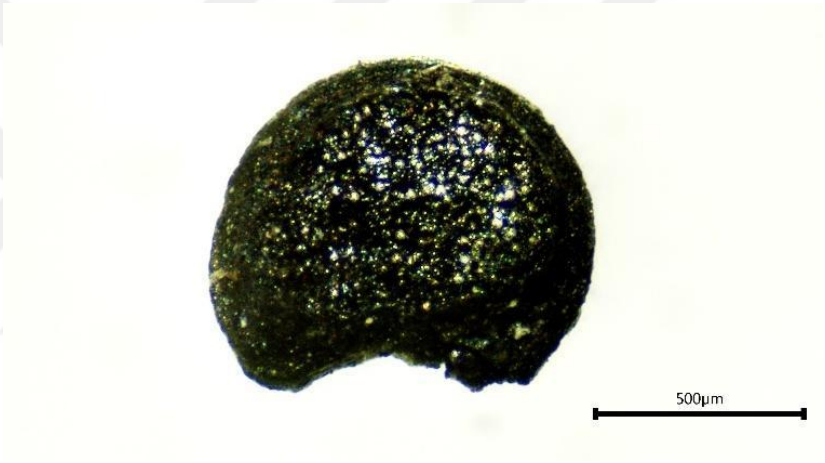


Figure 5.101: A fruitlet from Malvaceae family in Phase 7 at Aşağı Pınar.

One fruitlet from the pit-dwelling structure (A3, 4/1) in Phase 8, and one fruitlet from the surface (B2, 29/4) in Phase 7 were identified as the Malvaceae family at Bahçelievler.

Malva sp.

Twenty fruitlets of *Malva* sp. have been recorded in 4 out of 194 samples in VId1, Barcın Höyük. 1 fruitlet of *Malva* from a surface (BH42823, L12, loc. 495), One fruitlet from a platform bench (BH41698, M10, loc. 411), 14 fruitlets from a layer in 2a structure (BH40800, M10, loc.408), four fruitlets from a platform bench again in 2a structure (BH40529, M10, loc. 261) in VId1 at Barcın Höyük (Figure 5.102).



Figure 5.102: Malvaceae/Amaranthaceae fruitlets/fruits (BH40800) in Phase VId1 at Barcın Höyük (photo: H. Balcı).

The samples where *Malva* has been documented contain wild plant species in general. On the other hand, the outer part of the fruitlets have partly disappeared so they also could be *Chenopodium/Atriplex* from Amaranthaceae family that seeds look like have lost their *testa* (seedcoat). The remains had become swollen and had split due to burning making the identification difficult.

Four fruitlets of Malva have been documented in 2 out of 14 samples at Hoca Çeşme.

Tilia platyphllos

Only one fruit (recent) of large-leaf linden has been identified in pit H1-1d (fill 4, 6M, unit 121) in Phase 7 at Aşağı Pınar (Fruit 5.103). The fruit is probably recent but the fruit shell seems mineralized so it can be also ancient.

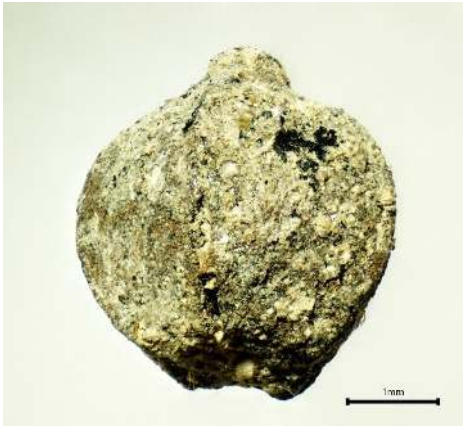


Figure 5.103: The fruit of *Tilia platyphllos* in Phase 7 at Aşağı Pınar.

5.6.15. Papaveraceae

The poppy (Papaveraceae) family is well known through the opium poppy (*Papaver somniferum* L.) species, which is grown for its latex (e.g. morphine) from the unripe fruit (capsule), for its oil and foodstuff from the seeds in general (Figure 5.104a-c). The family has over 40 genera and 1000 species, and the type of genus is *Papaver* L. (Cappers and Bekker 2021, 265). The fumitory (Fumariaceae) family is also considered in this family.



Figure 5.104: The main parts of Papaveraceae plants: *Papaver rhoeas* (a) entire plant with flowers, (b) fruit (capsule), (c) seed; Fumaria officinalis (d) plant view with flowers, (e) young fruits, (f) ripen fruit (edited by H. Balcı from online sources).[49]

The flowers of the family are single or arranged in a panicle, simple or compound raceme, or umbel (Cappers and Bekker 2021, 266). Seed dispersal shows differences depending on the fruit types. For example, poppy species have dehiscent fruit where the seeds are scattered from the fruit when it is opened; *Fumaria officinalis* is an example of dislodged fruits that leave the raceme when it is ripened (Figure 5.104d-f). In archaeobotanical assemblages, we mostly find seeds or fruits depending on the morphological characters of the species.

Fumaria sp.

[49] Images **a:** https://en.wikipedia.org/wiki/Papaveraceae; **b, c, d, f:** https://www.plantatlas.eu/item/classification/652; **e:** https://inpn.mnhn.fr/espece/cd_nom/99108/tab/fiche

Two fruits as charred, and 158 fruits (recent, probably *F. densiflora*) have been documented from 14 out of 134 samples in Phase 7 at Aşağı Pınar (Figure 5.105). The remains come from ditch H1-1, pits H1-1b, H1-1d, and H2-c.



Figure 5.105: *Fumaria* sp. fruit in Phase 7 at Aşağı Pınar (photo: H. Balcı).

Fumaria densiflora

Two fruits (recent) from a pyrotechnic feature in str 18 (BH38227, L12, loc. 409) in VId3. One fruit (recent) from a pit (BH12536, L14, loc. 117) in the Early/Middle Bronze Age at Barcın Höyük (Figure 5.106).



Figure 5.106: *Fumaria densiflora* fruit (BH12536) in the Early/Middle Bronze Age at Barcın Höyük (photo: H. Balcı).

Fumaria officinalis

At Barcın Höyük, two fruits (recent) from a pyrotechnic feature (BH44717, L10, loc. 378) in VIe. Four fruits (recent) from a pyrotechnic feature (BH11198, L13, loc. 142) in VId2. 22 fruits (recent) from a pyrotechnic feature in str 18 (BH38227, L12, loc. 409) in VId3. One fruit (recent) from a pit (BH8207, M11, loc. 105), one fruit from a surface (BH6768, L11, loc. 277) in VIb. One fruit from a pit (BH6557, L12, loc. 107) in EBA II.

Papaver sp.

One seed of *Papaver* sp. (recent) has been documented from a surface (BH5171, L11, loc. 230) in VIb at Barcın Höyük (Figure 5.107).



Figure 5.107: *Papaver* sp. seed (BH12536) in Phase VIb at Barcın Höyük (photo: H. Balcı).

5.6.16. Plantaginaceae

The plantain (Plantaginaceae) family includes over 80 genera and 2000 species, and the type genus is *Plantago* sp. The flowers of the family are mostly individually arranged in the axils of the bracts (Cappers and Bekker 2021, 276). *Plantago* has dehiscent fruit, and two seeds are inside this capsule (Cappers and Bekker 2021, 278). In the botanical assemblages, we mostly find the seed part. In the case sites, only one genus is documented at Barcın Höyük.

cf. Plantago sp.

One seed of *Plantago* sp. has been documented from a layer (BH12403, L13, loc.113) in the Early/Middle Bronze Age.

5.6.17. Poaceae

The Poaceae family has a wide variety of wild species around the world. This family is also discussed in the section "5.2. Cereals", which is focused especially on the most known genera and species in the cultivated cereals. In the botanical assemblage, there are many different types of seeds/fruits/florets that belong to the Poaceae family as wild cereals, which are called grasses. Still, the genus or species are not clear because of the insufficient comparative modern botanical collections. Most of these wild cereals grow in the field with the crops and mix with the harvest (Figure 5.108).



Figure 5.108: Different kinds of grasses as arable weeds in the field (online source).[50]

One hundred and seventeen florets/fruits have been documented in 32 out of 176 samples in VIe. 210 florets/fruits have been documented in 29 out of 194 samples in VId1. One grain in VId2, two grains in VId3, three grains in VIc, 11 grains in 8 samples in VIb, two grains in VIa, and two grains in EBA II were recorded at Barcın Höyük.

Only two fruits were identified to the Poaceae family from a skeleton area (B3-C3, 12/3) in Phase 6 at Bahçelievler.

At Aşağı Pınar, there are also a rich number of wild cereals which are identified as the Poaceae family and mostly we call 'grass.' 74 fruits/florets, 18 out of 134 samples in Phase 7. These remains are mostly presented with a wide variety of weeds and domesticated cereal

[50] https://universityagro.ru/en/arable-farming/weeds/

remains in the samples. For example, an indeterminate floret from Poaceae family (14N, 12.8) at Hoca Çeşme (Figure 5.109).



Figure 5.109: Unidentified Poaceae hulled grain at Hoca Çeşme (photo: H. Balcı).

Aegilops

Four fruits of Aegilops have been documented in 3 out of 194 samples in VId1 at Barcın Höyük. Two fruits from a surface (BH36632, M10, loc. 391), one fruit from a platform bench (BH41000, M10, loc. 427), and one fruit from a pyrotechnic feature (BH39345, L10, loc. 220) have been documented. One grain is also documented from a pit (BH2040, M10, loc. 54) in EBA II (Figure 5.110).



Figure 5.110: *Aegilops* grain (BH2040) in Phase EBA II at Barcın Höyük (photo: H. Balcı).

Avena sp.

There is only one fruit which is recorded as *Avena/dicoccoides* from a surface in Phase VId2 (BH11650, L13, loc. 145, 2.5 lt) at Barcın Höyük (Figure 5.111).



Figure 5.111: *Avena/T. dicoccoides* grain from frontal and dorsal views (BH11650) in phase VId2 at Barcın Höyük (photo: H. Balcı).

There are documented 10 fruits of *Avena* sp. in a pit sample (H2-t, 7U, unit 238) in Phase 7 at Aşağı Pınar, but these remains are probably wild barley that is also documented in the assemblage.

Bromus sp.

One fruit of *Bromus* has been documented from a layer (BH9592, M11, loc. 117) in VIb at Barcın Höyük. One floret and one fruit are also documented from a pit (BH12536, L14, loc. 117) in Early/Middle Bronze Age level at Barcın Höyük (Figure 5.112).

Two fruits of *Bromus* have been documented in two samples in Phase 7. One of the remains comes from a pit that is related to the ditch H2 (H2-t, 7U, unit 238), and the other one comes with a high number of cereal remains and a few wild plants from ditch H1-2 (fill D, 6N, unit 144).



Figure 5.112: *Bromus sterilis* grains (left: floret, right: grain, BH12536) in Early/Middle Bronze Age at Barcın Höyük (photo: H. Balcı).

Digitaria sp.

Seventy-four florets have been identified in 6 out of 134 samples in Phase 7 at Aşağı Pınar. Two samples include between 1 to 2 seeds/fruits, 4 samples include 49, 8, and 15 florets. 49 florets have been documented from ditch H1-2 (fill D, 6N, unit 144) that this sample contains a high number of pulses and hulled wheat remains, a few weeds, and 16 seeds of *Linum* cf. *bienne*.



Figure 5.113: Spikelets of *Digitaria* sp. in Phase 7 at Aşağı Pınar (photo: H. Balcı).

Eight spikelets have been documented from ditch H2 (fill D, 7U, unit 262) that this sample also include a wide variety of weeds, and high number of pulses and hulled wheat remains. Fifteen seeds/fruits come from pit H2-v (fill 4, 7U, unit 268). This sample also shares a situation similar to the two previous samples. We can say that *Digitaria sp.* is an arable weed that survives in the fields with the crops. The florets were preserved as mineralized in white color in the samples (Figure 5.113).

Hordeum spontaneum cf. *marinum*

Wild barley (*Hordeum vulgare* ssp. *spontaneum* (C. Koch) Thell) has a widespread area that can adapt to several kinds of environments according to cultivated subspecies of barley and other cereals (Cappers and Neef 2012, 273; Nesbitt 2006, Nevo et al. 1986, 211). The genetic diversity of wild barley in Türkiye also reflects similar patterns in the areas of Israel and Iran (Nevo et al. 1986, 211). In the ecological niche, climate change has also played a critical role in the genetic variation and distribution of wild barley (Russell, Silva, and Steele 2014, 8).



Figure 5.114: *Hordeum spontaneum/marinum* (?) grains (BH46341) in Phase VIe at Barcın Höyük (photo: H. Balcı).

We see wild barley, especially in the Barcın Höyük assemblage (Figure 5.114). Wild barley exists as arable weed with cereal crops in the samples. On the other hand, these wild

barley grains may also belong to the common type of *Hordeum marinum* Huds. When we compare the grain size (Nesbitt 2006, 86).

The 56 florets of wild barley were documented in 19 out of 176 samples in phase VIe. The 390 florets of 31 out of 194 samples in phase Vd1. Only half of the floret of wild barley is documented in VId2 from a surface sample out of 39 samples. Six florets from 5 samples out of 44 samples in VId3. In VIc, only four florets of wild barley are documented from a single pyrotechnic feature sample out of 63 samples. In the sample, a few fragmented wheat/barley grains, a half einkorn/emmer rachis node, four flax seeds, and one Caryophyllaceae seed are documented. 11 florets have been documented in 5 out of 108 samples in VIb.

Nineteen florets of wild barley have been recorded in 9 out of 134 samples in Phase 7 at Aşağı Pınar. Most of the remains (11 florets) come from ditch H1-2 (levels D and F), especially emmer grains and rachis nodes, fragmented wheat remains, and wild pulses in the samples.

cf. Lolium

Five fruits of *Lolium* have been documented in 4 out of 108 samples in VIb at Barcın Höyük. One fruit of *Lolium* from a layer (BH6439, M10, loc. 100), one fruit from a surface (BH6748, L11, loc. 270), one fruit from another surface (BH8744, M10, loc. 130), and two fruits from a layer (BH12385, M10, loc. 168) were recorded.

Phalaris sp.

Two fruits/seeds of *Phalaris* have been documented in 2 out of 194 samples in VId1 at Barcın Höyük. One fruit/seed from a collapse sample, which contains a wide variety of plant remains (BH35700, M10, loc. 357), and one fruit/seed from a surface (BH36632, M10, loc. 391) have been recorded. One fruit/seed from a layer (BH12385, M10, loc. 168) in VIb, one fruit/seed from a pit (BH2174, M11, loc. 3) in EBA II, two fruits/seeds from a pit (BH12536, L14, loc. 117), and from a layer (BH12403, L13, loc. 113) in Early/Middle Bronze Age were found (Figure 5.115).



Figure 5.115: *Phalaris* fruit/seed grains (BH12536) in Early/Middle Bronze Age at Barcın Höyük (photo: H. Balcı).

Setaria pumila

At Barcın Höyük, 62 florets have been documented in 5 out of 176 samples in VIe. One floret from a basin bin (BH45555, L11, loc. 635), 27 florets pyrotechnic feature (BH45767, L10, loc. 418), six florets from a layer (BH46318, L10, loc. 364), 27 florets from a layer (BH46341, M11, loc. 699) have been recorded (Figure 5.116). One floret from a platform bench (BH46305, L10, loc. 420) in VId1, and one floret from a pyrotechnic feature in str 18 (BH38221, L12, loc. 402) in VId3 has been recorded.



Figure 5.116: *Setaria pumila* florets grains (BH46341) in Phase VIe at Barcın Höyük (photo: H. Balcı).

Fourteen florets of *Setaria* sp. cf. *Panicum* sp. have been documented from eight out of 134 samples from different contexts in Phase 7 at Aşağı Pınar (Figure 5.117). There are also 13 documented fruits from a pot sample, but there is no information about their phase (6V, 41.35, analy.no.106).

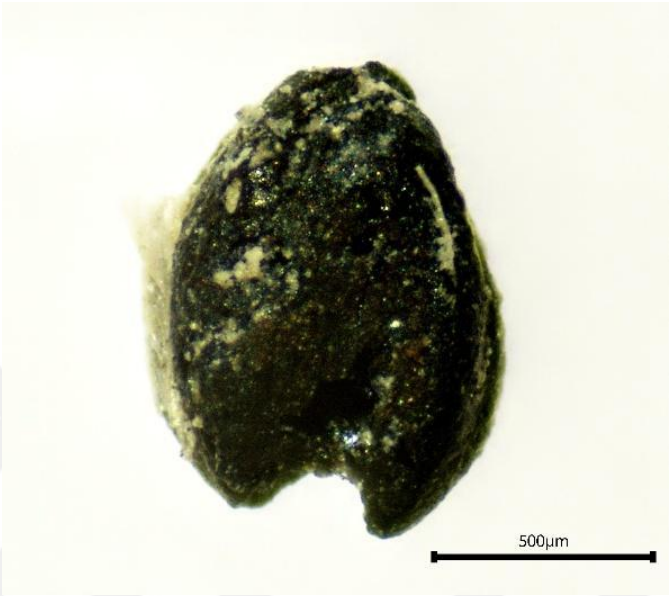


Figure 5.117: Floret of *Eragrostis/Setaria/ Panicum* in Layer 7 at Aşağı Pınar (photo: H. Balcı).[51]

5.6.18. Polygonaceae

The knotweed/smart weed (Polygonaceae) family is a flowering plants family and has over 45 genera and 1200 species with a worldwide distribution (Cappers and Bekker 2013, 217; Xu et al. 2017, 171). Some of the species are domesticated such as buckwheat (*Fagopyrum esculentum*) and Rhubarb (*Rheum* x *hybridum*). The represented genera are knotgrasses (*Polygonum*), docks (*Rumex*), and knotweeds (*Persicaria*) (Cappers and Bekker 2013, 217). These genera are also presented in archaeobotanical assemblages at Barcın Höyük and Aşağı Pınar case sites. Knotweed plants are mainly herbaceous, shrubs or small trees. Leaves are simple, flowers are small and posses an undifferentiated perianth, frequently bisexual, or sometimes unisexual, inflorescence is terminal or axillary, pedicel is articulate, and perianths are 3-6 partite, or 2-whorled (Figure 5.118) (Cappers and Bekker 2013, 217; Xu et al. 2017, 171).

[51] Could be *Eragrostis* sp. according to Nesbitt'identification on grass seeds [Nesbitt 2006, 99].



Figure 5.118: The entire plant in the field (a), inflorescence (b), and fruit (c) of *Polygonum aviculare* L. (edited by H. Balcı from online source).[52]

The flowers and fruits have short pedicels and are grouped into cymes which are sometimes combined into a spike or a raceme. The single fruits (1-seeded and mostly includes two or three carpels) develop in each flower (Cappers and Bekker 2013, 217}. These family members especially *Polygonum*, *Rumex*, and *Persicaria* which are mentioned above grow in fields, grasslands, or ruderal community, and the growing areas are generally moist valleys, mountain slopes, and upland fields (Xu et al. 2017, 183). The inflorescence period is generally between May-July, and infructescence period is between July-November depending on the genus and the type of habitat. These family genera appear with the crops as arable weeds in the archaeobotanical assemblages, especially at Barcın Höyük.

Five fruits from four samples in VIe, 58 fruits from 20 samples in VId1, five fruits from two samples in VId2, seven fruits from four samples in VId3, seven fruits from five samples in VIc, and two fruits from 2 samples in VIb have been documented at Barcın Höyük (Figure 5.119).

[52] https://www.plantatlas.eu/item/classification/1134

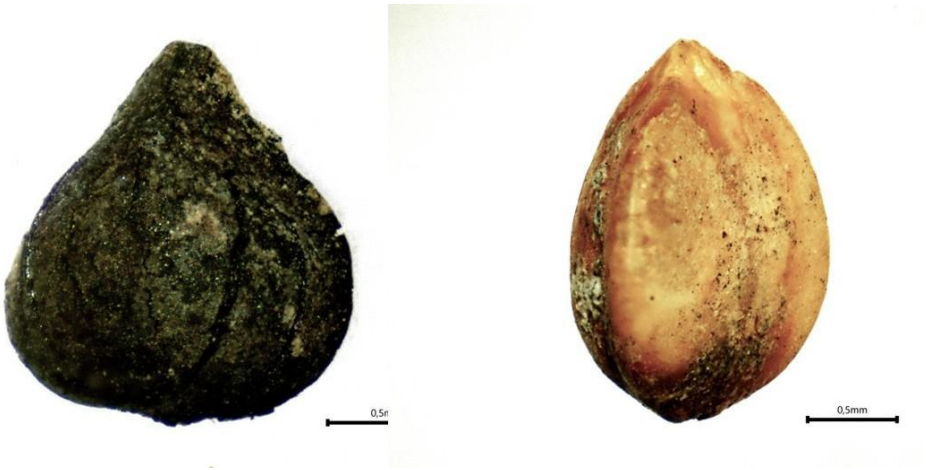


Figure 5.119: Fruits from Polygonaceae family, *Fallopia/Rumex*? (left: BH45634) and *Persicaria maculosa*? (right: BH45640) in Phase VIe at Barcın Höyük (photo: H. Balcı).

One fruit from a courtyard sample (B3, 13/7), which includes a high number of economic plants compared to other samples, in Phase 5, and one fruit from a courtyard (B3, 9/6) in Phase 4b have been recorded at Bahçelievler.



Figure 5.120: Fruit of Polygonaceae family in Phase 7 at Aşağı Pınar (photo: H. Balcı).

24 fruits from Polygonaceae family have been documented from 16 out of 134 samples in Phase 7 at Aşağı Pınar (Figure 5.120). The fruits frequently come from the pits rather than the ditches.

Fallopia sp.

Nine fruits have been documented from a surface, a pyrotechnic feature, a basin bin, and a layer from 4 out of 176 samples in VIe. 36 fruits have been documented mostly from the surfaces and platform benches in 7 out of 194 samples in VId1.

Three fruits of *Fallopia* sp. have also been identified from three samples in VIb at Barcın Höyük (Figure 5.121). One fruit from a layer (BH12400, M10, loc. 213) in VIc and one seed/fruit from a layer (BH7219, L11, loc. 242) in VIb have also been identified as *Fallopia convolvulus* at Barcın Höyük.



Figure 5.121: The fruit of *Fallopia* sp. (BH12667) in Phase VIb at Barcın Höyük (photo: H. Balcı).



Figure 5.122: The fruit of *Fallopia* sp. in Phase 7 at Aşağı Pınar (photo: H. Balcı).

Seven fruits have been recorded in 4 out of 134 samples in Phase 7 at Aşağı Pınar (Figure 5.122). The fruits have been found from ditch H1-1 and pits H1-1e, H2-h. In the samples, there is also a wide variety of weeds and crops.

Persicaria sp.

One perianth of Polygonaceae which probably belongs to genus *Persicaria* has been documented in a post-hole (BH5639, M10, loc. 516) in VIe1 at Barcın Höyük (Figure 5.123).



Figure 5.123: Perianth of *Persicaria* sp. (BH5639) in phase VIe at Barcın Höyük (photo: H. Balcı).

Persicaria cf. maculosa

Only one fruit of *Persicaria* cf. *maculosa* has been identified in VIb at Barcın Höyük (Figure 5.124).



Figure 5.124: The fruit of *Persicaria* cf. *maculosa* (BH11400) in phase VIb at Barcın Höyük (photo: H. Balcı).

Persicaria tinctoria

Five fruits have been identified from a collapse (BH35700, M10, loc. 357) in VId1, and one fruit in VIb at Barcın Höyük.

Polygonum sp.

Only one fruit has been recorded from a basin bin (BH45380, L11, loc. 635) in VIe. 28 fruits have been documented from 7 out of 194 samples in VId1. 18 of the fruits come from a basin bin, which contains a high number of lentils in str 2a (BH36876, L10, loc. 147) in VId1. One fruit in VId2, one fruit in VId3, two fruits from two samples in VIc, one fruit in VIb, and two fruits in EBA II have also been recorded at Barcın Höyük.



Figure 5.125: Fruit of *Polygonum* sp. in Phase 7 at Aşağı Pınar (photo: H. Balcı).

34 fruits have been recorded from 14 out of 134 samples in Phase 7 at Aşağı Pınar (Figure 5.125). The fruits obtained mostly in the ditch H2 together with some other weed species and crop remains as a mixture.

Rumex sp.

16 fruits of *Rumex* sp. have been documented in two samples in VId1 at Barcın Höyük. Four fruits from a collapse (BH35700, M10, loc. 357), and 12 fruits from a platform bench (BH41698, M10, loc. 411) were recorded. Two fruits from a surface (BH11839, L13, loc. 146) in VId2, 21 fruits from 12 out of 108 samples in VIb (Figure 5.126), two fruits from Late Chalcolithic, and one fruit from EBA II have been documented. a pit in VIb (L11, loc. 263, 6

lt) 7 fruits found with fragmented cereals, barley, 50 bitter vetch seeds, *Chenopodium* seeds, *Lithospermum* fruitlets, Poaceae grains.



Figure 5.126: The fruits of *Rumex* sp. (BH7236) in Phase VIb at Barcın Höyük (photo: H. Balcı).

Only one fruit has been recorded in ditch H1-2 (fill F, 6N, unit 147) in Phase 7 at Aşağı Pınar. Four fruits have been recorded in 4 out of 19 samples from ditch H2 (fill B1, tr.8L) in Phase 7 mixed. In these 19 samples, a high number of hulled wheat grains were obtained as a storage value.

5.6.19. Primulaceae

The Primrose (Primulaceae) family plants are generally annual or perennial herbs. The representative type of the family is the genus *Primula* L.. The family is flowering plants and includes over 50 genera and 2700 species.



Figure 5.127: The entire plant of *Androsace maxima*. (a) inflorescence; (b) infructescence (edited by H. Balcı from online source).[53]

[53] https://identify.plantnet.org/tr/k-world-flora/species/Androsace%20maxima%20L./data

The plants are mainly herbaceous and raley suffruticose, flowers are bisexual but the type of flower may change depending on the genus, frequently with bracts, and calyx is usually 4-9 lobed and persistent (Figure 5.127) (Xu et al. 2017, 51).

The flowering period is around May and fructescense around May-June depending on the genus and habitats (Xu et al. 2017, 52). The genera of the family generally prefer wet and moist habitats such as *Androsace* sp., fertile soil conditions but also can tolarate drought and barren conditions. It distributes several areas such as wetlands, mountain slopes, open grassy areas, field margins, etc. (Xu et al. 2017, 55). In the archaeobotanical assemblages, only one member (*Androsace maxima* L.) of this family which is mentioned below was documented at Barcın Höyük (Figure 5.128).

Androsace maxima L.

One fruit has been documented from a layer (BH8471, M11, loc. 106) in VIb at Barcın Höyük (Figure 5.128).



Figure 5.128: A half-fruit piece of *Androsace maxima* (BH8471) in phase VIb at Barcın Höyük (photo: H. Balcı).

5.6.20. Ranunculaceae

The buttercup/crowfoot (Ranunculaceae) family is a flowering plant family and has over 50 genera and 2000 species worldwide (Cappers and Bekker 2013, 229). The family includes

frequently herbaceous annuals, and some genera are perennial plants. There are also some woody climber genera in the family.[54]



Figure 5.129: The leaves and flower of *Adonis aestivalis* (online source).[55]

The type genus of the family is buttercup (*Ranunculus* L.). The family has a wide range of flower morphology, and each flower forms multiple fruits. Three different types of fruits occur as mostly the follicle and the achene, rarely the berry (Cappers and Bekker 2013, 229-230).

In the archaeobotanical assemblages, only the genus *Adonis* has been recorded in later levels of Neolithic Barcın Höyük. The genus *Adonis* has around 20-30 species, and yellow, red, or orange flowers depending on the species, such as *A. aestivalis* and *A. annual* have red/orange, *A. vernalis* has yellow flowers (Figure 5.129). The flowers have around 5-30 petals, the plants sizes are around 10-40 cm, and the leaves are feathery and finely divided.[56] This genus is spreaded in Europe and Asia and grows generally along the field borders. The fruits occur as the achenes, which are located on the moderately elongated receptacle, formed by a single carpel and the achenes include fruitlets, the seeds are inside of the fruitlets (Cappers and Bekker 2013, 230, 233). The fruit/fruitlet parts have been mostly found as subfossils remain in the archaeobotanical samples.

[54] https://en.wikipedia.org/wiki/Ranunculaceae

[55] https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:708056-1

[56] https://en.wikipedia.org/wiki/Adonis_(plant)

Adonis sp.

One fruitlet has been documented from a layer (BH5639, L11, loc. 242) in VIb (Figure 5.115) at Barcın Höyük. This sample contains a wide variety of wild plant species and a group of cereals and pulses.



Figure 5.130: The fruitlets of *Adonis* sp. (left: BH7236) in phase VIe and (right: BH10058) in VIa at Barcın Höyük (photo: H. Balcı).

One fruitlet has been recorded from a pit (BH10058, L12, loc. 169) in VIa (Figure 5.130). In this sample, one cereal grain, one lentil seed, and two Poaceae grains are also documented.

5.6.21. Rosaceae

The rose (Rosaceae) family includes over 80 genera and 3000 species worldwide. The family has both wild and domesticated genera and has different forms of fruits. The fruits occur as follicetum, achenetum, glandetum, drupe, drupetum, pome, and pometum according to genera (Cappers and Bekker 2013, 241). Most of the species are edible but their seeds are not directly consumable because of the amygdalin component when they are damaged. Cherries, plums, peaches, almonds (*Prunus*) and brambles (*Rubus fruticosus* agg.) are the most known genera from this family which are known as economic plants and some of them are documented above (see gathered plants section 5.5).

Two fruits have been recorded from a surface which includes hearth fill (BH44513, L11, loc. 619) in VId1. One fruit from a layer (BH12400, M10, loc. 213) in VIc, and two fruits were

recorded in two samples in phase VIb, one fruit from a surface (BH12678?778, M10, loc. 220), and one fruit from a layer (BH9592, M11, loc. 117) (Figure 5.131).



Figure 5.131: The fruits of Rosaceae family (left: BH9592) and (right: BH12678) in phase VIb at Barcın Höyük (photo: H. Balcı).

Two fruits/endocarps were identified to Rosaceae family from two samples in the ditch H1-1 (fill D, 6L, unit 74; fill D, 6M, unit 114) in Phase 7 at Aşağı Pınar. Both fruits are presented together with some other weed and crop remains.

5.6.22. Rubiaceae

The bedstraw (Rubiaceae) is a family of flowering plants and has over 550 genera and 14000 species.[57] The family is known for mostly tropical plants such as the genus Coffee (Coffea) or genus Madder (*Rubia* L.), which is the family type at the same time.

The plants are herbs, shrubs, or trees depending on the genus (Eriksson and Bremer 1991). The bedstraw (*Galium* L.) genus is an example of an herb. The family has also ornamental plants such as Gardenia.

[57] https://en.wikipedia.org/wiki/Rubiaceae



Figure 5.132: The entire plant -plants with white flowers in front- of *Galium* L. in the cereal field (photo taken by R. Cappers).[58]

In this family, we are familiar with bedstraw (*Galium* sp.) fruits as arable weed which has over 600 species and prefers the temperate regions. The genus has white flowers, climbing, and sticky stem character, and some of the species prefer to grow with the crops in the fields (Figure 5.132). The genus is recorded in all key sites with different quantities in archaeobotanical assemblages.

Galium sp. L.

Bedstraw (*Galium* sp. L.) is one of the most frequent arable weeds at Barcın Höyük, and it is clearly related to pulses crops, especially lentils. The evidence shows that bedstraw appears where the lentil is presented. Bedstraw is an amplectant plant and spreads by clinging to the lentil plant in the field. This ensures that the plant is carried to the settlement with the harvest (Figure 5.117). This is the case for many arable weeds. On the other hand, the arable weed species obtained may vary depending on the size of the crop and the size from which it is harvested. Although the wild plant fruits/seeds that come to the site with the crops are sifted, those of similar size to the crop are mixed into the crops to a certain extent. We usually come

[58] https://www.plantatlas.eu/item/Photo/92469

across more species in this way, such as with cereals and pulses or as trash by the sieving in an archaeobotanical assemblage. Today, the relationship between lentils and bedstraw is still identical.



Figure 5.133: The fruits of *Galium* sp. (BH36876) in Phase VId1 at Barcın Höyük (photo: H. Balcı).



Figure 5.134: The fruits of *Galium* sp. (BH7214) in Phase VIb at Barcın Höyük (photo: H. Balcı).

At Barcın Höyük, only four fruitlets have been recorded from two samples in VIe. In VIe, the pulses seeds have less evidence either. 2 fruits from a layer (BH37046, M11, loc. 403) and two fruitlets from a pyrotechnic feature (BH45111, M11, loc. 690) have been documented.

309 fruitlets of bedstraw have been recorded in 10 out of 194 samples in VId1. In this phase, 281 out of 309 fruitlets come from a lentil storage context, which counted around 30.000 lentils in structure 2a (L10, loc. 185, 147). The rest of the remains come from several surfaces, platform benches around 1-3 fruitlets in general, except 21 fruitlets, which were recorded in a platform bench with some other weeds (BH40529, M10, loc. 261) (Figure 5.133).

After VId1, only half of the fruitlet from a surface (BH41643, L12, loc. 461) in VId2, one fruitlet from a surface (BH39655, L12, loc. 427) in VId3, three fruitlets from a pyrotechnic feature, basin bin, and a layer in VIc, six fruitlets from layers in 3 samples in VIb have been documented at Barcın Höyük (Figure 5.134).



Figure 5.135: The fruits of *Galium* sp. (14N-12.8) at Hoca Çeşme (photo: H. Balcı).



Figure 5.136: The fruits of *Galium* sp. in Phase 7 at Aşağı Pınar (photo: H. Balcı).

Nine bedstraw fruits have been documented at Bahçelievler. Three fruits from a courtyard (B3, 13/3; B3, 15/8) in Phase 5, 5 fruits from a courtyard and inside of the structure (B3, 9/6; B4, 15/1) in Phase 4, and 1 fruit from inside of the structure (B4, 4/5) in Phase 3 were identified in the site.

Two fruits of bedstraw have been documented in two samples at Hoca Çeşme. One fruit is in an unknown context (17M, 7.23, 2-3/D-E), which contains many einkorn/emmer rachis nodes and a small number of pulses (Figure 5.135).

Seventy-five fruits of bedstraw have been recorded in 19 out of 134 samples in Phase 7 at Aşağı Pınar (Figure 5.136). The fruits were obtained from the ditches H1-1, H1-2, and H2 and the pits H2-a, H2-c, H2-t, and H2-v at the site. A similar situation of bedstraw with pulses, which is mentioned above, is in force at Aşağı Pınar.

5.6.23. Solanaceae

The Nightshade (Solanaceae) family includes over 90 genera and 2400 species. The family name comes from the genus Nightshades (Solanum), but it is also known as Lycopersicon, which represents the varied Tomato species (Cappers and Bekker 2013, 255). Lycopene is also a carotenoid-containing substance with antioxidant properties that gives vegetables and fruits such as tomatoes, red peppers, and watermelon their red color.



Figure 5.137: The fruit (capsule) and seeds of *Datura stramonium* (online source).[59]

[59] https://www.plantatlas.eu/item/classification/515

The fruits mostly include two carpels and also three to five depending on the genus, and they show a variety of shapes and types. For example, most of the fruits are juicy, and some of them can be dryer, but the fruit of the Datura genus is in the form of a spiny 2-loculated capsule that opens to four valves (Figure 5.137) (see Cappers and Bekker 2013, 255).

Datura cf. stramonium

There is a *Datura stramonium* photo taken by R. Cappers in Yenişehir that it is shared in the Digital Plant Atlas website. In the photo, we see *Datura* as a weed among bean crops in the field (Figure 5.138).



Figure 5.138: The entire plant *Datura stramonium* within bean plants in the field from Yenişehir, Bursa (Photo taken by R. Cappers, online source).[60]

Barcın Höyük is located in the middle of fields in the Yenişehir plain, Bursa. Both the surroundings of the mound and its top, before the mound was excavated, were used as farming fields where sunflowers and beans were grown in rotation. Considering that *Datura* seeds only came from a Bronze Age pit, it is highly probable that they were transported as common remains a little earlier than today, even if they were charred.

[60] https://www.plantatlas.eu/item/Photo/95399



Figure 5.139: Two seeds of *Datura* (BH2031) in EBA II at Barcın Höyük (photo: H. Balcı).

The remains from this family have been recorded only in Barcın Höyük in the archaeobotanical assemblages. Two seeds of *Datura* have been identified in a pit (BH2031, M10, loc. 54) in EBA II at Barcın Höyük, which could be recent and could have been moved by an insect (Figure 5.139).

cf. Solanum

Only one seed has been documented with 290 fruits of *Chenopodium* on a surface (BH11894, M10, loc. 208) in VIc at Barcın Höyük.

Solanum cf. nigrum

Three seeds (probably recent) have been documented in a pyrotechnic feature (BH38221, L12, loc. 409) in VId3 at Barcın Höyük (Figure 5.140). In this sample, both subfossil remains are known from many other contexts, and some species are probably recent and might have been brought by insects or rodents. Three seeds (recent) in VIc and one seed (recent) in VIb have also been documented.



Figure 5.140: Two seeds of *Solanum nigrum* (BH8039) in E/M Bronze Age at Barcın Höyük (photo: H. Balcı).

5.6.24. Thymelaeaceae

The sweet gonna/pink featherhead (Thymelaeaceae) is a cosmopolitan family of flowering plants and has 50 genera and over 890 species. The family type is the genus *Thymelaea* (includes 31 species) (Marmouzi et al. 2021, 175). The family members are generally shrubs, vines, herbs, or trees. The representative genus *Thymelaea* consists of shrubs and herbs. This genus is mostly common in the Mediterranean region (Marmouzi et al. 2021, 175).



Figure 5.141: The fruit of Thymelaeaceae (BH44937) in VIe at Barcın Höyük (photo: H. Balcı).

Three fruits have been documented from 3 out of 176 samples in VIe (Figure 5.141). One fruit from a layer (BH44937, M10, loc. 500), one fruit from another layer (BH44683, L10, loc.355), and one fruit from a pyrotechnic feature (BH34902, M11, loc. 430) have been recorded.



Figure 5.142: The fruit of Thymelaeaceae (BH2031) in EBA II at Barcın Höyük (photo: H. Balcı).

Two fruits have been documented in VIb. One from a layer (BH11515, M10, loc. 144) and one from a layer (BH5639, L11, loc. 242) have been documented. One fruit from the Thymeleaeceae family from a pit (BH2031, M10, loc. 54) in EBA II (Figure 5.142).



Figure 5.143: The fruit of Thymelaeaceae in Phase 7 at Aşağı Pınar (photo: H. Balcı).

Only one fruit was identified in one sample from the ditch H1-1 (fill D, 6L, unit 74) in Layer 7 at Aşağı Pınar (Figure 5.143). The sample contains a kind of trash by the crops.

5.7. Unidentified plant remains in the assemblages

5.7.1. Barcın Höyük



Figure 5.144: Unidentified seeds/fruits from Poaceae / Rosaceae (BH45523) in Phase VIe at Barcın Höyük (photo: H. Balcı).



Figure 5.145: Unidentified possible straw nodes/fragments (BH46515) in Phase VId1 at Barcın Höyük (photo: H. Balcı).

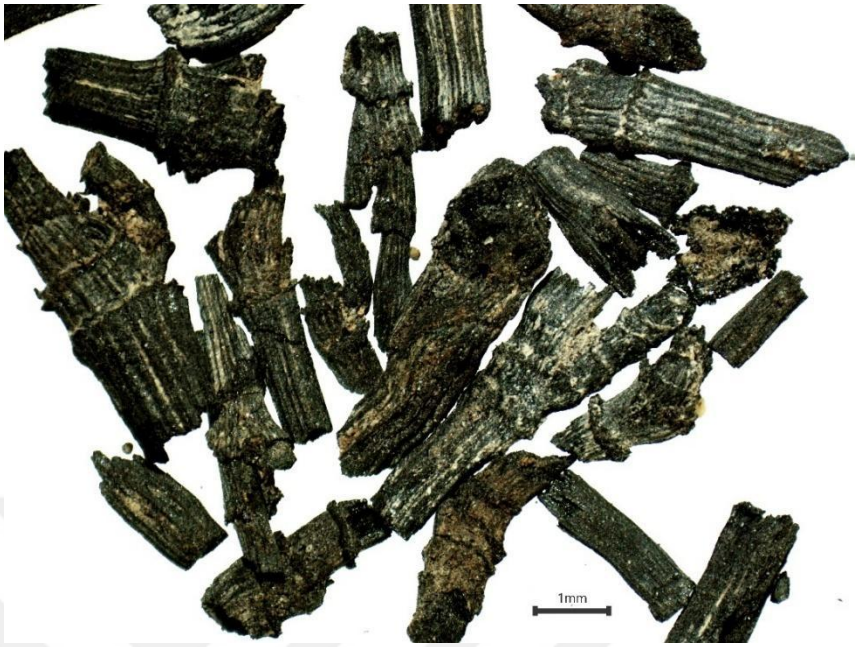


Figure 5.146: Unidentified culms from Poaceae (BH42637) in Phase VId1 at Barcın Höyük (photo: H. Balcı).

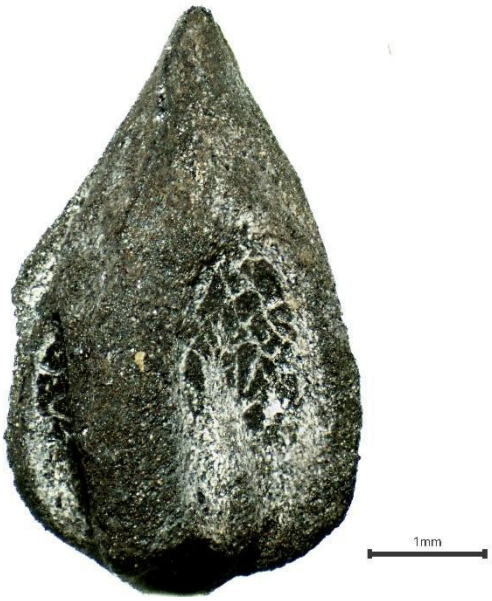


Figure 5.147: Unidentified seed/fruit (BH38876) in Phase VId1 at Barcın Höyük (photo: H. Balcı).



Figure 5.148: Unidentified seed/fruit (BH41246) in Phase VId1 at Barcın Höyük (photo: H. Balcı).



Figure 5.149: Compact organic remains/prepared food (BH34902, pyrotechnic feature) in Phase VIe at Barcın Höyük (photo: H. Balcı).



Figure 5.150: Unidentified plant part (BH45758) in Phase VIe at Barcın Höyük (photo: H. Balcı).

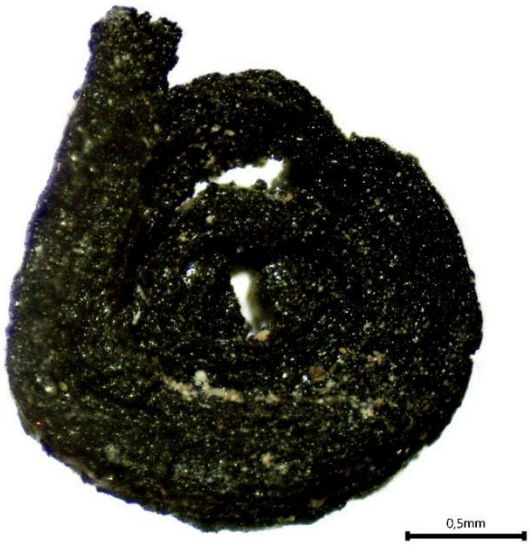


Figure 5.151: Unidentified plant part (BH45906) in Phase VIe at Barcın Höyük (photo: H. Balcı).



Figure 5.152: Unidentified fruit/fruitlet, Boraginaceae? (BH45640) in Phase VIe at Barcın Höyük (photo: H. Balcı).

5.7.2. Bahçelievler



Figure 5.153: Unidentified hulled Poaceae grain, *Hordeum*? (B3-9.6) in Phase 4b at Bahçelievler (photo: H. Balcı).



Figure 5.154: Unidentified Poaceae rachis? at Bahçelievler (photo: H. Balcı).



Figure 5.155: Unidentified fruit from Polygonaceae? (B3-66.1) in Phase 4b at Bahçelievler (photo: H. Balcı).

Aşağı Pınar



Figure 5.156: Unidentified fruits/fruitlets (Type 1, 6M-134) in Phase 7 at Aşağı Pınar (photo: H. Balcı).



Figure 5.157: Unidentified fruit (Poaceae/Asteraceae) (6M, 115.67) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

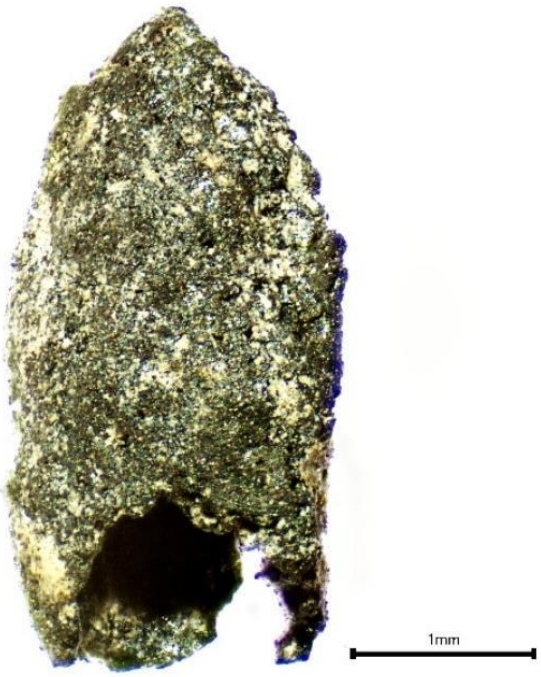


Figure 5.158: Unidentified seed (*Linum* cf. *bienne*?) (6M, 117.43) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

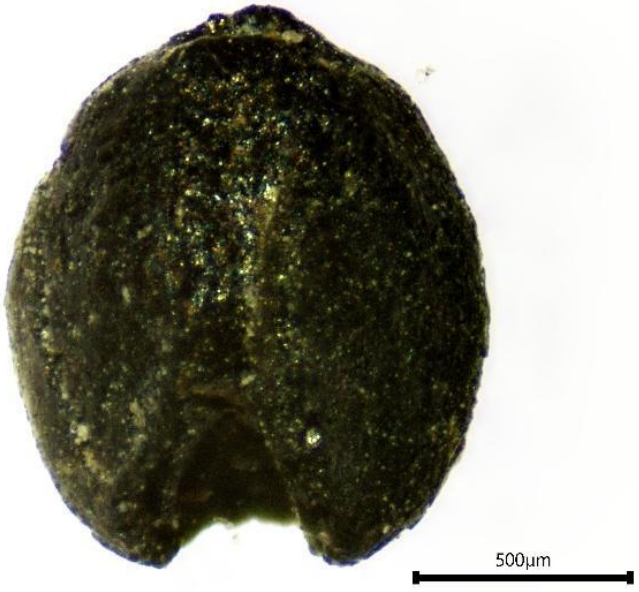


Figure 5.159: Unidentified fruit/floret (*Setaria/Eragrostis*?, 6M, 134.39) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

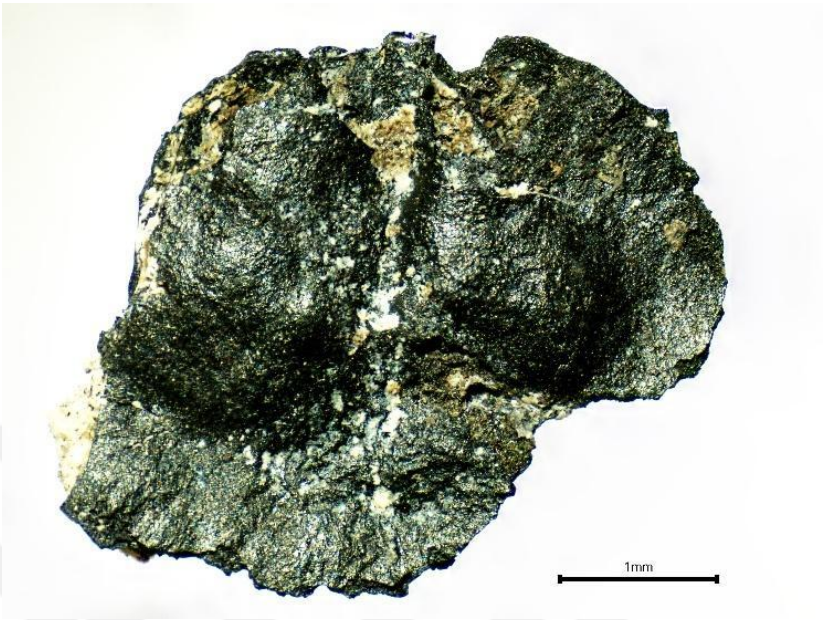


Figure 5.160: Unidentified perianth/fruit (Rosaceae?, 6L, 74) in Phase 7 at Aşağı Pınar (photo: H. Balcı).



Figure 5.161: Unidentified awn pieces (*Avena*?, 6L, 74) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

5.8. Other remains

Barcın Höyük



Figure 5.162: Goat or sheep dung (BH41698, M10, loc. 411, platform) in Phase VId1 at Barcın Höyük (photo: H. Balcı).



Figure 5.163: Mineralized goat or sheep dung/seed? (BH42523, M11, loc. 507, wall) in Phase VId1 at Barcın Höyük (photo: H. Balcı).



Figure 5.164: Compact organic remains (BH46271, L10, loc. 443, layer) in Phase VIe at Barcın Höyük (photo: H. Balcı).



Figure 5.165: Fungal spores (?) (BH45913, exploratory_locus_sounding) in Phase VIe at Barcın Höyük (photo: H. Balcı).



Figure 5.166: Compact organic remains/phytolith? (C2-22.3, indoor) in Phase 6 at Bahçelievler (photo: H. Balcı).

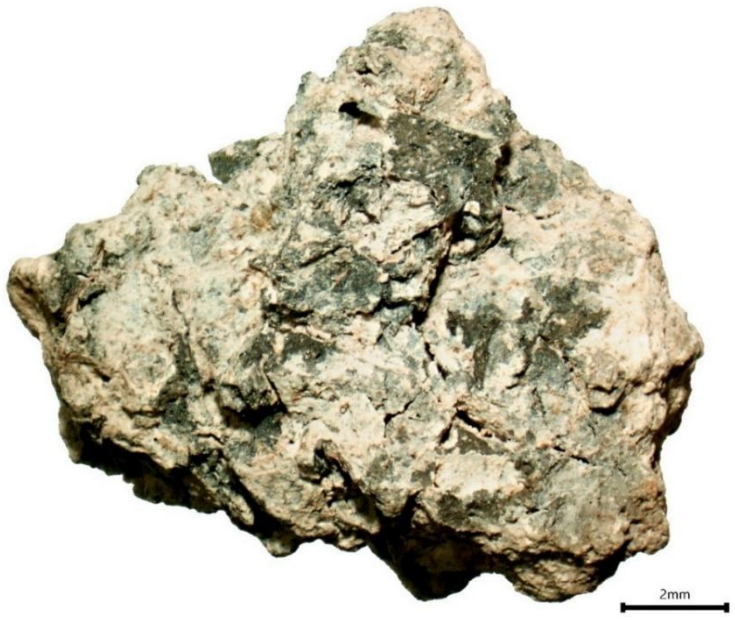


Figure 5.167: Compact organic remains/phytolith? (B3-59.2, indoor) in Phase 6 at Bahçelievler (photo: H. Balcı).



Figure 5.168: Compact organic remains/phytolith? (C3-34.7, inside door area) in Phase 6 at Bahçelievler (photo: H. Balcı).

Aşağı Pınar



Figure 5.169: Unidentified remain (6M, 117.43) in Phase 7 at Aşağı Pınar (photo: H. Balcı).



Figure 5.170: Unidentified remain (insect feces?, 6N, 121.55) in Phase 7 at Aşağı Pınar (photo: H. Balcı).



Figure 5.171: Small bones (rodent/mice?, 6M, 134.39) in Phase 7 at Aşağı Pınar (photo: H. Balcı).



Figure 5.172: Spinal bone (fish?), 6M, 134.39) in Phase 7 at Aşağı Pınar (photo: H. Balcı).

5.9. Summary of Archaeobotanical Assemblages of Key Sites

One of the questions of this research was about understanding the spread of the Neolithic in each of the four case-sites based on botanical data. Do the plant selection criteria change between the earliest pioneer Neolithic communities and those generations later who live in this context? The last question is evaluated in the upcoming chapters but the obtained botanical data, mentioned in detail in this chapter provide good knowledge about the crop plant selection, changing the taxa between Neolithic phases in the region during 7th millennium and late 6th millennium BC. At present, it is possible to talk about a broad-spectrum plant-based diet and an ecological niche diversity through the plant range in the case-sites.

5.9.1. Barcın Höyük

In Barcın Höyük assemblage, the most dominant species among economic plant categories are obtained from cereal and pulse groups according to absolute counting (see Tables 5.3, 5.4). Along with that, a wide-variety of wild plants have been also documented (see Tables 5.5, 5.6).

Table 5.3: Summarized of plant groups per phase at Barcın Höyük.

Plant groups	**Barcın Höyük**							
	VIe	VId1	VId2	VId3	VIc	VIb	VIc	**Total**
Cereal grains	960	3149	578	104	201	550	8	**5550**
Cereal by-product	832	708	9	7	14	127	0	**1697**
Pulses	21	28350	26	188	24	177	7	**28793**
Flax	6	29	2	0	5	0	0	**42**
Gathered Plants	3	16	1	136	2	1	0	**159**
Wild Plants	395	1952	32	73	472	161	3	**3088**
Total	**2217**	**34204**	**648**	**508**	**718**	**1016**	**18**	**39329**

Table 5.4: The summarized list of documented economic plants per phase at Barcın Höyük.

Barcın Höyük	**Period**	**Late Neolithic (6600-6000 cal. BC)**							**Chalcolithic - Bronze Age**			
The presence of economic plant remains per phase	**Phases**	**VIe**	**VId1**	**VId2**	**VId3**	**VIc**	**VIb**	**VIa**	**MC**	**LC**	**EBA II**	
	Samples	176	194	39	44	63	108	7	5	4	8	
	Liter of soil	449	614	107	104	174	275	23	17	21	35	**Total**
Plant names	**Plant parts**											
6-row Barley	floret-fruit	65	210	19	16	17	28	1	1	2	5	**364**
6-row Barley	rachis nodes	-	11	-	-	-	4	-	-	-	-	**15**
Einkorn	fruit	67	148	9	6	3	7	-	1	1	3	**245**
Emmer	fruit	119	324	144	7	10	46		2	7	25	**684**
Einkorn/Emmer	rachis nodes	829	691	9	7	14	121	-	-	2	130	**1803**
Bread/hard wh.	fruit	32	357	39	5	18	38	-	2	1	19	**511**
Bread/hard wh.	rachis nodes	3	5	-	-	-	2	-	-	-	-	**10**
naked wheat*	fruit	25	50	-	-	-	-	-	-	-	-	**75**
Indet wheat	fruit	8	41	7	1	5	9	1	-	-	14	**86**
Indet wheat	rachis nodes	16	13	-	-	-	2	-	-	-	-	**31**
Barley/Wheat**	fruit	652	2061	367	69	153	332	6	9	20	93	**3762**
Bitter vetch	seed	8	89	13	33	11	153	1	-		15	**323**
Chickpea	seed	-	7	-	-	1	2	-	-	-	-	**10**
Faba bean	seed	-	-	-	-	1	-	-	-	-	1	**2**
Grass pea	seed	-	-	-	-	-	-	-	-	3?	-	**3**
Lentil	seed	9	28160*	10	107	3	17	4	-	8	10	**28328**
Pea	seed	1	14		5	2	1	-	-	-	-	**23**
Pulses indet	seed (fragm.)	3	62	3	43	6	4	2	-	-	-	**123**
Flax	seed	6	29	2	-	5	-	-	-	1	-	**43**
Acorn	seed	-	-	-	2?	-	-	-	-	-	-	**2**
Bramble	fruitlet	-	0.5	-	1	1	-	-	-	-	-	**3**
Fig	fruit	-	-	-	-	-	3	-	-	-	1	**4**
Hazelnut	fruit	2.2	15	1	133	0.2	1	-	-	-	-	**152**

Table 5.5: The summarized list of documented wild plants per phase at Barcın Höyük.

Barcın Höyük	**Period**	**Late Neolithic (6600-6000 cal. BC)**							**Chalcolithic and Bronze Age**			
The presence of wild plant remains per phase	**Phases**	**VIe**	**VId1**	**VId2**	**VId3**	**VIc**	**VIb**	**VIa**	**MC**	**LC**	**BA**	
	Samples	176	194	39	44	63	108	7	5	4	13	
	Liter of soil	449	614	107	104	174	275	23	17	21	57	**Total**
Plant names	**Plant parts**											
Amaranthaceae	fruit/seed	-	-	-	-	1	5	-	1r	-	2	**8**
Amaranthus sp.	fruit/seed	6	42	1	1	4	6	-	-	-	2	**62**
Chenopodium cf. *album*	fruit/seed	95	121	9	18	396	24	-	1	-	-	**664**
Chenopodium cf. *polyspermum*	fruit	-	-	-	-	-	8	-	-	-	2	**10**
Asteraceae	fruit/seed	-	30?	-	-	-	-	-	-	-	-	**30**
Apiaceae	fruitlet	-	-	-	-	-	1	-	-	-	-	**1**
Aethusa cynapium	fruitlet	-	-	-	6r?	-	-	-	-	-	-	**6**
Boraginaceae	fruitlet	1	12	2	2	5	2	-	-	-	-	**24**
Echium vulgare	fruitlet	6	13	1	3	16	3	-	-	-	-	**42**
Heliotropium sp.	fruitlet	-	-	-	-	1	11	-	-	7	-	**12**
Lithospermum arvense	fruitlet	-	152	-	2	24	6	-	-	-	-	**184**
Lithospermum tenuiflorum	fruitlet	-	-	-	-	-	4	-	-	-	3	**7**
Brassicaceae	seed	24	5	1	-	-	-	-	-	-	-	**30**
cf. *Cephalaria*	fruit/seed	3	-	-	-	1	-	-	-	-	-	**4**
cf. *Silene*	seed	1	-	-	-	-	-	-	-	-	-	**1**
Spergula arvensis	seed	-	-	-	-	-	1	-	-	-	-	**1**
Stellaria media	seed	-	-	-	-	-	1	-	-	-	1	**2**
Convolvulus sp.	seed	-	222	-	2	-	-	-	-	-	-	**224**
Cyperaceae	fruit	-	1	-	2	-	3	-	-	-	-	**6**
Bolboschoenus cf. *glaucus*	fruit	-	11	-	-	-	8	-	-	-	-	**19**
Bolboschoemum cf. *maritimus*	fruit	-	-	-	2	-	1	-	2	-	-	**5**
Carex sp.	fruit	-	4	-	-	-	-	-	-	-	-	**4**
Carex cf. *divulsa*	fruit	-	29	-	-	-	-	-	-	-	-	**29**
Cypreus cf.	fruit	-	1	-	-	-	-	-	-	-	-	**1**
Chrozophora tinctoria	fruit	-	-	-	-	2	-	-	-	-	-	**2**
Astragalus sp.		-	-	-	-	-	-	-	-	-	3	**3**
Hippocrepis sp.	fruitlet	-	-	1	-	-	1	-	-	-	-	**2**
Medicago sp.	fruit	-	-	2	-	-	1	-	-	-	-	**3**
Onobrychis sp.	fruit	-	-	-	-	-	1	-	-	-	-	**1**

Table 5.6: The summarized list of documented wild plants per phase at Barcın Höyük (continued).

Barcın Höyük	**Period**	**Late Neolithic (6600-6000 cal. BC)**							**Chalcolithic and Bronze Age**			
The presence of wild plant remains per phase (continued)	**Phases**	**VIe**	**VId1**	**VId2**	**VId3**	**VIc**	**VIb**	**VIa**	**MC**	**LC**	**BA**	
	Samples	176	194	39	44	63	108	7	5	4	13	
	Liter of soil	449	614	107	104	174	275	23	17	21	57	**Total**
Plant names	**Plant parts**											
Geranium sp.	seed	-	1	-	-	-	-	-	-	-	-	**1**
Nepeta cf. *Ocimum*	fruitlet	-	137	-	-	-	-	-	-	-	-	**137**
Malva sp.	fruitlet	-	20	-	-	-	-	-	-	-	-	**20**
Fumaria densiflora	fruit	-	-	-	2r	-	-	-	-	-	1r	**2**
Fumaria officinalis	fruit	2r	-	4r	22r	-	2r	-	-	-	1r	**31**
Papaver sp.		-	-	-	-	-	-	-	-	-	1	**1**
Poaceae	fruit/floret	117	210	1	2	3	11	2	-	-	2	**347**
Aegilops	fruit/floret	-	4	-	-	-	-	-	-	-	-	**4**
Bromus sp.	fruit	-	-	-	-	-	1	-	-	-	-	**1**
Hordeum spontan.	floret	56	390	1	6	4	11	-	-	-	-	**468**
cf. *Lolium*	fruit	-	-	-	-	-	5	-	-	-	-	**5**
Phalaris sp.	fruit/seed	-	2	-	-	-	1	-	-	-	3	**6**
Setaria pumila	floret/fruit	62	1	-	1	-	-	-	-	-	-	**64**
Polygonaceae	fruit	5	58	5	7	7	2	-	-	-	-	**84**
Fallopia sp.	fruit	9	36	-	-	-	3	-	-	-	-	**48**
Fallopia convolv.	fruit	-	-	-	-	1	1	-	-	-	-	**2**
Persicaria cf. *maculosa*	fruit	-	-	-	-	-	1	-	-	-	-	**1**
Persicaria tinctoria	fruit	-	5	-	-	-	1	-	-	-	-	**6**
Polygonum sp.	fruit	1	28	1	1	2	1	-	-	-	-	**34**
Rumex sp.	fruit	-	16	2	-	-	21	-	-	-	-	**39**
Androsace maxima	fruit	-	-	-	-	-	1	-	-	-	-	**1**
Adonis sp.	fruitlet	-	-	-	-	-	1	1	-	-	-	**2**
Rosaceae	fruit		2			1	2	-	-	-	-	**5**
Galium sp.	fruitlet	4	309	1	1	3	6	-	-	-	-	**324**
Datura cf. *stramonium*	seed	-	-	-	-	-	-	-	-	-	2	**2**
cf. *Solanum*	seed	-	-	-	-	1	-	-	-	-	-	**1**
Solanum cf. *nigrum*	seed	-	-	-	3r?	3r?	1r?	-	-	-	-	**7**
Thymelaeaceae	fruit	3	-	-	-	-	2	-	-	-	1	**6**
Total		**2240**	**34149**	**655**	**518**	**475**	**931**	**18**	**19**	**52**	**340**	**39397**

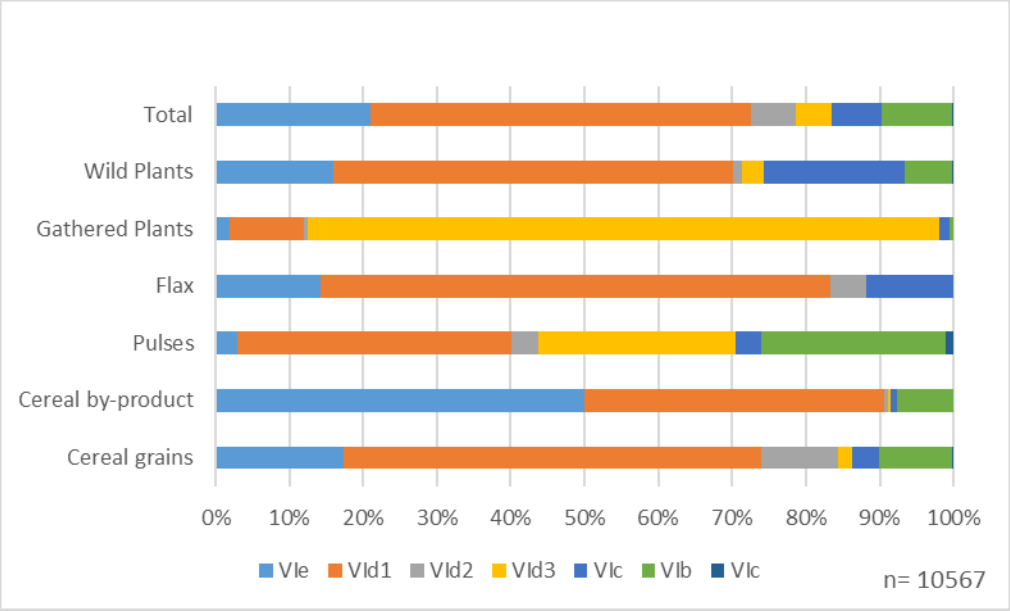


Figure 5.173: The quantity of plant groups per phase at Barcın Höyük.[61]

Based on absolute counts of the plant groups in total per phase show that Phase VId1 provides the largest dataset in the assemblage between the Neolithic phases at Barcın Höyük (Figure 5.173). Although the well-burnt preserved contexts of Phase VId1, especially the frequency of hulled wheat by-product decrease and cereal grains increase in Phase VId1 compared to Phase VIe. The intensity of plant remains per liter is discussed in Chapter 6 in detail. Pulses show increase in Phases VId1, VId3, and VIb skipping one phase at a time. After Phase VId1, hulled wheat by-product show increase in Phase VIb again. Gathered plants show abundance in VId3 because of the quantity of hazelnut shells. Overall, the plant range represents a stable continuity during the Neolithic but there are some changes in the crop ratios and additions which are discussed in Chapter 6 and Chapter 9.

[61] Two samples from burnt levels of VId1 are not included in the calculation (n=28762) : BH36852 (L10, loc. 185, 3.25 lt, str 2a, burnt collapse) includes 29 cereal remains -15 RN, 14 grains-, 8002 pulses, 161 wild plants; BH36876 (L10, loc. 147, 5.5 lt, str 2a, basin bin) includes 35 cereals -20 grains, 15 RN-, 20086 pulses, 449 wild plants that the storage value causes a deviation.

5.9.2. Bahçelievler

The obtained data is poorer because of many reasons (see Chapter 4.1.1.), even so, Phases 7, 6, and 5 provide some information about the crop range compared to wild plant taxa (see Tables 5.7, 5.8). The abundance of bread/hard wheat grains, lentil seeds, and terebinth shells in the recovered data demonstrate a concentration of some economic plants but it is difficult to interpret the selection criteria based on the little data available. Nonetheless, the possible crop ratios are discussed in Chapter 9 in detail.

Table 5.7: Summary of plant groups per phase at Bahçelievler.

Plant groups	Bahçelievler							
	8	7	6	5	4	3	2	Total
Cereal grains	3	24	107	154	19	2	10	**319**
Cereal by-product	0	0	0	4	0	0	0	**4**
Pulses	0	12	14	2	1	1	4	**34**
Gathered plants	0	1	7	111	2	1	0	**122**
Wild plants	9	24	2	13	13	6	0	**67**
Total	**12**	**61**	**130**	**284**	**35**	**10**	**14**	**546**

Table 5.8: The summarized list of documented economic plants per phase at Bahçelievler.

Bahçelievler	**Period**	**Late Neolithic (7000/6600-6000 cal. BC)**								
The presence of plant remains per phase	**Phases**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**Unknown**	
	Samples	10	20	42	26	14	8	11	13	
	Liter of soil	40	84	242	118	58	30	42	71	**Total**
Plant names	**Plant parts**									
6/2 row Barley	floret	-	-	2	3	-	-	-	-	**5**
6/2 row Barley	floret/fruit	-	1	1	2	1	-	-	2	**7**
Einkorn	fruit	-	-	1	1	-	-	-	-	**2**
Emmer	fruit	1	-	9	5	-	-	-	2	**17**
Einkorn/Emmer	rachis nodes	-	-	-	4	-	-	1	-	**5**
Bread/hard wheat	fruit	-	-	10	19	4	-	-	3	**36**
Bread/hard wheat	rachis nodes	-	-	-	-	-	-	-	-	**0**
Indet wheat	fruit	1	5	-	-	-	-	-	-	**6**
Barley/Wheat	fruit	1.3	18	84	124	14	2.1	9	21	**273**
Bitter vetch	seed	-	-	2	-	-	1	1	-	**4**
Lentil	seed	-	11	10	2	1	-	1	-	**25**
Pulses indet	seed	-	1	2	-	-	-	2	-	**5**
Acorn	seed	-	-	0.3	-	-	0.4	-	-	**0.7**
Grape	seed	-	-	-	2?	-	-	-	-	**2**
Hazelnut	fruit	-	0.3	0.8	0.7	-	-	-	-	**2**
Hackberry	fruit	-	-	0.3	-	-	-	-	-	**0.3**
Pistacia/terebinth	fruit	-	-	5	109	2	-	-	-	**116**
Nuts indet	seed/fruit	-	-	0.5	-	0.2	1	-	-	**2**
Amaranthaceae	fruit/seed	-	-		1	-	-	-	-	**1**
Amaranthus sp.	fruit/seed	-		-		1	-	-	-	**1**
Atriplex sp.	fruit/seed	-	-	1r?	4r?	1r?	4r?	-	-	**10**
Chenopodium cf. *album*	fruit/seed	8	23	-	6	5	4	-	-	**46**
Asteraceae	fruit/seed	-	-	-	1	-	-	-	-	**1**
Boraginaceae	fruitlet	-	-	-	-	-	1	-	-	**1**
Brassicaceae	seed	-	-	-	-	1	-	-	-	**1**
Caryophyllaceae	seed	-	-	-	1	-	-	-	-	**1**
Malvaceae	fruitlet	1	1	-	-	-	-	-	-	**2**
Poaceae	fruit/floret	-	-	2	-	-	-	-	-	**2**
Polygonaceae	fruit	-	-	-	1	1	-	-	-	**2**
Galium sp.	fruitlet	-	-	-	3	5	1	-	-	**9**
	Total	**12**	**60**	**131**	**289**	**36**	**14**	**14**	**28**	**585**

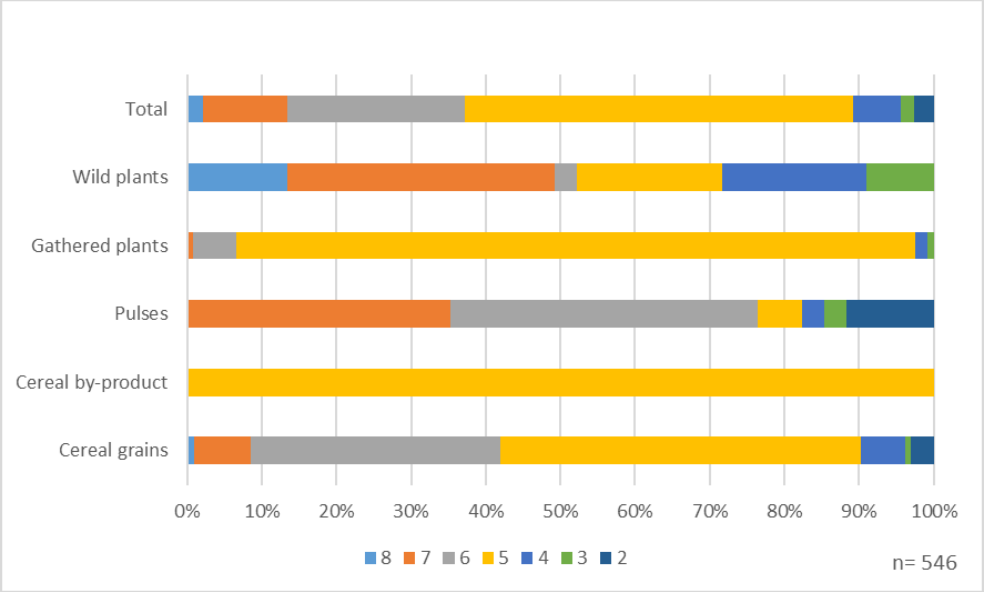


Figure 5.174: The quantity of plant groups per phase at Bahçelievler.

Pulses and wild plants (dominance of *Chenopodium* sp., see Table 5.x) and pulses show abundance in Phase 7, pulses and cereal grains in Phase 6, the quantity of cereal grains and gathered plants show a dominance in Phase 5 (Figure 5.174). The quantity of the remains decreases in the latest Phases 3 and 2. Overall, the recovered data helps answer some questions, which are discussed in Chapters 7, 9, and 10, about human-plant relations despite the poor preservation of plant remains.

5.9.3. Hoca Çeşme

Hoca Çeşme, the identified species are six-row naked barley, bread/hard wheat, einkorn, emmer, lentil, and pea as economic plants. The wild plant taxa are poor, depending on the samples investigated (Table 5.9).

Table 5.9: Summarized of plant groups in per phase at Hoca Çeşme.

Hoca Çeşme	
Plant groups	
Cereal grains	3087
Cereal by-product	413
Pulses	118
Gathered plants	3
Wild plants	164
Total	**3748**

Unlike the other case-sites, I documented naked barley in Hoca Çeşme. Especially, I had a chance to identify a wide-range of crop plant types despite the restricted sample size (see Table 5.10).

Table 5.10: The summarized list of documented economic plants per phase at Hoca Çeşme.

Hoca Çeşme IV-III	**Period**	**Late Neolithic (6400-6200/6000 BC)**													
The presence of plant remains	**Trench**	15M	15M	15M	15N	15N	17M	14N	16N	16M	13N	17N	14N	14N	
	Unit	2.11	1.7	3.13	5.33	5.32	7.23	4.18	17.58	12.43	3.26	5.36	2.8	4.20	
	Context	hearth	pit		surf.	surf.		pit		pit		pit		pit	
Plant names	**Plant parts**														**Total**
6-row Barley	fruit	572					2						1		**575**
6-row Barley	rachis n.	15													**15**
Einkorn	fruit	1?				13									**14**
Emmer	fruit	4?				2?			2	2					**10**
Einkorn/Emmer	rachis n.					257	67		3	12	12				**351**
Einkorn/Emmer	glume pie.					36									**36**
Bread/hard wheat	fruit	471		1									3		**472**
Bread/hard wheat	rachis n.					10								1	**11**
Barley/Wheat	fruit	1983	1	8	2		3	5			3			8	**2016**
Lentil	seed	37	2	3				1		2			1	1	**47**
Pea	seed	42					6	9							**57**
Lentil / pea	seed	12					2								**14**
Plum / almond	fruit / seed							1							**1**
Indet nutshell	fruit / seed														**2**
Chenopodium sp.	fruit / seed		1	1						1					**3**
Echium vulgare	fruitlet	16													**16**
Lithospermum sp.	fruitlet												2		**2**
Brassicaceae	seed													37?	**37**
Malvaceae	fruitlet	10											2		**4**
Poaceae	fruit/floret					4								2	**6**
Galium sp.	fruitlet						1						1		**2**
Unidentified	fruit / seed	37				2	9		8	17	16		5		**94**
	Total	**3194**	**4**	**13**	**2**	**324**	**90**	**16**	**13**	**34**	**31**	**0**	**15**	**12**	**3748**

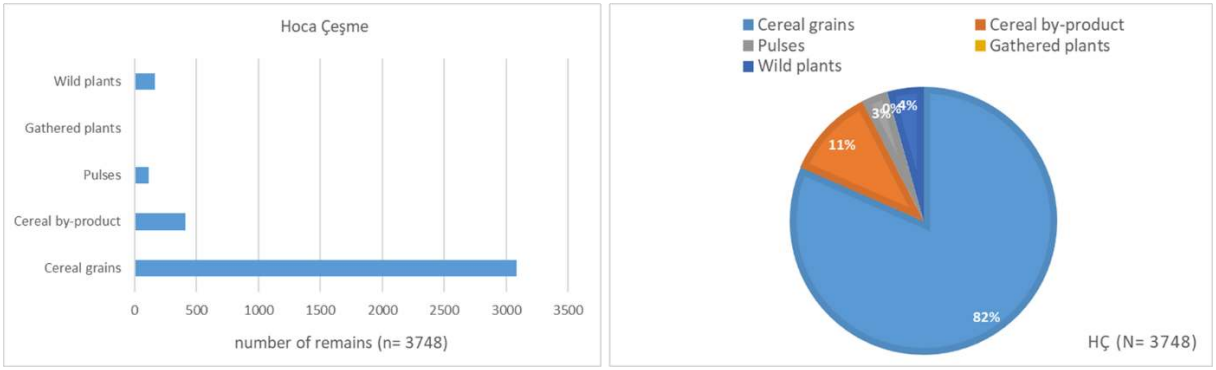


Figure 5.175: The quantity of plant groups per phase at Hoca Çeşme.

Cereal grains (6-row naked barley and bread/hard wheat) show abundance in the samples especially from a context 'hearth' like pyrotechnic feature (Table 5.10, Figure 5.175).

Einkorn and emmer wheat appear especially rachis node remains compared to grains (Table 5.10). In pulses, pea and lentil remains are also presented in good condition. The narrow wild plant taxa can show a fine-sieved product strategy at the site but it is difficult to propose such an idea with the small number of samples without any storage context.

5.9.4. Aşağı Pınar

Archaeobotanical samples indicates a broad spectrum of plant data at Phase 7 in Aşağı Pınar. The cereal species are the most abundant group of economic plants in quantity, and pulse species are the second most abundant group according to the quantity of plant remains (Tables 5.11, 5.12).

Table 5.11: Summarized of plant groups in per phase at Aşağı Pınar.

Aşağı Pınar 7	
Plant groups	
Cereal grains	8251
Cereal by-product	1003
Pulses	1153
Gathered plants	19
Wild plants	882
Total	**11308**

Among the cereals, hulled six-row barley, possible two-row barley, einkorn wheat, emmer wheat, and bread/hard wheat are the most common types. Among the pulses, lentil, grass pea, pea, bitter vetch, and chickpea have been documented. Lentil and grass pea are relatively more common. Among gathered plants, bramble as fruitlet, plum as endocarp, and one seed of grape have been identified.

The wild plant species/types show a remarkably a wide variety taxa like at Barcın Höyük (Table 5.13). Most wild plant remains become admixed into economic plants. It is common for wild species to grow naturally in the cultivated field and to arrive at the settlement with the domestic ones such as *Lithospermum, Echium vulgare* L.*, Polygonum*, and *Galium aparine* L. However, the especially frequent large-seeded wild plants imply that crops have been well sorted/sieved.

Table 5.12: The summarized list of documented economic plants per phase at Aşağı Pınar.

Aşağı Pınar **The presence of economic plant remains per phase**	**Period**	**Early-Middle Neolithic in Balkan Chronology (5950-5300/5000 BC)**							
	Phases	**7** (5950-5700 BC)	**7** mixed?	**6**	**6/5**	**5**	**4**	**Unknown**	
	Samples	134	19	3	7	5	2	27	
	Liter of soil	1075	145	18	48	36	14	160	**Total**
Plant names	**Plant parts**								
6-row Barley	floret	463	5	-	-	2	1	6	**477**
2-row Barley	floret	31	1	-	-	-	-	-	**32**
6/2-row Barley	rachis nodes	1	-	-	-	-	-	-	**1**
Einkorn	fruit	180	1426	-	-	3	-	2	**1606**
Emmer	fruit	1027	19515	-	-	4	-	38	**20542**
Einkorn/Emmer	fruit	10	359	-	-	-	-	-	**369**
Einkorn/Emmer	rachis nodes	989	352	4	1	16	1	1109	**2478**
Bread/hard wheat	fruit	184	4	6	-	1	-	1	**198**
Bread/hard wheat	rachis nodes	14	5	-	-	-	-	12	**31**
Indet wheat	fruit	46	1480	-	-	-	-	-	**1526**
Indet wheat	rachis nodes	28	-	-	-	1	-	-	**29**
Rye	fruit	1?	-	-	-	-	-	-	**1**
Barley/Wheat	fruit (fragm.)	6366	101	58	6	78	7	75	**6691**
Cereals/Pulses	fruit/seed	2345	-	-	-	-	-	-	**2345**
Bitter vetch	seed	17	1	-	-	1	-	2	**21**
Grass pea	seed	181	-	-	-	-	-	1	**182**
Lentil	seed	408	13	-	-	-	-	4	**425**
Pea	seed	147	6	-	-	-	-	-	**153**
Pulses indet	seed	400	3	-	-	-	-	3	**406**
Flax	seed	4?	-	-	-	-	-	-	**4**
Bramble	fruitlet	8	-	-	-	-	-	-	**8**
Cornelian cherry	fruit	2	-	-	-	-	-	-	**2**
Hazelnut	Fruit	3?	-	-	-	-	-	-	**3**
Nuts indet	seed/fruit	7	-	-	-	-	-	-	**7**

Table 5.13: The summarized list of documented economic plants per phase at Aşağı Pınar.

Aşağı Pınar **The presence of wild plant remains per phase**	**Period**	**Early-Middle Neolithic in Balkan Chronology (5950-5300/5000 BC)**							
	Phases	**7** (5950-5700 BC)	**7** mixed?	**6**	**6/5**	**5**	**4**	**Unknown**	
	Samples	134	19	3	7	5	2	27	
	Liter of soil	1075	145	18	48	36	14	160	**Total**
Plant names	**Plant parts**								
Amaranthaceae	fruit/seed	26	-	-	-	-	-	-	**26**
Amaranthus sp.	fruit/seed	13	-	-	-	-	-	-	**13**
Chenopodium cf. *album*	fruit/seed	81	-	212	-	-	-	-	**293**
Boraginaceae	fruitlet	1	1	-	-	-	-	-	**2**
Anchusa arvensis	fruitlet	1	-	-		-	-	-	**1**
Echium vulgare	fruitlet	137	-	-	-	-	-	-	**137**
Lithospermum arvense	fruitlet	54	-	-	-	-	-	-	**54**
Brassicaceae	seed	9	-	-	-	-	-	-	**9**
Cyperaceae	fruit	38	-	-	-	-	-	-	**38**
Carex sp.	fruit	4	-	-	-	-	-	-	**4**
Fabaceae	seed	145	-	-	-	-	-	-	**145**
Hippocrepis sp.	fruitlet	6	-	-	-	-	-	-	**6**
Trifolium sp.	fruit	48r?	-	-	-	-	-	-	**48r?**
Vicia sp.	seed	26	-	-	-	-	-	-	**26**
Lamiaceae	fruitlet	2	-	-	-	-	-	-	**2**
Malvaceae	fruitlet	9	-	-	-	-	-	-	**9**
Tilia platyphilos	fruit	1	-	-	-	-	-	-	**1**
Fumaria sp.	fruit	2, 158r?	-	-	-	-	-	-	**2, 158r?**
Poaceae	fruit/floret	74	-	-	-	-	-	-	**74**
Avena sp.	fruit	10?	-	-	-	-	-	-	**10?**
Digitaria sp.	fruit	74	-	-	-	-	-	-	**74**
Eragrostis/Setaria	fruit	14	-	-	-	-	-	-	**14**
Hordeum spontaneum	floret	11	-	-	-	-	-	-	**11**
Polygonaceae	fruit	24	-	-	-	-	-	-	**24**
Fallopia sp.	fruit	7	-	-	-	-	-	-	7
Polygonum sp.	fruit	34	-	-	-	-	-	-	**34**
Rumex sp.	fruit	1	4	-	-	-	-	-	**5**
Rosaceae	fruit	2	-	-	-	-	-	-	**2**
Galium sp.	fruitlet	75	-	-	-	-	-	-	**75**
Thymelaeaceae	fruit	1	-	-	-	-	-	-	**1**
Total		**13948**	**23276**	**73**	**219**	**106**	**9**	**1253**	**38768**

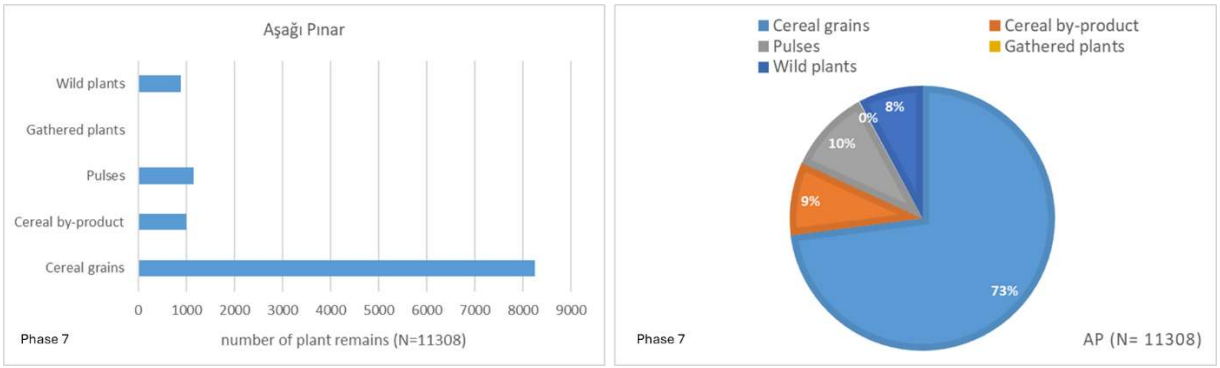


Figure 5.176: The quantity of plant groups per phase at Aşağı Pınar.

It is possible to surmise that the Aşağı Pınar community had arrived with a broad spectrum of cultivated plants. Quantitatively, we can say that emmer wheat has a severe density, and einkorn could come in second as hulled wheat. The cereal group is generally the most dominant (Figure 5.176), followed by the pulses group. The gathered plant group contains very few remains. Wild plant diversity, on the other hand, represents the group that we consider field grass or weeds, which generally arrive at the site with the crops.

Chapter 6

6. SPATIAL ASSESSMENT BASED ON PLANT DISTRIBUTION IN BARCIN HÖYÜK

One of the questions we ask during the archaeobotanical study is how the plants consciously brought from the environment to the settlement in various ways (harvest, gathering, etc.) are located on the site. Indeed, it is quite challenging to answer this question since we do not know whether the food products that were brought to the site entirely after processing stages elsewhere. Furthermore, many criteria shape this issue, such as sampling strategies, or the limits of the excavation trenches themselves, which may entirely miss the food storage areas. In this respect, in Chapters 6, 7, and 8, I will try to document and interpret the relative plant distribution and plant use over the sites to address the research question below: What can the context in which we find the botanical remains tell us about the settlements in question? Can intra-site insights from the distribution provide information on the settlements and the variability that they display?

Barcın Höyük offers the opportunity to focus on the plant distribution in indoor and outdoor areas in more detail with its various primary units (surfaces, basin bins, pyrotechnic features, platforms) and its uninterrupted sequence of Late Neolithic phases in a wider area. Each site is evaluated according to the data it provides within itself, according to the context and level characteristics it offers. In this section, I examine the spatial plant distribution at Barcın Höyük. Bahçelievler and Aşağı Pınar settlements appear below as the 7th and 8th chapters.

6.1. General Site Background

The Barcın Höyük excavation was conducted by the Netherlands Institute in Turkey between 2007 and 2015. The site is a low mound located in the middle of the Yenişehir Valley (40°15'48"N 29°35'54"E) and 228.84 m in altitude in Bursa province (Figure 6.1) (Gerritsen et al. 2013a, 144). The Barcın Höyük site consists of two low mounds connected by a saddle covering an area of about 1.7ha. The excavations were concentrated on the eastern mound from the center down the southern slope. The Neolithic phases exposed between 250 and 550 m2 as contiguous areas (Gerritsen and Özbal 2019, 59). The highest point of the mound is c. 229.00

m elevation, and the lowest elevation is around 223.00-224.00 m, and the mound rises 3 m above the level of the plain (Figure 6.2). Geomorphological research shows that the earliest occupation was located on a natural rise in the valley, which was in close proximity to a retreating lake or marsh (Groenhuijzen et al., 2015).

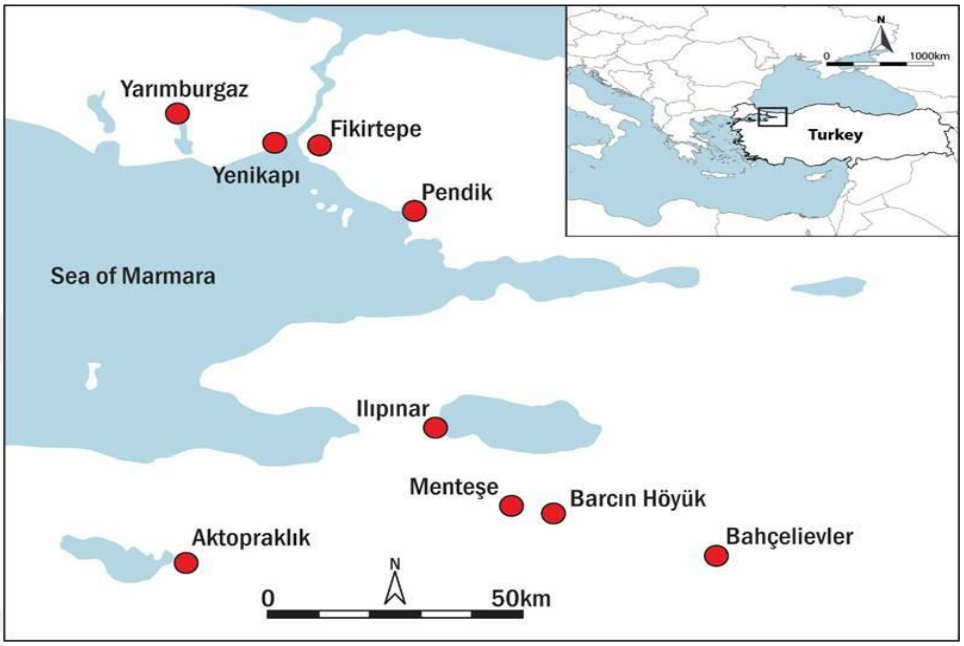


Figure 6.1: Locations of Barcın Höyük and Bahçelievler in Northwest Anatolia (Balcı et al. 2022, Fig.1a, 29).

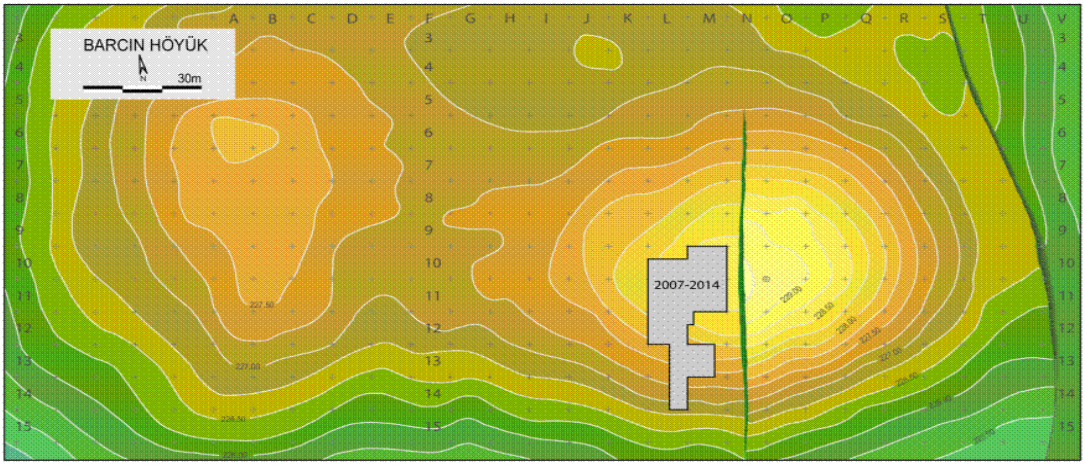


Figure 6.2: Excavated area between 2007-2015 at Barcın Höyük (Gerritsen and Özbal 2016, 200, Fig.2).

The upper layer of the mound includes partly Late Chalcolithic and Bronze Age remains, which were mostly huge pits, and these layers were destroyed by a cemetery during

the Byzantine period (Gerritsen et al. 2010). The Neolithic layers include around 4.5 m of deposit above the virgin soil, and the Neolithic site lies around c. 5000 m2, of which only 400-600 m2 has been excavated (10%; trenches L10-L14; M10-M13) (Figure 6.3) (van den Bos 2021, 166).

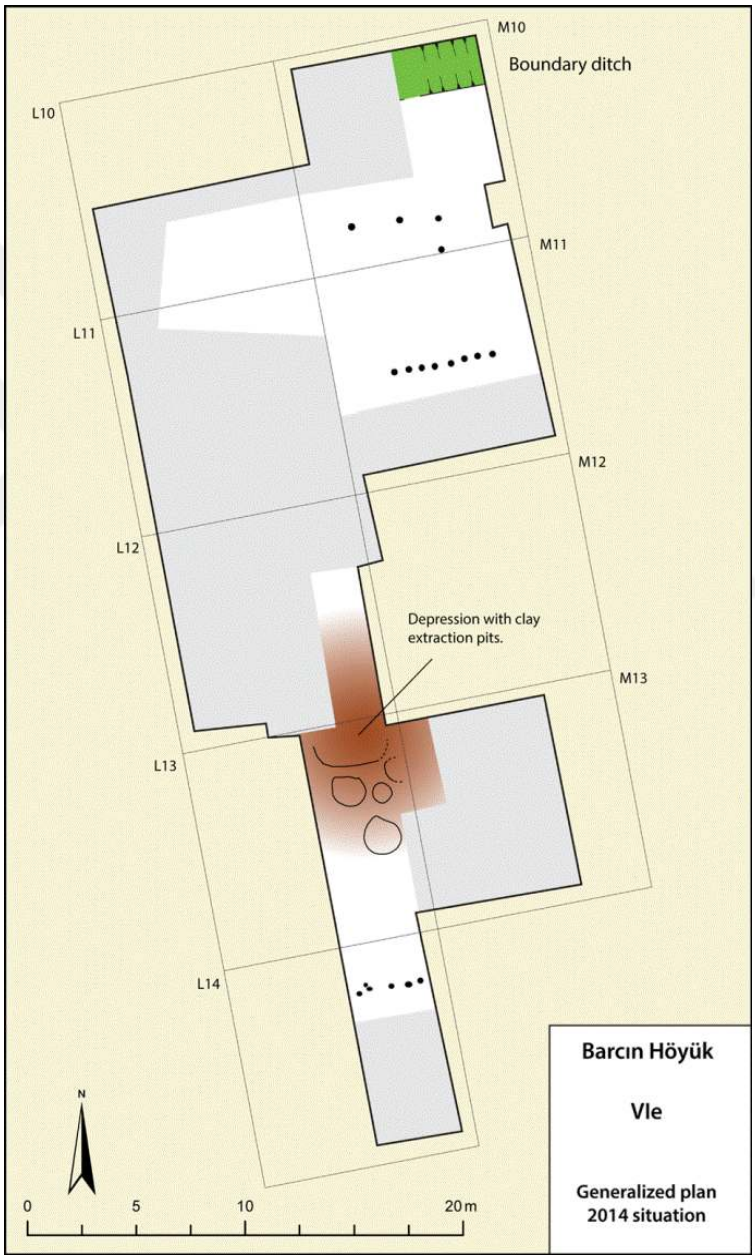


Figure 6.3: Excavated area at Barcın Höyük that shows trench borders (Gerritsen and Özbal 2016, Fig.3).

The Neolithic sequences are divided into five phases from VIa (latest) to VIe (earliest) (Gerritsen and Özbal 2016, 200). The latest phases VIa to VIc were disturbed by a large number

of Middle Chalcolithic and Bronze Age pits; earlier phases VId to VIe were much better preserved (Figure 6.4) (van den Bos 2021, 166). The earliest levels of the Neolithic site yield more valuable information about architectural practices and settlement organization. Although not in equal proportions from the earliest phase VIe to the latest phase VIa, the obtained data provides many ideas about the plant distribution in the site (Table 6.1, Figure 6.4).

Table 6.1: The total samples per Neolithic phase evaluated in the GIS data.

Barcın Höyük	**VIe**	**VId1**	**VId2**	**VId3**	**VIc**	**VIb**	**VIa**
Total (N) Sample	176	194	39	25	52	103	7
Liter of soil (N)	490	628	111	106	187	353	34
Empty samples	21	16	3	4	16	13	1

Phases VIe (6600-6500 BCE) and VId1 (6500-6400 BCE), which represent the two earliest occupational layers of Barcın Höyük for 200 years, are also divided into sub-phases. This phase is represented with two rectilinear post buildings 24 and 25 in the east-west direction, a courtyard, workshop areas, and a ditch on the northeast side (Figure 6.5). Phase VId1 is represented by four rectilinear buildings, which were located on the VIe buildings (Figure 6.13).

Phase	Period	Date	Site description	Structure numbers
VIe	Early Neolithic	6600-6500 BCE	Two rectilinear post buildings excavated. Settlement enclosed by ditch.	24, 25
VId1	Late Neolithic	6500-6400 BCE	Burnt row of rooms excavated, overlying phase VIe architecture. Settlement enclosed by a palisade/wall.	2a, 2b, 19, 21
VId2/3		6400-6300 BCE	Row of rooms excavated, overlying phase VId1.	3, 4, 10, 15
VIc		6300-6200 BCE	Occupation layers disturbed by pits; several house plans excavated.	9, 14
VIb		6200-6100 BCE	Occupation layers disturbed by pits; some partial house plans excavated.	5, 11, 13
VIa		6100-6000 BCE	Occupation layers disturbed by pits.	-
HIATUS				
Vb	Middle Chalcolithic	5600-5500 BCE	Several large pits dug through Neolithic strata; habitation on the flanks of the mound?	-
HIATUS				
Va	Late Chalcolithic	Early 4th mill. BCE	Pits?	-
IV	Early Bronze Age	Late 3rd mill. BCE	Pits.	-
III	Early/Middle Bronze Age	Early 2nd mill. BCE	One building excavated; pits.	-
II	Roman	N/A	Surface finds.	-
I	Byzantine	9th-11th cent. CE	Cemetery.	-

Figure 6.4: The sequences Barcın Höyük occupation sequences (van den Bos 2021, Fig. 7.3, 167).

Phases VId2 and VId3 (6400-6300 BCE) are the subphases of VId, and archaeobotanical data were obtained from relatively more limited areas compared to phase

VId1. In these subphases, four buildings (4, 10, 3, 15 from the east-west and north-south direction) were partly excavated (Figure 6.5). After Phase VId3, there is some destruction in the later phases caused by the large pits.

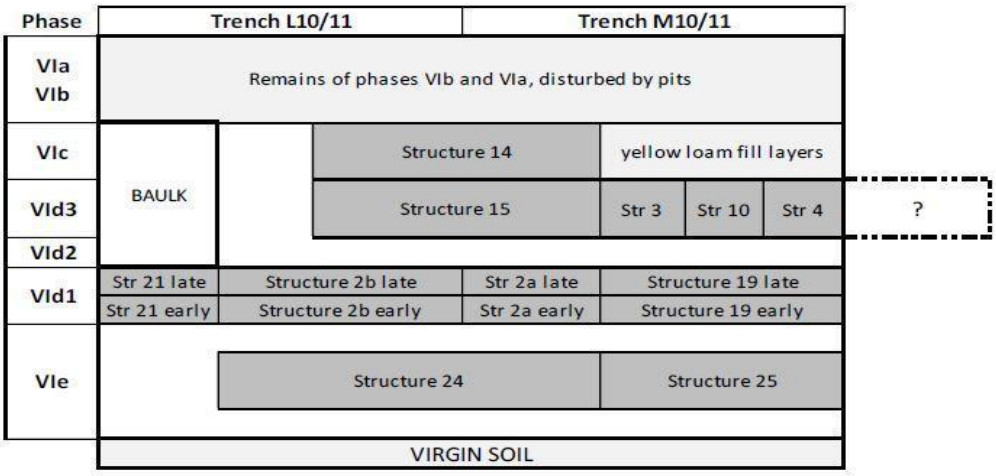


Figure 6.5: Barcın Höyük schematic view of structure row in E-W direction (van den Bos 2021, Fig. 7.5, 168).

Phase VIc (6300-6200 cal. BC) is closer to VId3 in terms of time, context and material culture. Phase VIb (6200-6100 cal. BC) represents a slightly different stage. Although VIb has a wider area of data compared to VIc, Phase VIa (6100-6000 cal. BC) is the Late Neolithic level for which we have the least data. This phase is poorly preserved due to the disturbances caused by the huge pits opened in the Chalcolithic Period, and therefore, archaeobotanical remains are very few.

6.2. Phase VIe

Phase VIe (6600-6500 cal. BC) represents the lifestyle and behaviors of the first settlers at Barcın Höyük. While it is not exactly known where the first people who settled down in the Yenişehir Valley came from, the obtained data indicate that they brought along their traditions, life experiences, and knowledge. The existing cultural and behavioral dynamics might have been shaped through criteria and new behavioral experiences created by the environment.

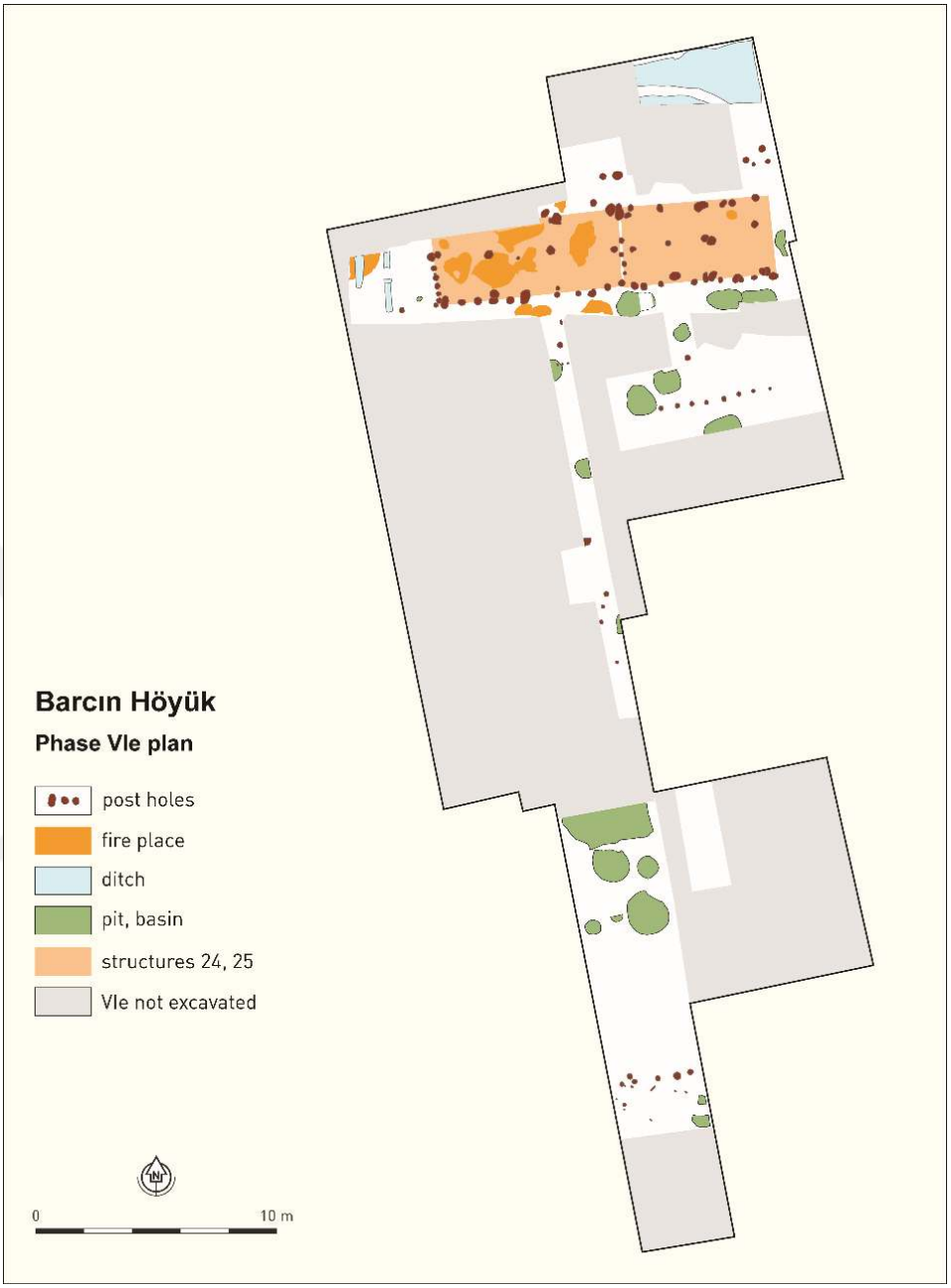


Figure 6.6: The generalized plan of phase VIe (c. 6600-6500 cal. BC) in the excavated area at Barcın Höyük (plan: F. Gerritsen).

Phase VIe is divided into subphases VIe1, VIe2, and VIe3, starting from the earliest occupation (6600 cal. BC). Spatial investigations on plant remains were also conducted according to these sub-phases. The excavated area, the north-south direction, consists of a northernmost outdoor area, which includes a ditch, and rectangular structures 25 and 24 in east-west directions (trenches M10, partly M11, L10). This central courtyard area is located in the south of the structures (trenches M11, L11), a restricted excavated outdoor area in the south

(Trench L12), and a midden deposit area in the southernmost area (trenches L13, L14) (Figure 6.6).

These rectangular structures -24 and 25- were built with wood and loam in a frame carrying heavy wooden posts installed in post-holes dug deep into the virgin soil around 40 and 60 cm and these two buildings shared their interior walls (Figure 6.6) (Gerritsen and Özbal 2016; Gerritsen and Özbal 2019, 60).



Figure 6.7: The density of plant remains per liter in VIe1 and VIe2 at Barcın Höyük.

6.2.1. Outdoor Area (Northernmost)

Because of the lack of sampling, this area consists of less plant evidence than other spaces in the excavated part of the site (Figure 6.7). Plant remains include a precise cereal assemblage, and there are almost no documented other plant groups, such as gathered, oily, or wild plants, in either of the soundings. The contexts in this outdoor area belong to the earliest occupation level (VIe1) of phase VIe.

6.2.2. Indoor Areas

When the elevation of approximately 224.15 m above sea level was reached in this area, it was determined that the circular elements with a diameter of roughly 30 cm, clearly distinguishable from the ashy fillings in terms of color and texture, were pile hole arrays. In this way, although its exact width is unknown, the existence of an architectural space called str[62] 24, which is 7.80 m long, was determined (Özbal et al. 2017, 18).

In addition to similar construction techniques, there are also structural differences between Structures 24 and 25. This may indicate that a standard architectural style had not yet been developed or that the functions of the structures are different. Str 25 has a hipped roof space created by placing 12 piles, approximately 1.5 m apart, at equal intervals of 3 piles in 4 rows.

It is observed that the piles forming the walls of str24 are placed more tightly in rows (Figure 6.6). The smaller diameter piles, again placed at close intervals, were used in the short walls of the same structure. The pile holes in the center of the space indicate that this structure may also have had a hipped roof (Özbal et al. 2017, 19).

Structure 25

In this area, the stake holes of the site, named str 25 (Trench M11), were distinguished from the surrounding ashy fill in terms of color and texture, as in Trench L10, and excavated (Figure 6.6). Similarly, special pits were dug for each of the post-holes, and the ditch trench system known from the upper layers was not used. In addition to similar construction techniques, there are structural differences between str 24 and 25. This may indicate that a standard architectural style had not yet been developed or that the functions of the structures are different. The post-holes in the center of the building indicate that this structure may also have had a hipped roof (Özbal et al. 2017, 19).

In str 25, the nine archaeobotanical samples were collected from a layer, surface, basin bin, and pyrotechnic feature (Table 12.1). The eight samples were taken from post-holes (M11, Δ746, Δ745, Δ742, Δ738, Δ734, Δ728, Δ718, Δ717), which belong to str 25, and are not included because of the possible depositional process from upper layers.

[62] Structure

The cereal group represents a wide distribution compared to other plant groups in the structure. Especially layer Δ699 (7.25 lt, VIe1), which is located under surface Δ698, includes the highest amount of cereal remains (118 grains, 53 rachis nodes), with 52 wild plant remains compared to other units (Table 12.1, Figure 6.8).[63] The pulses are only represented with two-half of bitter vetch seeds from basin bin Δ709 and pyrotechnic feature Δ690. In general, cereals are an abundant group of preserved economic plants, although the number of remains is small.

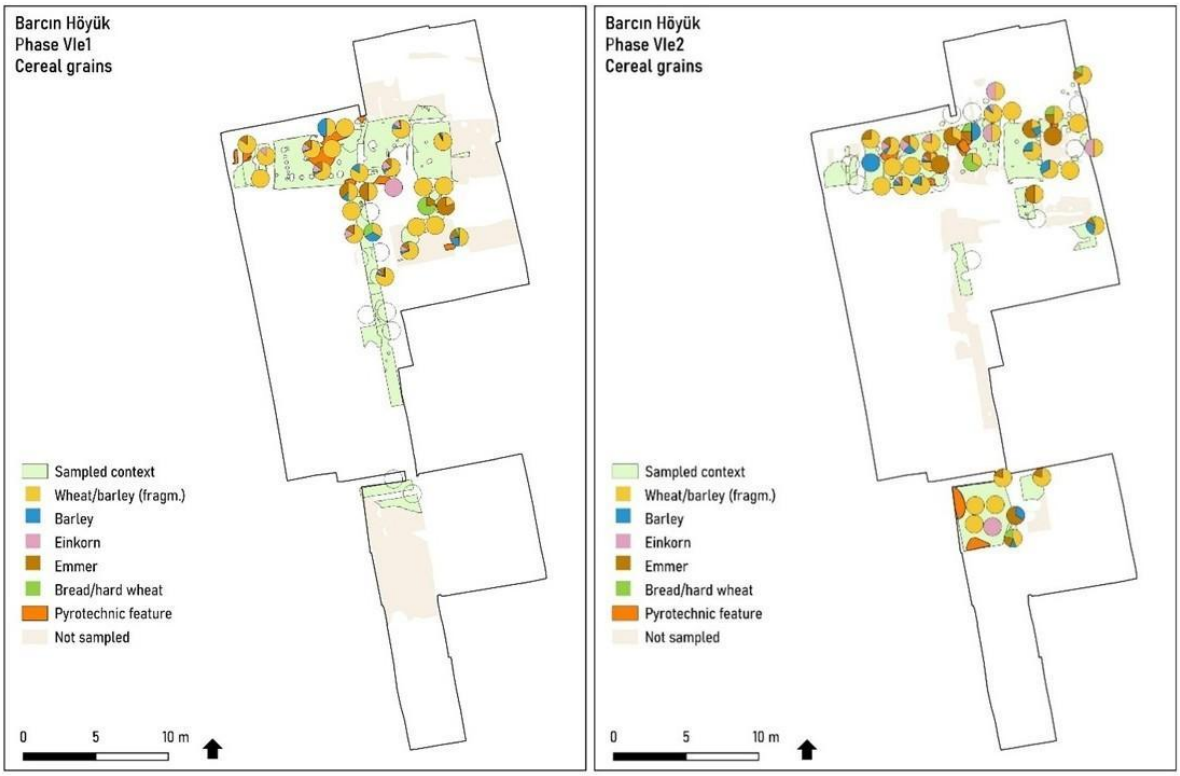


Figure 6.8: The distribution of cereal types per liter in VIe1 and VIe2 at Barcın Höyük.

Structure 24

Structure 24 is located in Trench L10 and partly in M11 in Phase VIe. Sampling is higher in str 24 compared to str 25. Like str 25, cereals are the subsequent group in the plant remains. As

[63] The 118 grains recovered consist of fragmented wheat/barley remains, and very few whole hulled wheat grains (4.5) were found. On the other hand, the 53 rachis nodes identified belong to hulled wheat. In this context, if we assume that the 118 grains are emmer wheat; there are two grains in a spikelet, four grains in a row, and an average of 36 grains in a spike/ear, which corresponds to around 3.5 spikes/ears.

contextual, most of the economic plant remains come from the layers, and most of the wild plants, as a mixture, were documented in pyrotechnic features (Table 12.2, Figure 6.6). The pyrotechnic features are usually cleaned after firing activity, and ash and charcoals are cleaned from the features for subsequent use. It is not a common situation to find charred botanical remains in these areas. On the other hand, the pyrotechnic features are valuable places for cleaning around surfaces, trash parts of harvest, etc., and they offer a chance for finding the hard parts, such as seeds, fruits, nodes, wood, etc., of these plants. In str24, wild plant remains show higher values in pyrotechnic features (Figure 6.8, 6.9). In surfaces and layers, the economic plant remains, frequently cereals, show a high distribution.

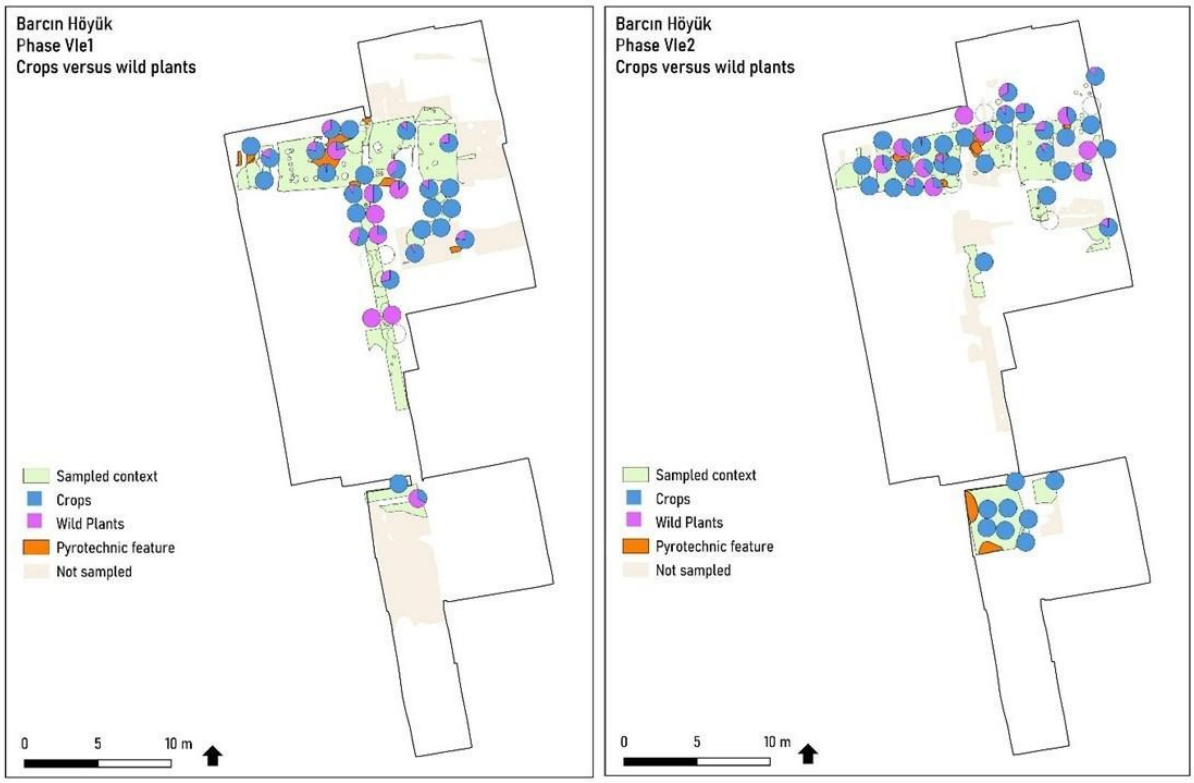


Figure 6.9: The distribution of crops versus wild plants per liter in VIe1 and VIe2 at Barcın Höyük.

The western part of the structure shows the poorest evidence compared to the rest of the areas in the structure. The botanical samples have been collected from a pyrotechnic feature Δ418 (L10, 4 lt, VIe1), white surface Δ445 (L10, 10,5 lt, VIe1), and layer Δ443 (L10, 4,25 lt, VIe2) in this part (Table 12.2). On the surface (lies below Δ443, initially reached in N and thereafter also in S, barley/wheat grains (4), and mouse bones (5), in the layer (fill layer? below

the oldest surface Δ438 of str 21) which is located above the surface Δ445, lentil seed (0.5), and sheep/goat dung (1) have been recorded.

The pyrotechnic feature (Δ418) has a circular shape (in the central area of former str2b inside all the postholes (?) four barley/wheat grains, five emmer/einkorn RN, and 37 wild plant seeds/fruits were documented in this feature (Figure 6.9). 27 of 37 wild plant remains belonged to wild (?) millet (*Setaria* cf. *pumila*) florets, which are a widespread weed from the cereal family (Poaceae) found around the world in the fields, at the corners of streets, on the border of gardens, etc. The other documented species are *Amaranth* (5 seeds), *Hordeum spontaneum* (0,5 floret), Caryophyllaceae (1 seed/fruit), and *Chenopodium* (3 seeds) in the feature.

The cereal group is abundant in the northeast and northwest parts of the structure, just like in other areas. The botanical samples were obtained from layer Δ416 **(**L10, 4 lt, VIe1, below layer Δ355), ashy and sandy layer Δ355 (L10, 28,5 lt, VIe2, below white surface loc353, related Δ519 in M10?), and a pyrotechnic feature Δ417 (L10, 4 lt, VIe1, possible resemblance Δ378, Δ385, Δ386) in the northeast, and two pyrotechnic features Δ407 (L10, 3,5 lt, VIe1) and Δ385 (L10, 4,24 lt, VIe2), ditch trench Δ412 (L10, 3,2 lt, VIe2,), and a layer Δ372 (L10, 2 lt, VIe2) in the northwest part of the structure.

The pyrotechnic features Δ417, Δ407, and layer Δ416 (below layer Δ355) belong to the earliest occupational level of phase VIe (Table 12.3). In general, a low number of cereal remains have been recorded in these earliest contexts. Compared to the central and western parts of the structure, the pyrotechnic features contain significantly fewer cereal remains and no documented wild plants (Figure 6.9).

The northeast side of str24 is well known for the ashy and sandy layer Δ355, which probably relates to the white surface Δ519 (M10) found outside of the structure on the north side. In this layer, a wide range of plant species were documented. Wheat/barley (71), hulled barley (4,5), einkorn (7), emmer (11), emmer/einkorn RN (279), bread/hard wheat RN (1), flax (3,5), *Atriplex* (39), Brassicaceae (15), *Chenopodium* (11), *Echium v*. (1), *Fallopia* (2), *Hordeum spontaneum* (2), Poaceae (1), and Thymeleaeceae (1) are the recorded economic and wild plants. These remains seem to be a waste fraction from the crop.

In contrast to the northeast and northwest parts of str 24, surface Δ389 (L10, 16 lt, VIe2) and one of the two hearths (Δ326, L10, 4 lt, VIe3 (VIe/VId1?)) on the southern side yielded

relatively high concentrations of plant remains. In the grey/white surface Δ389, hulled barley grains (4.5), einkorn (4), emmer (3), einkorn/emmer rachis nodes (52), wheat/barley (36), Brassicaceae (7), *Cephalaria* (3), Fabaceae (1), and *Hordeum spontaneum* (3) have been documented. Another white surface Δ389 (above surface Δ389, L10, 16,25 lt, VIe2) shows less evidence (equal liters of soils, approximately 16 liters, were collected from both surfaces) that wild plants provide a wider range with *Atriplex* (7), Brassicaceae (2), *Fallopia* (1), *Hordeum spontaneum* (0,5), Poaceae (2.5), *Fumaria* (2r?). This surface is probably related to the ashy and sandy layer Δ355 on the northeast side of the structure (Table 12.4).

In the pyrotechnic feature Δ326 (4 lt, VIe2), einkorn (4.5), einkorn/emmer rachis nodes (27), naked wheat (2), wheat/barley (13), wild Fabaceae (1.5), wild barley (11), Poaceae (2) were recorded. The context where the botanical samples were collected is dated to subphase VIe2 of phase VIe, and there were no documented pulses, oily/fiber, or gathered plants in the southern part of the structure.

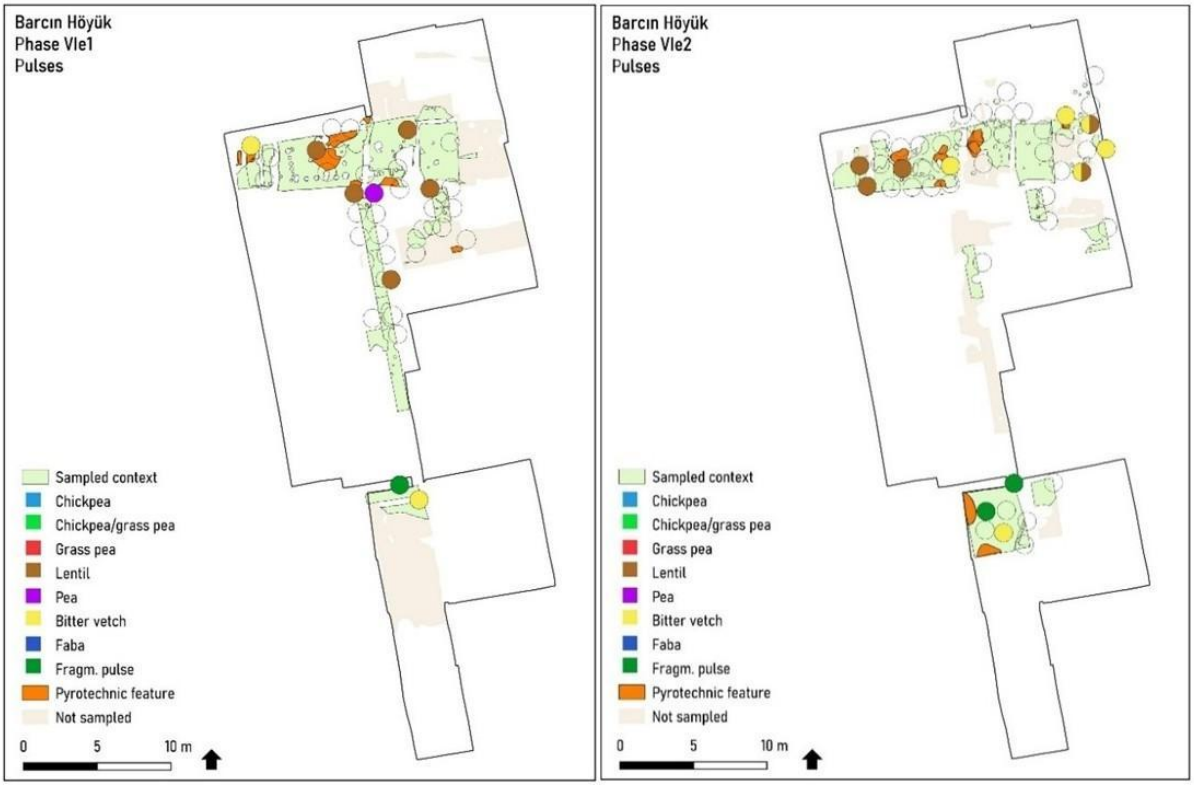


Figure 6.10: The distribution of pulses types per liter in VIe1 and VIe2 at Barcın Höyük.

As in str25, cereal remains are the most common plant remains in str24 (Figure 6.8). Fragmented cereal remains are the most frequently found in the contexts, which may be due to

many reasons. Pulses are rare but still show presence with 1.5 bitter vetch seeds from a pyrotechnic feature Δ446, a half lentil seed from layer Δ364 (cut by all VIe post-holes) from center of str24 and dated to the subphase VIe1, and again a half of the lentil seed from the west side of the str in a layer Δ443 which locates below the surface Δ438 and is dated to subphase VIe2. The center and north side of the structure provide richer evidence compared to its other sides (Figure 6.10).

In Structures 25 and 24, while almost no charred plant remains were recovered from a few pyrotechnic features, other pyrotechnic features contained mainly wild plants, hulled wheat rachis nodes, and a small amount of cereal remains (Tables 12.1-12.4).

6.2.3. Outdoor Area (Central-South)

In front of buildings 24 and 25

In the courtyard area, as in Trench L10, large stake holes with diameters of approximately 20-30 cm were detected without any comprehensible order. However, since the stakes in question are not as deep as those in the structures, they may also have the characteristics of a fence wall without another architectural function (Özbal et al. 2017, 20).

The north-central courtyard area is located in trenches L11 and M11, which represent the area in front of structures 25 and 24 in the south. The cereals and wild plants are the subsequent groups in the outdoor spaces. The presence of pulses and gathered plant remains is still rare (Table 12.5, 12.6).

The most intensive samples are from a charcoal layer, Δ657 (M11, 6 lt, VIe1) and basin bin Δ446 (M11, 2 lt, VIe1) in front of str 25. When we look at the recovered remains from this layer, the presence of high rates of hulled wheat rachis nodes (247) and wild plant fruits/seeds (40; 37 of 40 remains are from the grass (Poaceae) family, indicating that the assemblage here could be an area for processing/sorting trash (Table 12.5). In the basin bin Δ446, wheat/barley (70), hulled barley (5), einkorn (11), emmer (12), einkorn/emmer RN (43), naked wheat (4), naked wheat rachis (1), *Echium vulgare* (0.5), Fabaceae (1), Poaceae (11) were found. Only three fragmented wheat/barley grains were obtained from the other two basin bins, Δ444 and Δ443, but the liters of soil taken for these samples were already smaller volumes. These basin bins were probably emptied and cleaned. A white ashy pyrotechnic feature Δ691 (M11, 6,7 lt, VIe2) which is located on layer Δ657 was also unearthed in this area, dating to a slightly later

subphase of layer VIe, with wild plant remains inside (four hulled barley grains, two emmer grains, two naked wheat grains, cf. *Cephalaria* seeds/fruits (24), one *Echium vulgare* fruitlets, Poaceae florets/fruits (3.5), one Polygonaceae fruit).



Figure 6.11: The distribution of oily/fiber and gathered plants per liter in VIe1 and VIe2 at Barcın Höyük.

In the contexts considered as the front side (northwest part of Trench L11) of str24, mainly cereal and wild remains were recorded. Except for flax seeds (2.5) and hazelnut shells (1) obtained from a pyrotechnic feature Δ691 (M11, 2 lt, VIe1), no pulses or gathered plants were recorded (Figure 6.11, Table 12.5).

Central courtyard

The central courtyard includes the east and west parts, which are located in front of structures 24 and 25, and the south part of this area, which is located in Trench L11 and partly in Trench M11. This area mostly represents the earliest level of VIe, which is represented as VIe1 (Table 12.6).

East side

Two small soundings have been excavated as east and west parts in the central courtyard area, as recorded in the database with Trench M10, although it remains in the L11 and M11 areas (Table 12.6). The east side is located in front of str 25 as a part of the central courtyard (Figure 6.6).

The archaeobotanical samples were taken from two surfaces, two layers, and a basin bin in this area (21.35 liters of soil in total). Only cereal grains (64 grains in total) have been documented from the samples, except for a layered sample (M10, Δ500, 6 lt), which contains one and a half lentil seeds. The surfaces Δ502 (south) and Δ496 (north, above Δ500) are related to each other at the same level, and 53 wheat grains (12 emmer, 25 indeterminate wheat, 16 bread/hard) in total were documented on the white surface (Δ496, BH46359). In the botanical assemblage, the emmer grains look like they are germinated, while the embryos of the grains are still alive. This is not a common situation for any of the rest of the plant remains on the site. The grains could have been exposed to a humid environment before carbonization.

West side

This space is located in front of Str 24 and is a part of the central courtyard and recorded with M10 units, the same as the East side (Figure 6.6, Table 12.7). The archaeobotanical samples were taken from two surfaces and two layers (33.25 liters of soil in total). The contexts do not show a high number of plant remains but do provide the range of cereals that we have in this level. In this area, 11 cereal grains, two half rachis nodes, one pea seed, and four fruitlets of the buckweed family were documented in these four contexts.

A white ashy surface, Δ515 (M10, 3.75 lt, below the surface, Δ511), contained only one barley/wheat grain, emmer grain, and pea seed. The upper surface (Δ511, 4.5 lt) includes only one fragmented wheat/barley grain and half of an emmer/einkorn rachis node. This surface is a sequence of green-orange-green-orange surfaces and is evaluated as a dump of organic remains, possibly an area of animal/human excrement. The orange, sandy layers probably could be used to cover the excrement.

South-central part of the Courtyard

This area provides the poorest evidence compared to in front of the structures, except for only a basin bin Δ635 sample (L11, 7.75 lt, VIe1) (Tables 12.6, 12.7, Figure 6.7). In this sample,

fragmented cereal remains (47), lentil seed (1), Boraginaceae (1), *Chenopodium* (1)*, Fallopia* (1), Poaceae (13), *Polygonum* (1), and *Setaria* cf. *pumila* (1) were documented.

The Midden Deposits in the South

These midden deposits are located south of the excavated area in trenches L13 and M13. Especially in the upper deposits of these middens, larger numbers of sherds were obtained compared to str24 and str25 in phase VIe. In addition, a high number of fire-cracked stones, which were probably used for hot-rock cooking techniques by the earliest settlers, have been found in these midden deposits (Figure 6.6) (Gerritsen and Özbal 2019, 61).

In the southernmost midden deposits area (Trench L13), dated to phase VIe, all the contexts contain only economic plant remains. Only in one sample (Δ261, L13, 1.30 lt, VIe1), two Poaceae fruits/florets were recorded. Still, since there was an exploratory locus sounding at this location, this plant sample will not be considered in the evaluation (Table 12.8).

6.2.4. Assessment

In the earliest phase VIe, most remains were obtained from layers and surfaces. The plants per liter show intensity in basins/bins, layers, and ditch_trenches (Table 6.2). One of the reasons for this is that there were more excavations in these contexts compared to other areas. On the other hand, spaciousness and frequency of use are other influential factors. The other two contexts with a high density of remains are the basin bin and pyrotechnic feature areas.

Table 6.2: The quantity of plant groups per context in Phase VIe.

VIe	Sample (n)	liter	plants per Lt	plants total	Barley	Hulled wheat	Hulled wheat BP	Naked wheat	Pulses	Flax	Nuts	Wild Plants	Animal Re.
basin_bin	7	15.2	8.28	126	7	31	47	5	3	0	0	33	0
ditch_trench	2	5.2	4.8	25	3	5	15	0	1	0	0	1	0
layer	20	132.55	7.53	1002	26	69	650	5	7	4	0	240	1
posthole	20	82.85	0.83	69	3	10	7	3	6	0	0	39	1
pyrotechnic_feature	13	79.25	2.9	232	18	27	37	9	3	3	1	134	0
surface	18	121.4	2.61	317	15	54	98	43	3	0	2	67	35
total	80	436.45	4.05	1771	72	196	854	65	23	7	3	514	37

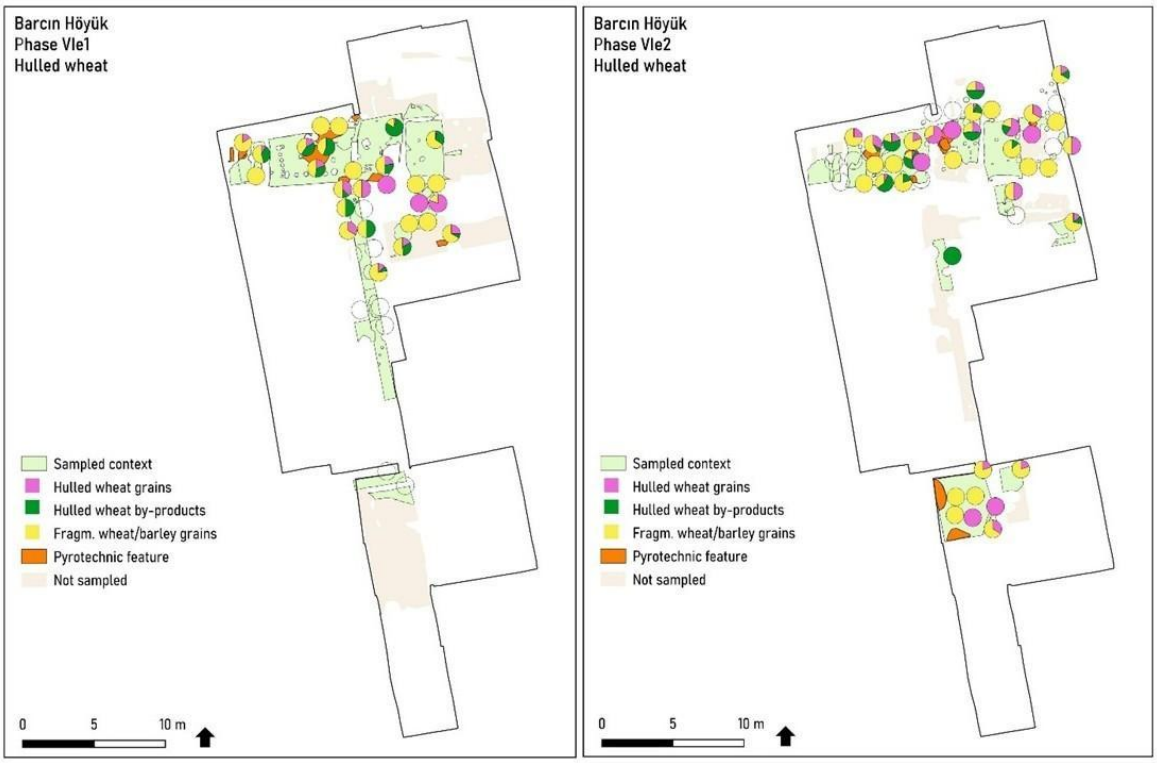


Figure 6.12: The distribution of hulled wheats and by-products per liter in VIe1 and VIe2 at Barcın Höyük.

When we look at the assemblages in phase VIe, there is almost no context that only includes economic plants (for phase VIe, mostly the cereal group can be considered), both in indoor and outdoor areas. However, although there is no standard distinction in plant distribution, when hulled wheat rachis nodes and wild plant remains increase proportionally in certain types of samples, and when low rates of cereal grains are obtained, it can be considered that the samples are sieves or processing trash, etc. (Figure 6.12). Wild plant groups with high values generally occur in pyrotechnic features or surfaces.

6.3. Phase VId1

The phase VId1 is expressed as VId1 early, VId1 late pre-fire, and VId1 late fire/collapse. The construction stage (an area of about 300 m2 has been unearthed) of the phase V1d1 (cal. 6500-6400/6370 BC) consists of four structures in a row (from west to east: 21, 2b, 2a, 19) in alignment with and in the same location as 24 and 25, the structures of VIe.

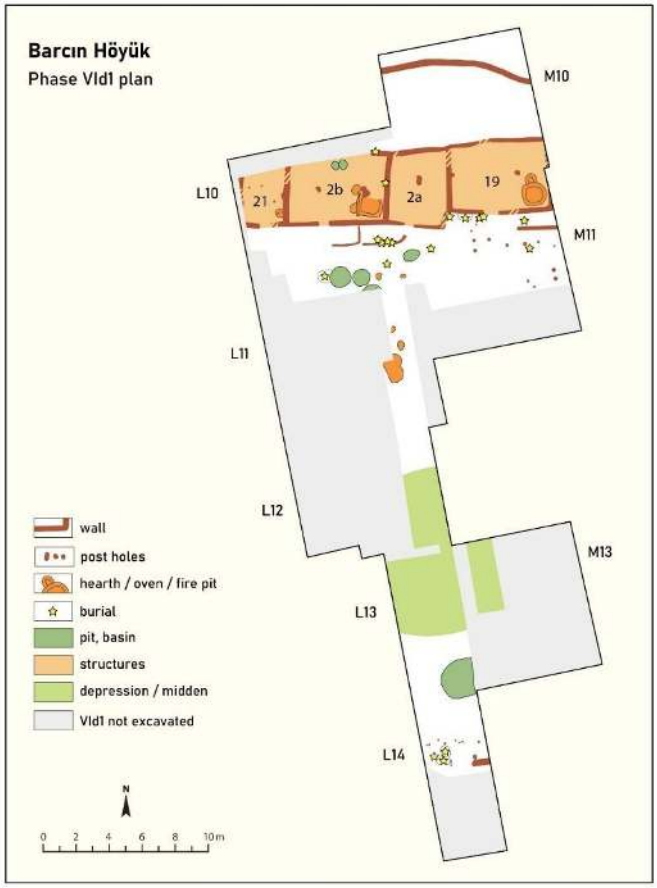


Figure 6.13: The generalized plan of phase VId1 (c. 6500-6400 cal. BC) in the excavated area at Barcın Höyük (F. Gerritsen).

The interior widths of the structures are different from each other, and it is probable that the mutual walls were shared (Figure 6.13). The structures of V1d1, similar to the structures of VIe, probably had a sloping roof supported by posts installed at wide intervals in the middle axis (Gerritsen and Özbal 2016). Based on the interpretation of the radiocarbon dates, it is considered that this phase lasted for about a hundred years, and this process can be observed in all of the houses in the form of architectural arrangements and repairments (Weninger et al. 2014).

The structure's northernmost side, considered an outdoor area (Trench M10), contained few preserved plant remains. Most of the remains belong to einkorn/emmer wheat and fragmented wheat/barley remains (Table 12.9). Only half of a bitter vetch seed was documented in the surface Δ426. One wild legume seed, one wild cereal grain, two animal bones (small pieces), and one fish bone have also been recorded in this context. Other valuable data comes from the white surface Δ416, which includes three emmer grains, two fragmented wheat/barley grains, five *Echium vulgare* fruitlets, one legume seed, and a fish bone.



Figure 6.14: The density of plant remains per liter in VId1 early and VId1 late at Barcın Höyük.

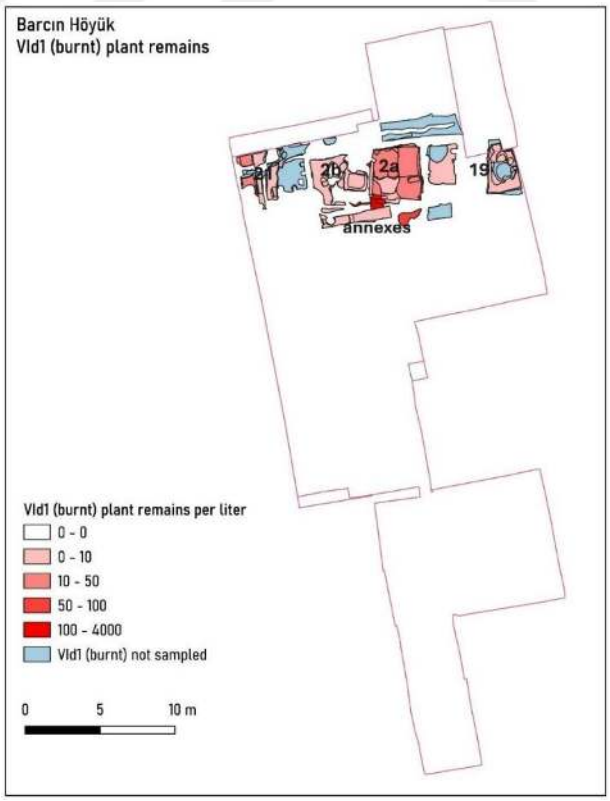


Figure 6.15: The density of plant remains per liter in VId1 burnt fire/collapse at Barcın Höyük.

In general, VId1 levels contain a high percentage of preserved plants compared to other phases, and especially the subphase VId1 late burnt/collapse, due to the fire it experienced, this sub-phase has a higher percentage of plant remains than the other levels (Figure 6.14, 6.15).

6.3.1. Indoor Areas

Indoor areas of phase VId1 are represented by structures 19, 2a, 2b, and 21, located in the center of the excavated area (trenches M10, M11, L10, L11). These four wattle and daub rectangular structures are located above the earliest structures 25 and 24 from phase VIe. These four structures are lined up in the east-west direction of the mound, and their widths are unequal. The larger size is around 23 m^2, and the smaller ones are about 12 m2 (Gerritsen and Özbal 2016, 202). In terms of square meters, structures 19 - 2a and 2b - 21 are closer to each other (Figure 6.13). The structures are connected to each other with shared walls, and their possible entrances are located in the south direction. Structures 19 and 21 provide relatively lower data compared to the other two structures. Many botanical samples from the early, late (pre-fire), and late (fire/collapse) phases identified in structures 2a and 2b are concentrated, especially in the overlapping layers and surfaces. Unlike the previous phase, in this phase, we see platforms inside the spaces and annexes at the southern entrances of the spaces (Figure 6.14, 6.15).



Figure 6.16: The distribution of cereal types in the earliest level of VId1 and VId1 pre-fire at Barcın Höyük.

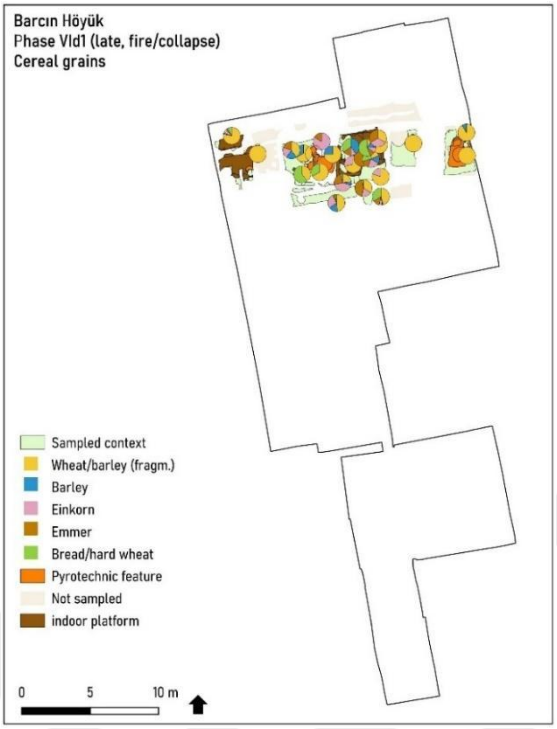


Figure 6.17: The distribution of cereal types in the late fire/collapse level of VId1 at Barcın Höyük.

Structure 19

The plant remains obtained in str 19 again consist mainly of cereals and partly of wild plants (Figure 6.16, 6.17). Cereals, although fragmented and in small amounts, are present in all contexts where the archaeobotanical samples have been collected (Table 12.10). Layer Δ549 (M11, 18.75 lt, VId1 late 1 fill) documented only one bitter vetch seed, and the wild plant group includes only wild cereals. This layer is located on the west side of the area and is probably similar to and contemporary with layer Δ543 (M11, 2.25 lt, VId1 late 1 fill). In layer Δ511 (M11, 5 lt, VId1 late 1 fill), a very small piece (0.2) of hazelnut shell and four mouse bones were documented. It is probably associated and contemporary with layer Δ510 (M11, 12 lt, VId1 late 1 fill), which is located above red surface Δ515 (Figure 6.18). Layer Δ510 also documented hulled wheat (three einkorn, nine einkorn/emmer), fragmented wheat remains, and a mouse bone. The subphase VId1 late 1 fill provided a broad and high value of plant remains compared to subphase VId1 early 3 unburnt.



Figure 6.18: The red floor in str19 from the northwest (Gerritsen and Özbal 2016, Fig.6).

In the subphase VId1 late 1 fill, hulled wheat (einkorn and emmer) has an abundance compared to barley or naked wheat, but statistically, barley shows presence in 3 out of 5 samples, so it could not be rare. On the other hand, there is no documented bread/hard wheat. Flax is absent, pulses are rare, and hazelnut shows a rare presence in gathered plants in this structure.

Structure 2a

Most of the preserved plant remains were obtained from VId1 late fire/collapse phase in str2a (Table 12.11). The firing activities cause better preservation of organic remains. For this reason, the fewer plant remains found in samples from other substages may not directly indicate less plant use. In the structure, especially four contexts provide a high number of plant remains. One of them is the platform bench ledge Δ427 (M10, 13.75 lt, VId1 late burnt/collapse phase), which is a small area in the NW part of str 2a as part of the plastered mud and wood floor. The platform is located above surface Δ439 and includes cereals, pulses, and wild plants (Table 12.11). In the cereal group; fragmented wheat/barley (27), hulled six-row barley (40), einkorn wheat (22), emmer wheat (35), an emmer ear (Figure 6.21, 6.22), einkorn/emmer RN (11.5), bread/hard wheat (103), and small-sized naked wheat (58), in the pulses group; lentil (2), pea (2), bitter vetch (24), fragmented pulses (60); in the wild plants: *Amaranth* (2), *Fallopia* (1), Poaceae (21), Polygonaceae (7), *Triticum* (1) were documented. Six small animal bones have also been recorded in this context.

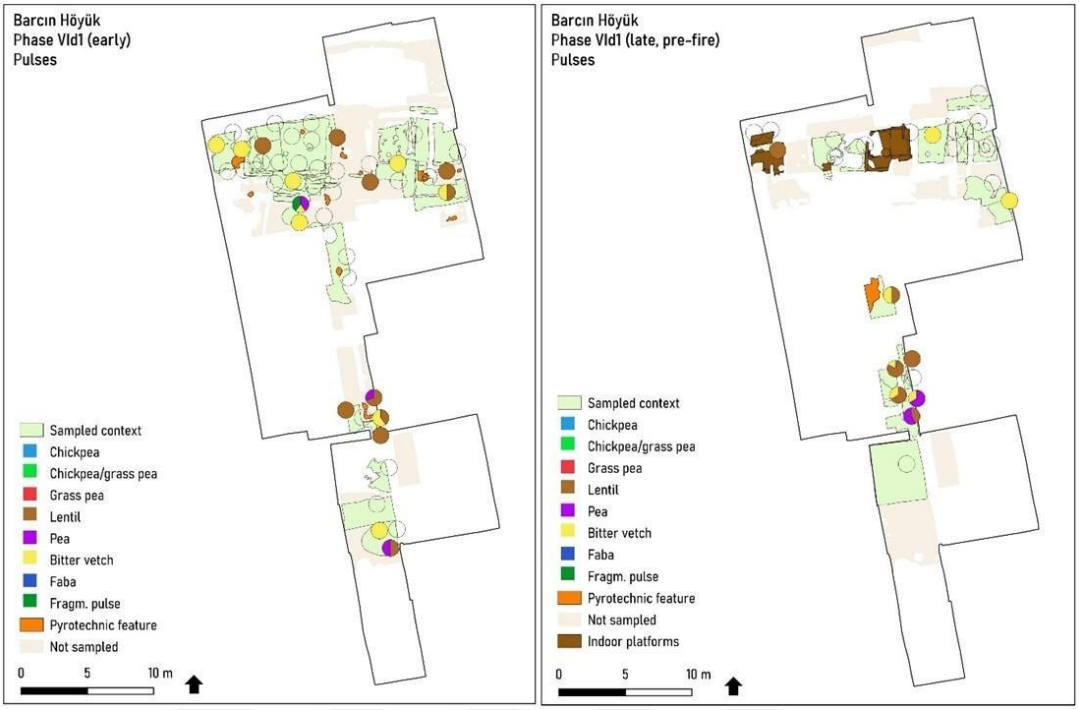


Figure 6.19: The distribution of pulses types per liter in phase VId1 early and VId1 late pre-fire at Barcın Höyük.

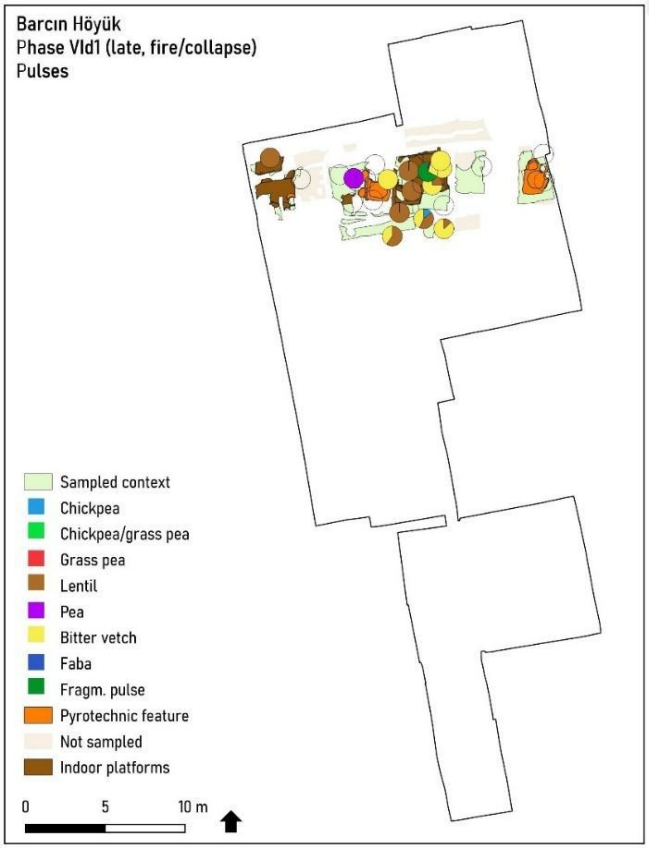


Figure 6.20: The distribution of pulses types per liter in phase VId1 late fire/collapse at Barcın Höyük.

Other intensive contexts are surfaces Δ391 (M10, 11 lt, VId1 late burnt/collapse phase) and Δ390 (M10, 7.01 lt, VId1 late 3 burnt phase) (Table 12.11). The surface Δ391 locates near to door opening in the structure that includes barley/wheat (11), einkorn (6), emmer (14), einkorn/emmer RN (41), bread/hard wheat (1), lentil (6), bitter vetch (6), hazelnut (0.5), *Bolboschoemum* cf. *glaucus* (1), *Carex* (3), *Fallopia* (3), *Galium* (1), *Phalaris* (1), Poaceae (2.5), *Polygonum* (1), type 1- Asteraceae (30) recent?, *Bolboschoenus maritimus/Scirpus marit.* (7). The surface Δ390 is a burnt stamped earth floor in the SE part of str 2a. On the surface, we also found several axes, a small bone spoon (both attributed to collapse layer Δ289), two sherd families, many horn core fragments (related to Δ291), and a large, very nicely polished stone. As a botanical assemblage, except cereal and pulse remains (Table 12.11), flax (11), hazelnut (4), weeds (26), and 44 mouse bones were documented.



Figure 6.21: Ear of emmer wheat found in the platform bench ledge in str2a in VId1 late burnt/collapse phase at Barcın Höyük (excavation archive).



Figure 6.22: Well-preserved emmer grains from ear sample (above) (BH41000) in VId1 at Barcın Höyük (photo: H. Balcı).

In this structure, lentil storage (basin bin, L10, Δ147, 5.5 lt, VId1 late burnt/collapse phase) was also found between Δ52 and Δ181 against wall Δ193 (Figure 6.23, 6.25). This storage seems to have been a wooden box around 25x25 cm with a 10-20 liter storage capacity built against the partition wall of str2a, and the floor in this area goes high up against the wall. In the storage assemblage, hulled six-row barley (8) and rachis nodes (3), einkorn (2), emmer (3), einkorn/emmer RN (12), bread/hard wheat (7), lentil (20080), bitter vetch (6), *Amaranth* (3), Brassicaceae (2), *Convolvulus* (54), wild Fabaceae (78), *Galium* (191), Poaceae (2), Polygonum (18), Vitaceae (1), and 3 mouse bones were documented.



Figure 6.23: Lentil storage at str2a in VId1 late burnt/collapse phase at Barcın Höyük.

Another sample of storage value was documented from a layer Δ185 (L10, 5 lt, VId1 late 4 burnt collapse) (Figure 6.24). This burnt layer is located on top of the wall intersections. This layer is a kind of burnt collapse below Δ184 between Δ52, Δ131, and Δ134 on the SE part of the trench. The intersection of the S walls of str 2a and 2b, also the supporter wall (E wall of str 2b), intersects with each other in this area. This layer also overlies layer Δ408 (M10), which is included in str 2a (Table 12.11).

This context also includes a wide range of economic and wild plant remains. In the cereals; wheat/barley (68), hulled six-row barley (18), einkorn (31), emmer (72), einkorn/emmer (90), einkorn/emmer RN (103), and bread/hard wheat (12), in the pulses; chickpea (4), lentil (8008), and bitter vetch (7), as oily-fiber plant flax (4), as gathered plant hazelnut (3), in the wild plants; *Chenopodium* (1), *Convolvulus* (56), wild Fabaceae (14), *Galium* (92), wild barley (6), Poaceae (6), Polygonaceae (12), 4 animal bones (4), a fish vertebra, and mouse bones (10) were documented.

In the four sampled contexts (layer Δ438, M10; surface Δ411, M10; layer Δ408, M10; platform bench ledge Δ261, M10), the proportion of economic plants is very low, and wild plant remains predominate. Rodent or fragmented animal bones were also recorded from some of these contexts.



Figure 6.24: Lentils in layer (collapse) at str2a in subphase VId1 late burnt/collapse phase at Barcın Höyük.

When we look at str2a in general, preserved plant remains are dominant in burnt contexts. The fact that fragmented grain remains are not high in the samples (especially when we look at the floor and platforms) suggests that grinding/food preparation processes did not take place in this area and that it may have served more of a storage use. Storing crops in the basins could be a crucial strategy for maintaining food security in Neolithic communities, particularly during periods when fresh harvests were scarce. However, these storage facilities, especially large seed repositories, often attracted pests, making them vulnerable to raids by rodents such as mice, which likely consumed significant amounts of stored cereals. Microarchaeological analyses showed that two rooms (str 2a and str2b) revealed a high concentration of bones, most likely belonging to the house mouse (*Mus musculus*) (Özbal and Galik 2019). I also documented mouse bones in several archaeobotanical samples, which show that the burnt/collapse phase includes a higher number of bones compared to the other phases.



Figure 6.25: The photo of the right footprint, found at the entrance of str2a in VId1 (Atamtürk et al. 2018, 168, Fig.4).

Of course, during the stratification process, sampling, flotation, etc., the charred remains are already broken or more fragile. For this reason, the criterion is not based on a few samples. Statistics from the data inside and outside the structures, and especially from the surfaces, are included.

Structure 2b

Structure 2b contains a lower proportion of preserved plant remains compared to 2a, although it has burnt contexts (Figure 6.14, 6.15). The cereal remains are the widespread group, like in 2a, but pulses, oily-fiber plants, and gathered plants show rare evidence. Wild plants are also presented with very low numbers except in one context (pyrotechnic feature, Δ330, 0.75 lt, L10, VId1 pre-fire) (Table 12.12). In pyrotechnic feature Δ330, which is fılled with layers of ashy charred material and orangey yellow soil, probably only the bottom of the fire pit has been found and sampled (only 0.75 lt). The feature is sloping towards N-NE, as with the rest of the Δ324 surfaces. wheat/barley (2), barley (0.5), einkorn/emmer RN (1), *Chenopodium* cf. *album* (61), Polygonaceae (4), and an animal bone were recorded. *Chenopodium* cf. *album* is one of the species which exists in pyrotechnic features in the assemblage of Barcın Höyük.

Some of the light material, except charcoal remains, such as fragmented animal bones, mouse bones, and fish bones, were documented in the samples. In the yellow-greyish surface Δ307 (L10, 4.75 lt, VId1 early) six mouse bones with a small amount of cereal and pulses remains, in surface Δ315 (L10, 4.5 lt, VId1 late pre-fire), a fish vertebra with a half of bitter vetch and a very small piece of hazelnut shell, in the basin bin Δ232 (L10, 3.25 lt, VId1 late fire/collapse subphase) 82 fish vertebras (like anchor) with a very small amount of cereal remains were recorded. This basin bin was covered with white plaster on the inside and crushed red stone particles were at the bottom. Small fish bones and other very small artifacts were visible at the bottom, which were noted (excavation archive) by the excavators. Micro-archaeology, lipid, and plaster samples were taken from this area, except the botanical sample. The basin bin was empty of economic plants, although the context was burnt, a very small number of cereals (4.5 grains and 1 einkorn/emmer rachis node) were recorded. The basin bin may have been reused for fish storage later or botanical remains mixed for any reason.

Structure 21

Structure 21 is located on the westernmost side of the structure row in the east-west direction, and it has been excavated in Trench L10 (Figure 6.13).

In str21, as in other structures, the cereal group is in first place in terms of prevalence among the documented plant remains (Table 12.13). On the other hand, both the fact that Structure 21 is smaller than the others and the contextual density of use may produce different results. The dense and diverse plant group is not seen except in two contexts. One of these is

the platform bench ledge Δ420 (L10, 10.50 lt, VId1 late 2 refurbishment) and the other is the area evaluated as collapse Δ383 (L10, 25 lt, VId1 late 4 burnt collapse) (Figure 6.15).

In the lower surface Δ438 (L10, 6.5 lt, VId1 early 3 unburnt) of the structure, wheat/barley grains (3), emmer grains (2), bitter vetch seed (1) and Poaceae (4), in the pyrotechnic feature Δ437 which lies on the surface Δ438, wheat/barley grains (8), hulled six-row barley (2), einkorn (2), emmer (2), einkorn/emmer RN (1,5), and wild barley (11) were documented.

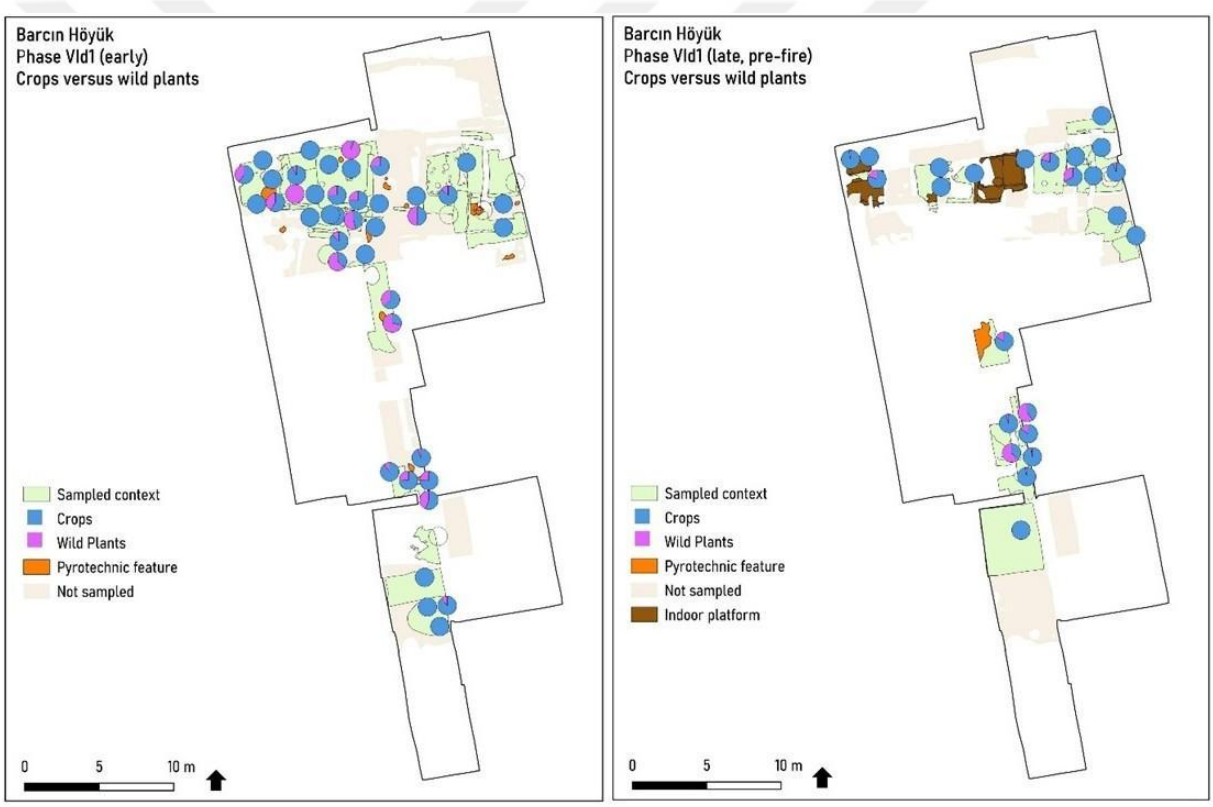


Figure 6.26: The distribution of crops versus wild plants per liter in VId1 early and VId1 late pre-fire at Barcın Höyük.

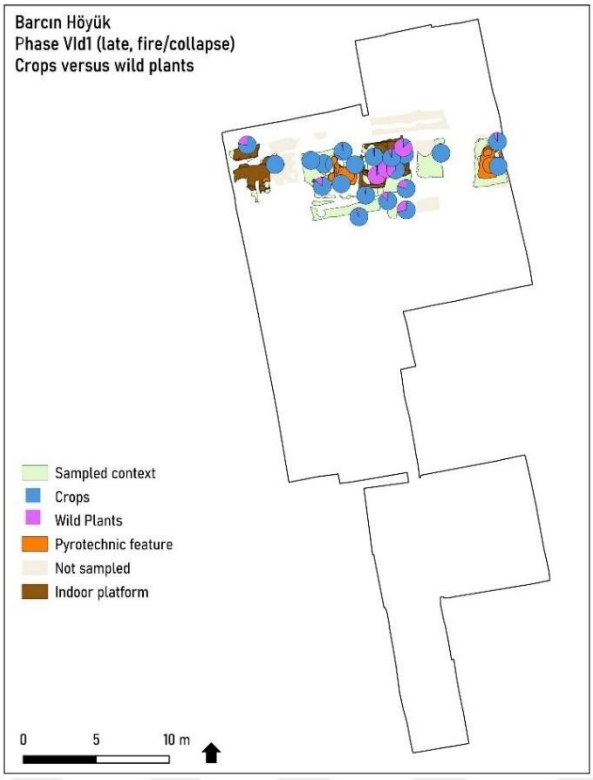


Figure 6.27: The distribution of crops versus wild plants per liter in VId1 late fire/collapse at Barcın Höyük.

In the late level of the structure (VId1 late 2 refurbishment), a platform bench ledge Δ426, which includes wooden beams, was found, and botanical samples were taken. In this feature, two naked wheat and 30 mouse bones were recorded. It is observable that the platforms, as new architectural elements in the structures in phase VId1, created a kind of home/place for the mice. Probably some of them died and stayed in this place. In this feature, wooden beams were partly preserved, and a black construction layer underneath Δ421 was found. Like platform Δ438, another platform bench ledge Δ420, which includes well-preserved wooden beams and a black construction layer in the same subphase, includes a wide variety of plant remains, and 100 burnt mouse bones were recorded (Table 12.13). A layer Δ422 below platform Δ420 includes 98 einkorn/emmer rachis nodes and a very small amount of cereal and wild plant remains.

Another intensive context -but it is not intensive compared to 25 liters of soil- that I mentioned above is collapse Δ422 (L10, 25 lt, VId1 late fire/collapse). In this collapse area, wheat/barley grains (129), hulled six-row barley (4), einkorn (12), emmer (5), einkorn/emmer rachis nodes (85), bread/hard wheat (14), lentil (2), flax (4), hazelnut shell (0.1), Brassicaceae

(1), *Chenopodium* cf. *album* (12), wild barley (57), and Polygonaceae (6) were documented as a rich and mixture assemblage.

6.3.2. Outdoor areas

Annexes and the West and East Courtyards in the center

Archaeobotanical samples from the outdoor area on the southeast side of str19 and str2a come from a surface, six layers, and a burial from different subphases in phase VId1 (Figures 6.13, 6.14, 6.15). There are fewer plant remains in this area, and the cereal remains show abundance (Table 12.14, 12.15). There are no documented oily/fiber plant, gathered plant, or wild plant remains in the contexts. In the surface Δ532 (M11, 4.5 lt, VId1 late fire/collapse), 10 fragmented animal bones were documented, as well as two wheat/barley in the east courtyard. In two documented layers, which are contemporary (Δ563, 5.5 lt; greenish and Δ557, 4.5 lt; green-charcoal) in the annex of str 21, there are no documented plant remains.

Three wheat/barley grains and a half lentil seed were found in a burial Δ508 (M11, 0.5 lt, VId1 early) which includes two baby burials, and a third possible one in which the skeletons were fragmentary and the skulls were missing. In an early layer, Δ579 (M11, 4 lt, VId1 late) in the north courtyard, six-row barley (2), einkorn (1.5), emmer (2), and a half einkorn/emmer rachis node were documented.

The western courtyard contains wider plant remains compared to the eastern outdoor area. Cereals are again the abundant group, and wild plants are in second place. In the pulses, only lentils and bitter vetch are presented in this area. There are no documented gathered plants, only three flax seeds have been recorded in an ashy/burnt collapse Δ186 (L10, 22.75 lt, VId1 late late fire-collapse) from the possible annex of str 2b. The wild plants consisted mostly of arable weeds.

There is another collapse, Δ357 (M10, 4.5 lt, VId1 late fire-collapse), which is probably located in the north annex of str 2b. This burnt collapse seals burnt annex surface Δ388, which is probably contemporary with str 2a. This feature can be a part of the roof collapse of str 2a. This collapse sample contained a wide variety of plant species. In the cereals: wheat/barley (154), hulled six-row barley (8), einkorn (18), emmer (42), einkorn/emmer rachis nodes (93), and bread/hard wheat (115), in the pulses; lentil (3), and bitter vetch (19), and in the wild plants; *Bolbosch*. cf. *glaucus* (9), *Carex* cf. divulsa (29), *Chenopodium* (4), Cyperaceae (1), *Cyperus* (1), Fabaceae (5), *Geranium* (1), *Nepta-Ocimum* (127), *Persicaria tinctoria* (5), *Phalaris* (1),

and *Rumex* (4) were documented. We see a typical crop-arable weed association in this assemblage (Figure 6.26, 6.27).

In the western courtyard area, located in front of str21, cereal remains show abundance (Table 12.15). Pulses show presence in only two contexts; one of them is basin bin Δ579 (L11, 15.5 lt, VId1 early), and the other one is surface Δ619 (L11, 11.5 lt, VId1 late). Pulses are represented by lentil and bitter vetch species.

South Courtyards

The south courtyard area was mostly excavated in Trench L12 and partly in Trench L13 in the south part of the excavated area at Barcın Höyük (Figure 6.13). It has been argued that the architectural elements identified in the L12 trench are an outdoor space next to structures 22 and 20, which are located in the not yet excavated M12 trench or an area under the annex, while traces regarding the use of the area as a place of function were identified (Figure 6.28). Within this context, a large number of pyrotechnic features that can be associated with pigment production were identified since in some of them, there were remains of cooking, and in some others, there was a huge amount of red paint remains (Özbal et al. 2017).

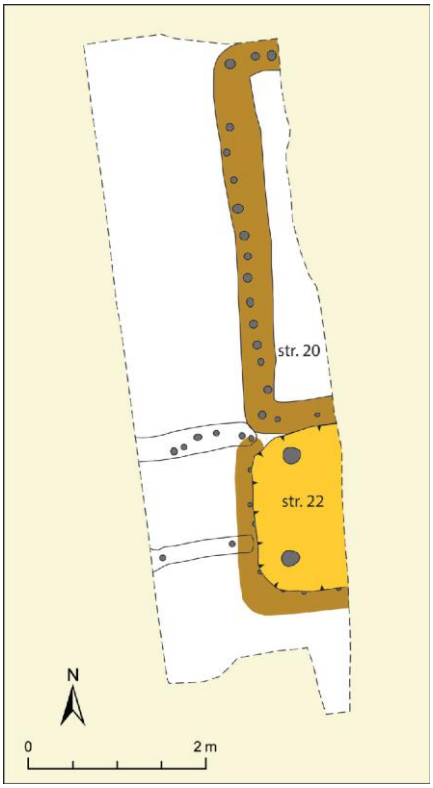


Figure 6.28: The western walls of str20 and the adjacent semi-subterranean str22 in phase VId1 late (Gerritsen and Özbal 2016).

The plant remains show an intensive distribution in this area. Cereals are still the abundant group in economic plants, but pulses also show frequent presence in the contexts (Table 12.16). Oily/fiber and gathered plants are still rare in this area, as well. The archaeobotanical assemblage was recorded from 19 contexts in outdoor areas: (9 surfaces, 1 layer, 1 pyrotechnic feature, 1 pit in L12; 3 surfaces, 2 basin bins, 1 layer, 1 burial in L13), and most of the remains were obtained from Trench L12 area which is considered as the south courtyard area (Figure 6.29).

In the cereal remains, fragmented wheat/barley remains show a high value compared to grains. Six-row barley (hulled), hulled wheat (einkorn and emmer), and bread/hard wheat show a strong presence, although the intensive fragmented cereal remains.



Figure 6.29: The distribution of oily/fiber and gathered plants per liter in VId1 early and VId1 late pre-fire at Barcın Höyük.

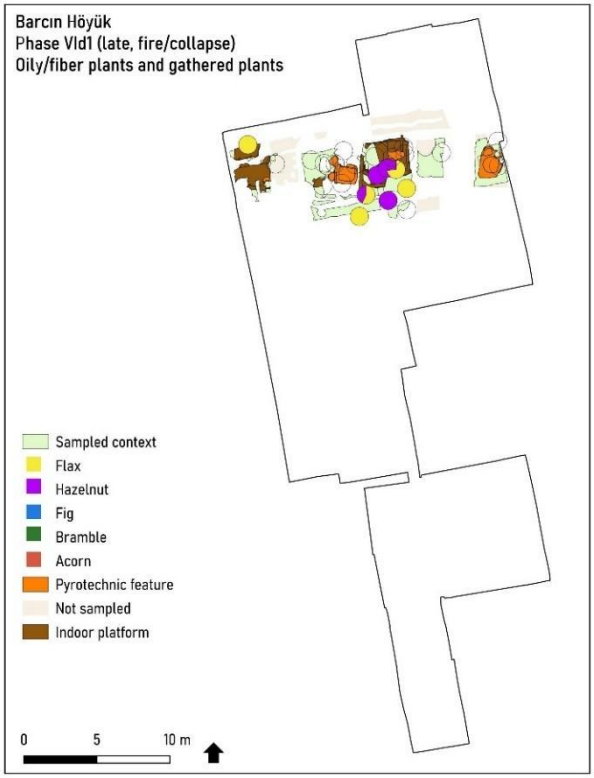


Figure 6.30: The distribution of oily/fiber and gathered plants per liter in VId1 late fire/collapse at Barcın Höyük.

An important point is the near lack of by-products. In addition to that, pulses show a regular presence in almost all contexts, both subphases VId1 early and VId1 late. Like this area, there is a frequent presence of bread/hard wheat in str2a between the structures and other outdoor spaces. In phases VIe and VId1, hulled wheat and hulled barley are generally abundant species compared to bread/hard wheat, but bread/hard wheat shows a frequency in this south courtyard area in phase VId1.

In the southernmost outdoor area (including Trench L13), especially in subphase VId1 early, there are fewer documented plant remains compared to the south courtyard (Trench L12). Most of the remains belong to the subphase VId1 early (Table 12.17). There are not too many crop plants, but still, all species in cereals are represented here, although there are a smaller number of plant remains.

6.3.3. Assessment

The distribution of the plant remains obtained from the layers and units belonging to phase VId1 (for the cereal group in particular) is consistently similar to the distribution in phase VIe.

The distribution of cereals is wide in two different areas, namely, in structures 21, 2b, 2a, and 19, and in the south outdoor activity area excavated as Trench L12 (in front of structures 22 and 20, while the rest of the structures stay in unexcavated Trench M12). In the northern side of the structures, defined as the north courtyard, there were almost no documented botanical remains except for two samples in the north and south of str21. On the other hand, in this phase, the density of plant remains per liter show intensity in basins/bins, platforms, collapses, and surfaces compared to VIe (Table 6.3).

Table 6.3: The quantity of plant groups per context in Phase VId1.

VId1	Sample (n)	liter	plants per Lt	plants total	Barley	Hulled wheat	Hulled wheat BP	Naked wheat	Pulses	Flax	Nuts	Wild Plants	Animal Re.
basin_bin	9	60.5	344.21	20825	20	24	48	21	20092	0	1	534	85
burial	2	5.75	0.34	2	0	0	0	0	2	0	0	0	0
collapse	6	66.25	11.81	783	23	101	206	132	31	8	1	273	8
ditch_trench	1	2.5	1.2	3	0	0	0	1	1	0	0	1	0
exploratory_locus_sounding	1	4.5	0	0	0	0	0	0	0	0	0	0	0
layer	27	176.1	4.44	783	23	101	206	132	31	8	1	273	8
pit	1	3.5	1.42	5	0	2	0	1	0	0	0	2	0
platform_bench_ledge	5	45.75	16.72	765	44	64	137	163	91	1	5	159	101
pyrotechnic_feature	10	41.5	4.67	194	10	29	27	13	11	0	0	88	16
surface	35	199.45	5.09	1017	68	126	68	72	77	13	6	509	78
wall	4	8.5	0.94	8	1	1	0	0	2	0	0	4	0
total	101	614.3	39.69	24385	189	448	692	535	20338	30	14	1843	296

Compared to the north outdoor area, there is a high plant value in the south courtyard area. The fact that there are almost no rachis remains in the workshop area in Trench L12 (in front of a possible structure in Trench M12, but it has not been excavated), which is located in the south of the site, shows that cereals have been either ground or processed in another way there. We know that remains of each kind of cereal have been obtained from this area.



Figure 6.31: The distribution of hulled wheat and by-products per liter in VId1 early and VId1 late pre-fire at Barcın Höyük.

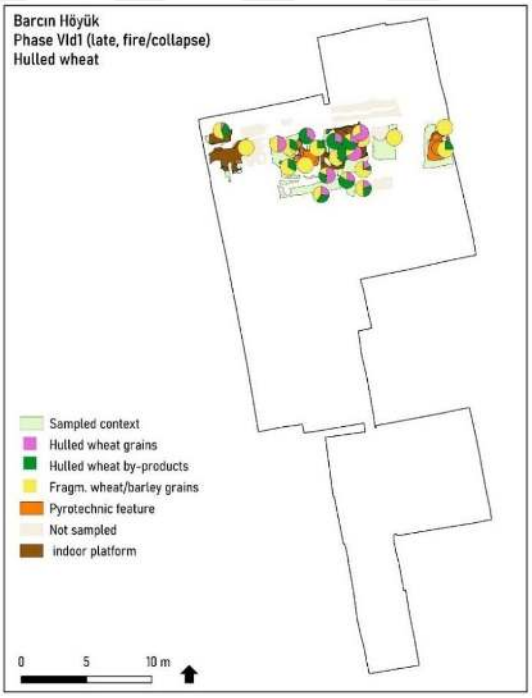


Figure 6.32: The distribution of hulled wheat and by-products per liter in VId1 late fire/collapse at Barcın Höyük.

As distinct from the cereal group, pulses were intensively obtained from inside structure 2a, and the south courtyard area (Trench L12) (Figure 6.31, 6.32). Flax and hazelnut remains

have also been documented, mostly in the units of str 2a in especially phase VId1 late fire/collapse (Figure 6.20, 6.30).

In phase V1d1, there are some differences noticed in plant distribution compared to VIe. The number of plant remains per liter on the surfaces increases while the number of plant remains in the pyrotechnic feature areas decreases. Unlike VIe, there existed two different contexts in phase V1d1. These are areas that are evaluated as platforms and collapse. Although contexts have not become definite in relations inside and outside the space, they are usually evaluated as inside the space. In these two contexts, plant remains are the highest in number compared to the other contexts. One of the reasons is that the collapsed areas have mostly been unearthed in burned layers, and the plant remains might have been preserved due to burning.

Among the cereal group, remains were most intensively obtained from the surface layer, platform, and collapse areas. Likewise, this is also relevant for wild plants. As for the pulse remains, if we evaluate the group of lentils (approximately 20,000 seeds) found in a small basin bin excavated in, and another group of lentils (approximately 8,000 seeds) obtained from a layer Δ185 excavated in str2a (Trench L10) separately, pulses are intensively obtained from the surface, layer, platform, and collapse areas.

Wild plant remains are generally obtained from areas where economic plants are intensively found, but they were also obtained in other spaces (Figures 6.26, 6.27). The relation between economic plants and wild plants mentioned in phase VIe also applies to this phase. Distinctly, in phase V1d1, there is an important increase in the number and species of pulse remains. While there was only 1 hazelnut shell found in phase VIe, we see an observable increase in phase V1d1 in terms of hazelnut remains.

6.4. Phases VId2, VId3, VIc

Phases VId2, VId3 (6400-6300 cal BC), and VIc (6300-6200 cal BC) represent the middle phases of Neolithic Barcın Höyük. In these phases, the rectangular houses generally continued to be located in east-west directions like the previous phases, and the south area has continued to be used for outdoor activities that include fire pits and other installations (Gerritsen and Özbal 2019, 60).

6.4.1. Phase VId2

Phase VId2 consists of the earlier levels of structures 4, 10, 3, 15, which are especially excavated in phase VId3 from east to west in some cases. In the archaeobotanical data, we have only a few remains from structures 4 and 15. In this phase, we have also data from the central courtyard and the southernmost courtyard (Figure 6.33).

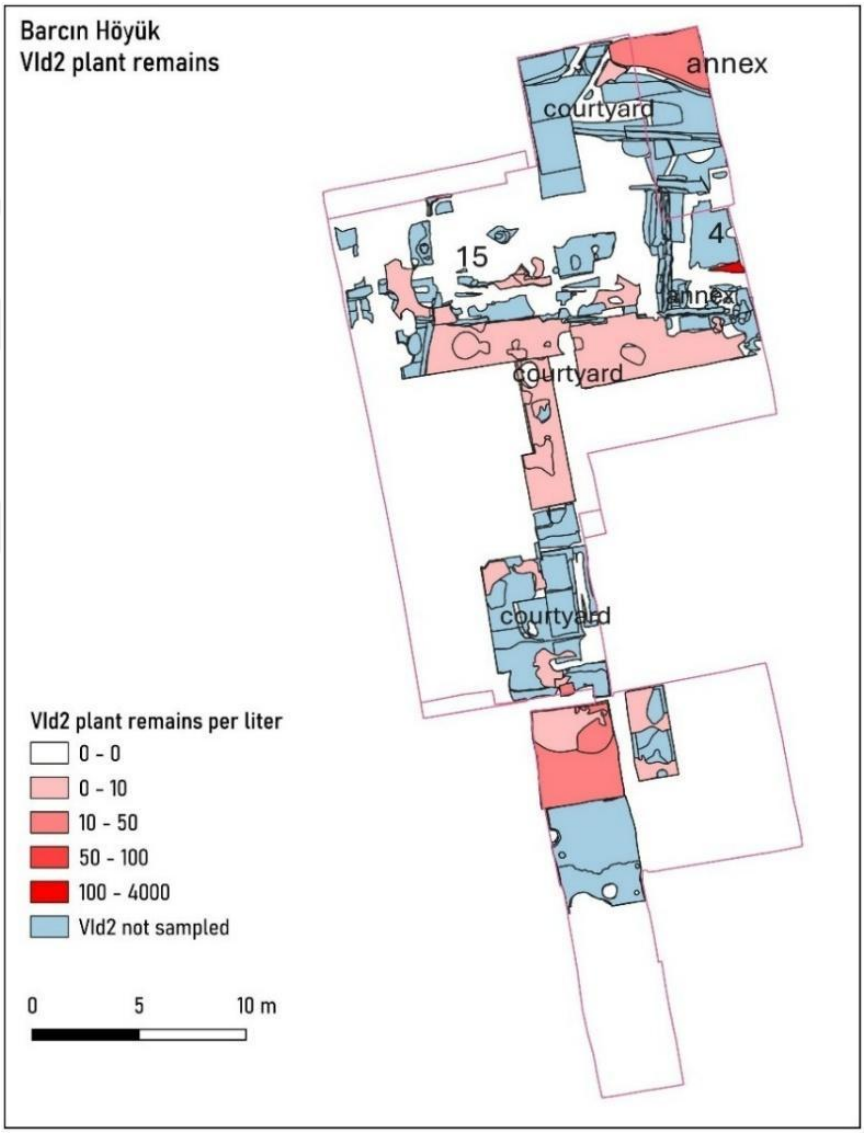


Figure 6.33: The density of plant remains per liter in VId2 at Barcın Höyük.

Regarding the plant distribution in the outdoor and indoor areas compared to previous phases, the botanical samples obtained in Phase VId2 are not as high as the limits of the excavated area, which may have affected this situation in previous phases. According to the sampled contexts, plant remains were obtained from more indoor places in the northern part.

When we look at the distribution in general, the wild plant-crop relation is also observed in the contexts where the cereals came from (Figure 6.36).



Figure 6.34: The distribution of cereal types and hulled wheat (einkorn-emmer) and BP per liter in phase VId2 at Barcın Höyük.

Six-row barley and emmer wheat among the cereals, lentils, and bitter vetch among the pulses are the most commonly identified species in the sampled contexts in phase VId2. A small amount of hazelnut shells were obtained from indoor and outdoor contexts on the north side of the excavated area (Table 12.18). Fragmented wheat/barley remains were documented in every sample except one, which is identified as layer Δ610. This frequency proves the dominant presence of cereals compared to other plants.

Apart from plant remains, rodent-like small animal bones were encountered more frequently in phase VId1. However, although rare, fish spinal bones (*vertebra*) are encountered in some contexts. In this phase, only two fish bones were found in addition to fragmented wheat/barley remains (10) on the western side of the northern section, on a white plastered surface Δ199 (L10, 12,3 lt, VId2) in an indoor place.



Figure 6.35: The distribution of pulses types and oily/fiber and gathered plants per liter in VId2 at Barcın Höyük.

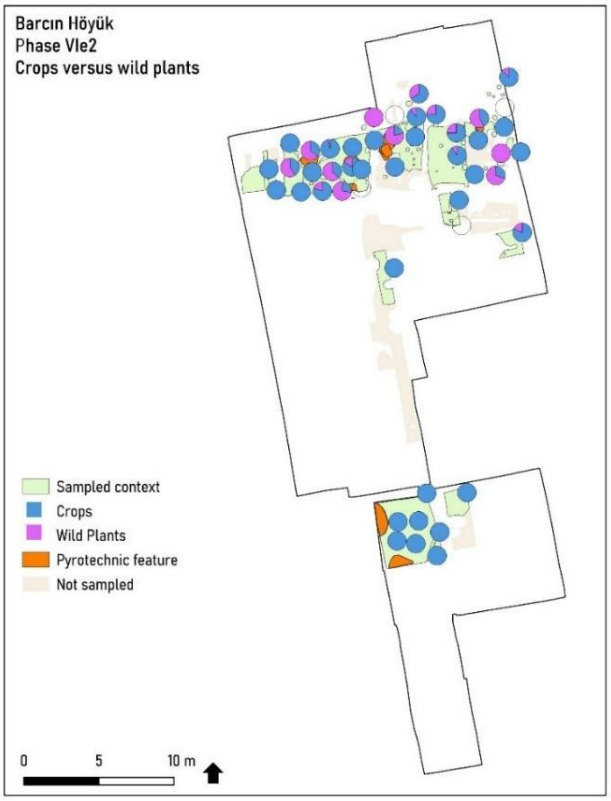


Figure 6.36: The distribution of crops versus wild plants per liter in VId2 at Barcın Höyük.

The central-southern side of the excavated area in phase VId2 shows a little bit higher plant use in the courtyard area. It is observable that there is a frequency of bread/hard wheat and emmer wheat in the cereals (Table 12.19, Figures 6.34, 6.35).

Table 6.4: The quantity of plant groups per context in Phase VId2.

VId2	Sample (n)	liter	plants per Lt	plants total	Barley	Hulled wheat	Hulled wheat BP	Naked wheat	Pulses	Flax	Nuts	Wild Plants	Animal Re.
layer	8	35.5	3.66	130	9	99	5	2	2	0	1	10	2
other	1	3	8.66	26	1	13	0	10	2	0	0	0	0
pit	1	7.5	0.8	6	0	1	0	2	2	0	0	1	0
pyrotechnic_feature	7	21.5	2.79	60	7	21	3	7	8	2	1	9	2
surface	10	54.55	1.74	95	7	20	4	27	17	0	0	18	2
total	27	122.05	2.59	317	24	154	12	48	31	2	2	38	6

Like the northern part of the side, lentils and bitter vetches are the representative species of the pulses group. The percentage of wild plants in the crop remains decreased in this phase. The plant distribution is not observed in all sampled contexts except for three of them (Figure 6.35).

Two of the three contexts that present higher and more diverse remains compared to the others represent the surfaces (L12, Δ461; L13, Δ146), and both surfaces are considered as the front area of the indoor areas (Table 6.4). At the same time, there are no documented gathered plants in the southern part of the site.

6.4.2. Phase VId3

In VId3, which is the last phase of VId after VId2, the plant distribution is similar to VId2 in some respects, but there are also differences. The spatial organization in VId3 is not identical to that in the previous phase. The plant remains come mainly from the northwestern indoor (str15, L10) and the central-southern indoor (str18, L12) (Figure 6.37).

On the northeast side, hazelnut shell (fruits) remains were found alone on the surface Δ378 of str10 (122) and in the wall area Δ367 of str 4 (10) (Table 12.20, Figure 6.39).

So far, we have not come across pulses remains intensively except for two or three specific contexts. The only sample with storage value was the lentil depot found in phase VId1. Around 100 lentil seeds were found in the excavated context as "other" in str15, which is evaluated as a compact chunk of mud material. Although this area is considered to be aligned with the lentil storage (Δ147, str 2a, L10) phase VId1 burnt[64]; it has been dated to VId3. Since

[64] Please see section 6.3.1 Phase VId1, Structure 2a in the same chapter.

this area is a kind of fill area with compact chunk material, and the area where the lentil basin bin (Δ147, late 3 burnt phases, VId1) was found is quite burnt, it may have been used as filling material later. Another detail that makes us think of this is that in this sample, even though there are two seeds, bindweed (*Convolvulus*) seeds were found. The seeds of this plant are not encountered frequently in the samples, and especially with the lentil remains of around 28,000 in VId1, more than 200 seeds were recorded. In order to confirm that the lentils in this area are related to the others, C14 analysis can produce definitive results.



Figure 6.37: The density of plant remains per liter in VId3 at Barcın Höyük.

In the central/southern indoor area (mostly str 18, Trench L12), various and frequent plant remains are generally encountered, although not in high numbers. In particular, more dense remains were found in two contexts. One of these is the surface Δ427, and the other is the pyrotechnic feature Δ409. The white surface Δ427 (L12, Δ427, 9.5 lt, VId3) which is located below another white surface Δ421 (Table 12.21) includes a small number of cereals, a half bitter vetch seed, wild Fabaceae (1), *Galium* sp. (1), wild barley (0,5), *Polygonum* (5) as weeds, and

a fish bone (*vertebra*) and mouse bone among the plant remains. This surface is for domestic use. On the other hand, a certain amount of remains were also obtained from other surfaces (Δ421, Δ415) located above this surface.

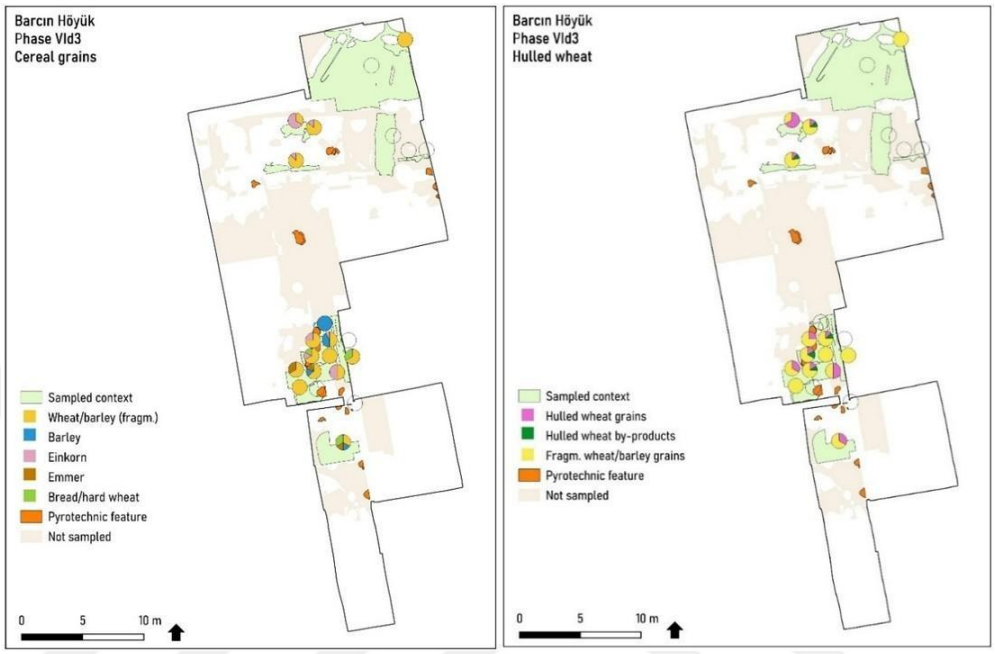


Figure 6.38: The distribution of cereal types and hulled wheat (einkorn-emmer) per liter in phase VId3 at Barcın Höyük.

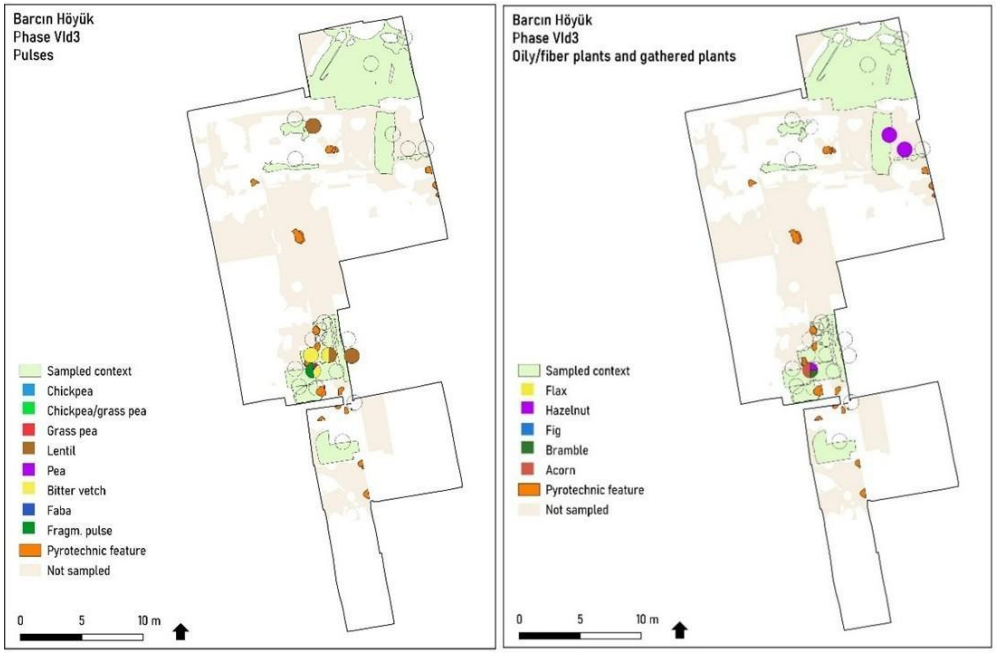


Figure 6.39: The distribution of pulses types and oily/fiber and gathered plants per liter in VId3 at Barcın Höyük.

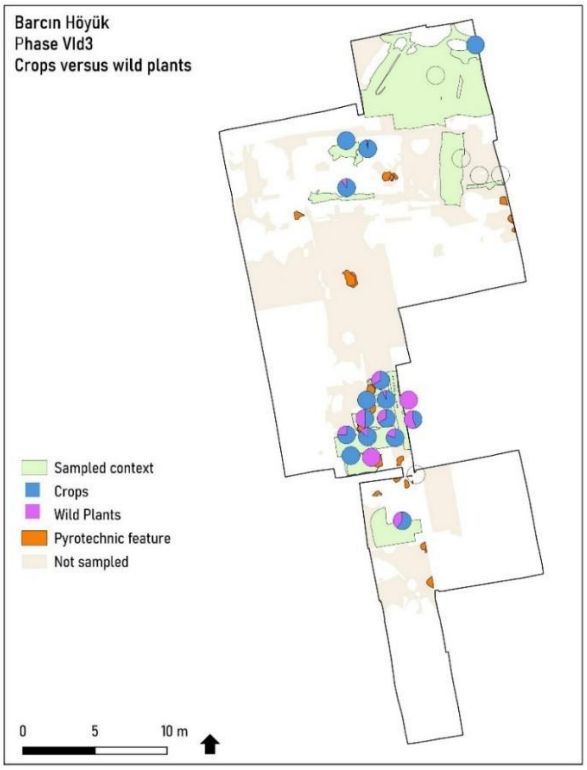


Figure 6.40: The distribution of crops versus wild plants per liter in VId3 at Barcın Höyük.

These white surfaces seem to be renovation surfaces for str18. When we look at three surfaces on top of each other, the sample volume of the surface Δ421 (4 lt) in between is half the volume of the others, and since the plant remains obtained are already low, the probability statistically decreases to 50%. It is difficult to say that there was more domestic use for Δ427 than for others at this stage.

Table 6.5: The quantity of plant groups per context in Phase VId3.

VId3	Sample (n)	liter	plants per Lt	plants total	Barley	Hulled wheat	Hulled wheat BP	Naked wheat	Pulses	Flax	Nuts	Wild Plants	Animal Re.
burial	1	3.25	2.15	7	0	0	0	1	1	0	0	5	0
ditch_trench	1	1.25	2.4	3	0	1	1	0	0	0	0	1	0
layer	6	18.75	0.53	10	0	2	0	0	3	0	0	4	1
other	1	2.5	42.8	107	0	1	1	0	101	0	0	2	2
platform_bench_ledge	1	2	1	2	0	2	0	0	0	0	0	0	0
pyrotechnic_feature	3	21.75	5.79	126	10	5	3	2	83	0	1	22	0
surface	10	58.75	2.75	162	6	5	2	3	1	0	122	17	6
wall	1	1	10	10	0	0	0	0	0	0	10	0	0
total	24	109.25	3.9	427	16	16	7	6	189	0	133	51	9

Another intensive context is pyrotechnic feature Δ409 (L12, 8 lt, BH38221, VId3) that obtained hulled six-row barley, emmer wheat, bread/hard wheat, fragmented wheat/barley in the cereals, and a high amount of pulses which includes bitter vetch seeds (31), pea seeds (5), and fragmented pulses (43) that probably are also mostly pea. In this feature, one bramble

fruitlet and wild plants (20) have been documented (Table 6.5). Wild plants have consisted of *Chenopodium* (13), *Echium vulgare* (2), *Lithospermum* (2), Polygonaceae (2), and *Setaria pumila* (1).

In the outdoor area at the southernmost part of the site, rare plant remains were detected (Table 12.22, Figures 6.38, 6.39, 6.40). The plant remains include cereals and wild plants. There are no documented pulses, oily/fiber plants, or gathered plants.

When we evaluate the outdoor and indoor areas in general, we see that pulses remains were mostly presented inside the structures (Figures 6.39). This situation was not observed as clearly in the previous phases as it is in phase VId3. Except for one context (pyrotechnic feature Δ409), all pulses remain from other areas, were all lentils and/or bitter vetch.

6.4.3. Phase VIc

In phase VIc, we have reached botanical data mainly from outdoor areas (Figure 6.41). When we look at the general distribution, we see a more dense and wider range of plant remains, mostly on surfaces (Table 6.6).

Table 6.6: The quantity of plant groups per context in Phase VIc.

VIc	Sample (n)	liter	plants per Lt	plants total	Barley	Hulled wheat	Hulled wheat BP	Naked wheat	Pulses	Flax	Nuts	Wild Plants	Animal Re.
basin_bin	2	6	0.5	3	0	0	0	1	0	0	0	2	0
burial	3	7.025	0	0	0	0	0	0	0	0	0	0	0
collapse	11	74.5	0.91	68	3	1	11	9	8	0	0	36	0
other	1	4.15	4.57	19	4	2	1	0	2	1	0	9	0
pit	3	30.5	2.55	78	3	8	1	8	8	0	0	49	1
posthole	1	3.25	0.61	2	0	0	2	0	0	0	0	0	0
pyrotechnic_feature	9	7.3	4.79	35	4	2	3	0	1	4	1	19	1
surface	9	50.35	8.2	413	4	1	1	6	5	0	0	392	4
total	39	183.08	3.37	618	18	14	19	24	24	5	1	507	6

It is possible to say that no single pure assemblage has been obtained from almost any context to date. Plant remains generally appear as a combination of cereals + pulses + rarely gathered plants + wild plants, or as mainly cereals + wild plants or fragmented cereal remains. These combinations may show differences in the phases in some respects.

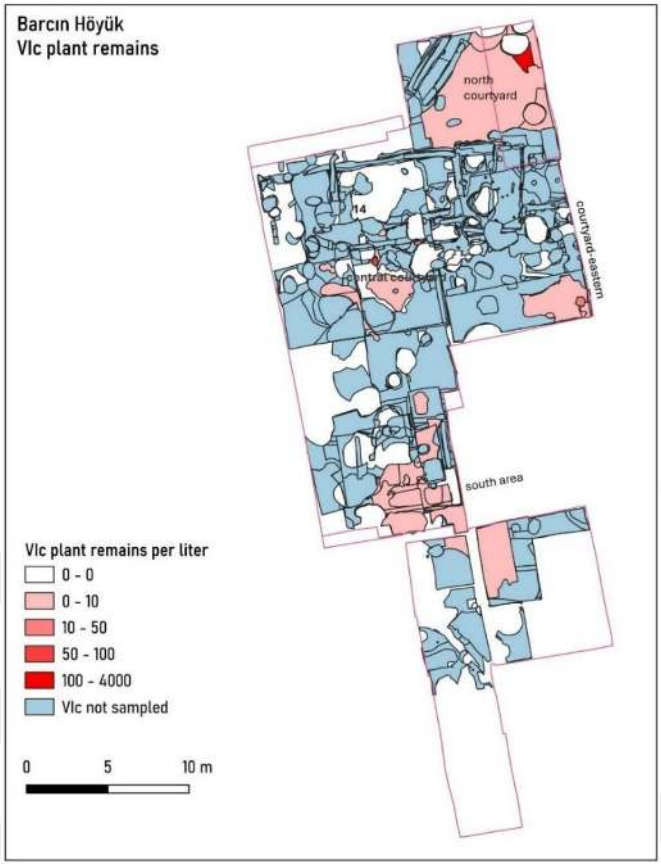


Figure 6.41: The density of plant remains per liter in VIc at Barcın Höyük.

On the other hand, although rarely, more individual plant groups have been obtained from some contexts (Figures 6.42, 6.43, 6.44). One of these is the base found in the northern courtyard area belonging to subphase VIc3 (the last stage of VIc before VIb). Only goosefoot (*Chenopodium album*) fruits (379), *Amaranth* (1), and *Heliotropium* (1) were identified in this surface Δ208 (Table 12.23).

Goosefoot has a morphology that contains a large amount of fruit even on a single plant. Even if the fruits were not collected directly for conscious use, one or two branches of plants with ripe and dried fruits on them may give us this figure. When we look at it from this perspective, it is difficult to say why these fruits were found on this surface. Botanical samples taken from the surfaces are taken without going under the layer and in a spreading manner, and with different sample numbers if the area is very large. For this reason, the possibility of a cluster caused by an insect carrying it is very low since the same plant remains came from both samples taken from this surface.

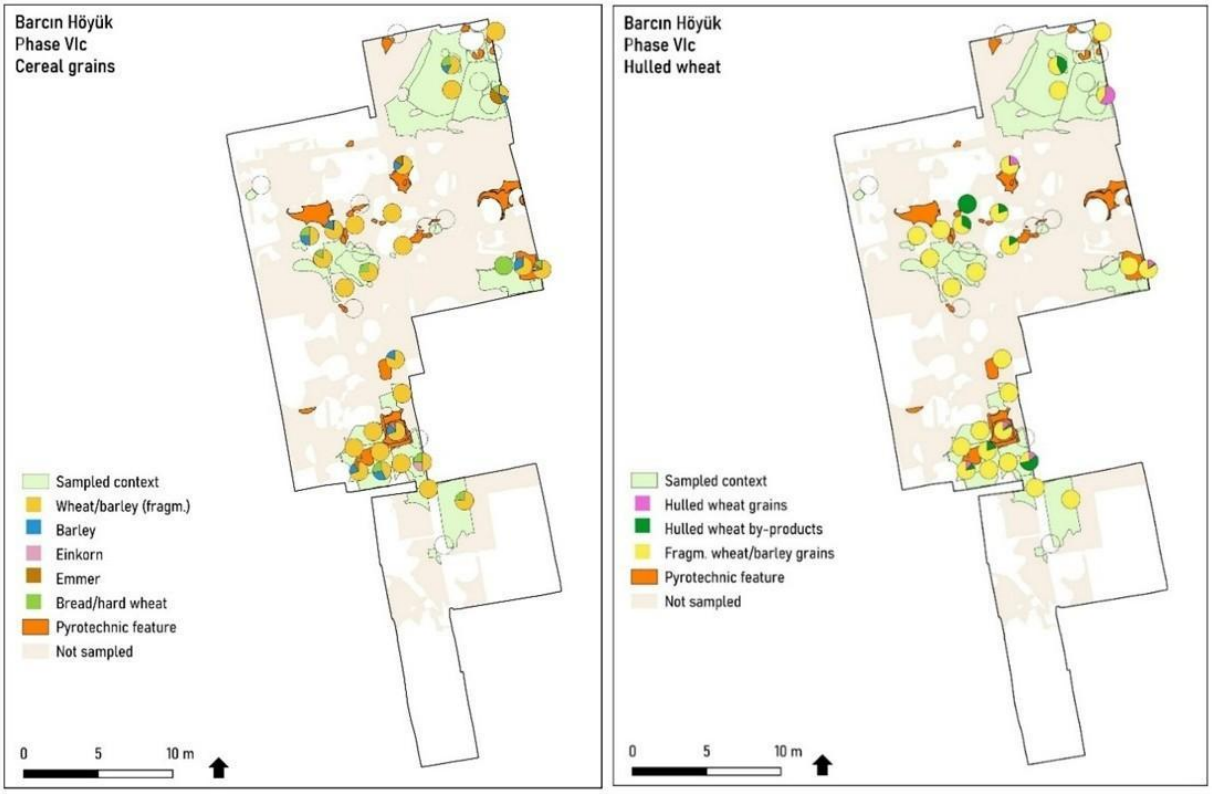


Figure 6.42: The distribution of cereal types and hulled wheat (einkorn-emmer) per liter in phase VIc at Barcın Höyük.

In the north courtyard area, hulled six-row barley, emmer wheat, bread/hard wheat in the cereals, bitter vetch, and lentil in the pulses show presence.

In the central-eastern part of the outdoor area, only a pit, Δ327, in subphase VIc3 provided cereal and wild plant remains, except for two lentil seeds. In this context, the *Chenopodium album* (2), *Echium vulgare* (16), and *Lithospermum* (24) have been recorded as weeds. These species are typically arable weeds, which are mostly present with cereal crops in the field at Barcın Höyük.



Figure 6.43: The distribution of pulses types and oily/fiber and gathered plants per liter in VIc at Barcın Höyük.

In the central outdoor area, most of the sampled contexts contain fragmented wheat/barley remains. Relatively, cereal species show presence, but wild plants and rarely pulse and gathered plants have also been documented. The number of plant remains is generally very low, and emmer and einkorn are the most common hulled wheat species at Barcın Höyük, but they have not been found in this area in half or in whole grain (Figures 6.42, 6.43). They may be present in fragmented wheat/barley remains, but the fragments are too small and poorly preserved to identify species or genus.

Flax and bramble remains are present in the site but are not frequently encountered (Figure 6.43). Four flax seeds were recovered from a pyrotechnic feature, Δ536, and one bramble fruitlet was from a white-greyish surface, Δ535, in the central-western outdoor area (Table 12.24).

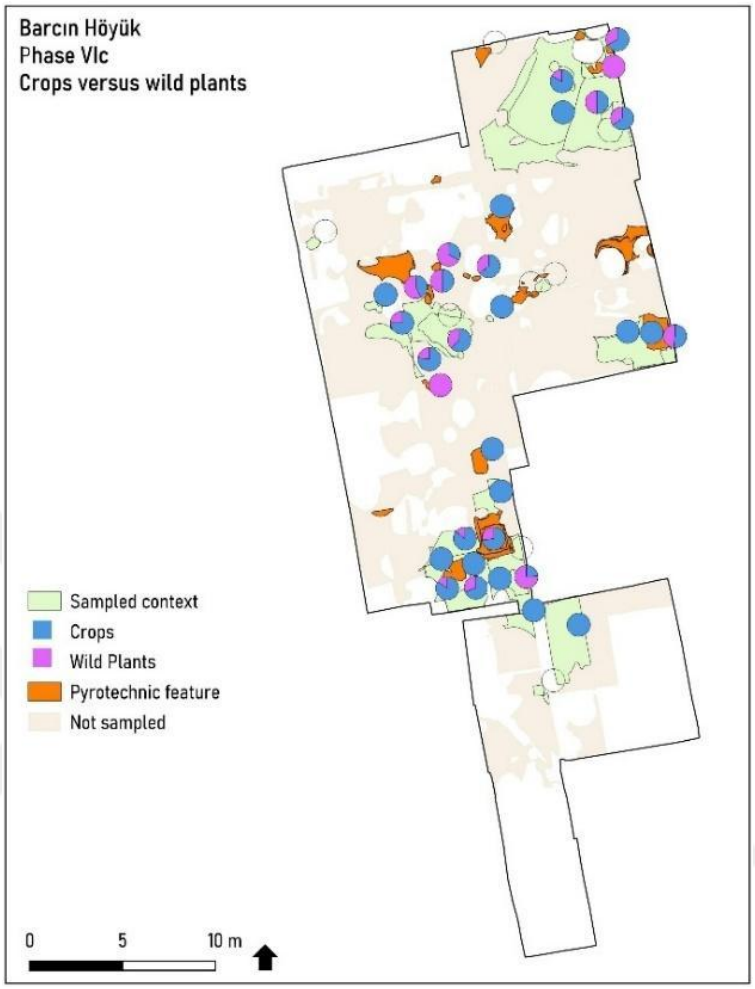


Figure 6.44: The distribution of crops versus wild plants per liter in VIc at Barcın Höyük.

The earliest subphase of VIc includes a wider plant range, but the number of remains is not as high as in the central outdoor area. Differently, in the earliest subphase of VIc, chickpea and pea seeds (pebble surface Δ379, L12), which we did not encounter in the northern part, and a faba bean seed (cf. *Lathyrus*) (layer Δ105, L13) in the southernmost area were found. Apart from this context, a faba bean seed was recorded in a pit dated to EBA II (Δ3, M11, BH2174) at later levels (Table 12.25).

Faba beans (*Vicia faba*) or grass peas (*Lathyrus sativus*) are not species we are used to seeing at Barcın Höyük's Neolithic phases. However, especially towards 6000 BC, these two species are encountered in other settlements in the region. For example, we already know grass peas from the 7th layer of Aşağı Pınar (5950-5700 cal BC)[65], which has Late Neolithic layers

[65] Please look at Pulses section in chapter 5.

and is one of the case study sites of this research. Here, it is important to follow the chronological process of the transition of faba beans and grass peas, if there is such a transition, from Northwestern Anatolia to Europe. This topic will be discussed in the conclusion chapter.

6.5. Phases VIb-VIa

In the transition from VIc to VIb, we encounter a new settlement organization. We see new buildings emerging in areas used as courtyards in previous phases. In phase VIb, the buildings are more separate in the area rather than a structure row in the north as in earliest phases. The use of courtyards which were considered as communal daily activity spaces changes in this phase. On the other hand, part of this occupational level was destroyed by many large pits dug into it by later phases as in phase VIa.

6.5.1. Phase VIb

In VIb, as in VIc, plant remains are diverse in many contexts, but not numerous. As in the previous phase, fragmented cereal remains are more abundant than whole cereal grains. Wild plants are present proportionally, together with cereals. Pulses remains are the third most abundant group after cereals and wild plants, as is usual. The intensity of plant remains per liter increase in surfaces in Phase VIb (Table 6.7).

Table 6.7: The quantity of plant groups per context in Phase VIb.

VIb	Sample (n)	liter	plants per Lt	plants total	Barley	Hulled wheat	Hulled wheat BP	Naked wheat	Pulses	Flax	Nuts	Wild Plants	Animal Re.
burial	1	0.25	0	0	0	0	0	0	0	0	0	0	0
collapse	1	9	0	0	0	0	0	0	0	0	0	0	0
ditch_trench	1	4	0.75	3	0	0	1	0	1	0	0	1	0
layer	17	130.25	3.17	413	4	1	1	6	5	0	0	392	4
other	1	3.5	0.85	3	0	0	3	0	0	0	0	0	0
pit	6	37.25	2.89	108	4	5	4	3	90	0	0	2	0
posthole	2	1	2	2	0	1	0	0	0	0	0	0	1
pyrotechnic_feature	6	18.5	1.67	31	1	12	5	6	7	0	0	0	0
surface	14	63.9	10.06	68	9	11	26	10	10	0	2	0	0
wall	1	2.75	0	0	0	0	0	0	0	0	0	0	0
total	50	270.4	2.32	628	18	30	40	25	113	0	2	395	5

Archaeobotanical samples, which have similar volumes, were taken from three pyrotechnic features (Δ133, Δ121, Δ118) in the northern courtyard area (Trench M10) (Figure 6.45). Of these pyrotechnic features, only Δ118 yielded higher remains, which is mentioned below, and a few remains that are compatible with Δ118 were obtained from Δ133, and no remain was found in Δ121, a feature that has red burnt soil type (Table 12.26).

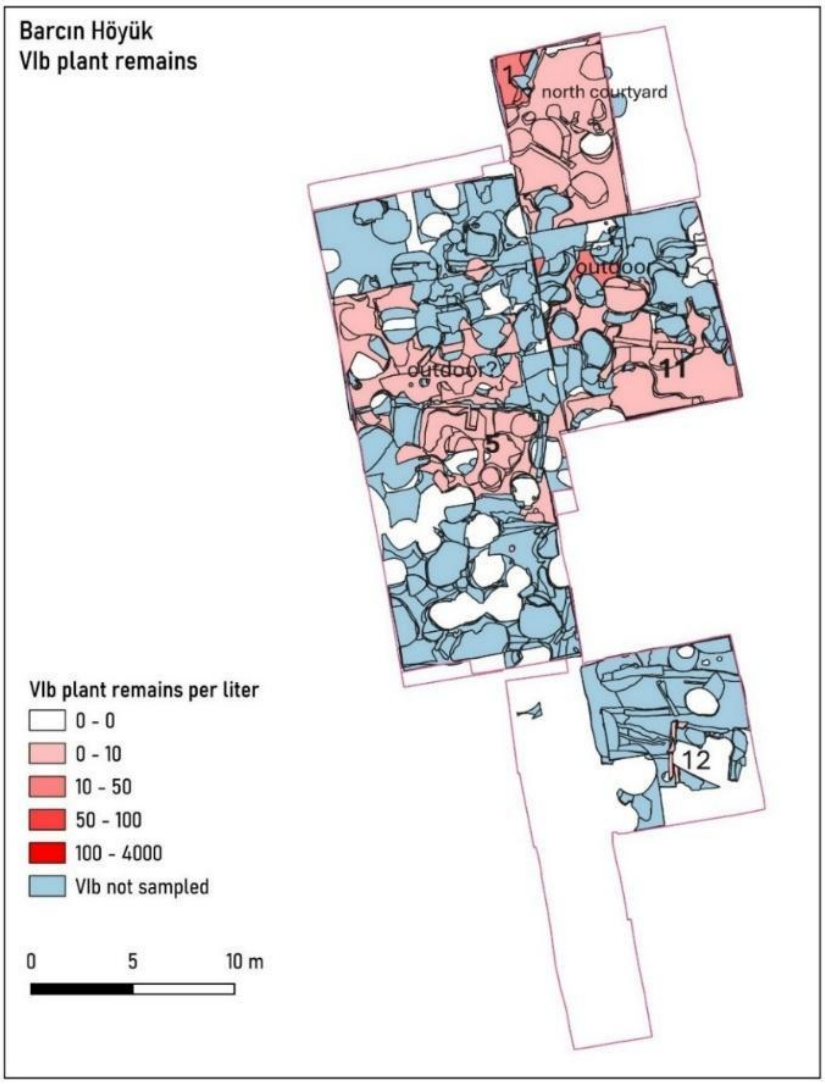


Figure 6.45: The density of plant remains per liter in VIb at Barcın Höyük.

The intensive value has been obtained from a pyrotechnic feature Δ118 (M10, 5 lt, VIb1), which includes emmer grains (7), emmer rachis nodes (4), bread/hard wheat (5), fragmented wheat (30) among the cereals, lentil (3), and bitter vetch (2) among the pulses, *Bolboschoenus* cf. *glaucus* (7), *Chenopodium* cf. *album* (3), *Lepidium* (2), *Lithospermum* cf. *arvense* (38), and *Rumex* (1) among the wild plants in north courtyard area.

There is only one surface and three layers of samples (Δ103 is not certain) from str 1 (?) in the south of the north courtyard, but plant remains were obtained from all the sampled contexts (Figure 6.46, 6.47). Surface Δ220, located in the northwest corner of the structure, is

located below the fill layer Δ168, and similar plant species were recorded from both (Table 12.26).



Figure 6.46: The distribution of cereal types and hulled wheat (einkorn-emmer) per liter in phase VIb at Barcın Höyük.

Bread/hard wheat rachis nodes are by-products that have rarely been encountered in the site since the early phases. In layer Δ168, four bread/hard wheat rachis nodes were documented.

It is very clear that bread/hard wheat was brought to the settlement after the process of threshing their husks after the harvest was carried out somewhere outside the site. Since bread/hard wheat can be separated from its chaff (threshing) more easily compared to hulled wheat spikelets (einkorn, emmer), its storage or processing (grinding, pounding, etc.) is mainly carried out by de-hulling it from its chaff/husk. Since hulled wheat grains are mostly more adherent to their husk (as spikelets) during storage, they are stored in that way and must be de-hulled from their husk when they are processed. Evidence of the widespread distribution of einkorn/emmer rachis nodes from the earliest stages confirms this process.

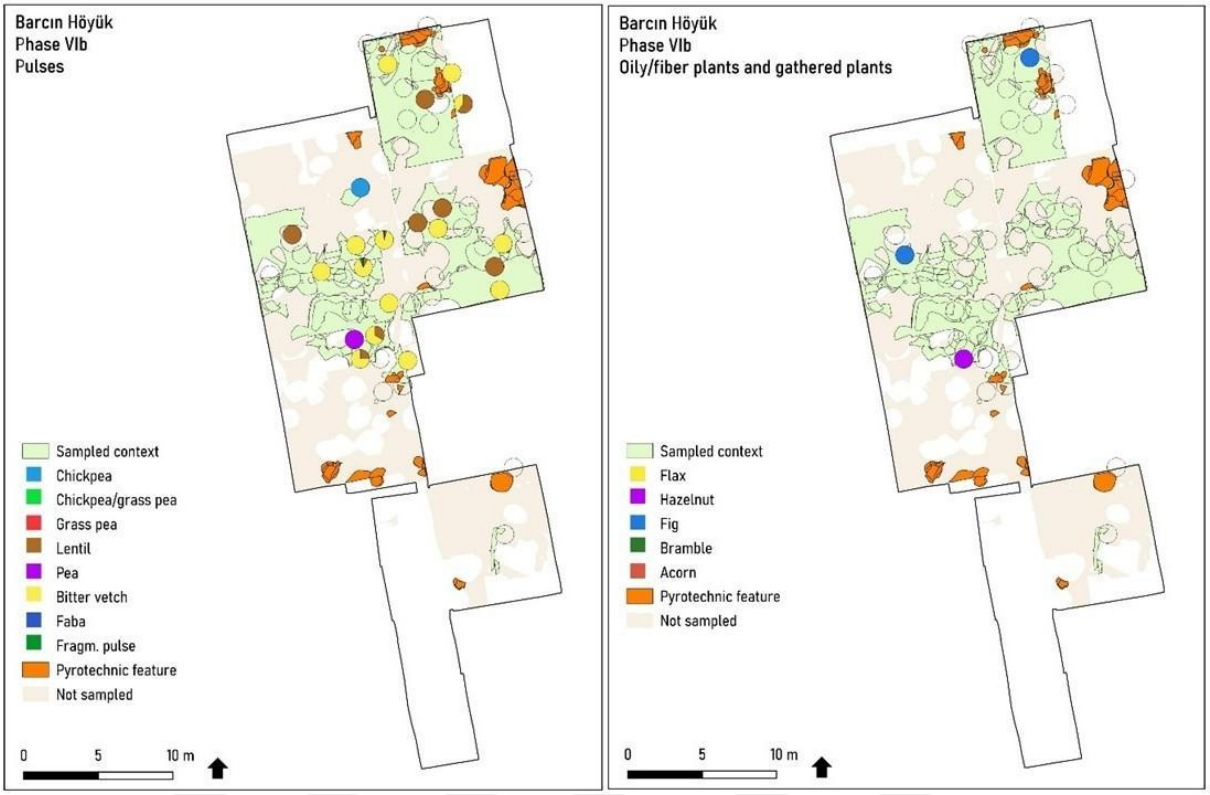


Figure 6.47: The distribution of pulse-types and oily/fiber and gathered plants per liter in VIb at Barcın Höyük.

In the eastern part of the site (mainly including Trench M11), the plant remains are generally low compared to the eastern part (Trench L11). Among the cereals, emmer is the frequent hulled wheat, secondly bread/hard wheat, einkorn and hulled barley show a low presence. On the NE side of Trench M11, two pyrotechnic features have been recorded in VIb1 (Δ148) and VIb2 (Δ142). Only wood charcoals have been found in these features (Table 12.27). We have data from a surface Δ184, which is located in a west-southwest direction, and documented emmer (7), wheat/barley fragments (4), bitter vetch (4), and gromwell (*Lithospermum arvense*) (8). These species are typical of what's left of a cereal field. A similar assemblage was recorded on an indoor surface, Δ154 (M11, 12.60 lt, VIb2) from str11 (Figure 6.48).

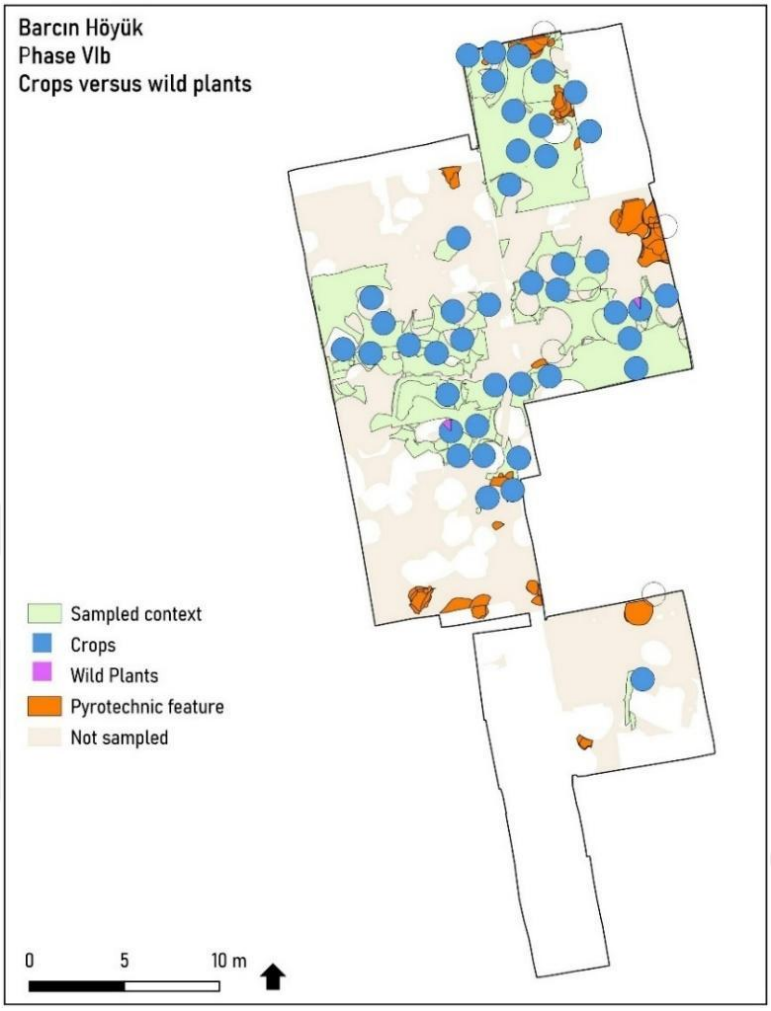


Figure 6.48: The distribution of crops versus wild plants per liter in VIb at Barcın Höyük.

We can say that pulses have become more frequent in the southwestern area (Tables 12.28, 12.29). Lentils and bitter vetch have mostly been encountered in legumes since the earliest occupation layer. In this phase, two chickpea seeds, one half and one whole, were recorded from two different pits, Δ107 (L10) and Δ263 (L11). While only a few grains and a half of chickpea seed were recorded from the first pit, Δ107 (L10), grains (35), wild plants (36), and bitter vetch (82), lentils (3) were recovered from the other pit, Δ263 (L11). Another high value of bitter vetch seeds (42) has been documented in layer Δ242 (L11), which is located in the same area as pit Δ263.

Although there is no high number or variety of data recovered from the gathered plants from the surrounding area, one hazelnut shell from a surface Δ341 (L11) from str5 and three fig fruits from three different contexts were recorded (Tables 12.28).

6.5.2. Phase VIa

Our botanical information in phase VIa is limited (Figure 6.49, Table 6.8). Pits were mainly excavated in this phase, and these pits also damaged the structures in Phase VIb (Table 12.30). When we look at it statistically, it is very clear that the occurrence of legumes is always lower and rarer than cereals. For example, while cereals are found in a sample of 30-35, the number of pulses is usually 1-2.

Table 6.8: The quantity of plant groups per context in Phase VIa.

VIa	Sample (n)	liter	plants per Lt	plants total	Barley	Hulled wheat	Hulled wheat BP	Naked wheat	Pulses	Flax	Nuts	Wild Plants	Animal Re.
layer	2	5	0.2	1	0	0	0	0	1	0	0	0	0
pit	7	23	0.39	9	1	1	0	1	6	0	0	0	0
total	9	28	0.35	10	1	1	0	1	7	0	0	0	0



Figure 6.49: The density of plant remains per liter in VIa at Barcın Höyük.

While cereal remains come from many samples in layers continuously, legumes are obtained from given places. However, in the samples from this phase, legumes came from 5 out of 8 samples, and cereal remains are almost negligible.

6.6. Discussion

As a general evaluation, both cereals and pulses have been used inside and in front of the structures, and partly in courtyard areas, especially in Phases VIe and VId1. The areas in front of the structures must have been covered somehow by an architectural element, such as a protective roof, etc. In order to keep the products in healthy condition in the short-term or long-term while using or preserving them, they should be protected from both climatic factors and pests such as insects, mice, etc. Therefore, for better control, the vicinity of and the settlement itself must have been predominantly used.



Figure 6.50: Structure row from the west to the east in VIe (left) and VId1 (right) at Barcın Höyük (photo: excavation archive).

It is probable that cereals might have been stored/preserved in basins, elevated areas (such as benches) inside the space, perhaps hanging on beams or within the rafters. While this

overhead system can protect the product from both humidity and pests, it is also suitable for creating a usable area on the floor of the space.

In phase Vd1, there must have been an additional architectural element in the style of an 'annex' in front of the southern section of the structures (Figure 6.50). Considering that the structures are not very spacious, activities such as food processing and preparation, etc. must have been conducted outdoors in fair weather, depending on the season. We see that this architectural tradition was continued on the southern sides of the buildings in phase VId2 (Gerritsen and Özbal 2016, 204). Evidence yielded that areas with high cereal concentrations also had a collection of mice bones, suggesting that these commensal animals were potentially hiding in the rafters, especially in str 2a in Phase VId1.

During the analysis of the botanical samples, nearly all of the samples (except a huge amount of lentils found in a basin in str 2a in Phase VId1 and including around 30000 lentil seeds in total) were not obtained in singular groups of remains, and the economic and wild plants were mixed. Although the number of pulses remains in phase V1d1 increases compared to phase VIe, this high increase is rather observed in lentil and bitter vetch. Chickpea and pea remains could also be found in Phase V1d1 in a small amount. The questions regarding this matter will be able to be clarified later on with more research.

As mentioned above, there are wild plants considered field weeds growing compatibly with agricultural plants among cereals and pulses. A part of these plants ripen and get mixed with the agricultural product during the harvest, threshing, and sorting, and so the fruits and seeds of these plants might have been brought to the settlement along with agricultural products. However, this is not considered to have affected the food economy. On the other hand, if the seeds/fruits were mixed with the crops, their sizes can explain the sieving strategies, and their growing needs can explain the condition of the environment.

Another result is that among cereals, besides the hulled wheat grains (einkorn and emmer), rachis nodes (by-product) were also intensively obtained from the samples. This result was observed in both the earliest Phases VIe and VId1; however, we see that this rate gradually decreases in the later phases. As for the bread/hard wheat type, no rachis remains were encountered except for five. Therefore, it might be correct to state that the threshing remains of the naked wheat species have been removed outside the settlement. As for the hulled wheat species, it can be stated for the moment that even if the first stage of threshing was being

processed outside the settlement, most of the wheat had retained its spikelets. The important point here is that compared to VIe, the ratio of cereal grains drops in Phase V1d1. This might mean that in phase V1d1, the cereal had been cleaned more from the threshing of the harvest, either in the place where it had been harvested or in a convenient area distant from the settlement. This changing strategy regarding the processing of crops increases even more in the later phases, especially in Phase VIb (6200 cal. BC). It is clear that in Barcın Höyük, rather than a communal crop preparation and consumption style, a more individual/well organized economic plant use is exhibited within households in Phase VIb. A similar comment regarding the change in the settlement organization and the individualization of households, with some differences, is also suggested by the site directors (Gerritsen and Özbal 2019, 60). On the other hand, isotopic research showed that there was no difference in the diet of early or late Neolithic levels of Barcın Höyük despite the change in settlement organization (Budd et al. 2020).

According to the obtained data, the first settlers of Barcın Höyük must have brought agricultural products with them or obtained the crops somehow from somewhere else during the occupation. In each possibility, we can state that the Barcın inhabitants know how to grow, process, and store. It is also possible to reach this conclusion based on the fact that the available plant species show continuity (Phases VIe, VId1, VId2, VId3, VIc). We already know that the first settlers of Barcın Höyük grew economic plants (cereals, pulses, flax?), which can be considered as fundamental for Anatolian lands, and also gathered plants from around their surroundings. The fundamental crops have different environmental tolerances, so this is another indicator that the first settlers of Barcın Höyük arrived as farmers and herders, and used different ecological niches to keep their wide economic plant range to minimize the risk of insufficient nutrition against the ecological fluctuations.

Chapter 7

7. SPATIAL ASSESSMENT BASED ON PLANT DISTRIBUTION IN BAHÇELİEVLER

This chapter presents a phase-by-phase spatial distribution of plant remains at Neolithic Bahçelievler, showing how the types and locations of plants varied over time.

7.1. General Site Background

The site of Bahçelievler is located in Bilecik city center (40°09'46"N 29°58'31"E) and 563.92 altitute, and includes Neolithic phases between 8-2, and Hellenistic/Iron Age Phase 1. The site was occupied for the first time around 7000 BC and continued until around 6000 BC during the Late Neolithic Period (Fidan et al. 2022, 134).



Figure 7.1: The site of Bahçelievler with Phases (8-2) and trench locations indicated by associated color legend (excavation archive).

The site is excavated in a restricted area to show all phases partially (Figure 7.1). As a result, the earliest phases, 8 and 7 of Bahçelievler, include less data compared to later phases 6 and 5 (Figure 7.2).

Excavations at Bahçelievler in Phases 8-3 yielded oval/round structures with diameters of 3–5 meters and walls up to 45–50 cm thick in some structures. The walls were strengthened in some instances by mud or mudbrick, and post-holes are visible in some walls as well as clusters of small pebbles (Figure 7.2) (Fidan 2020, 36).

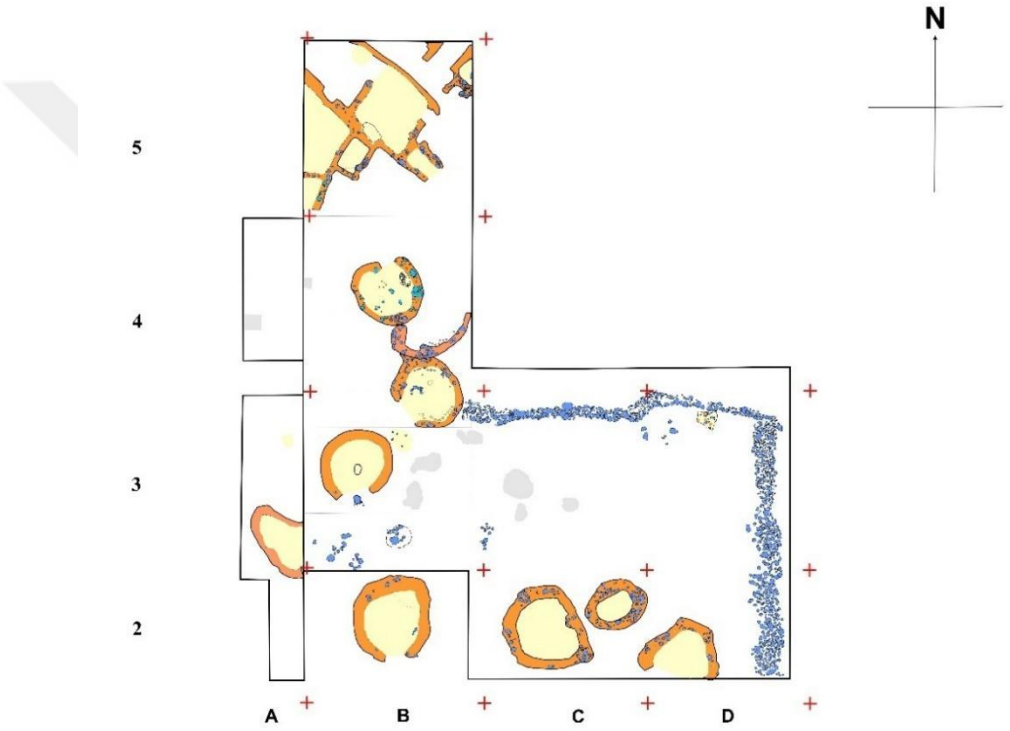


Figure 7.2: The drawing of site organization of all phases at Bahçelievler (excavation archive).

Workshop and courtyard areas were discovered between the structures, yielding most of the artifact assemblages with the exception of stone tools, which for the large majority come from inside the buildings (Kolankaya-Bostancı and Fidan 2021, 102).

7.2. Phase 8

Phase 8 corresponds to the earliest occupational stage, which the excavators suggest date to 7100/7000-6900/6800 cal. BC (Fidan et al. 2022). This phase is represented by one small round building (trench A3) and a burnt outdoor area throughout the north side (trenches A3-A4) of the excavated area (Figure 7.1).

The number of plant remains compared to the sampled liter of soil is less than in the later phases. In the circular building (trench A3). In this phase, one emmer wheat grain, one unidentified naked wheat, and one fragmented wheat/barley grain have been documented as economic plants from the lower level of the oval/round structure. A fruit of *Malva* sp. and a fruit of *Chenopodium* cf. *album* have also been found (Table 7.1).

Table 7.1: The distribution of plant groups according to the indoor and outdoor spaces in Phase 8 at Bahçelievler.

The distribution of plant groups in Phase 8 at Bahçelievler									
Outdoor-Indoor Areas	Trench, unit/sample no, liters of soil	6-row hulled barley	Hulled wheat (einkorn /emmer)	Hulled wheat RN	Naked wheat	Fragm. wheat/ barley	Pulses	Oily and Gathered plants	Wild Plants
indoor									
str lower level	A3, 4/1, 5.25 lt					0.3			1
str lower level	A3, 3/4, 5 lt					0.5			1
str lower level	A3, 3/3, 3.25 lt				1				
str lower level	A3, 3/1, 2.75 lt		1						
str top level	A3, 2/5, 2.60 lt								
str top level	A3, 2/4, 2.20 lt								
str top level	A3, 2/2, 4 lt								
burnt str south side	A3, 1/1, 2.80 lt								
outdoor									
above surface **courtyard**	B2, 26/6, 4 lt.					0.5			7
above surface **courtyard**	B2, 19/1, 3 lt						0.2		
layer **courtyard**	B2, 18/4, 3 lt								
cleaning top surface north wall burnt soil	A2, 1/1, 2.80 lt								

In the outdoor spaces where the samples were collected, the soil was extremely burnt, reddish, and ashy, but very little plant data was recorded. In this outdoor area, half of at

wheat/barley grain fragment, a very small pulse piece (0.2?), and *Chenopodium* cf. *album* (7) were documented in the courtyard area (Table 7.1).

7.3. Phase 7

Phase 7 is excavated as trenches B2 and C2 and is represented by two oval/round buildings and an outdoor space between and around the buildings. This phase dates around 6800-6600 cal. BC (Fidan et al. 2022, 142).



Figure 7.3: The oval/round buildings (trenches B2-C2) from the south side in Phase 7 (Fidan 2020, 31, Fig.3).

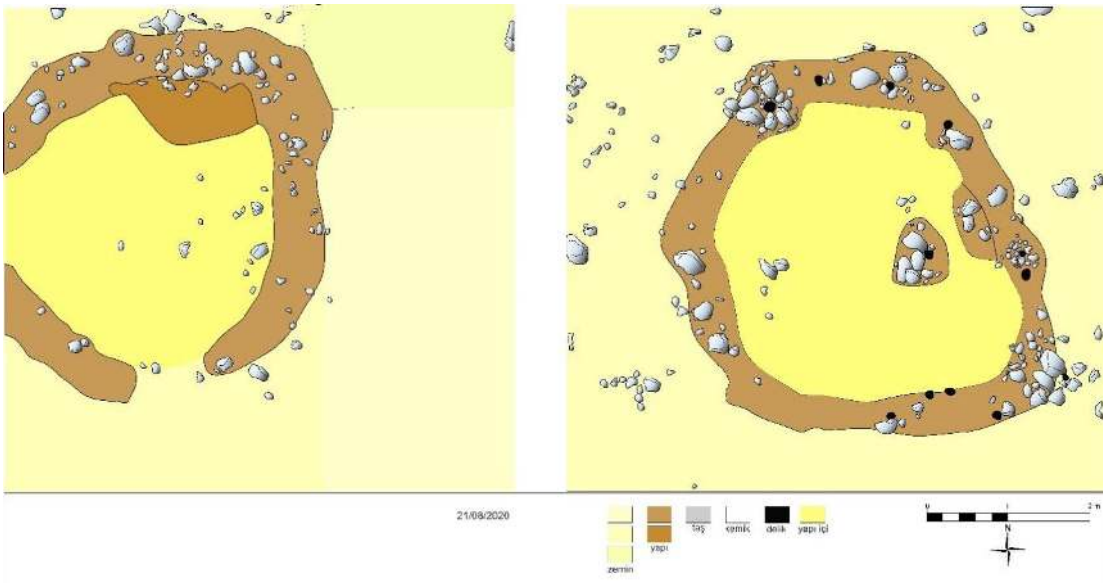


Figure 7.4: Drawings of the buildings in Phase 7 (Fidan, excavation report season 2020, 3).

One of the buildings (str1, east side, trench C2) is around 4.5 $m^{2,}$ and the wall thickness is around 35-40 cm. On the walls of the building, post-holes were documented, and most of them were surrounded by river stones (Figure 7.3, 7.4) (Fidan 2020, 31-32).

The other building (str2, west side, trench B2) is around 3.5 m^2, and the wall thickness is around 50 cm, and part of a firing activity area has been noticed in the building (Figure 7.4) (Fidan 2020, 32).

In oval/round structure 1 from trench B2, there is also a pyrotechnic feature (B2, 29/11 samp., 41 lt) value, except the building surface. Compared to the sampled liter of soil (41 lt in total from 11 samples), there is not much data, but we still have some plant remains that complement other remains (Table 7.2).

Table 7.2: The distribution of plant groups according to the indoor and outdoor spaces in Phase 7 at Bahçelievler.

The distribution of plant groups in Phase 7 at Bahçelievler									
Outdoor-Indoor Areas	Trench, unit/sample no, liters of soil	6-row hulled barley	Hulled wheat (einkorn /emmer)	Hulled wheat RN	Naked wheat	Fragm. Wheat /barley	Pulses	Oily and Gathered plants	Wild Plants
indoor – structure 1 (west)									
layer str1? 2nd stage of layer/3 near west wall	B2, 31/1, 6 lt					2			11
layer str 1? 3rd stage of layer/3 east side	B2, 27/4, 3,25 lt								
pyrotechnic feature str1?	B2, 29/11 samp., 41 lt				3	11	0.5	0.3	8
layer str1? 3rd stage	B2, 27/3, 3.75 lt								
layer str1? 3rd stage	B2, 27/2, 3.50 lt					0.1	1		
burnt layer top of surface str1?	B2, 9/2, 11.75 lt, 7b	1				1	1		5

Inside str1 (trench B2, units 31/27, 9), a hulled barley grain, wheat/barley fragments (3), a half lentil seed, possibly one pea, and one indeterminate pulse seed, and *Chenopodium* cf. *album* fruits (16) were documented. From the pyrotechnic feature, three *Triticum* sp. grains (possibly bread/hard wheat), wheat/barley fragments (11), half lentil seed, a very small piece of potentially hazelnut shell (0.3), and *Chenopodium* cf. *album* fruits (7) and *Malva* sp. (1) were recorded.

Table 7.3: The distribution of plant groups according to the indoor and outdoor spaces in Phase 7 at Bahçelievler.

The distribution of plant groups in Phase 7 at Bahçelievler									
Outdoor-Indoor Areas	Trench, unit/sample no, liters of soil	6-row hulled barley	Hulled wheat (einkorn /emmer)	Hulled wheat RN	Naked wheat	Fragm. Wheat /barley	Pulses	Oily and Gathered plants	Wild Plants
indoor – structure 2 (east)									
layer str2?	C2, 22/5, 4.25 lt.				1.5		9		
layer str2?	C2, 19/2, 4.50 lt					0.3	1		
layer str2?	C2, 19/1, 1.50 lt					1.3			
courtyard									
surface	C2, 22/5, 4.20 lt				1	2	0.5		

We have obtained more data from indoor spaces in this phase, in another oval/round str2. Cereal fragments have been documented in almost all contexts, and pulses remains are present, especially lentil remains. In str 2 (trench C2), possible naked wheat (1.5), wheat/barley (1.5), and lentils (10) have been recorded. Nine of 10 lentils have been documented from a layer (C2, 22/5, 4.25 lt.). There are no documented wild plant remains in this structure.

There is one sample from the courtyard surface (C2, 22/5, 4.20 lt) and bread/hard wheat (1), wheat/barley fragments (2), and a half lentil seed have been documented (Table 7.3).

In this phase, there are not many completely preserved grains/seeds from cereals and pulses, but we see that cereals and pulses have a frequent presence in both building contexts where samples have been collected, compared to Phase 8.

7.4. Phase 6

Phase 6 is especially represented by circular structures and courtyard areas, similar to Phase 7, with trenches C2, C3, and B3 as the excavated areas (Figure 7.5). The phase dates to 6600-6500 cal. BC (Fidan et al. 2022, 142).

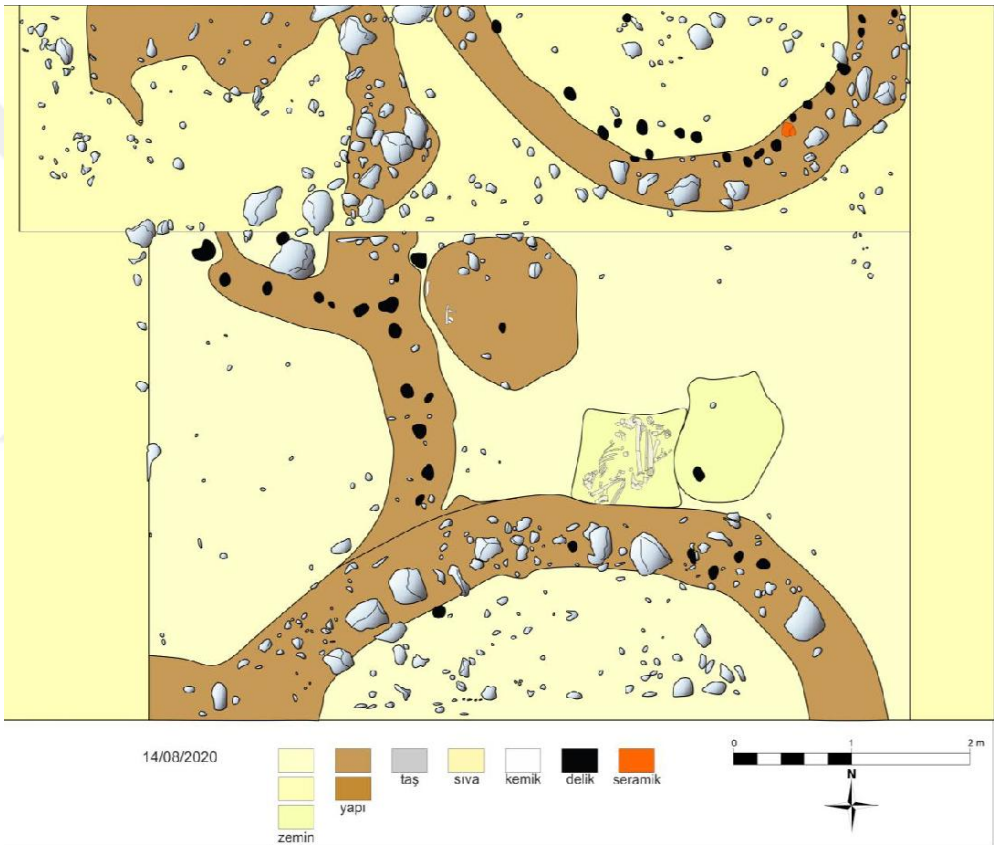


Figure 7.5: The drawing shows the structures and courtyard area in Phase 6 (Fidan, 2020 excavation report, 8).

In the oval/round structure (trench C2, unit 22/8, 3, 2, 11.25 lt.), an emmer grain, a possible bread/hard wheat, wheat/barley (1.5), lentil seeds (7), lentil/pea (2), a very small piece of possibly hazelnut shell (0.3), an indeterminate wild plant, and a kind of coprolite or food remain have been documented (Figure 7.5) (Table 7.4). There was only one sample from outside of the structure, and no botanical data was obtained.

In the outdoor area (trench C3), which is located near trench C2 (units 21-19, 26.35 lt.), there are also no documented plant remains (Table 7.4).

Table 7.4: The distribution of plant groups according to the indoor and outdoor spaces in Phase 6 at Bahçelievler.

The distribution of plant groups in Phase 6 at Bahçelievler									
Outdoor-Indoor Areas	Trench, unit/sample no, liters of soil	6-row hulled barley	Hulled wheat (einkorn /emmer)	Hulled wheat RN	Naked wheat	Fragm. wheat/ barley	Pulses	Oily and gathered plants	Wild Plants
indoor-outdoor									
surface inside str	C2, 22/8, 5.25 lt		1			1	0.2		
surface inside str	C2, 22/3, 2 lt					0.5	2		1
surface top level inside str	C2, 22/2, 4 lt				1		7	0.3	
surface courtyard	C2, 20/3, 3.5 lt								
outdoor									
layer courtyard	C3, 21/1, 2.75 lt								
layer courtyard	C3, 20/1, 6.25 lt	.							
layer courtyard	C3, 19/7 2.75 lt								
layer courtyard	C3, 19/5, 2 lt								
layer courtyard	C3, 19/3, 12, 6 lt								
top of surface courtyard	C3, 34/3, 4 lt				1	1			
top of surface courtyard	C3, 34/7, 1.5 lt					2	1		2
layer around str courtyard	C3, 33/1, 8.60 lt, 6b					1		0.3	

In another circular structure (units 34-32) in the same trench, some botanical data were provided. Unit 34 represents the entrance and lower level of the structure, and documented

bread/hard wheat (1), wheat/barley (3), lentil (1), wild barley (2), and possibly coprolite/food material (4) have been documented. In the later level of the structure, wheat/barley (1.5), a half-bitter vetch seed, and a possible hackberry shell piece (0.3) have been recorded. (Table 7.4, 7.5).

Table 7.5: The distribution of plant groups according to the indoor and outdoor spaces in Phase 6 at Bahçelievler.

The distribution of plant groups in Phase 6 at Bahçelievler									
Outdoor-Indoor Areas	Trench, unit/sample no, liters of soil	6-row hulled barley	Hulled wheat (einkorn /emmer)	Hulled wheat RN	Naked wheat	Fragm. wheat/ barley	Pulses	Oily and gathered plants	Wild Plants
indoor									
layer inside str	C3, 32/5, 8 lt, 6b								
layer inside str	C3, 32/2, 8.75 lt, 6b					0.2			
layer inside str south side	C3, 32/1, 12.50 lt, 6b					0.3	0.5		

The courtyard area, which is located between trenches C3 and B3 in the west-east direction, included more intensive plant remains compared to the northernmost (C2) and western (C3) courtyards and indoor areas. The layer context (C3-B3, unit 13/3-2, 10 lt), which is near the skeleton, contains a half-emmer wheat grain, wheat/barley (1), and an indet half piece of nutshell (0.5). The 10 cm. top layer from the skeleton (C3-B3, unit 12/3, 5.5 lt.) contains more plant remains. In this level, emmer wheat (8), fragmented wheat/barley grains (39), terebinth (5), and wild grass grains (2) have been recorded (Figure 7.6).

In the rest of the courtyard area which is located partly in trench B3 (units 68, 60, 54, 38, 27), hulled barley (3), emmer (1), bread/hard wheat (5), wheat/barley (13), a possible small piece of acorn (0.3), a possible half hazelnut shell, and wild grass grains (2) were found. This courtyard area, yielded a burial, and botanical samples were taken (B3, 34/1, 4, 6.20 lt) (Figure 7.6). A bread/hard wheat grain, wheat/barley (17), a lentil seed, and an indeterminate wild plant seed/fruit were obtained from this space (Figure 7.6).

Table 7.6: The distribution of plant groups according to the indoor and outdoor spaces in Phase 6 at Bahçelievler.

The distribution of plant groups in Phase 6 at Bahçelievler									
Outdoor-Indoor Areas	Trench, unit/sample no, liters of soil	6-row hulled barley	Hulled wheat (einkorn /emmer)	Hulled wheat RN	Naked wheat	Fragm. wheat/ barley	Pulses	Oily and gathered plants	Wild Plants
courtyard?									
layer near burial courtyard	C3-B3, 13/3,2, 9.25 lt		0.5			1		0.5	
layer 10 cm top from skeletons 3 and 5 courtyard	C3-B3, 12/3, 5.5 lt		8			39		5	2
surface courtyard	B3, 68/5 samples, 32 lt				1	9		0.3 acorn?	
layer courtyard	B3, 60/2, 4.5 lt					0.5			
layer courtyard	B3, 54/2, 5.75 lt								
bone workshop area courtyard	B3, 38/1, 8.30 lt	1	1		2	0.7		0.5 hazel?	1
bone workshop area courtyard	B3, 36/1, 3.60 lt					2			1
burial courtyard	B3, 34/1, 4, 6.20 lt				1	17	1		1
layer courtyard	B3, 27/2, 12 lt	2				1			
indoor									
str	B3, 26/5-7, 10 lt				1.5				
str	B3, 74/5-4, 6 lt				0.5	2			
str	B3, 73/2, 4 lt								
str	B3, 59/1-2, 7.75 lt			2	0.2			2	

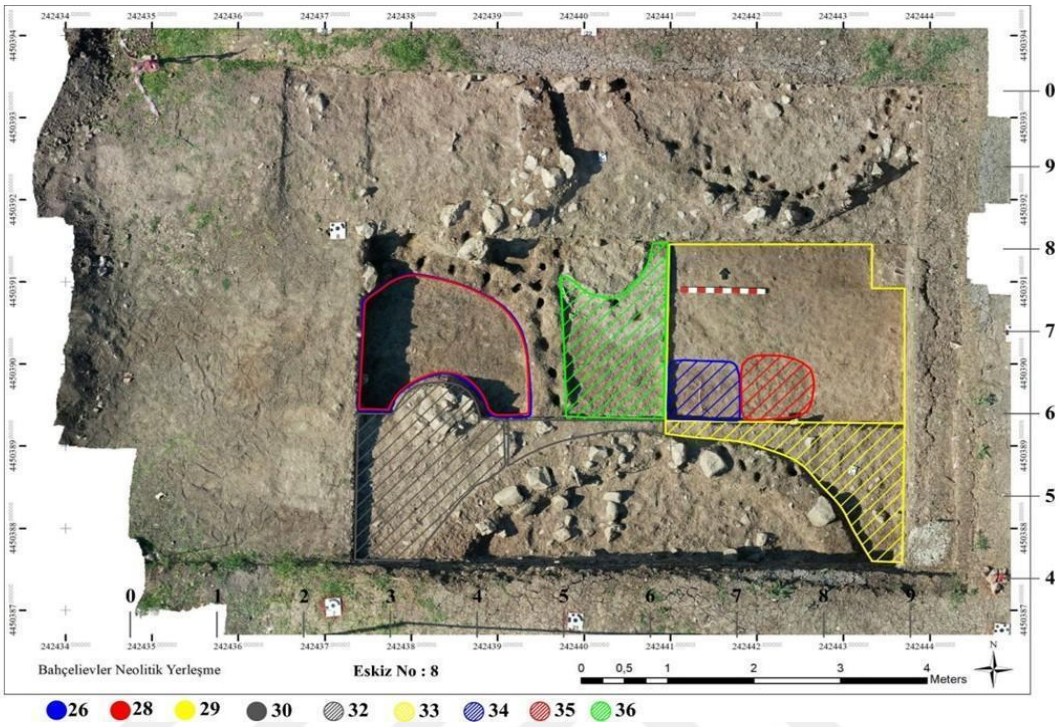


Figure 7.6: The locations of the contexts (trench B3) in Phase 6 (excavation database).

In the circular structure (B3, units 74, 73, 59, 55, 37), the plant remains show a narrow range compared to the outdoor area (Table 7.6). Bread/hard wheat (2), wheat/barley (8), lentil (1), bitter vetch (1), and two pieces of possible dung/coprolite/food remains have been documented in this structure.

In general, outdoor contexts include more frequent plant remains than indoor contexts compared to Phase 7. Fragmented wheat/barley grains show frequency in both areas in this phase. On the other hand, pulses exist especially inside the structures, and gathered plant remains show presence in courtyard areas.

7.5. Phase 5

Phase 5 at Bahçelievler is excavated as trench B3 and is represented with a courtyard area and a half circular structure (Figure 7.7). The phase dates to around 6420-6236 cal. BC and represents Fikirtepe Culture (Fidan et al. 2022, 143).

This phase provides more intense archaeobotanical data compared to other phases. A wide plant range has been obtained, especially from the courtyard area (Table 7.7, Figure 7.7).

Table 7.7: The distribution of plant groups according to the outdoor spaces in Phase 5 at Bahçelievler.

The distribution of plant groups in Phase 5 at Bahçelievler									
Outdoor-Indoor Areas	Trench, unit/sample no, liters of soil	6-row hulled barley	Hulled wheat (einkorn /emmer)	Hulled wheat RN	Naked wheat	Fragm. wheat/ barley	Pulses	Oily and Gathered plants	Wild Plants
courtyard									
surface?	B3, 51/1, 12 lt					0.1		1	
layer courtyard	B3, 50/4-5, 10 lt								
layer courtyard	B3, 21/1, 3.5 lt				0.5	3			2
inside pot courtyard	B3, 17/ 13 samples, 6.75 lt	3	0.5	0.5	3	37		5	
around pot courtyard	B3, 17/ 7 samples, 37.6 lt	1	0.5	3	1	9	0.5	1	5
layer? courtyard	B3, 15/ 7, 6, 8, 9 samples, 10 lt				2	5.5 1 rn		0.2	3
surface? between str courtyard	B3, 13/ 1, 4, 7, 15.25 lt	0.5	4.5		10	56	2	104	4
surface under of pot courtyard	B3, 24/2, 8, 13, 16, 14.5 lt					9		0.5 hazel?	2

In the courtyard area (trench B3, units 51, 50, 21, 17, 15, 13) hulled six-row barley (0.5), emmer wheat (4.5), bread/hard wheat (13), wheat/barley (65), lentil (2), terebinth (104), grape (1), Asteraceae (1), *Atriplex* (3), Caryophyllaceae (1), *Chenopodium* (1), *Galium* (2), Polygonaceae (1). Most intensive data was recorded from unit 13, which is clarified as a courtyard surface (?) between other courtyard units (Table 7.7, Figure 7.7).

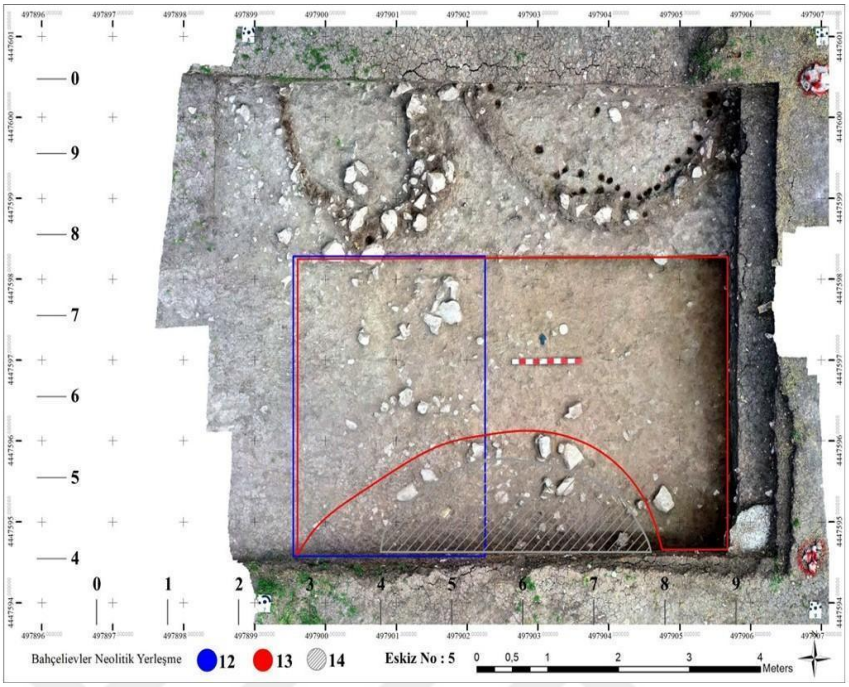


Figure 7.7: The upper level of courtyard area in Phase 5 (B3, 13/1, red line) (photo: excavation database).

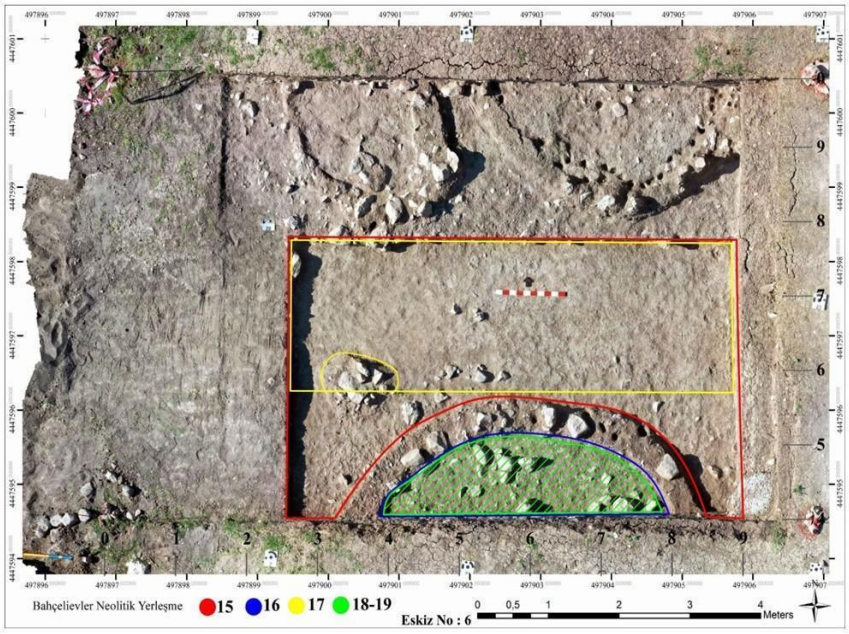


Figure 7.8: The lower level of courtyard area in Phase 5 (photo: excavation database).

In the lower level of this courtyard area, a pottery finding in which the outer part of the pot was plastered with lime was found (B3, unit 17), and one botanical sample was taken from inside the pottery (17/13, 6.75 lt) and another sample from around the pottery (17/7, 37.60 lt)

(Figure 7.8, 7.9). Hulled six-row barley (3), emmer wheat (0.5), einkorn/emmer rachis node (0.5), bread/hard wheat (3), wheat/barley (37), lentil (2), terebinth (4), grape (1), and possibly mouse bones (3) have been documented from the inside of the pot (Figure 7.9).



Figure 7.9: Pottery finding (trench B3, unit 17) and fragmented cereal remains in Phase 5 at Bahçelievler.

Around the pottery, hulled six-row barley (1), emmer/einkorn (0.5), einkorn/emmer rachis node (3), bread/hard wheat (1), wheat/barley (9), a pulse fragment (0.5), terebinth (1), *Chenopodium* (5), and possibly a mouse bone and a bird bone have been recorded.

Table 7.8: The distribution of plant groups according to the indoor area in Phase 5 at Bahçelievler.

The distribution of plant groups in Phase 5 at Bahçelievler									
Outdoor-Indoor Areas	Trench, unit/sample no, liters of soil	6-row hulled barley	Hulled wheat (einkorn /emmer)	Hulled wheat RN	Naked wheat	Fragm. wheat/ barley	Pulses	Oily and Gathered plants	Wild Plants
indoor									
layer east of str	B3, 22/1, 2.75 lt				2	4			
layer inside of str	B3, 16/2-3, 6.45 lt		1			0.3		0.2 hazel?	
layer inside of str	B3, 14/1, 4.75 lt								
pit into 6th phase courtyard	C3-B3, 9/3, 5.5 lt				3				

The fact that the outer part of the pot was plastered with lime may be related to the desire to keep it free from insects and other pests. Even today, the insect-proof effect of lime is known and applied.

The circular structure (B3, units 24, 22, 16, 14) contains less plant data compared to the courtyard area, as in Phase 6 (Table 7.8). An emmer grain, two bread/hard wheat grains, wheat/barley (13), two small possibly hazelnut shell pieces (0.7), *Chenopodium* (1), and *Atriplex* (1) are the documented plant remains in this structure. There are no documented pulse remains in this area according to the sampled contexts.

7.6. Phase 4

Phase 4 is also represented with oval/round structures and a courtyard area and dated to around 6300-6200 cal. BC (Fidan et al. 2022, 143).

In this phase, the fragmented wheat/barley remains, a small number of pulses, and gathered plant remains, and five types of wild plants have been recorded. In the courtyard area (trench B3, units 8, 9, 10,13, 25; 30.75 liters of soil), hulled six-row barley (1), bread/hard wheat (2), wheat/barley (11), terebinth (2), *Amaranth* (1), Brassicaceae (1), *Chenopodium* (7), *Galium* (1), and Polygonaceae (1) were documented (Table 7.9). There are no documented pulses in this area.

Indoor sampled contexts include less data than from the courtyard area in Phase 4 (26 liters of soil in total) (Table 7.9, Figure 7.10). The structures were excavated in trench B3, and there are four sampled contexts. In the pit (B3, 66/1, 4.25 lt), only wheat/barley (2.5), lentil (1), and a half possible chickpea have been recorded. Rooms 1 (B3, 7/1, 7.30 lt) and 2 (?) (B3, 6/1/2/4, 5.35 lt) have no documented remains except a little piece of wheat/barley (0.2) in room 2 (?). These contexts are also dated to sub-Phase 4a. Only one sample (B4, 15/1, 9.25 lt) is dated to sub-Phase 4b, and bread/hard wheat (2), wheat/barley (0.5), terebinth (0.1), and *Galium* (4) have been documented.

Table 7.9: The distribution of plant groups according to the indoor and outdoor spaces in Phase 4 at Bahçelievler.

The distribution of plant groups in Phase 4 at Bahçelievler									
Outdoor-Indoor Areas	Trench, unit/sample no, liters of soil	6-row hulled barley	Hulled wheat (einkorn /emmer)	Hulled wheat RN	Naked wheat	Fragm. wheat/ barley	Pulses	Oily and Gathered plants	Wild Plants
courtyard									
layer courtyard	B3, 8/6, 2 lt				1				
layer courtyard	B3, 9/1, 3.60 lt, 4a					1			
layer courtyard	B3, 9/3,6, 5.85 lt, 4b	1 r?			1	0.5		0.5	4
layer burnt mudbrick material courtyard	B3, 10/1, 4.80 lt, 4b					2		1.5	
surface courtyard	B4, 25/1,3, 9.5 lt, 4b					1.5			
outside of str.	B4, 13/1, 5 lt	0.5				6		0.2	7
indoor									
pit inside of str.	B3, 66/1, 4.25 lt, 4a					2.5	1.5		
layer room 1* inside str.	B3, 7/1, 7.30 lt, 4a								
layer room 2? inside str.	B3, 6/1,2,4; 5.35 lt, 4a					0.2			
top of surface inside of str.	B4, 15/1, 9.25 lt, 4b				2	0.5		0.1	4



Figure 7.10: One of the half-oval/round structures with post-holes in Phase 4a at Bahçelievler (Fidan, excavation report 2020, 9).

When we look at the contrast of the plant diversity, cereals (mostly bread/hard wheat and fragmented wheat/barley), gathered plants (terebinth), and a few wild plant species are frequent within the plant assemblage. The courtyard area has a wider range compared to indoor areas.

7.7. Phase 3

Phase 3 is dated to 6200-6050 cal. BC (Fidan et al. 2022, 143). In this phase, a well-preserved round structure and a small courtyard area represent this phase (Figure 7.11). The building is located in the Northwest direction in trench B4 and is around 4 m in diameter and has post-holes around 15 cm in diameter on the wall (Figure 7.11). A pyrotechnic feature has been documented inside the structure (Fidan, excavation report 2020, 11).

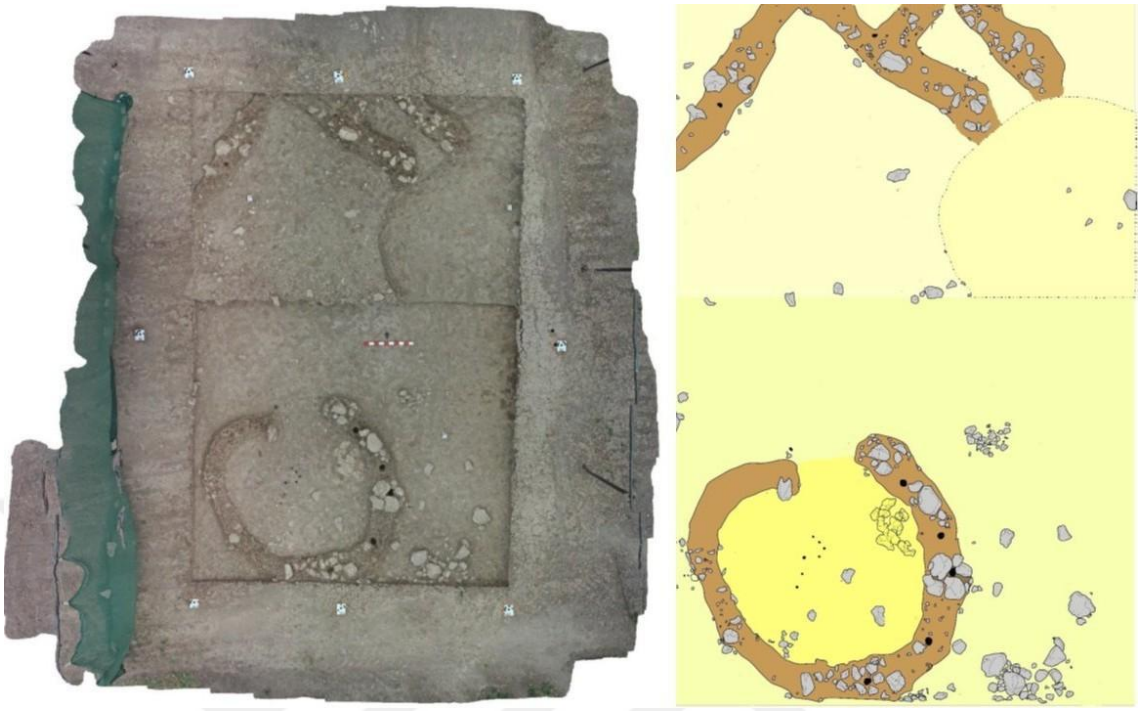


Figure 7.11: Partly Phase 3 with oval/round structure (south, trench B4) and some of the walls which belong to rectangular buildings (north, trench B5) in Phase 2 at Bahçelievler (Fidan, excavation report 2020, 11-12).

There are only seven archaeobotanical samples in Phase 3. Three samples from a courtyard space (B4, unit 5, samples 2-3-7, 9 liters of soil), four samples from two different units (B4, 6/1, 3 lt; B4, 4/3-5, 15.25 lt) from the inside of the structure (Table 7.10).

Table 7.10: The distribution of plant groups according to the indoor and outdoor spaces in Phase 3 at Bahçelievler.

The distribution of plant groups in Phase 3 at Bahçelievler									
Outdoor-Indoor Areas	Trench, unit/sample no, liters of soil	6-row hulled barley	Hulled wheat (einkorn /emmer)	Hulled wheat RN	Naked wheat	Fragm. wheat/ barley	Pulses	Oily and Gathered plants	Wild Plants
courtyard									
surface? courtyard	B4, 5/2, 3, 7.9 lt					2	1	0.4	4
indoor									
top of surface inside of str.	B4, 6/1, 3 lt					0.1			1
layer inside of str.	B4, 4/3-5, 15.25 lt					0.5			7

No identifiable whole or half barley or wheat remains were obtained in this phase. Among the identified remains, fragmented wheat/barley grains (2), bitter vetch (1), a very small nut fragment, probably an acorn (0.4), and *Chenopodium* cf. *album* (4) were recorded from the courtyard area.

A very small number of wheat/barley remains (0.6) and wild plant remains were recovered from the indoor area. *Atriplex* (4), Boraginaceae (1), *Galium* (1), and Poaceae (1) are documented wild plants. Although the quantity is low, the genus/species identified, especially in wild plants, are consistent with the previous phases.

7.8. Phase 2

Phase 2 dates to around 6100-6000 cal. BC and represents the latest Neolithic layers of the site. Fikirtepe boxes have been found in this phase, and the Fikirtepe Culture imprints are dominant in this phase (Fidan et al. 2022, 143). The type of structures changes in this phase. The bigger/smaller rectangular/square structures were unearthed in this phase (Figure 7.12). On the other hand, the excavated area is still restricted, and a few economic plant remains have been documented (Table 7.11).

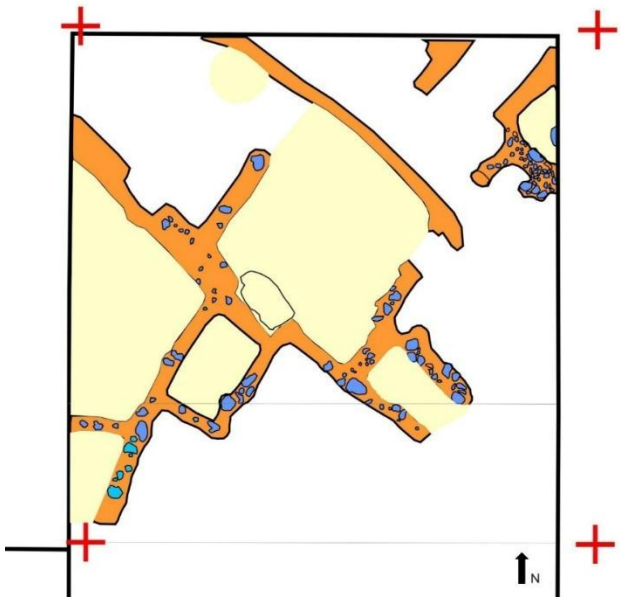


Figure 7.12: General plan of rectangular structures in Phase 2 at Bahçelievler (edited from excavation archive).

Wheat/barley (2) and a half seed of pulse (B5, 14/1,4, 7.25 lt), einkorn/emmer rachis node (1), wheat/barley (5.5), and a half lentil seed (B5, 8/4-5, 8.25 lt) were documented from inside of the structure. Only two fragments of wheat/barley grains were recorded from a courtyard unit (B5, 12/2, 5 lt) from outside the structure as sampled context.

There are a few samples that are from unknown contexts (B5, units 4, 3, 2, 1), and mostly, there are no preserved plant remains. Only a very small piece of cereal and two fragmented pulse seeds have been documented from one sample (B5, 4/1, 2 lt) in this phase (Table 7.11).

Table 7.11: The distribution of plant groups according to the indoor and outdoor spaces in Phase 2 at Bahçelievler.

The distribution of plant groups in Phase 2 at Bahçelievler									
Outdoor-Indoor Areas	Trench, unit/sample no, liters of soil	6-row hulled barley	Hulled wheat (einkorn /emmer)	Hulled wheat RN	Naked wheat	Fragm. wheat/ barley	Pulses	Oily and Gathered plants	Wild Plants
indoor-outdoor									
inside of str	B5, 14/1, 4, 7.25 lt					2	0.5		
layer? east side inside str.	B5, 9/1, 4 lt								
corner of str	B5, 8/7, 2.25 lt								
inside of str	B5, 8/4-5, 8.25 lt.			1		5.5	0.5		
outside of str	B5, 12/2, 5 lt					1			
layer courtyard	B5, 2/1, 5.20 lt								
pit	B5, 4/1, 2 lt					0.2	2		
pit	B5, 3/2, 2 lt								

The frequency of encountering pulses remains is remarkable here, compared to the few archaeobotanical samples.

7.9. Discussion

In Phase 8, we know only the presence of emmer wheat with one grain, goosefoot (*Chenopodium* cf. *album*), and *Malva* sp. species. Although the other remains cannot be directly

identified by type, they at least prove the presence of cereals in this phase. The occupational level, Phase 7, shows a more reliable presence of cereals and pulses more strongly than Phase 8, especially in indoor spaces.

Phases 6 and 5 include the most intensive plant data. In Phase 6, outdoor contexts include more frequent plant remains than indoor contexts compared to Phase 7. Fragmented wheat/barley grains show frequency in both areas in this phase. On the other hand, pulses exist especially inside the structures, and gathered plant remains show their presence in courtyard areas. Phase 5 has the highest and widest plant data, especially in the courtyard areas. provides more intense archaeobotanical data compared to other phases. Phase 4, when we look at the contrast of the plant diversity, cereals (mostly bread/hard wheat, and fragmented wheat/barley), gathered plants (terebinth), and a few wild plant species are frequent within the plant assemblage. The courtyard area has a wider range compared to an indoor area.

Due to the few samples collected in Phase 3, the presence of cereals is the only group of plant assemblage that we are currently sure of. In Phase 2, only cereal and pulses remains are present, while gathered plants and no wild plants have were recorded at all.

When we look at the spatial distribution of plant remains in general, while cereals show a more widespread distribution both in indoor and outdoor spaces, pulses remains (lentil and bitter vetch) are mostly found in indoor places, and gathered plants (mainly terebinth in phases 6 and 5) are found in courtyard areas. Wild plants can be seen in both indoor and outdoor spaces. The most common plants are the goosefoot plant and a small amount of *Malva* species. However, we start to see species such as the bedstraw, gromwell, and wild grass in later phases, which we are used to seeing together with cereals and pulses, especially after the 6th phase.

Chapter 8

8. SPATIAL ASSESSMENT BASED ON PLANT DISTRIBUTION IN AŞAĞI PINAR

8.1. General Site Background

Aşağı Pınar is a part of the Kırklareli Project and represents the Late Neolithic and Chalcolithic -6000-4700 BC- layers of Eastern Thrace according to Anatolian Chronology[66] (Figure 8.1). The site of Aşağı Pınar has a valuable place in understanding the Southeast European Neolithic. It is also in a position to contextualize the relations between Anatolia and Europe during the Neolithization process. Archaeobotanical studies can provide us with information about human-plant relations, adaptation, and the beginning and process of agricultural activities in the region. In this respect, the question is, how far can we go in understanding human-plant relations or dissimilarities of plant use through the site organization with archaeobotanical analyses for Aşağı Pınar in the earliest cultural layers.



Figure 8.1: The location of Aşağı Pınar in Turkish Thrace.

[66] Layers 7-6 at Aşağı Pınar represent Early Neolithic in Balkan Chronology (Figure 8.2).

Aşağı Pınar's distinct settlement features go beyond some of the frameworks we are familiar with in Anatolia. A sort of difference exists between Turkish Thrace and the Eastern Marmara, where these cultural characteristics are primarily evident as dissimilarities. The organization of settlements, architecture, and everyday artifacts particularly stand out.

Aşağı Pınar provides a complete sequence of the Neolithic period in the Balkans, dating from 6000 to 4750 cal. BC across eight layers (Figure 8.2).

Aşağı Pınar			
Layer	Dates	Karanovo Sq.	Period
1		Karanovo IV	Middle -Late Neolithic
2	5000 BC		
3	5200 BC		
4	5300 BC		
5	5400 BC	Karanovo III	
5.-6.	5500 BC	Karanovo II-III	
6	5700 BC	Karanovo II	Early Neolithic
7	5900-800 BC	Karanovo I	

Figure 8.2: The comparative chronology of Aşağı Pınar layers with the Karanovo Culture (E. Özdoğan).

Aşağı Pınar, which is located in Turkish Thrace displays a stronger Balkan character than the Eastern Marmara settlement, which E. Özdoğan clarifies as a cultural boundary that extends from the beginning to the middle of the 6th millennium BC. This layer represents Phases 7 and 6. Phase 7 dates back to 5950-5700 cal. BC, marking the Early Neolithic phase in the Balkans and signifying the so-called Karanovo I of Bulgaria. Contemporary with Karanovo II, the subsequent layer 6 is dated to 5700-5550 BC. The early phase of Aşağı Pınar concluded with a transition that occurred around the middle of the 6th millennium BCE. The transition layer 5/6 presents the Starčevo and Vinča transition in the western and central Balkans.

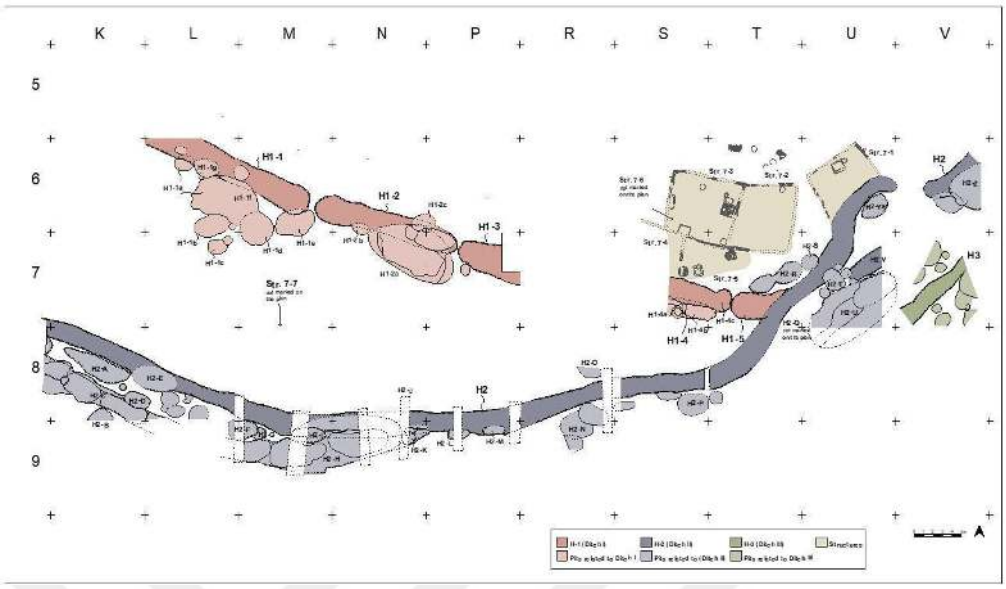


Figure 8.3: Drawing the settlement organization of Phase 7 at Aşağı Pınar (Aşağı Pınar archive).

Phase 7 is divided into three sub-phases. The earliest sub-phase features a building complex with adjacent rooms and a rectangular plan with wattle-and-daub structures, which include ovens small benches and platforms in some rooms; nevertheless, in-situ findings are quite rare within the buildings (Figure 8.3) (E. Özdoğan 2022, 285; E. Özdoğan and Schvarzberg 2020, 213). This situation is also valid for botanical remains, although not in high numbers.



Figure 8.4: A view of layer 7 at Aşağı Pınar (photo: Aşağı Pınar archive).

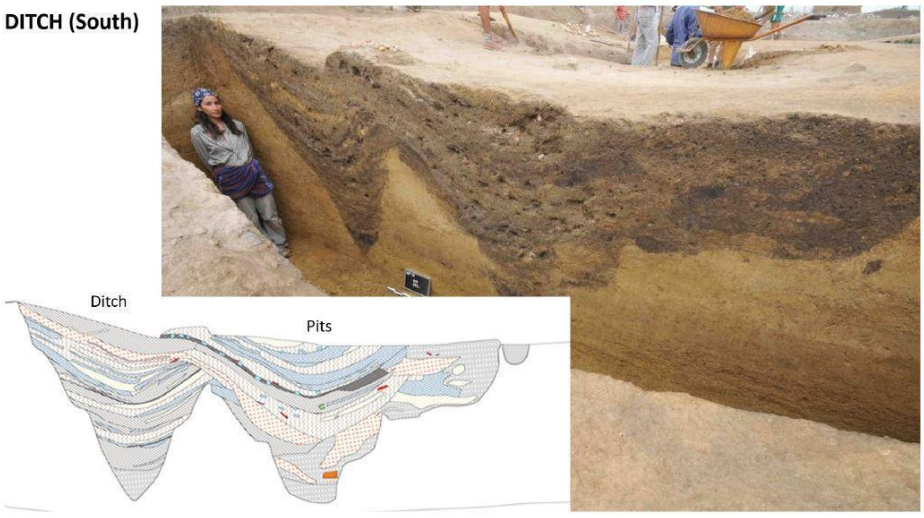


Figure 8.5: The pits in the profile in south ditch II (H2) in Phase 7 at Aşağı Pınar (Akyol et al. 2022, Fig. 5).

Other sub-phases of Layer 7 are represented by two ditches (Ditch H1-1,2, Ditch H2) (Figure 8.3, 8.4, 8.5). The deposit of both ditches contains layers of chalk, clay, charcoal, burned mud brick, and soil material; both were sometimes re-dug and enlarged (E. Özdoğan 2023; 2022, 285). Compared to lack of archaeological findings in structures, several archaeological materials have been documented, such as bone tools, stone tools, figurines, decorated sherds, and some of the human bones found in the ditches (E. Özdoğan 2022, 285). The function of the ditches is still not fully understood, but it is clear that they were intentionally filled. However, it was observed that some parts of the ditches had been plastered after a certain amount was filled, and an oven was built on these surfaces (E. Özdoğan 2022, 285). Unlike from the inside of the structures, a large amount of botanical remains were recovered from certain areas of both ditches I (H1) and II (H2), and some related pits associated with the ditches.

8.2. Layer 7

8.2.1. Structures

Structures 7-1, 7-2, 7-3, 7-5

All the structures are located in the northeast area of the site (Figure 8.6). The archaeobotanical samples have been collected from 12 different units from structures 7-1, 7-2, 7-3, and 7-5 (Table 8.1).

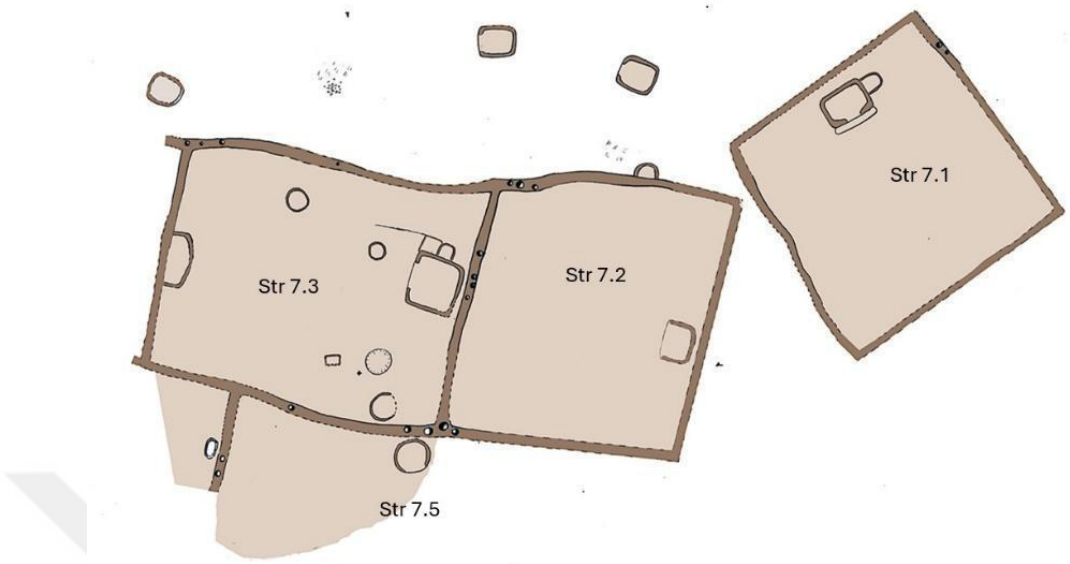


Figure 8.6: Plan of the structures in the Northeast part of the excavated area in layer 7 at Aşağı Pınar (E. Özdoğan, Aşağı Pınar archive).

Str 7-1

Most of the obtained plant remains were collected from Structure 7-1 which had much more plant material than the other structures. Only two einkorn/emmer rachis nodes and four fragmented wheat/barley grains have been documented from the indoor area from two different surfaces of str7-1 in the samples (trench 6U, layer units 290, 270) (Table 8.1) (Figure 8.7).

In the outdoor area of the structure, two grains of emmer wheat, six grains of einkorn wheat, and fragmented wheat/barley grains (3) in the cereal group, and one seed of bitter vetch in pulses, and one endocarp of blueweed (*Echium vulgare*) as arable weed in wild plants have been documented from a layer (trench 5U, layer units 172) in the north part of the structure (Figure 8.7). In the same area, only two grains of two/six-row barley and fragmented wheat/barley grains (5) were also documented from a different layer (trench 5U, layer units 166) in this structure.

Str 7-2

In structure 7-2 (installation, trench 6T, 238), only a single floret of wild barley (*Hordeum spontaneum*) was recorded (Table 8.1).

Table 8.1: Documented archaeobotanical remains in the structures in Layer 7 at Aşağı Pınar.

Aşağı Pınar Layer 7								
Structures	Trench-Unit info	Barley GR+BP	Hulled wheat GR+BP	Naked wheat GR+BP	Fragm. wheat/ barley GR	Pulses	Oily/fibre/gathered plants	Wild plants
Str 7-1								
Outdoor								
layer	5U, 172		8+0		3	1		1
layer	5U, 166	2+0			5			
Indoor								
surface	6U, 290				1			
surface	6U, 270		0+2		3			
debries	6U, 209							
Str 7-2								
outdoor								
layer	6T, 273							
instolation	6T, 238							1
7-2, 7-3 out.	6T, 275							
Str 7-3								
indoor	6S, 104	1+0						
outdoor	6S, 106							
instolation	6T, 197							
Str 7-5								
instolation	7S, 107		1+0					

Str 7-3

In this structure, only one floret of barley was recorded in the indoor space (trench 6S, unit 104) in the samples.



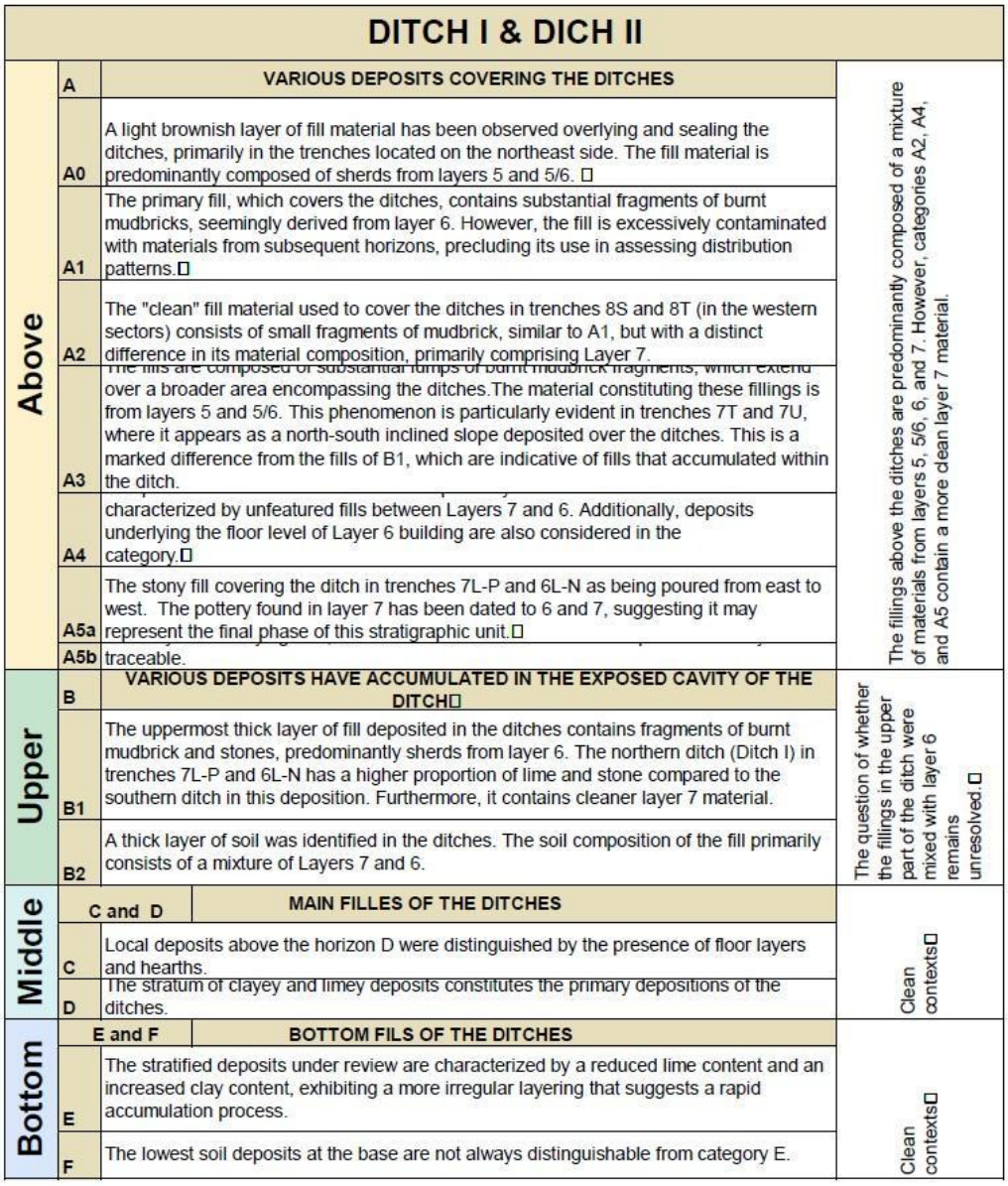
Figure 8.7: The structures 7-2 and 7-3 in the Northeast part of Layer 7 at Aşağı Pınar (Akyol et al. 2022, Fig. 2).

Str 7-5

This structure was partly excavated compared to the other structures (Figure 8.6), and there is only one sample (trench 7S, unit 107) as an installation unit and only a single emmer grain was recorded in the sample (Table 8.1).

8.2.2. Ditch I (H1-1, H1-2, H1-3, H1-4, H1-5)

The plant distribution is higher in the ditches compared to the structures. Ditch I (H1) and Ditch II (H2) contained more economic plant remains. There are also some differences, such as wild plant and by-product density, between Ditches I and II. In addition, there is a big difference between the density of plant remains between the upper and lower levels of the ditches. Ditch I (H1) consists of five different segments (H1-1, H1-2, H1-3, H1-4, H1-5) (Figure 8.8); H1-1 and H1-2 contain a high density of plant remains compared to the other segments, H1-3, H1-4, and H1-5 (Table 8.2). One of the reasons is sampling strategy because the west and east side of the ditches were excavated in the last excavation seasons and the middle parts were excavated in earlier seasons. The quantity of samples are different because of this reason.



DITCH I & DICH II			
Above	A	VARIOUS DEPOSITS COVERING THE DITCHES	The fillings above the ditches are predominantly composed of a mixture of materials from layers 5, 5/6, 6, and 7. However, categories A2, A4, and A5 contain a more clean layer 7 material.
	A0	A light brownish layer of fill material has been observed overlying and sealing the ditches, primarily in the trenches located on the northeast side. The fill material is predominantly composed of sherds from layers 5 and 5/6. □	
	A1	The primary fill, which covers the ditches, contains substantial fragments of burnt mudbricks, seemingly derived from layer 6. However, the fill is excessively contaminated with materials from subsequent horizons, precluding its use in assessing distribution patterns.□	
	A2	The "clean" fill material used to cover the ditches in trenches 8S and 8T (in the western sectors) consists of small fragments of mudbrick, similar to A1, but with a distinct difference in its material composition, primarily comprising Layer 7.	
	A3	The fills are composed of substantial lumps of burnt mudbrick fragments, which extend over a broader area encompassing the ditches.The material constituting these fillings is from layers 5 and 5/6. This phenomenon is particularly evident in trenches 7T and 7U, where it appears as a north-south inclined slope deposited over the ditches. This is a marked difference from the fills of B1, which are indicative of fills that accumulated within the ditch.	
	A4	characterized by unfeatured fills between Layers 7 and 6. Additionally, deposits underlying the floor level of Layer 6 building are also considered in the category.□	
	A5a	The stony fill covering the ditch in trenches 7L-P and 6L-N as being poured from east to west. The pottery found in layer 7 has been dated to 6 and 7, suggesting it may represent the final phase of this stratigraphic unit.□	
	A5b	traceable.	
Upper	B	VARIOUS DEPOSITS HAVE ACCUMULATED IN THE EXPOSED CAVITY OF THE DITCH□	The question of whether the fillings in the upper part of the ditch were mixed with layer 6 remains unresolved.□
	B1	The uppermost thick layer of fill deposited in the ditches contains fragments of burnt mudbrick and stones, predominantly sherds from layer 6. The northern ditch (Ditch I) in trenches 7L-P and 6L-N has a higher proportion of lime and stone compared to the southern ditch in this deposition. Furthermore, it contains cleaner layer 7 material.	
	B2	A thick layer of soil was identified in the ditches. The soil composition of the fill primarily consists of a mixture of Layers 7 and 6.	
Middle	C and D	MAIN FILLES OF THE DITCHES	Clean contexts□
	C	Local deposits above the horizon D were distinguished by the presence of floor layers and hearths.	
	D	The stratum of clayey and limey deposits constitutes the primary depositions of the ditches.	
Bottom	E and F	BOTTOM FILS OF THE DITCHES	Clean contexts□
	E	The stratified deposits under review are characterized by a reduced lime content and an increased clay content, exhibiting a more irregular layering that suggests a rapid accumulation process.	
	F	The lowest soil deposits at the base are not always distinguishable from category E.	

Figure 8.8: The stratigraphical information of Ditches I and II (excavation archive).

Since the fillings in the ditch and related pits exhibit clear vertical stratification, each layer has been numbered and categorized as bottom, middle, and upper. An attempt has been made to create a distribution that emphasizes these layers in the text (Figure 8.8, 8.11).

H1-1 (Trenches 6L-6M) (Pits H1-1d, H1-1e)

This segment is located to the west of ditch H1 (Figure 8.9). Most of the archaeobotanical samples were also documented from the eastern side of this part of the ditch H1, especially from D (middle fill) and E (bottom fill) (Table 8.2).



Figure 8.9: Northern ditch H1 (H1-1, H1-2, H1-3) in layer 7 at Aşağı Pınar (Akyol et al. 2022, Fig.4).

Among the common species, emmer wheat, bread/hard wheat, and wheat/barley grain fragments in cereals, lentils, peas, bitter vetch, and Fabaceae (pulse fragments) in pulses are the identified economic plants in this ditch area.

In the western part of H1-1 (fill D, trench 6L, units 86 and 81), einkorn/emmer rachis nodes (16), bread/hard wheat grains (1), and frag. wheat/barley grains (92) in cereals, lentil seeds (5), and grass pea seeds (1) in pulses, Brassicaceae (4), *Chenopodium* (6), *Fallopia* (1), and *Echium vulgare* (2) in wild plants have been documented (Table 8.2) (Figure 8.10).

In the eastern part of the ditch H1-1, hulled barley florets (4), emmer grains (12), einkorn grains (3), einkorn/emmer rachis nodes (1), bread/hard wheat grains (13), and fragm. wheat/barley (326) in cereals, lentil seeds (5), pea seeds (10), and frag. pulses seeds (17) in pulses, an indeterminate nut/fruit as gathered plant, and *Carex* (4), *Chenopodium* (45), *Echium vulgare* (94), *Fumaria* (recent?74), *Galium* (2), *Lithospermum* sp. (10), Poaceae (2), Polygonaceae (5) in wild plant group have been recorded from the lowest level of the ditch (fill E, trench 6M, unit 134) (Table 8.2).

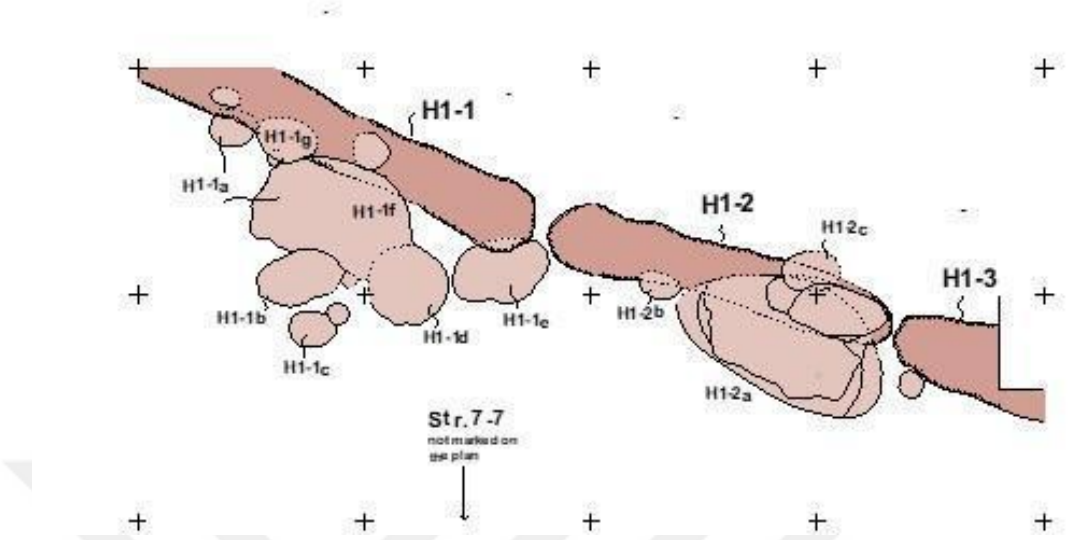


Figure 8.10: Drawing of ditch H1-1,2,3 and related pits in the Northwest part of the excavated area in Layer 7 at Aşağı Pınar (Aşağı Pınar archive).

In the fill D of the eastern part of ditch H1-1, there is a wide variety of economic plants and wild plants, which were located slightly above the lowest phase of ditch H1-1. The samples have been collected from four different units (trench 6M, units 133, 117, 114, 100). In this fill, barley (4), emmer (9), einkorn/emmer RN (17), bread/hard wheat (15), frag. wheat/barley (237) in the cereals, grass pea (4), lentil (77), pea (10), bitter vetch (1), frag. pulses (19) in pulses, indeterminate nut frag (3), *Linum* cf. *bienne* (1), bramble fruitlet (1), *Chenopodium* (5), *Fallopia* (3), *Echium vulgare* (4), *Lithospermum* sp. (3), *Setaria* (1), and Rosaceae (1) in wild plants have been documented (Table 8.2).

In the upper fill (fill B1 trench 6M, unit 81) in between H1-1 and H1-2, hulled barley grains (150), emmer grains (73), einkorn grains (4), einkorn/emmer rachis nodes (4), indeterminate wheat (*Triticum*) RN (19), and frag. wheat/barley (40) in cereals, grass pea (39), lentil (4), and fragm. pulses (19) in pulses, and 2 fruitlets of *Polygonum* sp. have been documented.

The related pits with the ditch H1-1 along the west to the east are H1-1a, H1-1g, H1-1f, H1-1b, H1-1c, H1-1d, H1-1e (trenches 6L, 6M, 7L, 7M). Most of the samples were collected from the pits H1-1d and H1-1e, and a large amount of plant remains was documented in these pits (Table 8.2).

Table 8.2: The summarized archaeobotanical dataset in ditch H1-1 and related pits in layer 7 at Aşağı Pınar.

Aşağı Pınar Phase 7								
Ditches	Trench-Unit info	Barley GR+BP	Hulled wheat GR+BP	Naked wheat GR+BP	Fragm. wheat/ barley	Pulses	Oily/fibre/gathered plants	Wild plants
Ditch H1-1								
D, west	6L, 86	-	0+16	1+0	62	6	-	5
D, west	6L, 81	-			30	5	-	8
E, east	6M, 134	4+0	15+1	13+0	326	32	1	162+ 74r?
D, east	6M, 133	-	1+0	-	-	3	-	3
D, east	6M, 117	2+0	3+6	11+0	108	81	2	5
D, east	6M, 114	2+0	5+7	2+0	89	15	-	5
D, east	6M, 100		0+2	2+0	40	12	3	4
H1-1, H1-2, B1	6M, 81	150+0	77+4	0+19	52	62	-	2
Pits related to H1-1								
H1-1a, 4	6L, 83	-	-	2+0	10	6	-	5
H1-1b, 2a	6L, 77	1+0	3+1	-	8	2	-	262r?
H1-1d								
4	6M, 124	4+0	6+7	4+0	64	31	1	
4	6M, 121	11+0	7+6	10+0	267	35	-	11
4	6M, 118	-	4+0	5+0	45	12	-	4r?
4	6M, 116	-	0+1	-	23	2	-	2
4	6M, 115	4+0	2+12	4+0	97+61	13	-	12
4	6M, 108	2+0	1+0	5+0	21	6	-	-
4	6M, 103	7+0	3+4	1+1	50+35	7	-	58r?
H1-1e								
4	6M, 120	82+0	45+68	89+0	90+2013	197	3.2	35
4	6M, 111	10+0	17+7	22+2	207+200	138	0.1	18
4	6M, 107	-	1+5	3+0	64	10	-	9
H1-1g, 5	6L, 97	-	-	-	4	2lens	-	-

Between pits H1-1a, H1-1b, H1-1d, H1-1e, and H1-1g, which are related to ditch H1-1, pits H1-1d and H1-1e have the most intensive plant data, and they are located at the southeast edge of ditch H1-1 (Figure 8.12).

Pit H1-1d

The pit is located on the southeastern edge of ditch H1-1 in the northwest part of the excavated area and is also related to pit H1-1f, which is located west of pit H1-1d. The archaeobotanical samples were collected from units 92, 98, 103, 108, 121, 115, 116, 118, 121, and 124, which belong to mid-level 4 in trench 6M. Units 121, 115, and 103 contain a higher amount of plant remains than the other units (Table 8.3).

PITS RELATED WITH DICH I AND DICH II			
Above	1	The fill material is a mixture of different types of soil, which has been placed over and/or accumulated in the upper part of the ditch-pits, with occasional extension into the ditches. In certain instances, the fill material contains intrusive materials from subsequent layers.	The fillings above the pits are predominantly composed of a mixture of materials from layers 5, 5/6, 6, and 7.
Upper	2a	The fill material is composed of stones and burnt mudbrick fragments, particularly evident along the western side of H2-H (Ditch II Pits). The material yield of this deposit is predominantly Layer 6. In contrast, the fill material of the northern ditch pits contains smaller stones, and the predominant material is Layer 7.□	The question of whether the fillings in the upper part of the ditch pits were mixed with layer 6 remains unresolved.□
	2b	The stratigraphic unit 2b consists of clayey blackish layers that sporadically manifest as fine soil lenses, intermittently interwoven with limey surfaces.	
	3	The deposits contain burnt mudbrick fragments and/or mudbrick pits, and in some cases, these deposits penetrate the H2 layer. These characteristics are interpreted as being indicative of Layer 6. Such accumulations are most frequently observed in areas where H2 H.	
Middle	4	Limmly layers in the ditch pits	Clean contexts□
	5	It was observed in some of the ditch pits below category 4, which consists of calcareous lenses. However, it is composed of fewer calcareous lenses than 4.	
Bottom	6	Yellow or dark brown deposits observed at the bottom of ditch pits.	Clean contexts□
	7	Black colored homogeneous deposit observed only to the west and southwest of the H2-C ditch pit.	

Figure 8.11: The stratigraphical information of the pits which are related to Ditch I and II (excavation archive).

Cereals and pulses remain a large group in the plant range in this pit. Among the common species, hulled barley (28), emmer wheat (20), einkorn (3), einkorn/emmer RN (30), bread/hard wheat (25) and RN (1), and wheat/barley grain fragments (567) in cereals, and also fragm. wheat/barley/pulses (61), grass pea (1), lentil (62), pea (18), bitter vetch (2), a possible

half seed chickpea (0.5), fragmented pulses (24) in pulses and only one small piece of unidentified nut as gathered plant are the identified economic plant types in pit H1-1d.

There is also a documented wide variety of wild plants in this pit. *Anchusa* sp. (1), *Chenopodium* sp. (2), *Echium vulgare* (3), *Galium* (1), *Lithospermum* sp. (5), Polygonaceae (2), *Setaria* sp. (8), wild legume (2), and *Medicago* (1) are some of the identified wild plant genera/species. Most of the documented species are typically arable weeds in the fields.

Pit H1-1e

The pit is located on the southeastern edge of ditch H1-1 in the northwest part of the excavated area. The archaeobotanical samples were collected from the mid-level (4) of units 107, 111, 103, and 120 in pit H1-1e at trench 6M. A high amount of soil, containing a higher amount of plant remains, was collected from units 111 and 120.

Cereal and pulse remains are large groups in the plant range, like in H1-1d. Among the common species, two-row/six-row barley grains, einkorn and emmer wheat grains, einkorn/emmer rachis nodes, bread/hard wheat grains, and fragmented wheat/barley grains in cereals, pea, lentil, grass pea, bitter vetch seeds, and fragmented pulses seeds in pulses, and only one fruitlet of bramble and a small piece of unidentified nut as gathered plant are the identified economic plant types in pit H1-1e. Blueweed, gromwell, goosefoot family, and knotweed family are documented wild plants. Here are the identified plant remains according to the units in detail:

H1-1e, level 4, 6M, 120, barley (82), emmer (39), einkorn (6), emmer/einkorn RN (68), bread/wheat (68), indeterminate naked wheat (21), fragmented wheat/barley (90), fragmented wheat/barley/pulses (2013), grass pea (15), lentil (26), pea (51), fragmented pulses (105), probably wild flax (3), a possible small piece pistacia (0.2), Brassicaceae (1), *Chenopodium* (5), *Echium vulgare* (3), *Fallopia* (2), *Lithospermum* (16), Poaceae (3), and Polygonaceae (5).

H1-1e, level 4, 6M, 111, barley (10), emmer (15), einkorn (2), emmer/einkorn RN (7), bread/hard wheat (22), bread/hard wheat rn (2), fragmented wheat/barley (207), fragmented wheat/barley/pulses (200), grass pea (8), lentil (53), pea (41), bitter vetch (2), fragmented pulses (34), a small piece indeterminate nut (0.1), *Chenopodium* (9), *Echium vulgare* (2), *Galium* (1), legume (1), *Lithospermum* (1), Poaceae (3), Polygonaceae (1).

H1-1e, level 4, 6M, 107, emmer (1), einkorn/emmer RN (5), bread/hard wheat (3), fragmented wheat/barley (64), lentil (3), pea (3), bitter vetch (1), fragmented pulses (3), *Chenopodium* (3), *Lithospermum* (4), Medicago (1), Polygonaceae.

It is possible to say that the plant remains accumulated in this pit likely originated from the same field source, although minor differences in wild plant diversity are apparent.

H1-2 (Trenches 6N-7P?) (Pits H1-2a, H1-2b, H1-2c)

The ditch is located east of the ditch H1-1. Five samples have been collected from five different units in the ditch. A high amount of plant remains is documented in the middle and bottom fill of the ditch H1-2 from units 144 (D- middle fill) and the lowest level (F- bottom fill) of the ditch (6N, 147) (Table 8.3). The ditch's middle fill contains higher evidence than the bottom and shows some differences between the sampled unit values.

H1-2, fill F, 6N, 147, emmer (28), einkorn/emmer RN (6), bread/hard wheat (9), fragmented wheat/barley (110), lentil (17), fragmented pulses (9), wild pulses (legume) (85), *Digitaria* (1), *Galium* (2), wild barley (6), cf. grass pea (1), Poaceae (2), Polygonaceae (1), Polygonum (3), and *Vicia* sp. (23).

H1-2, fill D, 6N, 146, barley (2), emmer (8), einkorn/emmer RN (46), fragmented wheat/barley (50), lentil (6), pea (1), fragm. pulses (3), Cypreaceae (37), legume (7), and wild barley (4).

H1-2, fill D, 6N, 144, barley (78), emmer (102), einkorn (53), einkorn/emmer RN (183), bread/hard wheat (6), and fragmented wheat/barley (105) in cereals, grass pea (50), lentil (12), chickpea (1), and fragmented pulses seeds (45) in pulses, *Amaranthus* (5), *Bromus* sp. (1), *Digitaria* (49), legume (6), Galium (6), probably wild flax (16), Malve (1), Poaceae (43), Polygonaceae (4), and *Setaria* (1) in wild plants have been documented.

Overall, cereals and pulses form the large groups in the plant range. Among the common species, barley is not present in the lowest fill F, einkorn wheat, emmer wheat, einkorn/emmer rachis, and wheat/barley grain fragments are present in both fills F (bottom) and D (middle), grass pea, pea, and chickpea are presented in only fill D, but lentil shows presence in both fills in the ditch H1-2. Only one seed of chickpea has been documented in one sample (6N-unit144). The documented wild plant families/species/types are sedge family, fingras, pulses family, bedstraw, wild barley, wild flax (?), grass family, knotweed family, knotweed, bitter type, and

unidentified species/types. The differentiation of wild plant types may represent the different vegetation types of the field.

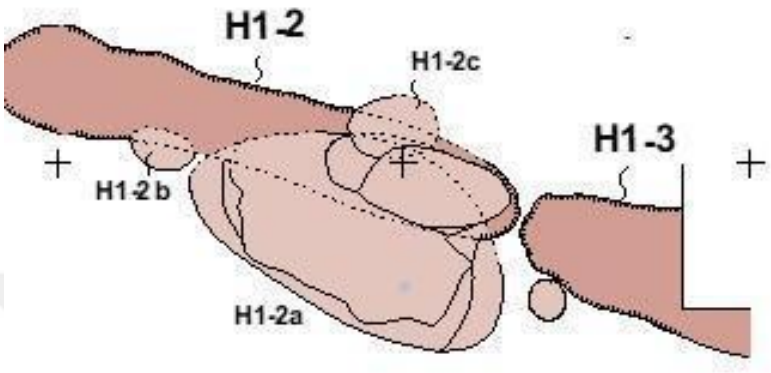


Figure 8.12: The plan of ditches H1-2, H1-3 and the pits in layer 7 at Aşağı Pınar.

On the eastern side of ditch H1-2, three pits are related to ditch H1-2. These are H1-2a, H1-2b, and H1-2c. Most of the samples come from pit H1-2a which is the largest pit compared to pits H1-2b and H1-2c (Figure 8.12).

Pit H1-2a

The pit is located on the southeast part of the ditch H1-2. Sixteen samples (units 184, 186, 187, 188, 205, 206, 211, 212, 215, 291, 294, 308, 309, 310, 313, 369) have been collected. Units 206 (fill 6), 211-212 (fill 5), and 205 (fill 4), provide most of the plant data in this pit (Table 8.x).

H1-2a, level 6, 7N, 206, einkorn (3), emmer (3), fragmented wheat/barley (105), lentil (6), pea (2), and potential hazelnut (3).[67]

H1-2a, level 5, 7N, 212, einkorn (1), emmer (3), fragmented wheat/barley (17), grass pea (1), Amaranthaceae (1), legume (3), Poaceae (2).

H1-2a, level 4, 7N, 205, barley (5), einkorn (9), emmer (12), einkorn/emmer RN (3), fragmented wheat/barley (34), lentil (3), bitter vetch (1), indeterminate pulse (1), plum (1), legume (4), Poaceae (4), and Polygonum (1).

[67] With a question mark.

Table 8.3: The summarized archaeobotanical dataset in ditch H1-2 and related pits in layer 7 at Aşağı Pınar.

Aşağı Pınar Phase 7								
Ditches	Trench-Unit info	Barley GR+BP	Hulled wheat GR+BP	Naked wheat GR+BP	Fragm. wheat/barley	Pulses	Oily/fibre/gathered plants	Wild plants
Ditch H1-2								
F	7P, 374		0+2	1+0	2			1
F	6N, 147		28+6	9+0	110	26		124
D	6N, 146	2+0	8+46		50	10		48
D	6N, 144	78+0	155+183	6+0	105	108	1	131
D	6N, 141	6+0	4+0		7	5		1
Pits related to H1-2								
H1-2a								
6	7N, 215							
6	7N, 206		6+0		105	8	3	1
5	7N, 212		3+10		17	1		6
4	7N, 205	5+0	21+3		34	5	1	9
4	7N, 188							
4	7N, 187							
4	7N, 186							
4	7N, 184					1		1
5	7P, 369	1+0	0+1		5			
4	7P, 310		1+0					
4	7P, 309		5+0					
4	7P, 308							
4	7P, 294							
4	7P, 313							
2b	7P, 291							
H1-2b								
H1-2c								
4	7P, 368		1+0		14			

As a result, in this pit, six-row barley, einkorn wheat, emmer wheat, einkorn/emmer rachis, and wheat/barley grain fragments in cereals, lentil, pea, grass pea, and bitter vetch in pulses are the identified species. A small piece of plum endocarp and three small fragments of indeterminate nutshell are identified as gathered plants. The documented wild plant families/species/types are the pulse family, wild barley, the grass family, and knotweed, with a small number of remains.

Ditch H1-3, H1-4, H1-5

Ditch H1-3

The archaeobotanical samples are not as intensive as those found in the western part of ditch H1. Ditch H1-3 is located in the middle area, and its eastern side is not excavated (Figure 8.13). We have only the samples from the western side of ditch H1-3. In the bottom fill (D) of the ditch, five fragmented wheat/barley grains, one fragmented pulse, and one grain of the Poaceae family have been documented. There is a very small pit (level 4, 7P, 331,) in the southwestern part of the ditch, and six fragmented wheat/barley have also been recorded from this pit (Table 8.4).

Table 8.4: The summarized archaeobotanical dataset in ditches H1-3, H1-4, and H1-5 in layer 7 at Aşağı Pınar.

Aşağı Pınar Phase 7								
Ditches	Trench-Unit info	Barley GR+BP	Hulled wheat GR+BP	Naked wheat GR+BP	Fragm. wheat/barley	Pulses	Oily/fibre/gathered plants	Wild plants
Ditch H1-3								
D	7P, 329							
D calcareous deposit	7P, 328				2	1		1
D	7P, 324							
D under the shells	7P, 323				3			
pit, 4 ashy	7P, 331				6			
C	7P, 325							
Ditch H1-4								
F	7S, 143							
D	7S, 133							
C	7S, 130							2
Ditch H1-5	7T, 198, D							

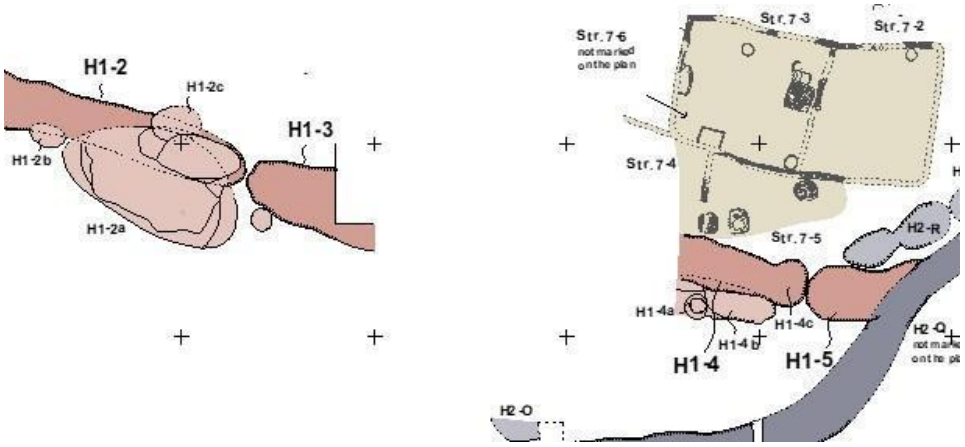


Figure 8.13: Plan of the northern ditches H1-3, H1-4, and H1-5 in the middle and eastern part of the site in layer 7 at Aşağı Pınar.

Ditch H1-4

Three different units were sampled from the bottom fill F (7S, 143), middle fill D (7S, 133), and middle fill C (7S, 130). Only from middle fill C have one fruitlet of the Boraginaceae family and one legume seed as a wild plant been documented (Table 8.4).

8.2.3. Ditch II (H2)

H2 is situated to the south of Ditch I, extending east-west. In contrast to Ditch I, this ditch does not seem to have any segments. The pits associated with Ditch II are named with letters from H2-A through H2-Z. In this ditch, the pits are mainly found in the southern section, similar to Ditch I (Figure 8.14, 8.15).

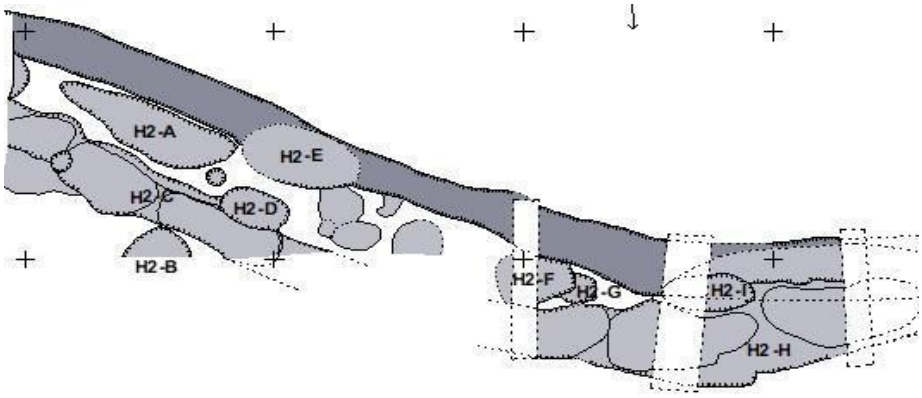


Figure 8.14: The western part of ditch H2 and related pits in the south of the ditch in layer 7 at Aşağı Pınar.

Archaeobotanical samples were collected from 34 different units in ditch H2 (Table 8.x). Most of the plant remains originate from fills E and D (bottom and middle fills of the ditch), while a significant amount of cereal remains from upper fill B1 is derived from the top deposit of the ditch, which dates to layer 7 mixed with layer 6. Due to this contextual issue, the results are not included in detail.

Table 8.5: The summarized plant distribution according to the ditch H2 in layer 7 at Aşağı Pınar.

Aşağı Pınar Phase 7								
Ditch II H2	Trench-Unit info	Barley GR+BP	Hulled wheat GR+BP	Naked wheat GR+BP	Fragm. wheat/ barley	Pulses	Oily/fibre/gathered plants	Wild plants
Ditch H2 (west-east direction)								
F	8K, 321		0+1	1+0	2	1		
E	8K, 317		0+0.5	0+2	2			2
D	8L, 74		68+16			1	1	
F	9M, 220							
B1	8P, 199		0+15					
D	9P, 279				3			
C	9P, 257							1
F	8S, 239		1+0					
D	8S, 234		1+0					
D	7T, 222				1			
D	7T, 162							
E	7U, 289				8	1		3
E	7U, 287	3+0	33+68		30	7	3	3
D	7U, 262	58+0	118+48	5+0	110	44	1	36
D	7U, 258		3+8		26			8
D surface	6U, 271				1			
D surface	6U, 270		0+2		3			
D?	6U, 212							
E	6V, 310		3, 2+2.5	2+0	46	12		7
D	6V, 308	2+0	0+1.5	3+0	43	7		

In the western part (trenches 8K and 8L), bottom fill (F) of the ditch contains einkorn/emmer RN (1), bread/hard wheat (1), fragm. wheat/barley (2) in cereals, and lentil (1) in pulses, and middle fill D includes emmer (65), einkorn (3), einkorn/emmer RN (16) cereals,

bitter vetch (1) in pulses, and a fruitlet of bramble as gathered plant have been documented (Table 8.5).

The eastern part of ditch H2 (mostly trench 7U) includes a higher density of plant remains compared to the western part. The bottom fill F includes barley (3), emmer (29), einkorn (4), einkorn/emmer RN (68), fragmented wheat/barley (30) in cereals, grass pea (2), lentil (5) in pulses, bramble (2) as gathered, *Chenopodium* (3), *Galium* (1), and legume (2) have been recorded.

In the middle fill D, a more intensive plant assemblage has been recorded (Table 8.5). In this level, hulled barley (58), emmer (73), einkorn (48), einkorn/emmer RN (54), T. compactum (5), fragm. wheat/barley (136) in cereals, grass pea (17), lentil (8), fragmented pulses (19) in pulses, *Carex* (1), *Chenopodium* (3), *Digitaria* (4), *Galium* (8), legume (4), wild flax? (3), *Malva* (4), Poaceae (2), *Polygonum* (15) in wild plants have been documented.

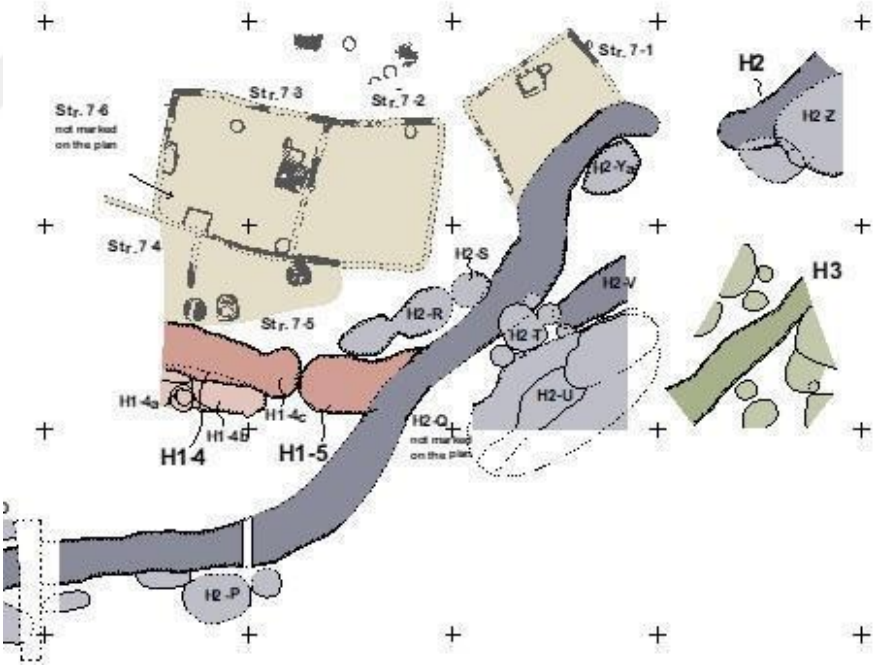


Figure 8.15: Plan of the eastern part of ditch H2 and related pits in layer 7 at Aşağı Pınar.

The documented plants in this ditch, from abundance to rarity, are emmer wheat, einkorn wheat, emmer/einkorn rachis fragments, unidentified wheat type (*Triticum* ssp.), six-row barley grains, bread/hard wheat, bread/hard wheat rachis, and small fragments of wheat/barley -mostly emmer and einkorn- in cereal group, grass pea, fragmented pulses, lentil,

pea, and bitter vetch in pulses group. In the wild plant group, goosefoot, sedge family, fingras, pulses family, knotweed, bedstraw, grass family, knotweed family, bitter type, and unidentified species/types are documented.

Pits H2-a, H2-b, H2-c, H2-d, H2-g, H2-h (south-western side)

Pits H2-a, H2-b, H2-c, H2-d, H2-g, and H2-h are located in the southwestern part of ditch H2 (mostly included in trenches 8K and 9M). H2-a is located west and south of the ditch. Pits H2-c and H2-d are located south of pit H2-a, and H2-d is related to pit H2-c (Table 8.6). Pits H2-g and H2-h are located a little bit closer to the middle part of the ditch.

Pit H2-a

Pit H2-a is one of the most intensive contexts that includes plant data. There are six different units, and they belong to middle fill 4. In these units, unit 307 contains more intensive data than the other units. In this pit, hulled barley (6), einkorn (1), emmer (15), einkorn/emmer RN (24), bread/hard wheat (7), bread/hard wheat RN (2), small-sized naked wheat (2), fragm. wheat/barley (135) in cereals, fragm. wheat/barley/pulses (7), grass pea (1), lentil (8), pea (2), fragmented pulses (8), *Prunus* (1) as gathered plant, Brassicaceae (1), *Chenopodium* (2), *Galium* (1), *Lithospermum* (1), Poaceae (1), Polygonaceae (2), and *Setaria* (1) in wild plants have been recorded.

Pit H2-c

Pit H2-c is another intensive pit like pit H2-a, and it is located just south of pit H2-a (Figure 8.x). There are archaeobotanical samples from 10 units from the lowest level (6) to the middle level (4) from the pit. Middle fill 4 has more samples and intensive plant data compared to the lowest levels (Table 8.6). Here is the plant distribution from the lowest to the upper fills in the pit in detail:

H2-c, bottom fill 6, 8K, 294, einkorn/emmer RN (4), fragm. wheat/barley (16), fragm. pulses (1).

H2-c, bottom fill 5 or 6, 8K, 299, barley (3), emmer (15), einkorn/emmer RN (23), fragm. wheat/barley (83), grass pea (3), lentil (1), pea (1), Poaceae (1).

H2-c, middle fill 4, 8K, 297, emmer (1).

H2-c, middle fill 4, 8K, 295, emmer (180), einkorn/emmer RN (14), fragm. wheat/barley (170), grass pea (1), lentil (2), pea (1), *Fumaria* (recent?30), Poaceae (1), Polygonaceae (2), indeterminate (15).

H2-c, middle fill 4, 8K, 293, barley (3), emmer (34), einkorn/emmer RN (28), bread/hard wheat (6), fragm. wheat/barley (130), lentil (3), bitter vetch (2), fragm. pulses (2), *Chenopodium* (5), Malvaceae (1).

H2-c, middle fill 4, 8K, 285, barley (6), emmer (31), einkorn (2), einkorn/emmer RN (76), bread/hard wheat (2), bread/hard wheat RN (6), fragm. wheat/barley (175), grass pea (3), lentil (15), bitter vetch (3), fragm. pulses (2), 0.1 indeterminate nut fragment, bramble fruitlets (2), Brassicaceae (1), *Chenopodium* (5), *Galium* (1), Lamiaceae (2), *Malva* (1), *Medicago* (1), Poaceae (2), Polygonaceae (2), and *Setaria* (1).

H2-c, middle fill 4, 8K, 284, emmer (2), einkorn (2), einkorn/emmer RN (25), fragm. wheat/barley (194), grass pea (1), lentil (3), fragm. pulses (3), 0.1 indeterminate nut fragment, Polygonaceae (1), and Silene (2).

H2-c, middle fill 4, 8K, 280, barley (0.5), barley RN (1) emmer (7), einkorn (4), einkorn/emmer RN (86), bread/hard wheat (4), fragm. wheat/barley (160), lentil (2), pea (1), fragm. pulses (2), 0.2 indeterminate nut fragment, Amaranth (2), Carex (1), Chenopodium (1), Poaceae (1), 10+ than cereal awns, and *Setaria* (1).

H2-c, middle fill 4, 8K, 279, fragm. wheat/barley (4), lentil (1), and fragm. pulses (1).

H2-c, middle fill 4, 8K, 275, barley (1), emmer (1), bread/hard wheat (2), fragm. wheat/barley (20), fragm. pulses (1), Brassicaceae (1), and *Chenopodium* (1).

Units 295, 285, 284, and 280 have a more intensive plant assemblage compared to other units.

Pits H2-t, H2-u, H2-v, H2-z (south-eastern part)

H2-t is located in the eastern part of ditch II, which is associated with the south corner of the ditch. Pit H2-u is located south of pit H2-t and is larger than pit H2-t (Figure 8.x). These pits are associated with H2 and show similar plant variety and rate features. Samples were taken from the pits from fills 6, 5, 4, and rarely 2b, in order of density.

Table 8.6: The summarized plant distribution according to the pits of ditch H2 layer 7 at Aşağı Pınar.

Aşağı Pınar Phase 7								
Ditch II H2 Pits west	Trench-Unit info	Barley GR+BP	Hulled wheat GR+BP	Naked wheat GR+BP	Fragm. wheat/ barley	Pulses	Oily/fibre/gathered plants	Wild plants
Pits related to ditch H2 (west-east direction)								
H2-a (south corner of the ditch)								
4	8K, 312	5+0	3+0	1+0	16	2		3
4	8K, 310		0+2	3+0	28	7		3
4	8K, 307	1+0	7+15	6+2	43+7	3	1	3
4	8K, 306			1+0	37	3		1
4	8K, 286		3+0		4	1		1
4	8K, 267		3+7		7	3		2
H2-b								
4	8K, 246,		1+0		1			
H2-c								
6	8K, 294		0+4		16	1		
5 or 6	8K, 299	3+0	15+23		83	5		1
4	8K, 297		1+0					
4	8K, 295		180+14		170	4		34
4	8K, 293	3+0	34+28	6+0	130	7		6
4	8K, 285	6+0	33+76	2+6	175	23	2.1	16+25
4	8K, 284		4+25		194	7	0.1	3
4	8K, 280	0.5+1	11+86	4+0	160	5	0.2	6
4	8K, 279				4	2		
4	8K, 275	1+0	1+0	2+0	20	1		2
H2-d								
4	8K, 302	1+0	160+14	3+0	567	1		3
H2-g	9M, 245	-	-	-	-	-	-	-
H2-h								
5/6	9M, 211							1
5	9M, 247	1+0	1+0		3			
5	9M, 210							
4	9N, 204				2			1

Pit H2-t

There are two recorded units (7U, 282 and 238), and 282 belongs to the lowest level 6, and 238 is probably mid-upper level 4 (Table 8.7). Pit H2-t is located just near the south corner of ditch H2 in the east (Figure 8.16).

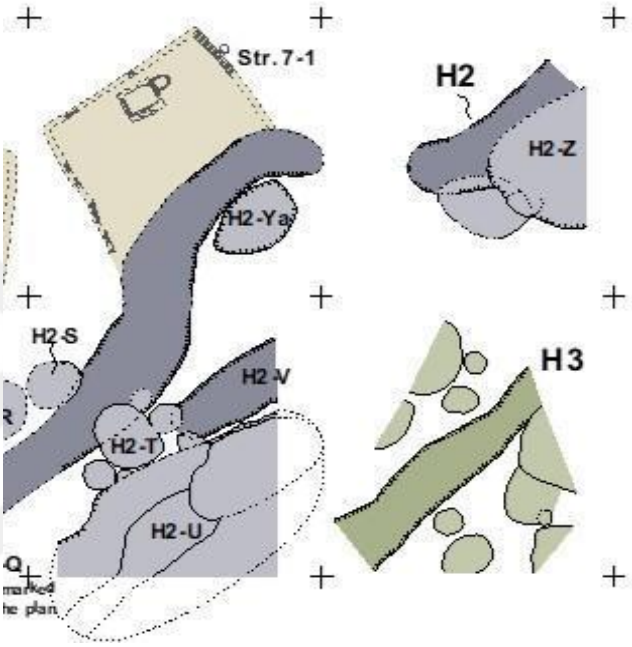


Figure 8.16: The northeastern side of ditch H2 and related pits in layer 7 at Aşağı Pınar.

In unit 238, hulled barley (8), einkorn (3), emmer (14), einkorn/emmer RN (39), fragm. wheat/barley (72) in cereals, grass pea (7), lentil (11), fragm. pulses (40) in pulses, cornelian cherry (2) as gathered plant, wild oat?/wild barley (10), *Bromus* (1), legume (7), *Fumaria* (1), *Galium* (55), *Polygonum* (1), and *Setaria* (1) in wild plants have been documented.

Pit H2-u

Pit H2-u (trench 7U) is located to the south of pit H2-t and it is a little bit larger than H2-t. The sampled six units range from the lowest level (6) to the upper level (B1) in the pit. Here are the documented plant remains according to the pit fills:

H2-u, bottom fill 6, 7U, 280, emmer (3), einkorn (3), einkorn/emmer RN (11), fragm. wheat/barley (7) in cereals, lentil (2), fragm. pulses (2) in pulses, legume (4), and *Galium* (3) as field weeds.

H2-u, bottom fill 6, 7U, 272, emmer (1), fragm. wheat/barley (9), and lentil (1).

H2-u, middle fill 5, 7U, 274, emmer (4), einkorn (3), einkorn/emmer RN (15), fragm. wheat/barley (5), and lentil (2).

H2-u, middle fill 5 above, 7U, 259, emmer (1), fragm. wheat/barley (5), and fragm. pulses (2).

Table 8.7: The summarized plant data in the eastern pits, which are related to ditch H2 in layer 7 at Aşağı Pınar.

Aşağı Pınar Phase 7								
Ditch II H2 Pits east	Trench-Unit info	Barley GR+BP	Hulled wheat GR+BP	Naked wheat GR+BP	Fragm. wheat/barley	Pulses	Oily/fibre/gathered plants	Wild plants
Pits related to ditch H2 (west-east direction)								
H2-t								
6	7U, 282							
4?	7U, 238	8+0	17+39		72	58	2	76+14
H2-u								
6	7U, 280		6+11		7	4		7+3
6	7U, 272		1+0		9	1		
5	7U, 274		7+15		5	2		
5 above	7U, 259		1+0		5	2		1
4	7U, 248	1+0	10+2	3+0	20	8		10
2B above	7U, 234	7+0	1+0		2	2		2
2B above	7U, 222	1+0	0+3		11			
H2-v								
4	7U, 268	4+0	21+86		30	54		25
H2-z								
4	6V, 306	4+0	12+0.5	1+0	50	13		2

H2-u, middle fill 4, 7U, 248, barley (1), emmer (7), einkorn (3), einkorn/emmer RN (2), indeterminate *Triticum* (3), fragm. wheat/barley (20), grass pea (2), lentil (5), fragm. pulses (1), legumes (5), and Poaceae (2).

H2-u, upper fill 2B, 7U, 234, barley (7), emmer (1), fragm. wheat/barley (2), lentil (2), and wild *Vicia* sp. (2)

H2-u, upper fill 2B, 7U, 222, barley (1), einkorn/emmer RN (3), and fragm. wheat/barley (11).

It is easy to say that the presence of wild plant species decreases in this pit, and barley certainly appears in upper fills. Another clear observation is about middle fill 4: the plant remains mostly increased in middle fill 4 in the pits.

H2-v and H2-z

H2-v (middle fill 4, 7U, 268) is located east of the pits H2-t and H2-u. In this pit, barley (4), einkorn (4), emmer (17), einkorn/emmer RN (86), and fragm. wheat/barley (30) in cereals, grass pea (18), lentil (22), and fragm. pulses (14) in pulses, *Amaranth* (2), *Digitaria* (15), *Galium* (3), *Polygonum* (5) in wild plants have been documented.

H2-z (middle fill 4, 6V, 306) is located on the south side of ditch H2 at the most eastern edge of the ditch area as excavated. In this pit, there is data from fill 4 like pit H2-v and barley (4), emmer (10), einkorn (1.5), einkorn/emmer RN (0.5), bread/hard wheat (1), fragm. wheat/barley (50) in cereals, grass pea (1), lentil (2), pea (2), fragm. pulses (8) in pulses, and only *Polygonum* sp. (2) as a wild plant have been documented.

As a conclusion, the analysis of economic plant assemblages from Ditch H2 reveals a clear dominance of wheat over barley. Among the wheat types, hulled wheats -particularly emmer wheat (*Triticum dicoccum*)- are significantly more abundant than naked wheats. Samples taken from upper fill B1, located in the western part of the ditch (specifically Trench 8L, Units 61/62, 68, and 71), yielded the highest concentration of wheat remains within H2. At this filll, nearly 20,000 emmer wheat grains and approximately 1,300 einkorn wheat (*Triticum monococcum*) grains were recovered.

Despite the high number of grains, only around 300 rachis fragments were found, suggesting that these cereals may have undergone extensive processing (e.g., threshing and sieving) prior to deposition at the site. Interestingly, pulses were almost entirely absent from the B1 level assemblage, with the exception of two seeds of bitter vetch (*Vicia ervilia*). Pulse remains were instead recovered from middle fill D and bottom fill E of the ditch, though in relatively low quantities.

Wild plant remains were also recovered in small amounts, predominantly from middle fill D and bottom fill E, with limited representation in the upper fill. Spatially, the highest concentration of plant remains were found in the pits along the length of Ditch H2, specifically in H2-a, H2-c, and H2-d in the western section, and H2-t and H2-u in the eastern section. These pits yielded a significantly greater volume of botanical material compared to other features associated with the ditch, suggesting possible activity areas or deposition zones related to food processing or discard practices. The sampling strategy may affect this result since there may have been more intensive sampling from the west and east sides of the ditches compared to the middle part that I mentioned above.

8.3. Discussion

The plant distribution indicates a higher concentration in the ditches compared to the structures. Ditch I (H1) and Ditch II (H2) both contain greater economic plant remains. Notable differences are observed between the two ditches, particularly in the density of wild plant remains and processing by-products. Additionally, a significant variation is seen in the density of plant remains between the upper and bottom fills of each ditch. While the function of these ditches during layer 7 remains unclear, the archaeobotanical evidence suggests intense human-plant interactions within these areas.

In Ditch I, economic plant remains are predominantly concentrated in the western segments, whereas in Ditch II, high densities are observed in both the western and eastern sections. In contrast, the central areas of both ditches and associated pits show a lack of data, likely due to the sampling strategy. This discrepancy in data density is believed to stem primarily from uneven sampling rather than from uneven activity patterns. A particularly notable difference is that Ditch II contains fewer wild plant remains relative to hulled wheat, whereas Ditch I exhibits a more balanced proportion (see Table 8.8). This variation in the ratio of crop plant to wild plant remains may reflect differences in crop processing and cleaning stages. In this context, the lower proportion of rachis nodes and wild species in H2 suggests that cereals deposited in this ditch might have undergone more advanced processing, such as sieving and winnowing, before being brought to the site.

Preliminary analyses indicate that cereals are the dominant economic plant group, followed by pulses, at the earliest occupational layer of Aşağı Pınar. Among the hulled wheats, emmer (*Triticum dicoccum*) shows the highest density, with einkorn (*Triticum monococcum*)

likely being the second most prevalent. Barley (*Hordeum vulgare*) is also well represented, though it appears more frequently in the upper layers, rather than in the deepest levels of the ditches or associated pits.

Table 8.8: The plant distribution depending on the contexts in layer 7 at Aşağı Pınar.

Aşağı Pınar Phase 7							
Contexts	**Total samples**	**Cereal**	**Pulses**	**Gathered plants**	**Wild plants**	**Indeterminate.**	**Total**
Structure 7-1	**4**	17	1	0	4	4	**26**
Structure 7-2	**3**	0	0	0	1	0	**1**
Structure 7-3	**3**	1	0	0	0	0	**1**
Structure 7-5	**1**	1	0	0	0	0	**1**
Ditch H1-1	**8**	557	175	0	98	24	**854**
Pits related to H1-1 (total)	**20**	937	361	3	75	24	**1400**
H1-1a	**1**	1	1	0	5	3	**10**
H1-1b	**1**	8	2	0	6	0	**16**
H1-1d	**11**	325	79	1	38	6	**449**
H1-1e	**3**	599	277	2	26	16	**920**
H1-1g	**1**	4	2	0	0	1	**7**
Ditch H1-2	**5**	811	149	1	287	117	**1365**
Pits related to H1-2 (total)	**18**	153	11	4	18	9	**195**
H1-2a	**16**	142	11	4	18	9	**184**
H1-2b	**1**	0	0	0	0	0	**0**
H1-2c	**1**	11	0	0	0	0	**11**
Ditch H1-3	**5**	0	0	0	0	0	**0**
Ditch H1-4	**4**	0	0	0	2	0	**2**
Ditch H1-5	**1**	0	0	0	0	0	**0**
Ditch H2	**26**	851	94	5	73	23	**1046**
Pits related to H2 (total)	**36**	1409	196	5	133	72	**1815**
H2-a	**6**	95	13	1	8	21	**138**
H2-b	**1**	2	0	0	0	0	**2**
H2-c	**11**	701	50	2	13	22	**788**
H2-d	**1**	183	1	0	1	2	**187**
H2-g	**1**	0	0	0	0	0	**0**
H2-h	**4**	7	0	0	2	0	**9**

H2-r	**1**	2	0	0	0	0	**2**
H2-t	**2**	139	61	2	66	15	**283**
H2-u	**7**	137	17	0	18	11	**183**
H2-v	**1**	136	54	0	24	0	**214**
H2-z	**2**	3	0	0	0	0	**3**

The cereal group is generally the most dominant among the plant remains, followed by pulses. In contrast, the group of gathered (wild-collected) plants is represented by only a few remains. Wild plant diversity, often comprising field grasses or weeds, is typically associated with crop processing waste and likely entered the settlement alongside harvested crops. This group reflects a broad spectrum of vegetation observable within the samples. However, it is important to examine the ecological characteristics and distribution of these wild plants within the crop assemblages, as they can offer insights into the growing conditions of the cultivated fields.

Chapter 9

9. CROP RATIOS IN KEY SITES

This chapter evaluates the frequency of economic plant remains -primarily cereals and pulses- at three Neolithic key sites: Barcın Höyük, Bahçelievler, and Aşağı Pınar. The analysis focuses on grain kernels/seeds counts per sample, storage values, and diachronic trends in crop preferences. I aim to create data to answer one of the research questions about subsistence strategies which did the inhabitants of each site adhere to, especially when it comes to plant choice? In addition, from the crop ratio models, can we understand the different manifestations of the adaptation process during the Neolithic in Northwest Türkiye?

Only small numbers of the economic plant remains will be evaluated to understand the settlement noise. Looking at the proportion of crops from minimum to maximum can provide us with information to help us discuss some of our research questions, such as which crop takes up how much space in the field, how that crop is stored and how much space was needed in terms of volume to store it. Calculating the principal products includes counting the grain kernels for cereals and counting the seeds for the pulses. By-product remains are obtained only from cereals, mostly found as rachis nodes in the assemblages. Because of their fragile structure, the by-products of pulses are not preserved as archaeobotanical remains. Cereal by-products consist of threshing and de-graining (de-hulling) remains.

A predominant frequency of one item may indicate that the plant was rarely/randomly used in the site. It may not have been part of stable agricultural production, but perhaps a small-scale exchange from outside or a supplementary use. In addition, the way the plant was processed or that it came with fuel are also possible. A very low frequency of 4–5 may indicate very low/never processing in large quantities or processing areas were not sampled. The high frequency of 4-5 reflects the opposite scenario. There are some other interpretation criteria such as sampling strategy, preservation, deposition, etc. that we might also consider.

In fact, the presence of high quantities of plant remains in some samples indicates their potential storage use, suggesting that these plants were stored or processed on-site. However, smaller quantities are considered more reliable indicators of routine activity. The more frequently a plant was brought to and processed at a site, the greater the likelihood of its consistent recovery in the archaeobotanical record.

9.1. The ratio of Wheat and Barley

Wheat includes hulled wheats (*Triticum monococcum* ssp. *monococcum* and *Triticum turgidum* ssp. *dicoccum*) and naked wheat (*Triticum aestivum/durum, Triticum* ssp.). Six-row barley (*Hordeum vulgare ssp. vulgare*) is represented by the hulled form in the key sites. As additional, two-row/six-row barley (*H. vulg.* ssp. *vulg./dictichon*) is also represented by the hulled form at Aşağı Pınar.

9.1.1. Barcın Höyük

According to the ratio of grain kernels, the wheat group seems abundant according to barley in the earliest phase VIe compared to VId1. We can say that barley has a ratio of ¼ wheats (Figures 9.1, 9.2, and 9.3., 9.4.). According to the density of presence, the quantity of barley increases in VId1 compared to phase VIe, especially in minimum 1 grain kernel (Figure 9.1), but we do not see a big difference in this phase. The wheat group contains storage values[68] in the phases, but we do not observe storage values for barley.

Table 9.1: The total samples per phase for the ratio of wheat and barley grain kernels at Barcın Höyük.

Barcın Höyük	**VIe**	**VId1**	**VId2**	**VId3**	**VIc**	**VIb**	**VIa**
Total (N) Sample	173	185	36	32	53	100	7
Sample numbers that contain Wheat-Barley GK	81	121	16	16	19	51	4
Max N=5	**71**	**85**	**10**	**15**	**18**	**45**	**3**
The rate of occurrence in total samples	47.3%	65.4%	44.4%	50%	35,8%	50%	57.1%

While the frequency of wheat or barley found in the samples collected from Barcın Höyük is 70-50% in phases VIe, VId1, and VIb, it drops below 50% in the other phases (Table 9.1). This decrease may indicate a shift in agricultural intensity, a change in settlement structure or function, or simply poorer preservation. Alternatively, these phases could represent

[68] **Storage value:** High concentration of a plant type in some of samples/contexts in the site rather than the frequently presence in low numbers (1-5/10).

transitional periods where economic or environmental pressures prompted diversification or a temporary decline in cultivation.

The frequency of one grain kernel (wheat and barley) highlights diachronic shifts in cereal preference and agricultural strategy between phases VIe and VIa at Barcın Höyük (Figure 9.1).

Wheat - comprising both hulled forms (*T. monococcum*, *T. dicoccum*) and bread/hard wheat as naked wheat (*T. aestivum/durum*) - dominates across nearly all phases, with especially high representation in VIe, VId1, and VIb. This consistent prevalence suggests wheat's centrality in Neolithic agricultural systems at Barcın, possibly due to its higher yield, broader culinary applications, or better storage qualities compared to barley (Figure 9.1, 9.2).

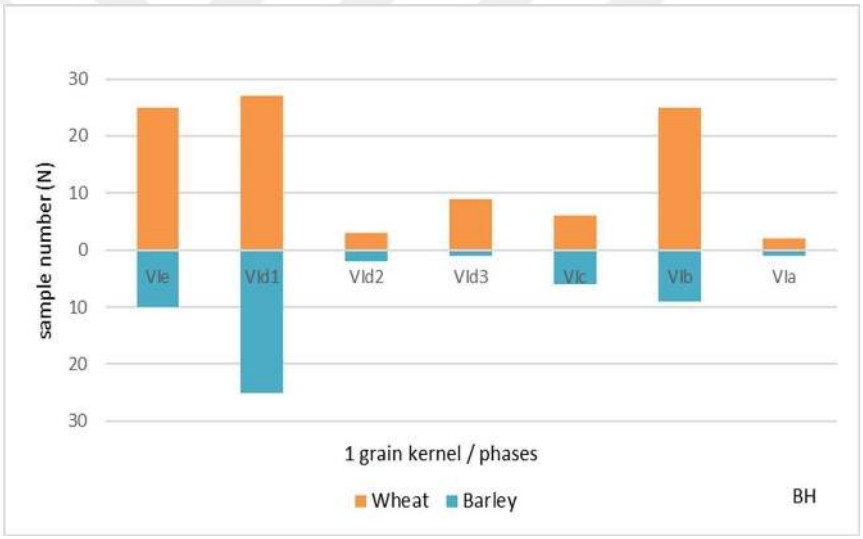


Figure 9.1: The ratio of 1 wheat/barley grain kernel per Neolithic phase at Barcın Höyük.

Barley (*Hordeum vulgare* ssp. *vulgare*, hulled) is less consistently present in phases VIe, VId1, VIc, and VIb. These differences may reflect taphonomic factors, cultural preference, or shifts in land use. The low barley presence might also imply it was used as a supplementary crop, possibly for animal fodder or marginal lands, rather than as a staple grain. On the other hand, wheat is represented here with three types of wheat and this situation may increase the possibility of the presence of wheat compared to barley.

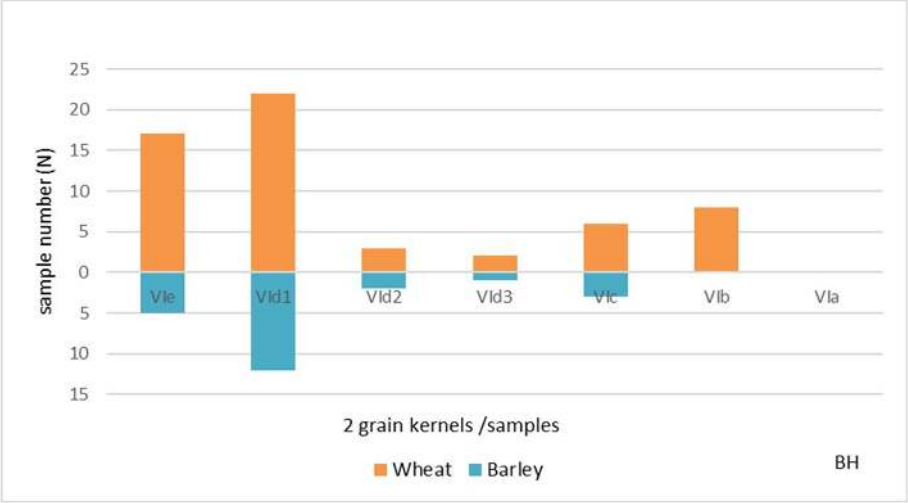


Figure 9.2: The ratio of 2 wheat/barley grain kernels per Neolithic phase at Barcın Höyük.

The number of samples yielding at two cereal grain kernels -a proxy for better-represented deposits- presents the temporal distribution of cereals and again underscores the predominance of wheat cultivation, a pattern consistent with early Neolithic subsistence strategies in western Anatolia.

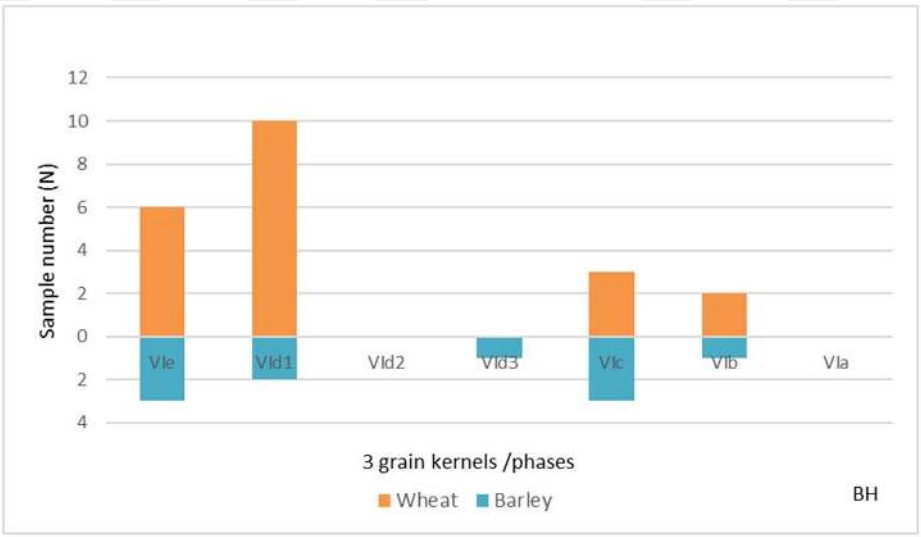


Figure 9.3: The ratio of 3 wheat/barley grain kernels per Neolithic phase at Barcın Höyük.

Phases VIe and VId1 yield the highest number of well-represented wheat samples (17 and 22, respectively), affirming the central economic and dietary role of wheat during these early phases. This suggests a stable and well-developed cereal cultivation regime. The inclusion of both hulled and naked wheat types may reflect a dual strategy, combining hardy traditional

crops with more easily processed varieties. It is observed that naked wheat increase in later phases (Figure 9.3, 9.4).

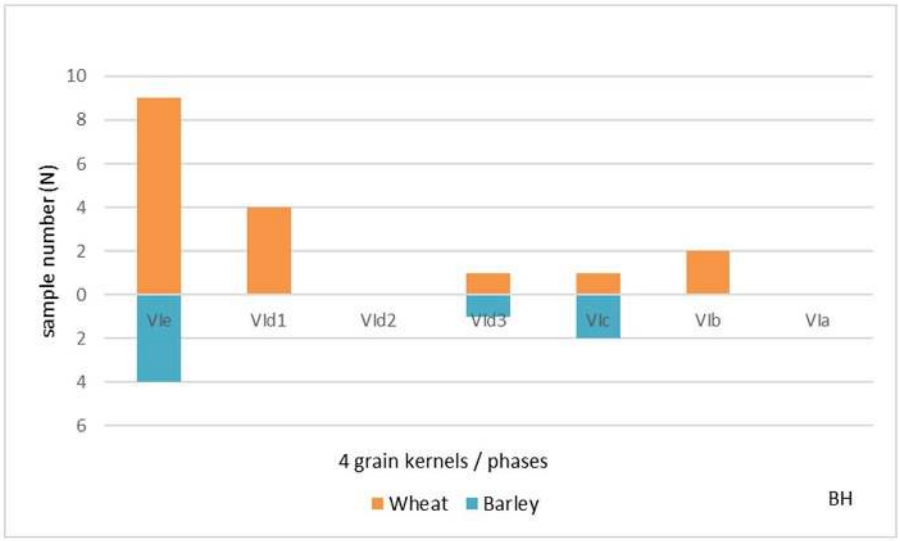


Figure 9.4: The ratio of 4 wheat/barley grain kernels per Neolithic phase at Barcın Höyük.

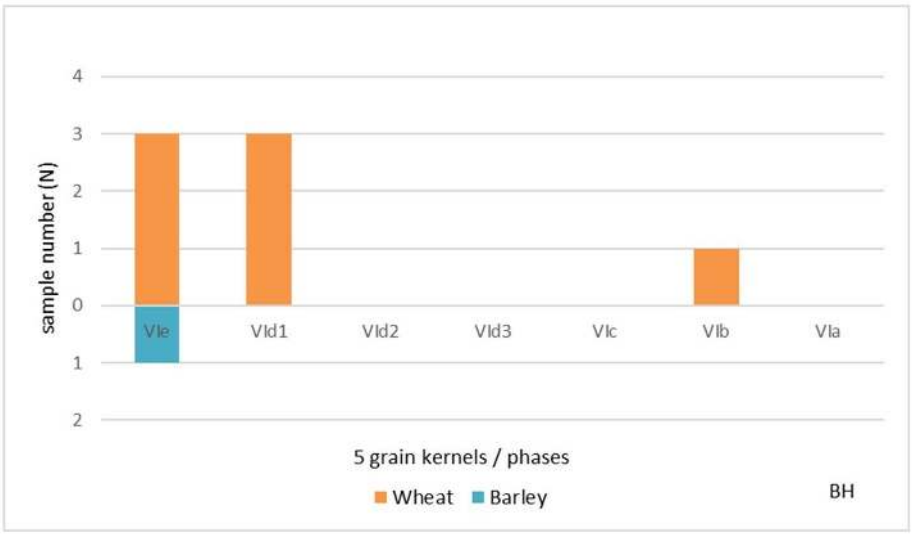


Figure 9.5: The ratio of 5 wheat/barley grain kernels per Neolithic phase at Barcın Höyük.

Barley presence remains marginal across all phases, notably in VId1 and VIc, which again may reflect taphonomic biases, lesser cultivation, or selective use. The persistent under-representation of barley in richer samples (2+ kernels) strengthens the argument that barley was a supplementary, rather than a staple, crop at Barcın Höyük (Figure 9.2).

Phases VId2, VId3, and VIa display minimal cereal sample frequency, indicating a possible lull in cereal deposition, decreased crop processing activities at the sampled loci, or reduced preservation. VIb sees a slight resurgence of wheat but barley remains are absent, consistent with the broader diachronic pattern of wheat dominance (Figure 9.4, 9.5).

In sum, the minimum-number data supports a model in which wheat was the staple cereal throughout the early Neolithic occupation of Barcın Höyük, with barley playing a more minor or context-specific role. This pattern aligns with broader trends in early farming societies of western Anatolia and the Balkans, where wheat is often dominant in early assemblages like as in my key sites Bahçelievler (Northwest Anatolia) and Aşağı Pınar (Turkish Thrace).

Together, the data from samples with two or more kernels reinforce interpretations from the single-kernel graph, suggesting that Barcın Höyük's agricultural system was wheat-centric, with barley serving a minor or context-dependent role. The agricultural economy appears to have been most active and/or best-preserved during phases VIe and VId1, possibly corresponding to peaks in population, site occupation intensity, or cereal storage and processing activities. On the other hand, excavated areas of the phases and sampling intensity may also affect the results (Table 9.1).

9.1.2. Bahçelievler

Storage-related data is absent at Bahçelievler. The quantity of plant remains retrieved from the samples is generally low. Taking into account the number of representative samples across the phases, the most substantial data derives from P hases 7, 6, and 5 (Table 9.2). In the wheat group, bread/hard wheat grain kernels are more representative rather than hulled wheats.

Table 9.2: The total samples per phase for the ratio of wheat and barley grain kernels at Bahçelievler.

Bahçelievler	**8**	**7**	**6**	**5**	**4**	**3**	**2**
Total (N) Sample	12	19	45	26	14	8	11
Sample numbers that contain Wheat-Barley GK	2	5	14	10	3	0	0
Max N=5	**2**	**5**	**13**	**9**	**3**	**0**	**0**
The rate of occurrence in total samples	16.6%	26.3%	31.1%	38.4%	21.4%	0%	0%

Phases 6 and 5 yield the highest number of wheat samples (8 and 5). These two phases are also contemporary with phases VIe and VId1 at Barcın Höyük, affirming the central economic and dietary role of wheat during these phases, just like the Barcın Höyük data does.

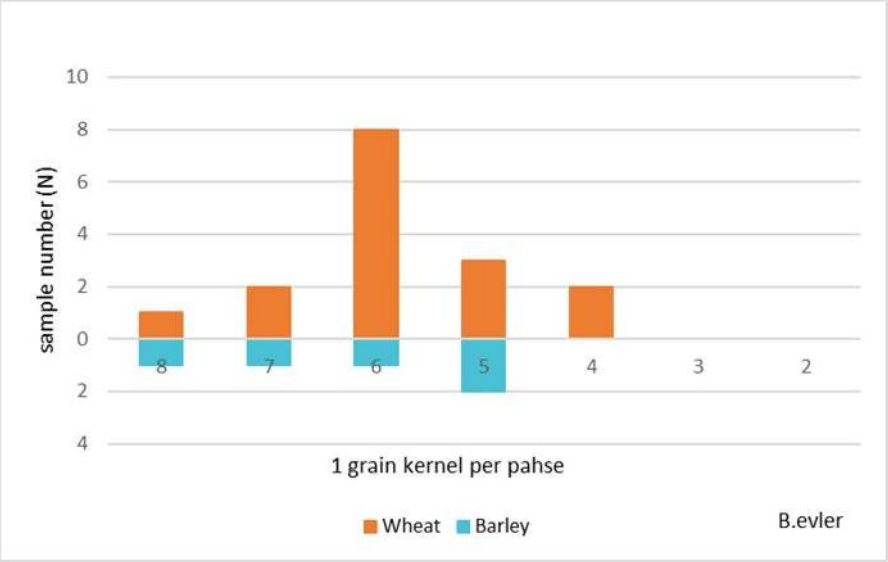


Figure 9.6: The ratio of 1 wheat/barley grain kernel per Neolithic phase at Bahçelievler.

Barley is notably more prevalent in levels 6 and 5. Although barley appears in nearly every phase when considering minimum counts, its presence diminishes as the number of remains increases. This may suggest that, as at Barcın Höyük, barley functioned not as a primary crop but rather as a supplementary one (Figure 9.6, 9.7).

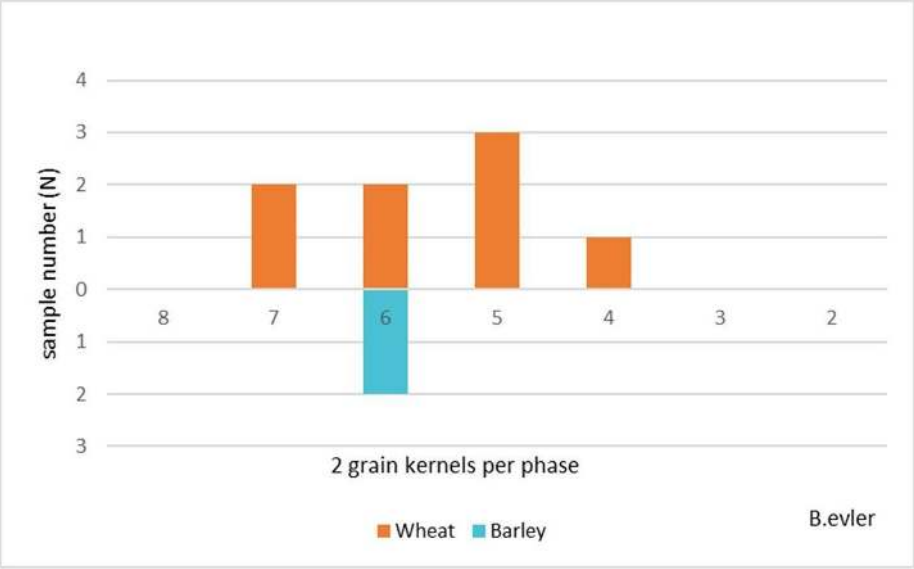


Figure 9.7: The ratio of 2 wheat/barley grain kernels per Neolithic phase at Bahçelievler.



Figure 9.8: The ratio of 3 wheat/barley grain kernels per Neolithic phase at Bahçelievler.

Apart from the rate of minimum numbers (1-2), only one sample yielded 4 wheat grain kernels in Phase 5 (Table 9.2). There are no documented 5 grain kernels in one sample in any phase at Bahçelievler. It is possible to suggest a stable cultivation regime – dominantly wheat- at Bahçelievler, although there is not a ratio of high numbers (the quantity of 3-5 grains per sample) (Figure 9.6, 9.7, 9.8).

9.1.3. Aşağı Pınar

The incidence of wheat and barley groups in Aşağı Pınar are only evaluated at Phase 7 in this research (Table 9.3). The wheat group is composed of emmer, bread/hard wheat and einkorn wheat types in order of dominance. The wheat group is composed of emmer wheat, bread/hard wheat and einkorn wheat in order of dominance. The rows in spike and grain numbers in these wheat types definitely affect this rate.

Table 9.3: The total samples per phase for the ratio of wheat and barley grain kernels at Bahçelievler.

Aşağı Pınar	**7**
Total (N) Sample	203
Sample numbers that contain Wheat-Barley GK	120
Max N=5	**65**
The rate of occurrence in total samples	59%

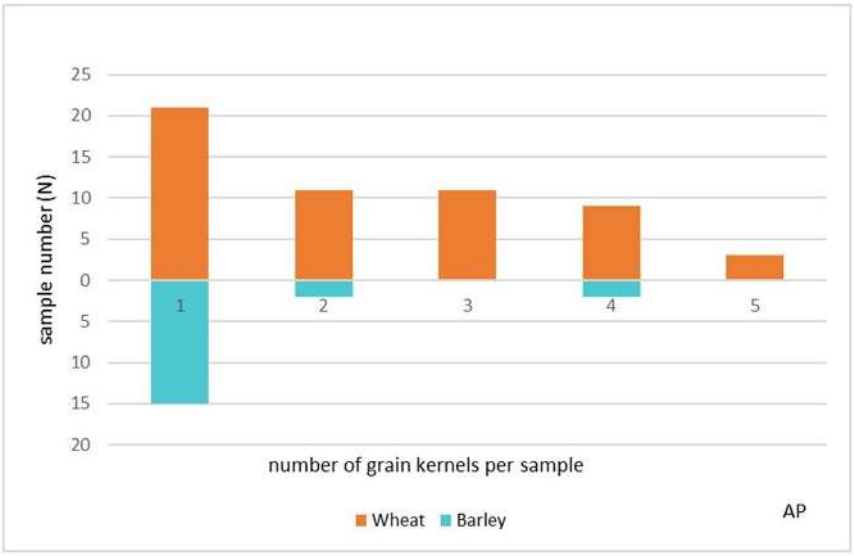


Figure 9.9: The ratio of wheat/barley grain kernels from 1 to 5 in Phase 7 at Aşağı Pınar.

Although barley appears more frequently in minimum counts, as observed in Barcın Höyük and Bahçelievler, its presence declines in higher quantities. Overall, no storage-related data associated with barley has been identified in Layer 7 contexts (Figure 9.9). As seen at both of the other key sites, it is highly likely that barley served as a supplementary crop alongside wheat.

9.2. Hulled Wheats

Hulled wheats are represented with einkorn (*Triticum monococcum* ssp. *monococcum*) and emmer (*Triticum turgidum* ssp. *dicoccum*) species.

9.2.1. Barcın Höyük

The ratio between einkorn and emmer grain kernels as hulled wheat was found in 53 samples out of 173 samples in Phase VIe (Table 9.4). According to the ratio, emmer wheat shows higher quantity compared to einkorn wheat (Figures 9.10, 9.11, 9.12, 9.13). When we look at the ratio (Figure 9.10), emmer has more abundance than einkorn, but when we look at the small values, a similar distribution is observed. There is a slight difference in the ratios but the grain number of the spikelets also effects the ratio. For example, an einkorn spikelet has only one grain kernel but an emmer spikelet (except the top of the spikelet) has two grain kernels. So, proportionally,

even if emmer and einkorn are grown in equal proportions, einkorn wheat will have less yield compared to emmer.

Table 9.4: The total samples per phase for the ratio of einkorn and emmer wheat grain kernels.

Barcın Höyük	**VIe**	**VId1**	**VId2**	**VId3**	**VIc**	**VIb**	**VIa**
Total (N) Sample	173	185	36	32	53	100	7
Samples containing einkorn and emmer wheat GK	64	91	9	9	6	27	1
Max N=5	**53**	**73**	**3**	**9**	**6**	**25**	**1**
The rate of occurrence in total samples	36.9%	49.1%	25%	28.1%	11.3%	27%	14.2%

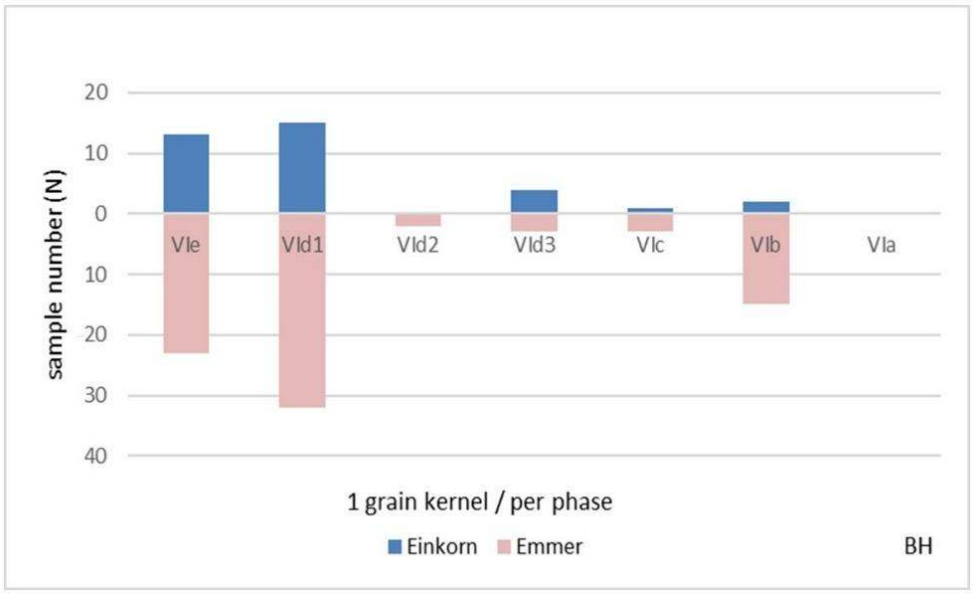


Figure 9.10: The presence of 1 grain kernel of einkorn/emmer per Neolithic phase at Barcın Höyük.

In Phase VId1, emmer wheat still shows a higher ratio compared to einkorn wheat, like in phase VIe (Figure 9.10, 9.11). On the other hand, when we look at the graphs of the two phases in general, it seems that emmer wheat shows a higher storage value in phase VId1 compared to Phase VIe.

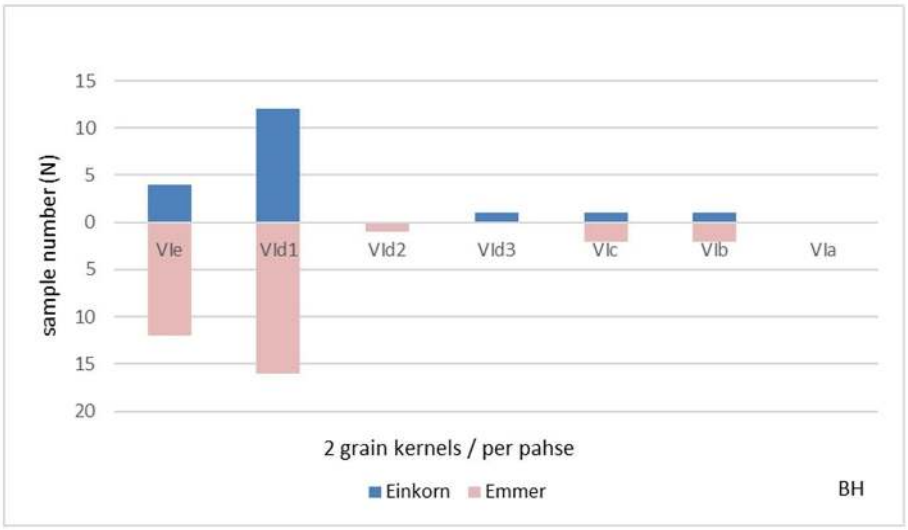


Figure 9.11: The presence of 2 grain kernels of einkorn/emmer per Neolithic phase at Barcın Höyük.

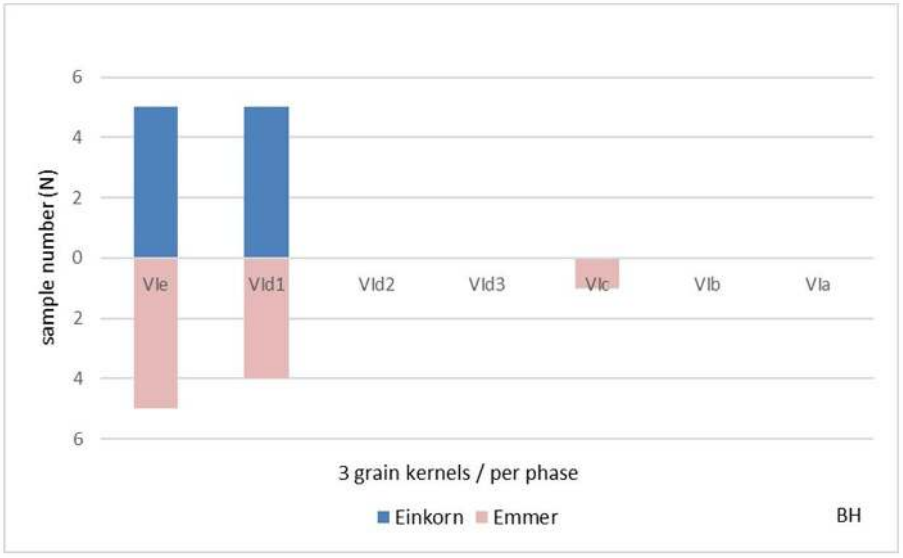


Figure 9.12: The presence of 3 grain kernels of einkorn/emmer per Neolithic phase at Barcın Höyük.

As we move to later stages and the number of grains in a sample increases, the presence of einkorn wheat weakens, except in the earliest two phases VIe and VId1 (Figure 9.12, 9.13, 9.14).

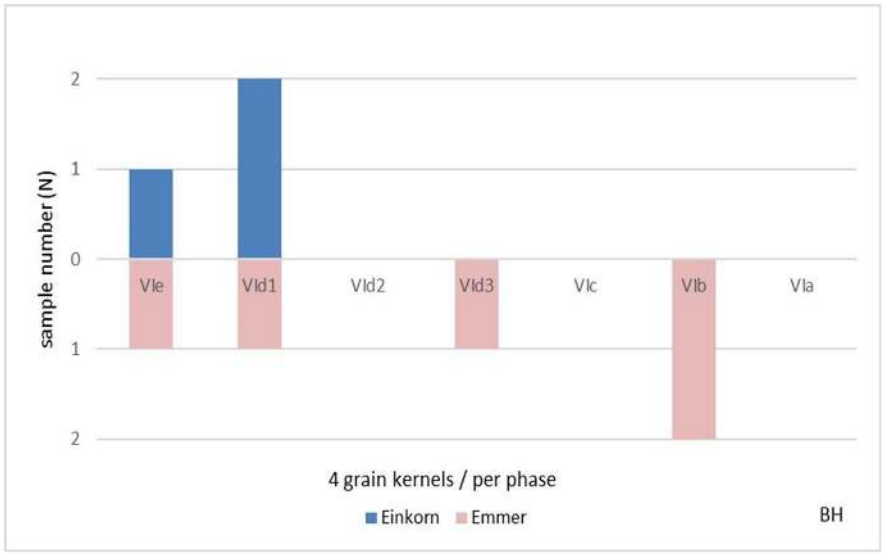


Figure 9.13: The presence of 4 grain kernels of einkorn/emmer per Neolithic phase at Barcın Höyük.

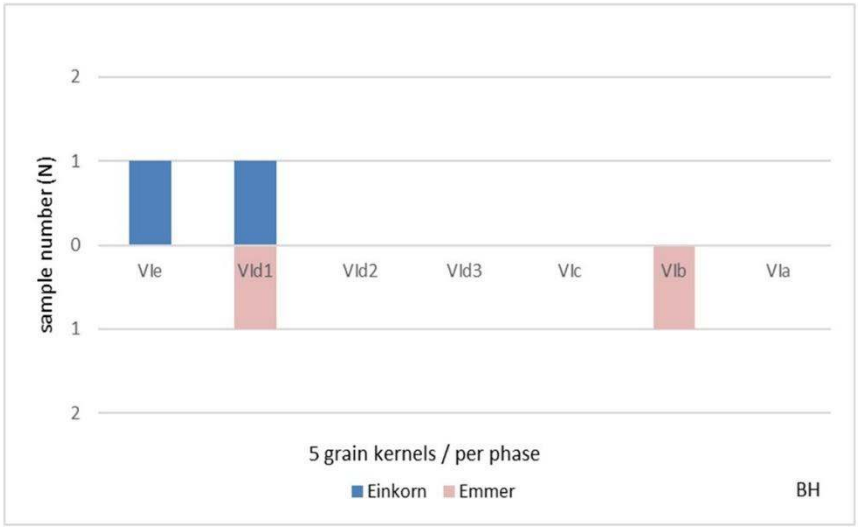


Figure 9.14: The presence of 5 grain kernels of einkorn/emmer per Neolithic phase at Barcın Höyük.

As the number of the remains increases (4-5), the rate of wheat grains in the samples decreases. This must also be related to the storage strategy for wheat at the site (Figure 9.13, 9.14). As the intensive sampling decreases in the stages, it becomes more difficult to observe the distribution frequency. The number of samples with four or five kernel grains varies between only 1-3 samples. However, when we evaluate in general, emmer wheat shows a more stable presence in most of the phases compared to einkorn wheat.

9.2.2. Bahçelievler

Einkorn or emmer remains occur up to Phase 4 (Table 9.5). In Bahçelievler, grain kernels were mostly found in fragmented bits, which affects the ratio value on a wheat type basis. The data were obtained only from the lowest grain numbers (1) in Bahçelievler.

Table 9.5: The total samples per phase for the ratio of hulled wheat grain kernels at Bahçelievler.

Bahçelievler	**8**	**7**	**6**	**5**	**4**	**3**	**2**
Total (N) Sample	12	19	45	26	14	8	11
Sample numbers that contain einkorn-emmer GK	1	6	4	5	0	0	0
Max N=5	**1**	**6**	**3**	**5**	**0**	**0**	**0**
The rate of occurrence in total samples	8.3%	31.5%	8.8%	19.2%	0%	0%	0%

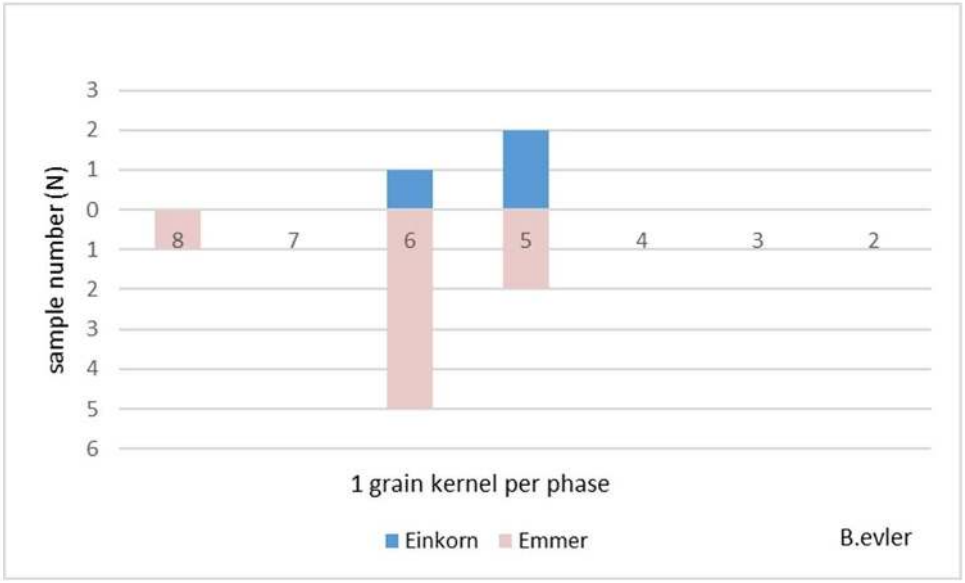


Figure 9.15: The presence of 1 grain kernel of einkorn/emmer per Neolithic phase at Bahçelievler.

Only in one sample, five emmer grains were recorded in Phase 5. There are no recorded other numbers in any phase. Emmer and einkorn have almost equal rates (Figure 9.15). On the other hand, emmer shows a little bit more dominance compared to einkorn wheat.

9.2.3. Aşağı Pınar

In samples collected in Aşağı Pınar, the rate of emergence of hulled wheat is close to 45% (Table 9.6). Emmer wheat is the dominant species among einkorn and emmer in layer 7 at Aşağı Pınar. Einkorn wheat is present in low numbers (1-2), while after 2, emmer becomes the stable crop (Figure 9.x).

Table 9.6: The total samples per phase for the ratio of hulled wheat grain kernels at Aşağı Pınar.

Aşağı Pınar	**7**
Total (N) Sample	203
Sample numbers that contain einkorn-emmer GK	88
Max N=5	**52**
The rate of occurrence in total samples	43.3%

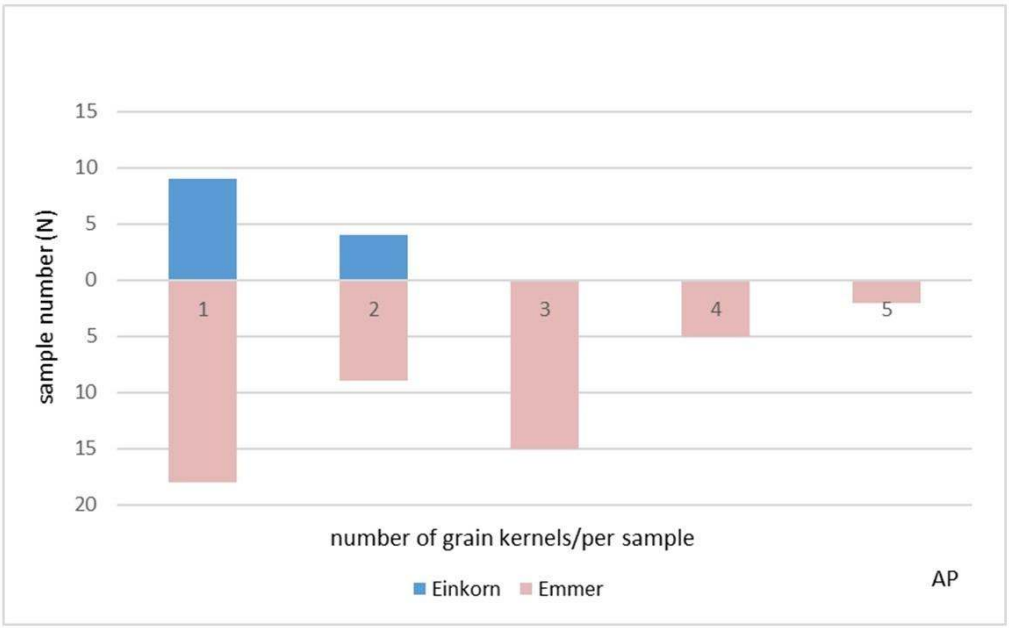


Figure 9.16: The presence of grain kernels of einkorn/emmer from 1 to 5 in Phase 7 at Aşağı Pınar.

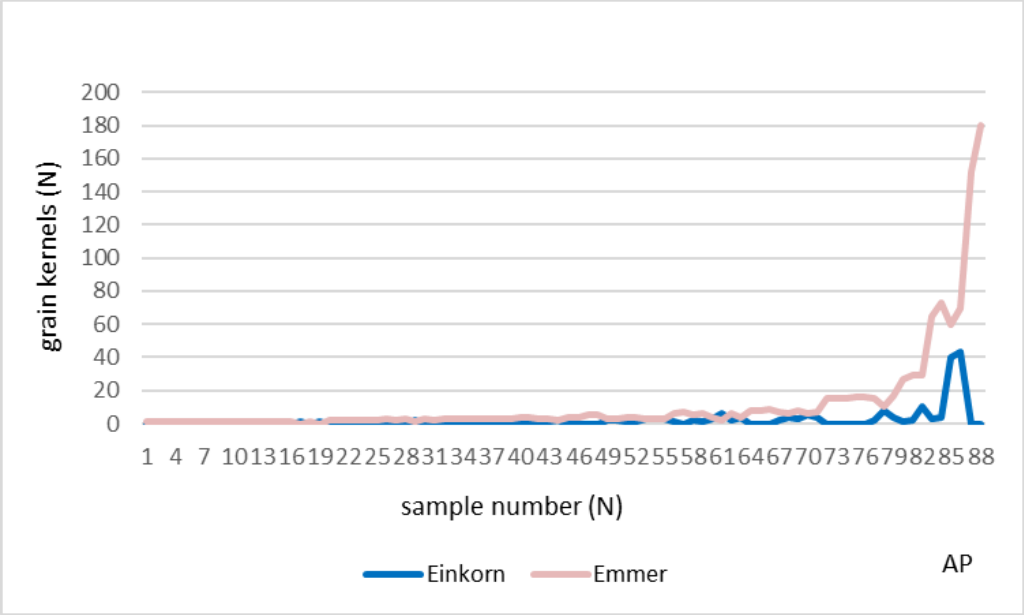


Figure 9.17: The grain kernels of hulled wheats in Phase 7 at Aşağı Pınar.

Although einkorn wheat has a storage value, emmer wheat was encountered in many more samples (Figure 9.16, 9.17). Especially in the lower fills of layer 7, the einkorn and emmer wheats presents wider data, while in the middle and upper fills, this duo turns into emmer-bread/hard wheat duo. We also observe such a change in the late Neolithic phases (VIc-VIb) at Barcın Höyük.

9.3. Hulled wheat and naked wheat

Hulled wheat is represented with einkorn (*Triticum monococcum* ssp. *monococcum*) and emmer (*Triticum turgidum* ssp. *dicoccum*) and naked wheat is represented with bread/hard wheat (*Triticum aestivum/durum*) and indeterminate naked wheats which are probably bread/hard wheat (*Triticum* ssp.).

9.3.1. Barcın Höyük

Grain kernels of hulled wheat and naked wheat were found in 62 samples out of 173 samples in Phase VIe, and in 76 samples out of 185 samples in Phase VId1 (Table 9.7). Phase VId1 clearly stands out with the highest proportion of wheat remains, indicating either a peak in wheat production, improved preservation conditions (the burnt levels), or intensified consumption patterns during this phase. Interestingly, Phase VIe, the earliest represented in this dataset, also shows a comparably high wheat frequency, suggesting that similar practices in

wheat usage or storage may have persisted from the early to the later parts of Level VI (Table 9.7).

Table 9.7: The total samples per phase for the ratio of hulled and naked wheat grain kernels in Neolithic Phases at Barcın Höyük.

Barcın Höyük	**VIe**	**VId1**	**VId2**	**VId3**	**VIc**	**VIb**	**VIa**
Total (N) Sample	173	185	36	32	53	100	7
Sample numbers that contain hulled/naked wheat GK	70	105	12	14	15	43	2
Max N=5	**62**	**76**	**6**	**14**	**14**	**40**	**2**
The rate of occurrence in total samples	40.4%	56.7%	33.3%	43.7%	28.3%	43%	28.2%

Conversely, intermediate phases such as VIc and VIb exhibit a noticeable decline in wheat presence. We see an increase again in phase VIb. These fluctuations may reflect shifts in agricultural practices, climate variability, storage strategies, or changes in economic priorities over time. The cyclical nature of wheat occurrence across the phases points to a dynamic socio-environmental landscape that influenced plant economy at the site.

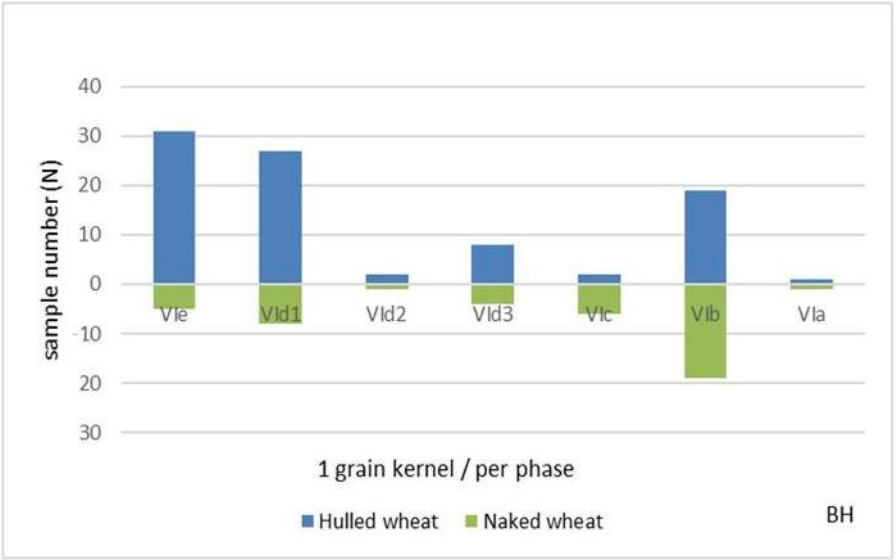


Figure 9.18: The presence of 1 grain kernels of hulled/naked wheat per Neolithic phase at Barcın Höyük.

According to the ratio of grain kernels, hulled wheat (*Triticum monoc.* ssp. *monoc.* and *Triticum turg.* ssp. *dicoc.*) is the predominant group compared to naked wheat (*Triticum aestivum/durum,* indeterminate naked *Triticum* ssp.) and contains storage value in some of the samples, especially in early occupation levels (Figures 9.18, 9.19).

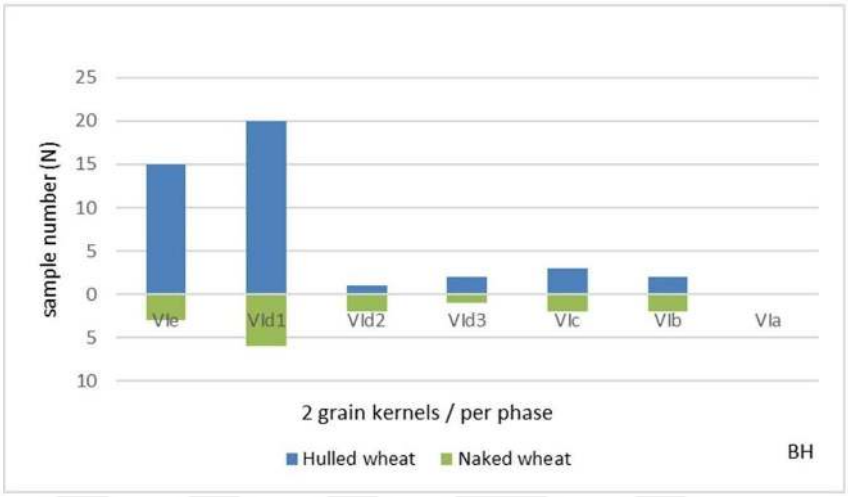


Figure 9.19: The presence of 2 grain kernels of hulled/naked wheat per Neolithic phase at Barcın Höyük.

Hulled wheat dominates in minimum number (1) across nearly all phases, with an especially high representation in the earliest Phases VIe and VId1 (Figure 9.18). This consistent prevalence suggests a hulled wheat centrality in the early agricultural systems at Barcın (Figures 9.18-9.22).

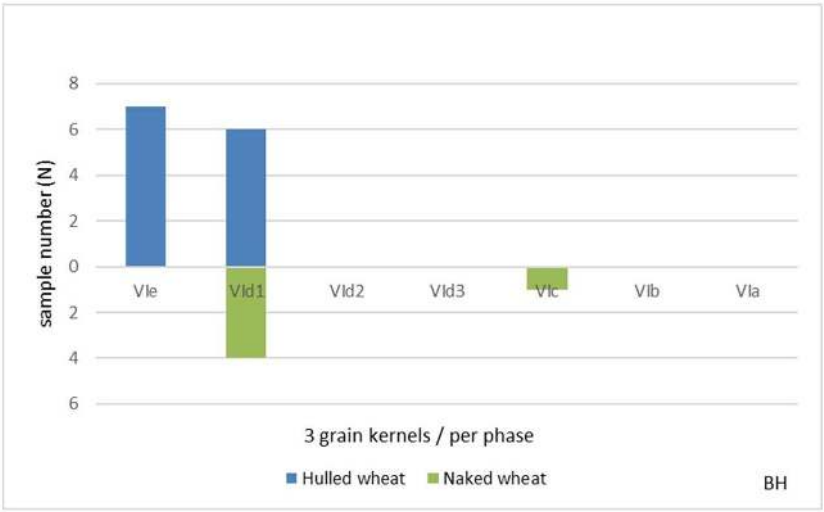


Figure 9.20: The presence of 3 grain kernels of hulled/naked wheat per Neolithic phase at Barcın Höyük.

Apparently, naked wheat increases in Phases VId1 and VIb. Naked wheat is less consistently present, especially in phase VIe. These differences may reflect taphonomic factors, cultural preference, or shifts in land use. The low naked wheat presence might also imply it was used possibly as a supplementary crop at the earliest levels rather than as a staple grain.

The inclusion of both hulled and naked wheat types may reflect a dual strategy, as mentioned above. It is observed that naked wheat increases in later phases in small and high quantities (Figure 9.21, 9.22).

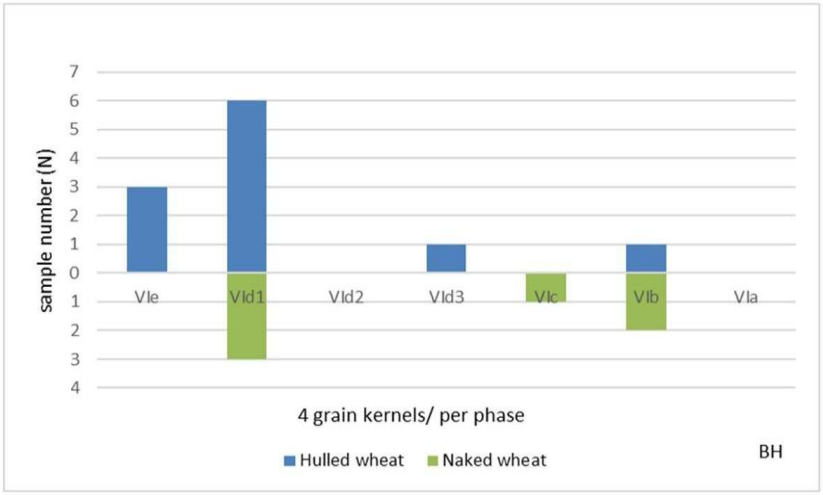


Figure 9.21: The presence of 4 grain kernels of hulled/naked wheat per Neolithic phase at Barcın Höyük.

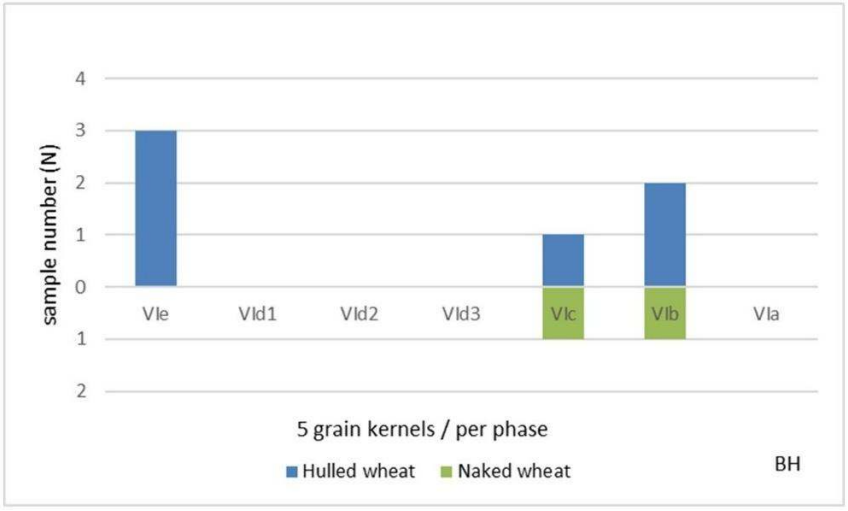


Figure 9.22: The presence of 5 grain kernels of hulled/naked wheat per Neolithic phase at Barcın Höyük.

Phases VId2, VId3, and VIa display minimal both hulled and naked wheat sample frequency, indicating a possible lull in cereal deposition, decreased crop processing activities at the sampled loci, or reduced preservation. VIc and especially VIb see a resurgence of naked wheat in ratio between 3-5 grain kernels, consistent with the broader diachronic pattern of naked wheat dominance (Figures 9.20-9.22).

Hulled wheat is still the predominant group compared to naked wheat, but naked wheat shows a slightly higher distribution after VId1 than Phase VIe and contains storage value too in the ratio 3-5 grains (Figures 9.20, 9.21, 9.22).

It is well known that naked wheat varieties yield more product and require less labor during processing compared to hulled wheat (please see chapter 5, cereal section). The increasing prevalence of naked wheat over time at Barcın Höyük may be related to this fact, but it may also reflect that agricultural strategies - such as land and soil preferences, locations for processing, logistic needs, and storage - had become more systematized within the 100 years (6600-6500 cal. BC) following the initial settlement phase VIe.

9.3.2. Bahçelievler

When examining the occurrence rate of wheat in the samples collected from Bahçelievler, it is observed that the likelihood of finding grain kernels drops to zero in samples with 10 or fewer items. This may be influenced by factors such as different depositional processes between cultural layers, settlement organization, and spatial uses. However, when looking at the occurrence rate in terms of percentages, a general statistical average emerges based on the sample numbers (Table 9.8).

Table 9.8: The total samples per phase for the ratio of hulled and naked wheats grain kernels at Bahçelievler.

Bahçelievler	**8**	**7**	**6**	**5**	**4**	**3**	**2**
Total (N) Sample	12	19	45	26	14	8	11
Sample numbers that contain hulled/naked wheat GK	2	4	13	8	3	0	0
Max N=5	**2**	**4**	**12**	**7**	**3**	**0**	**0**
The rate of occurrence in total samples	16.6%	21.0%	28.8%	30.7%	21.4%	0%	0%

The 1 grain kernel ratio indicates that hulled wheat is more prevalent in Phases 5 and 6, whereas naked wheat dominates in Phase 6 and continues to appear across earlier and later phases (Figure 9.23). The absence of data in Phases 2 and 3 implies either a lack of preservation or sampling gaps, as mentioned above.

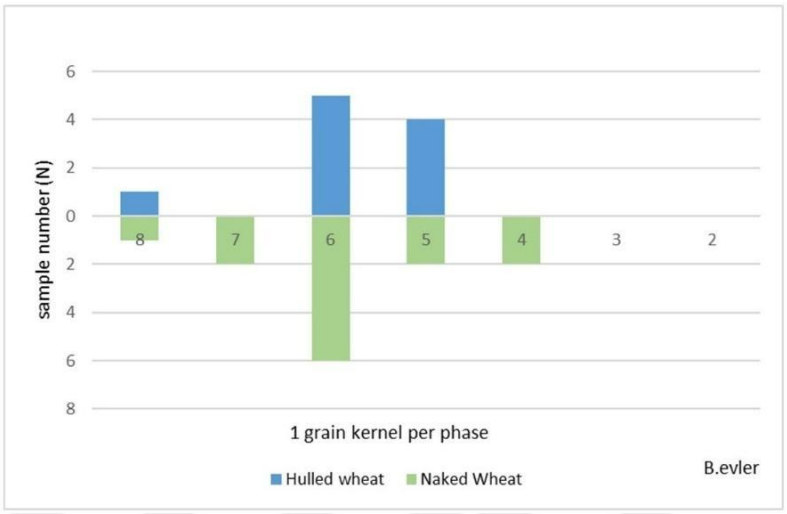


Figure 9.23: The presence of 1 grain kernel of hulled/naked wheats per Neolithic phase at Bahçelievler.

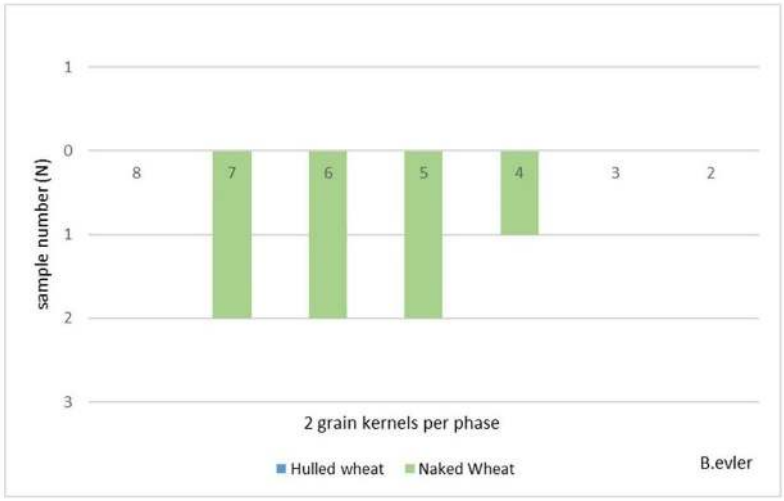


Figure 9.24: The presence of 2 grain kernels of hulled/naked wheats per Neolithic phase at Bahçelievler.

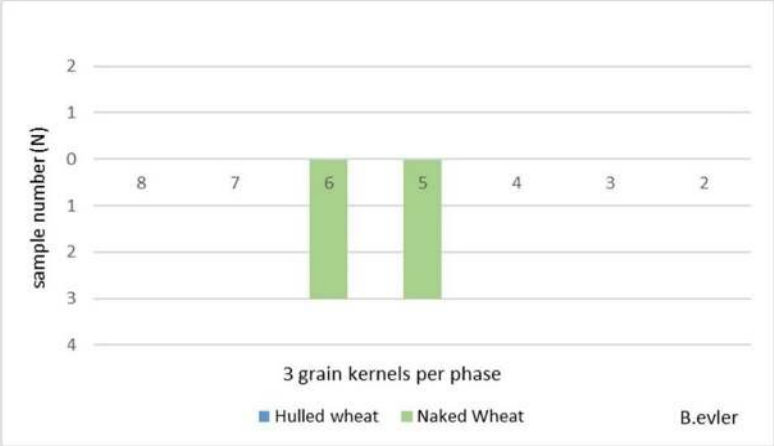


Figure 9.25: The presence of 3 grain kernels of hulled/naked wheats per Neolithic phase at Bahçelievler.

In the ratio of 2 grain kernels, hulled wheat is completely disappearing and naked wheat looks dominant in phases 7, 6, 5, and 4, where the wheat data were obtained (Figure 9.24). Hulled wheat is disappearing completely. One of the reasons for this could of course be the number of grains per spike depending on the wheat species, for example if emmer, einkorn and bread/hard wheat species are planted and harvested in equal proportions, the ratio of bread/hard wheat will increase towards 5 grain kernels per sample (Figures 9.24, 9.25). Although the cereal remains recovered from Bahçelievler mostly consist of fragmented grains, naked wheat is clearly dominant among the identified wheat types. Even though high sample numbers are not observed across all low-count ranges, naked wheat appears to be the primary crop.

9.3.3. Aşağı Pınar

In the archaeobotanical sampling carried out at Aşağı Pınar layer 7, the presence of wheat grains shows over 50% ratio (Table 9.9). Clearly, hulled wheat is in the foreground. Within the hulled wheat, emmer wheat constitutes the vast majority of the data (see section 6.3.1).

Table 9.9: The total samples per phase for the ratio of hulled and naked wheats grain kernels at Aşağı Pınar.

Aşağı Pınar	**7**
Total (N) Sample	203
Sample numbers that contain hulled/naked wheat GK	110
Max N=5	**65**
The rate of occurrence in total samples	54.1%

The frequency of 1 grain kernel (hulled/naked wheat) highlights diachronic shifts in cereal preference and agricultural strategy in Phase 7 at Aşağı Pınar (Figure 9.26).

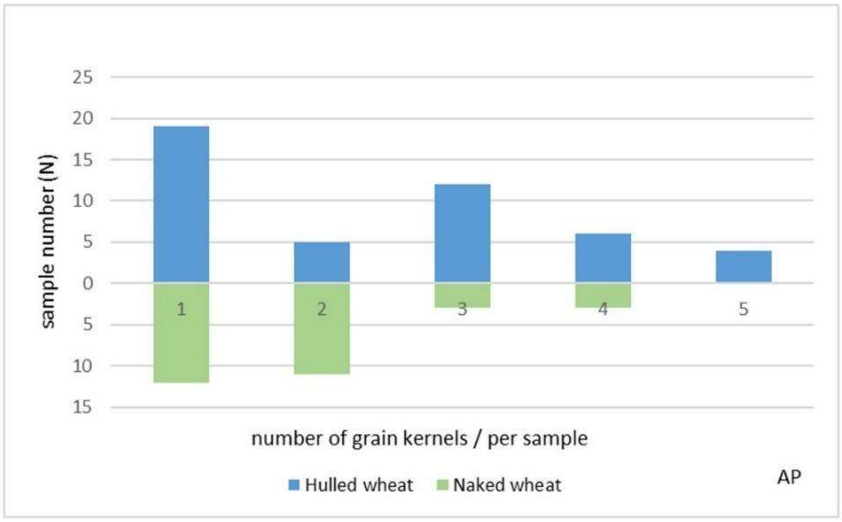


Figure 9.26: The presence grain kernels of hulled/naked wheats from 1 to 5 per sample in Phase 7 at Aşağı Pınar.

Hulled wheat - comprising both einkorn and emmer (*T. monococcum*, *T. dicoccum*) - dominates across nearly all number ratios between 1-5 (Figure 9.26). This consistent prevalence suggests hulled wheat centrality in farming system of layer 7 at Aşağı Pınar, possibly due to its higher yield, broader culinary applications, or better storage qualities compared to naked wheat (Figure 9.27).

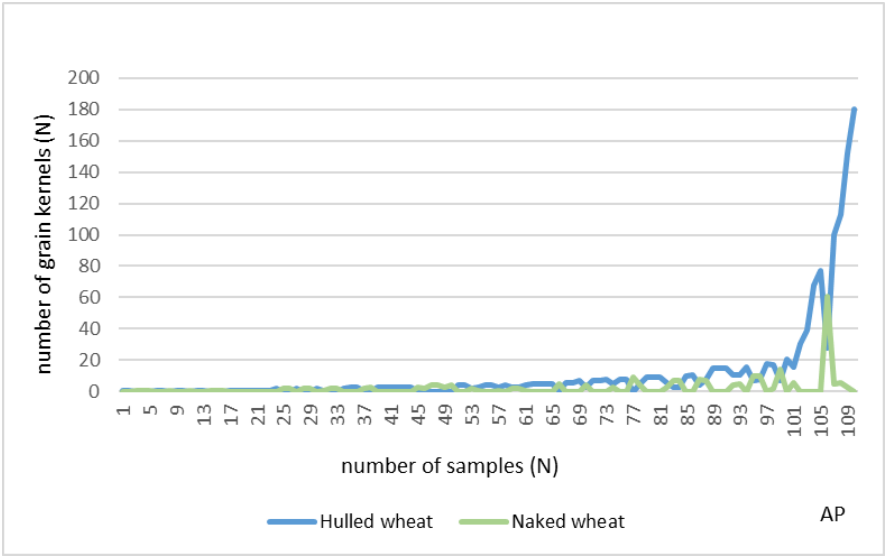


Figure 9.27: The presence of hulled and naked wheats with low and high numbers per sample in Phase 7 at Aşağı Pınar.

Naked wheat (*T. aestivum/durum*) is less consistently present in ratio between 3-5 grain kernels per sample (Figure 9.26). The low naked wheat presence might also imply it was used as a supplementary crop rather than as a staple crop because it does not present any storage value compared to hulled wheat -mostly emmer- (Figure 9.27).

9.4. Pulses

Pulses family (Fabaceae) are represented with bitter vetch (*Vicia ervilia*), chickpea (*Cicer arietinum*), grass pea (*Lathyrus sativus*), lentil (*Lens culinaris*), pea (*Pisum sativum*), faba bean (*Vicia faba*) and fragmented pulses seeds. The pulses types show difference in sites. The common and frequent species are lentil and bitter vetch seeds in the sites. Grass pea shows presence only in Aşağı Pınar, faba bean is only in phase VIc, pea and chickpea seeds are not widely found but show presence in all sites.

9.4.1. Barcın Höyük

Compared to cereals, pulses show a lower distribution. Pulses seeds were only found in 18 samples out of 173 samples in phase VIe, and in 55 samples out of 185 samples (Table 9.10). Pulses increase by an average of 20% in VId1. This increase continues in VId2 and then decreases again until phase VIb.

Table 9.10: The total samples per phase for the ratio of pulses types at Barcın Höyük.

Barcın Höyük	**VIe**	**VId1**	**VId2**	**VId3**	**VIc**	**VIb**	**VIa**
Total (N) Sample	173	185	36	32	53	100	7
Sample numbers which contain pulses	18	55	12	7	12	34	4
Max N=5	**18**	**44**	**11**	**5**	**12**	**28**	**4**
The rate of occurrence in total samples	10.4%	29.7%	33.3%	21.8%	22.6%	34%	57.1%

In the earliest phase VIe, generally pulses show rare evidence, lentil and bitter vetch show higher value compared to pea and chickpea in the pulses. There is no identified chickpea in this phase. Lentil and bitter vetch show equal presence only in the small ratios (1 seed per sample) (Figure 9.28).

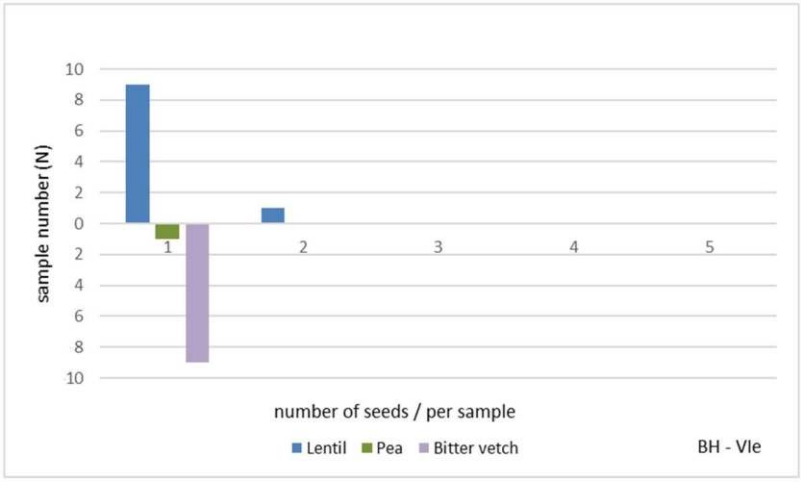


Figure 9.28: The density of pulses types from 1 to 5 in Phase VIe at Barcın Höyük.

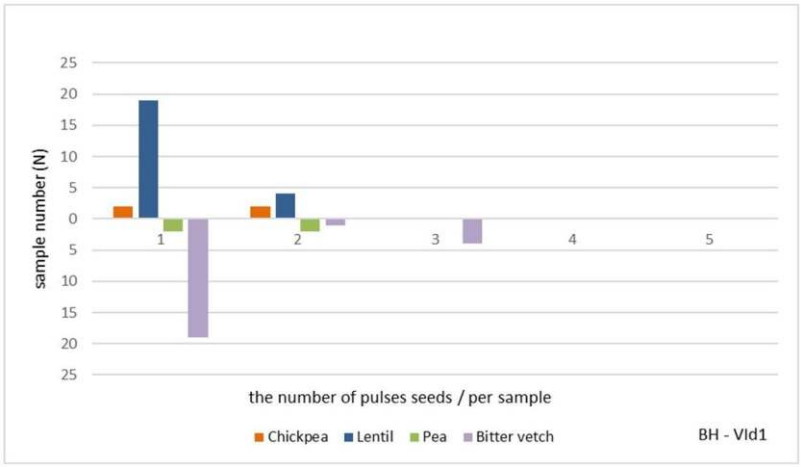


Figure 9.29: The density of pulses types from 1 to 5 in Phase VId1 at Barcın Höyük.

In phase VIe, pulses generally show rare evidence, but in Phase VId1, we see that pulse remains are more widespread and reach a higher value in the data (Figure 9.29). We see chickpea in this phase\ but it is rare. Lentil and bitter vetch show evidence in all values (from 1 to 5) and both of the types seem in equal quantity again like as VIe.

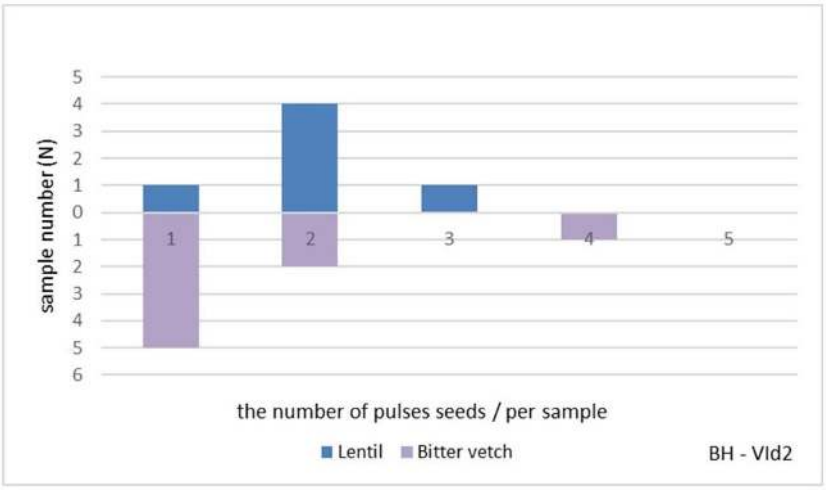


Figure 9.30: The density of pulses types from 1 to 5 in Phase VId2 at Barcın Höyük.

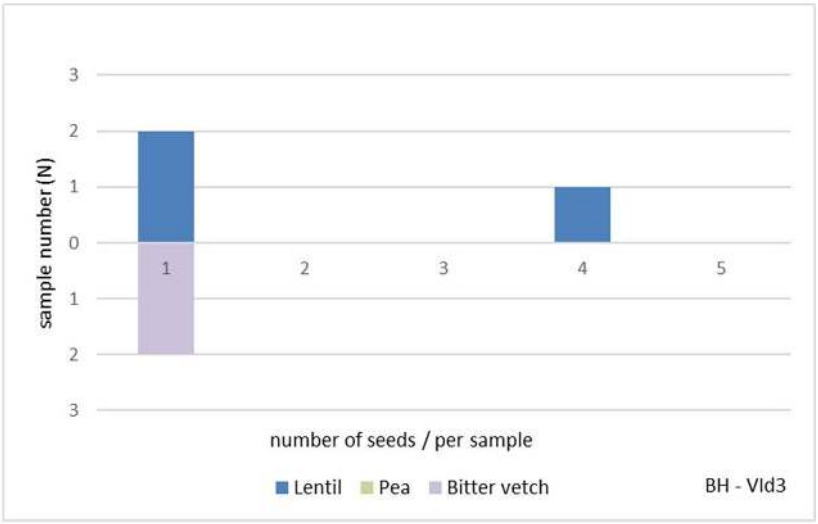


Figure 9.31: The density of pulses types from 1 to 5 in Phase VId3 at Barcın Höyük.

Only lentils and bitter vetch appear in small amounts (1-5) in VId2 and VId3 (Figures 9.30, 9.31). Since the earliest phases, these two pulses species have shown a stable presence. Their statistically higher presence may be directly related to consumption patterns and spatial use.

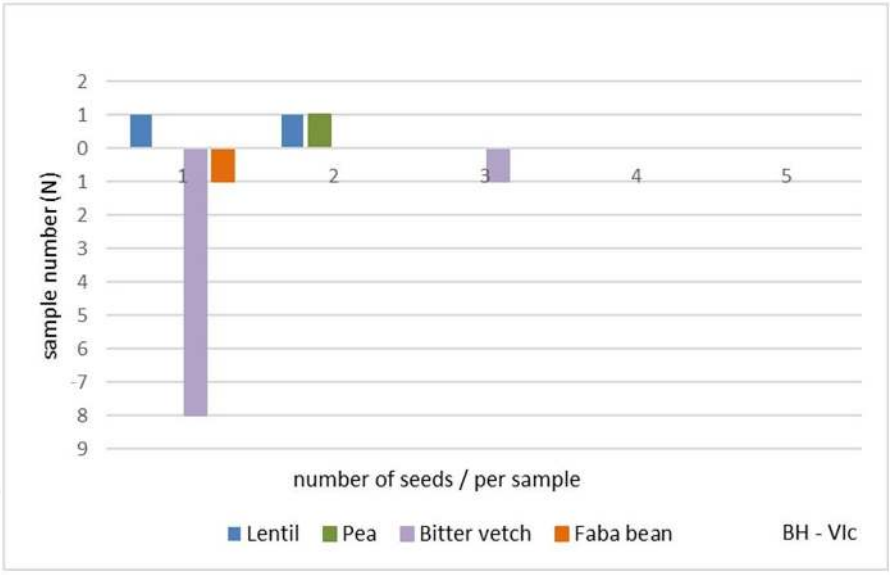


Figure 9.32: The density of pulses types from 1 to 5 in Phase VIc at Barcın Höyük.

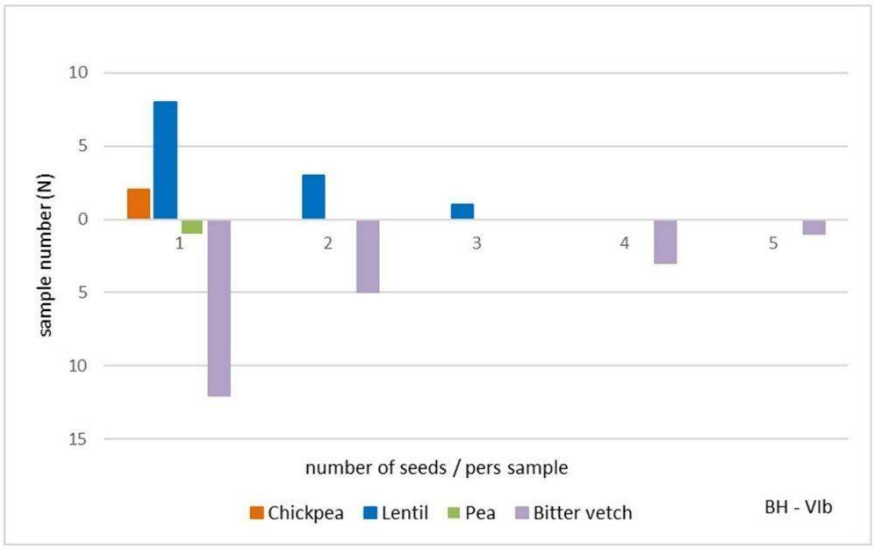


Figure 9.33: The density of pulses types from 1 to 5 in Phase VIb at Barcın Höyük.

In addition to the stable presence of lentil seeds, a more dominant distribution is also observed in bitter vetch seeds towards the later Neolithic phases of Barcın Höyük. We see that bitter vetch, which appeared regularly but in minimum numbers (1-2) in the earlier phases, became a dominant pulses type with the phases VIc-VIb (Figures 9.32, 9.33). Bitter vetch remains, which are encountered in low numbers in most of the earlier phases, appear to have some storage value by phase VIb (Figure 9.34).

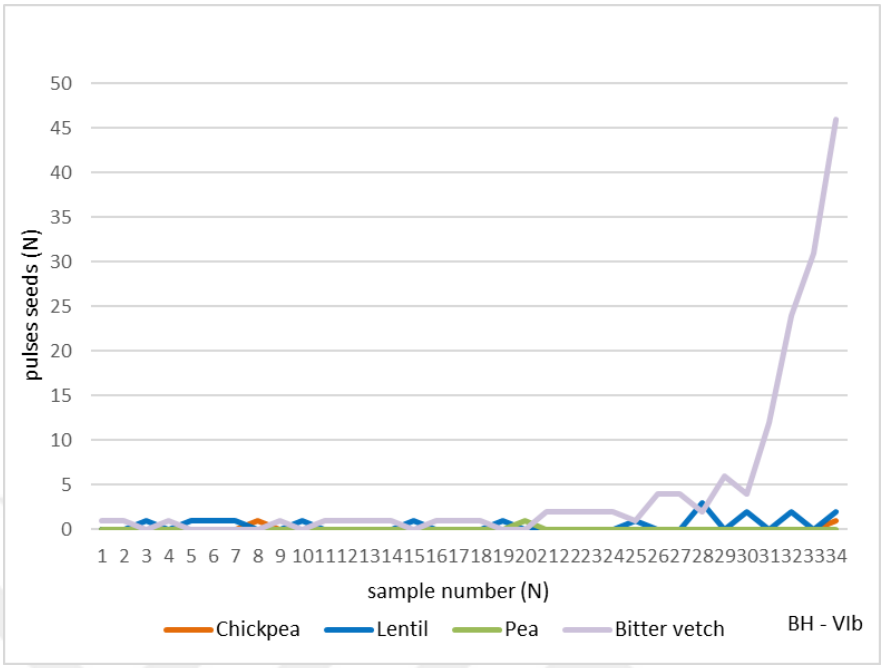


Figure 9.34: The pulses seeds from minimum to maximum per sample in Phase VIb at Barcın Höyük.

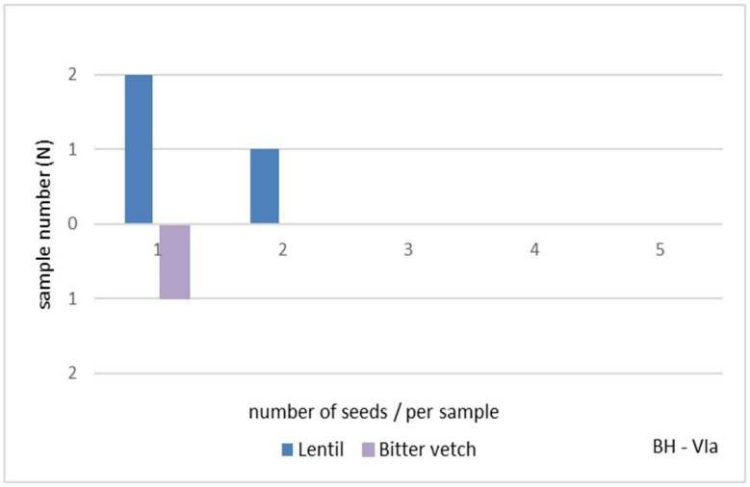


Figure 9.35: The density of pulses types from 1 to 5 in Phase VIa at Barcın Höyük.

In phase VIa, which is the last representative of the Neolithic levels in Barcın Höyük, data was obtained from only 4 out of 7 samples and lentil and bitter vetch were obtained from these four samples (Figure 9.35). These remains, the contexts were damaged by pits where they were found, still have a high rate in terms of frequency of occurrence when considered statistically.

In general, lentil and bitter vetch are pulses species that show stable presence and frequency from the earliest Neolithic levels to the late levels at the site. We know that lentils were stored at the same time, especially in phase VId1 (see chapter 6). Bitter vetch seems to be dominant from phase VIc. Peas and chickpeas seem to be more supplementary crops.

9.4.2. Bahçelievler

The frequency of pulses remains is quite low compared to cereals at Bahçelievler. Our main information about pulses comes from phases 7 and 6 (Table 9.11). The highest rate of occurrence appears in phases 7 and 6.

Table 9.11: The total samples per phase for the ratio of pulses types at Bahçelievler.

Bahçelievler	**8**	**7**	**6**	**5**	**4**	**3**	**2**
Total (N) Sample	12	19	45	26	14	8	11
Sample numbers that contain pulses	0	6	6	2	2	1	2
Max N=5	**0**	**5**	**6**	**2**	**2**	**1**	**2**
The rate of occurrence in total samples	0%	31.5%	13.3%	7.6%	14.2%	12.5%	18.1%



Figure 9.36: The presence of 1 seed per phase at Bahçelievler.

The obtained pulses remains are mostly represented with a minimum number. In most stages, except for one or two samples, all residues are represented with 1 or 2 seeds under 5 (Figure 9.36). Only in Phase 5, 2 lentil seeds from a sample and 5 from another sample have

been documented. In Bahçelievler site, the most common lentil and bitter vetch species are dominant in almost all phases.

9.4.3. Aşağı Pınar

Pulses present an average of 55% in 203 samples in layer 7 at Aşağı Pınar (Table 9.12). This rate is almost close to that of cereals (59%). Aşağı Pınar 7 shows denser storage value in pulses compared to Barcın Höyük or Bahçelievler. 47 out of 110 samples recorded more than 5 seeds (Table 9.12).

Table 9.12: The total samples per phase for the ratio of pulses types at Aşağı Pınar.

Aşağı Pınar	**7**
Total (N) Sample	203
Sample numbers that contain pulses	110
Max N=5	**63**
The rate of occurrence in total samples	54.18%

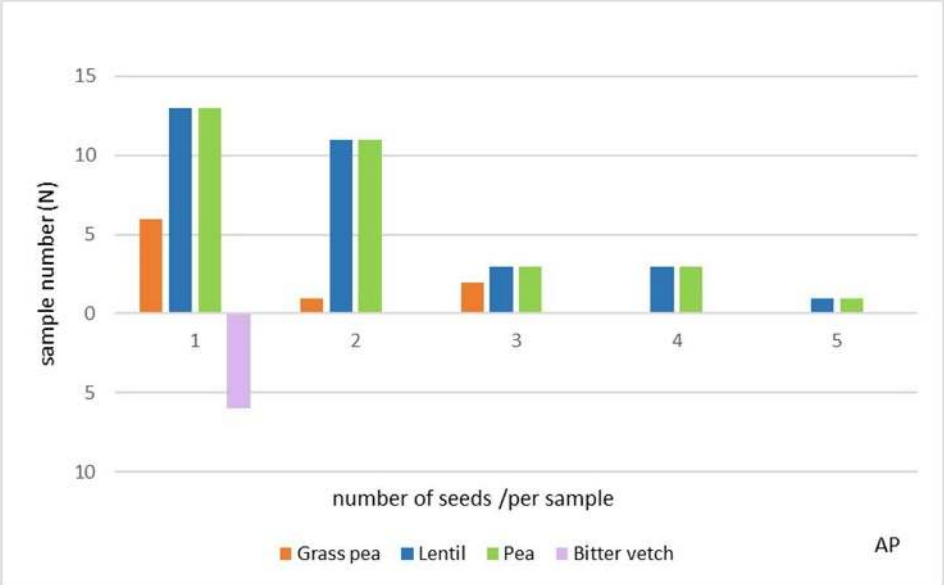


Figure 9.37: The presence of pulses types from 1 to 5 in Phase 7 at Aşağı Pınar.

Although pea, lentil, grass pea and bitter vetch species are present in layer 7 at Aşağı Pınar, the first three species are densely distributed (Figure 9.37). Grass pea does not show predominance in minimum numbers (1-5) but must have carried storage value in the sampled contexts (Figure 9.38). While pea and lentil show a stable prevalence, bitter vetch is present

only in the smallest proportion (1 seed per sample), which may indicate that it was a supplementary crop or mixed from the field as arable weed (Figure 9.37).

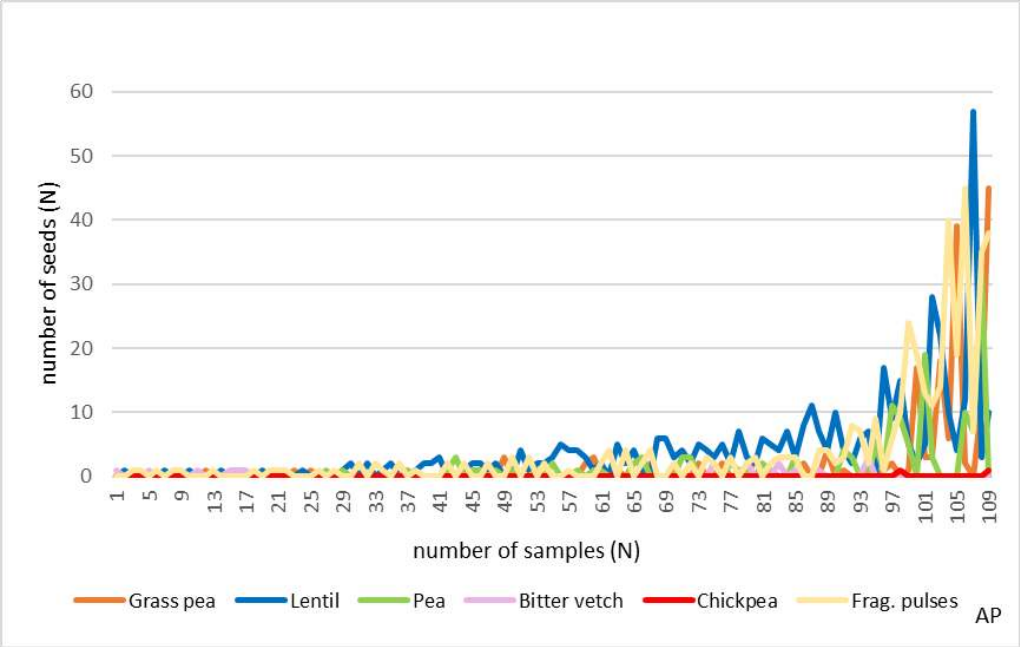


Figure 9.38: The presence of pulses types in Phase 7 at Aşağı Pınar.

As a conclusion, the archaeobotanical evidence from layer 7 at Aşağı Pınar indicates a significant role for pulses in the plant economy, with an average presence of 55% across 203 samples - nearly matching the frequency of cereals (59%). Compared to sites like Barcın Höyük and Bahçelievler, Aşağı Pınar demonstrates a notably higher storage density of pulses (Figure 9.x). Among the identified species, pea, lentil, and grass pea are most prominent, with the latter showing storage-level concentrations despite being less common in minimum counts. Bitter vetch, appearing only in trace amounts, likely functioned as a supplementary crop or field pulse. This assemblage suggests that pulses played a central, possibly planned role in food storage and subsistence strategies during this phase.

9.5. Discussion

At Barcın Höyük, wheat consistently dominates the cereal assemblage, particularly in early phases (VIe and VId1). Hulled wheats (einkorn and emmer) are more frequent than naked wheat, although the latter increases in later phases (e.g., VIb), suggesting a gradual transition towards more easily processed crops. Barley appears only in supplementary roles, with minimal storage signals. Pulses -especially lentil and bitter vetch- show stable but modest representation, with bitter vetch gaining storage prominence in later phases (VIc–VIa).

At Bahçelievler, archaeobotanical data is sparse and generally based on small samples. However, wheat is again dominant, especially naked wheat in later phases. Barley appears in low numbers and rarely in storage-relevant quantities. Pulses are minimally represented, with lentils and bitter vetch appearing in low quantities, suggesting a supplementary role.

Aşağı Pınar, Phase 7, presents a distinctive profile. Pulses are nearly as frequent as cereals (55% vs. 59%), and storage-level quantities are frequently observed. Hulled wheat dominates, especially emmer, while barley remains rare. Among pulses, pea, lentil, and grass pea dominate the assemblage; bitter vetch appears only in trace amounts.

As a conclusion, the archaeobotanical evidence highlights a wheat-centered agricultural system across all three sites, especially in the early Neolithic phases. Barley consistently appears in minor roles, suggesting it was used as a supplementary or adaptive crop. A diachronic increase in naked wheat suggests evolving agricultural strategies, possibly driven by labor efficiency and processing advantages. Pulses play varying roles: they are modest but stable at Barcın Höyük, minimal at Bahçelievler, and central at Aşağı Pınar, where storage-level densities and diverse species point to also a well-integrated pulses-based subsistence strategy besides cereals.

Together, these patterns reflect regional variability in crop selection and storage, shaped by environmental conditions (Figure 9.39), settlement structure, and evolving agrarian practices during the Neolithic in Northwest Türkiye.

Chapter 10

10. DISCUSSION AND CONCLUSION

This study has explored the Neolithization process in Northwest Türkiye through a comprehensive macro archaeobotanical analysis of three key sites: Barcın Höyük, Bahçelievler, and Aşağı Pınar 7. Though from a limited number of samples, previously unpublished results from Hoca Çeşme were also included here for reference purposes. By focusing on the plant-based subsistence strategies of these settlements, the research has shown that Neolithization in this region did not follow a singular or widespread path. Rather, it was a mosaic-like process shaped by diverse ecological, terrestrial and partly wetland conditions. Likewise, cultural changes mark the landscape such as rectangular/round structures as well as social conditions (differences in crop choices and settlement organization during time). The evidence from all studied sites supports the interpretation that early Neolithic communities selectively adopted and adapted to agricultural practices within local contexts. These findings add meaningful complexity to existing stories about the spread of Neolithic lifeways from Southwest Asia into Europe.

10.1. Discussion

Some research questions, which are mentioned at the beginning (Chapter 1.3) in the thesis, aimed to understand adaptation processes through the plant subsistence economies based on plant choices of Neolithic communities in the region through non-wood macro-botanical data. I will attempt to discuss and evaluate these questions, addressing their strengths and weaknesses based on the data I have obtained;

I would like to categorize the subsistence strategies of the four sites depending on the provided botanical data which was discussed separately per taxa with their environmental aspects in Chapter 5, their spatial distribution in Chapters 6, 7, 8 and possible crop ratio assumptions in Chapter 9, and combine this data with the subsistence knowledge discussed in Chapter 3 (3.3.6) and the theoretical ideas using HBE to understand the data and explore their environmental and social context.

The plant subsistence strategies that merged founder crops (such as einkorn, emmer, barley, lentil, pea) but also drew on locally gathered species in a small-scale and site-specific crop processing methods, where we do not observe the frequency of cereal by-products or every

cereal species in every phase as regularly. While wheat was consistently dominant across the sites, its relative frequency, the degree of storage, and the representation of by-products like rachis nodes varied considerably.

Barcın Höyük (Bursa, 6600–6000 cal. BC)

Site character: Inland site, Yenişehir plain area (altitude: 228.84, coordinate: 40°16'01"N 29°36'06"E), old lake marsh and recently farm fields, moisture environment, the plain surrounded by mountain slopes (Figure 10.1). The architecture is represented with rectangular structures with post-holes.

- Ecological Niche Diversity
  - The cultivated cereals (hulled barley, einkorn, emmer, bread/hard wheat) show different ecological tolerances:
    - Barley: drought-resistant, lower-yielding, but secure
    - Einkorn and emmer: more moisture-demanding, higher yield but more labor-intensive (winnowing, de-hulling processes, etc.)
    - Bread/hard wheat: more selective, requires fertile soils, but productive
  - Pulses (lentil, pea, chickpea, bitter vetch) – these types are suited to diverse micro-niches, such as stony and well-drained soils.
    - This variety, despite the absence of irrigation (there is no archaeological evidence for irrigation in the Neolithic for the moment), indicates the use of different patches (fields) and reflects a risk-spreading strategy (Patch Choice Model). Pulses could be a supplementary food in the diet, as isotopic research on Barcın human bones showed that cereals comprise at main part of the diet (Budd et al. 2020).
- Risk Minimization?
  - In the earliest phases, the wider diversity of cereals and pulses suggests a trial-and-error strategy (meaning field conditions) combined with risk minimization.
  - The presence of basin bins in Phases VIe and VId1 shows a well-adaptive long-term energy return strategy (see Chapter 6.3).
  - Toward 6300/6200 BC, the concentration of barley and bread/hard wheat aligns a focus on crops that offered the best balance of yield and labor efficiency (e.g.,

less labor for processing the grains of bread/hard wheat and higher yield compared to emmer or einkorn) (see Chapter 5.2.3).

- Wild resources (hazelnut, bramble, fig) are not abundant but are significant as supplementary foods which could fill in seasonal or shortage gaps. This strategy reflects risk minimization.

❖ Niche Construction

- Herding (sheep, goat, cattle, and later pig) – reflects the classic "Neolithic package" (Galik 2014), while the animal diet relied on C_3 plants[69] (Budd et al. 2020).
- Lipid analysis shows intensive dairy use in every phase, meaning domesticated animals were managed not only for meat but also for secondary products (Özbal et al. 2024; Gerritsen and Özbal 2019). This reflects a kind of niche construction and optimization of long-term energy return.
- Small-large game hunting and fishing (small-sized cyprinids, maybe collected unintentionally while collecting mussels) (Budd et al. 2020)– use of local resources, but likely as secondary food strategies due to lower energy return.
- The diverse but non-storage wild taxa (weeds) indicate a disturbance of farming and weedy habitats around the fields.

❖ Temporal change?

- Initial diversity followed by specialization is a common pattern within HBE:
  - Early occupation: broad-spectrum diet (diversity, risk avoidance)
  - Later levels: focus on high-yield, predictable resources (increase of barley + bread/hard wheat)?

Barcın Höyük inhabitants' strategy can be identified within the framework of Optimal Foraging Theory (OFT) and the Patch Choice Model. It is clearly observed that there might be risk minimization and diversification (wide-range products) in especially early Neolithic layers (6600-6200 cal. BC) of the site. The exploitation of diverse ecological niches shows strategic land use and ecological flexibility. With Phases VIc and VIb (after 6300/6200 cal. BC), a potential increase of hulled barley and bread/hard wheat in crop ratios (please see 9.1.1. and 9.3.1) may reflect a specialization in high-return cereals for energy efficiency and food security.

[69] C_3 plants consist of such as wheat, barley, rice, rye, soybean, etc.

In the $\delta^{13}C$ and $\delta^{15}N$ analyses, the isotope values on human and animal bones suggest a strong terrestrial diet and the human population of Barcın Höyük dominantly consumed animal resources (both cattle, sheep/goat with meat and/or milk products) (Budd et al. 2020).



Figure 10.1: Locations and environmental positions of Barcın and Bahçelievler in Yenişehir and Bilecik areas.

Bahçelievler (Bilecik, 7000-6000 BC)

Site character: inland site, stays on the east side of the mountain slopes in north-south direction (altitude: 563,92, coordinate: 40°09'46"N 29°58'31"E), corner of riverbank, semi-arid environment (?). First round (Phases 8-3, later rectangular (Phase 2) structures with courtyards, (Figure 10.1).

- Ecological Niche Diversity?
  - A situation similar to Barcın Höyük regarding cereal crop diversity; however, the low quantity of remains obtained is not comparable to that of Barcın Höyük. The presence of hulled barley, emmer, and bread/hard wheat is clear, but einkorn is debatable.
    - Barley can grow dry in marginal conditions – "low risk" crop

        - Emmer and einkorn can adapt to several conditions, but emmer prefers open lowland and foothill fields, and einkorn likes thin, rocky, limestone-derived soils between 500 and 1000 meters of altitude. Both crops need higher labor efficiency – "almost low risk" crop.
        - Bread/hard wheat can provide higher yield in fertile soils but is more sensitive compared to emmer and einkorn – "high-risk, high-return" crop
            - In this perspective, though the sample size makes interpretation difficult, there may have been a focus on efficient, staple grains rather than a broad-spectrum cereal strategy.
    - In pulses, only lentil and bitter vetch appear. This can also be caused by low-level preservation, as we do not have too many lentil and bitter vetch seeds (please see 5.9.2).
        - This narrower pulse range (compared to Barcın) may reflect reduced dietary breadth.
            - Lentils include high protein, relatively easy to grow
            - Bitter vetch is low-ranked and often used as fodder or fallback food.
    - Gathering of terebinth
        - Terebinth is abundantly the identified gathered plant at Bahçelievler. This nut/fruit tree/shrub grows in dry scrubby zones, indicating an exploitation of semi-arid ecological patches that the Bahçelievler site landscape seems to have available.
- Risk minimization and Diet Breadth
    - Well-established Herding
        - The evidence of well-established herding knowledge suggests that domestic animals were a central subsistence anchor that could provide a high caloric base.[70]
        - The secondary product of milk is not clear yet, as archaeological evidence. If there is no strong signal of secondary product use of milk,

[70] Online conversation with Sultan Sarı (30.08.2025).

meaning herding was likely oriented primarily toward meat and herd security rather than maximizing long-term yield.

- This represents a risk minimization strategy, with herding functioning as a predictable safety net against the variability of crops.

- Hunting
  - Hunting of *Cervidae* (deer family) and wild pig represents about 10% of the assemblage compared to domestic animals.
    - This suggests that hunting was not primary, but an opportunistic supplement, reflecting low-ranked resource use. Research on bone tool elements also showed that red deer and pig bones were used besides herding animals for making tools, even (Azeri 2023, 20).
  - This situation suggests the Diet Breadth Model that hunting persisted in the diet (documented cutmarks on these identified animals)[71], but shows a reduced and secondary level food source.

In this respect, we may talk about a broad-spectrum diet where several crops were identified in minimum numbers, although there is a possible focus on barley and bread/hard wheat, which can reflect yield maximization, but this remains uncertain because of insufficient preserved botanical data. The reduced diversity in pulses and the minor role of wild plants suggest a narrower dietary niche compared to Barcın Höyük. On the other hand, the Bahçelievler inhabitants' strategy emphasizes well-planned herding, which can provide reliability in non-plant-related subsistence.

Hoca Çeşme IV-III (Edirne, 6400 – 6200/6000 BC)

Site Character: Coastal, north of Aegean Sea (altitude 32.43, coordinate: 40°42'39"N 26°07'11"E), wetland alluvial plain environment (Figure 10.2). First round-planned wattle and daub structures (Phases IV-III), rectangular-planned wattle and daub (Phase II).

[71] Online conversation with Sultan Sarı (30.08.2025).

- ❖ Ecological Niche Diversity
    - o In cereals, the presence of naked 6-row barley bread/hard wheat, einkorn, and emmer show different ecological tolerances:
        - ▪ Both naked barley and bread/hard wheat prefer wetter and fertile alluvial conditions.
        - ▪ Einkorn and emmer as hulled wheat appear especially with the rachis nodes in the assemblage, but there are identifiable grains in low numbers that prove their presence in the site. These types prefer more arid, and foothill fields compared to the naked types; the presence of hulled types signals a risk-minimization strategy for long-term nutrition reliability.
    - o Pulses are represented by lentil and pea, and they appear in smaller quantities compared to cereals (see Chapter 5.9.3).
        - ▪ Both lentil and pea are nutrient-dense and high-ranked resources, but they probably have a secondary dietary role within aquatic and cereal resources
            - Lentil is a more drought-adapted crop that prefers more calcareous soil and an open scrub environment.
            - Pea prefers more fertile soil and a wetter environment.
- ❖ Yield maximization & labor efficiency for other niches?
    - o In cereals, the presence of naked 6-row barley (it is hulled in the other three sites), and bread/hard wheat might represent a high-return and relatively easier to process compared to hulled forms for labor efficiency; this preference reflects a yield maximization strategy.
- ❖ Patch Choice Model
    - o Fishing and Mollusk gathering represent an aquatic adaptation in the site (Özdoğan 2013a). Aquatic resources are often high-ranked patches in coastal ecologies because they offer high-calorie nutrition.

Overall, from an Optimal Foraging perspective, the inhabitants focused on labor-efficient cereals (naked barley and wheat) that were potentially complemented by aquatic resources. On the other hand, the presence of hulled wheat (emmer-einkorn) and two types of

nutrient-dense pulses (lentil-pea) may include an opportunistic role when core resources (fishing and maybe herding?) were insufficient. As an idea, the subsistence strategies of the Hoca Çeşme's inhabitants reflect ecological adaptation to a wetland-coastal environment, show patch specialization (aquatic focus), and they combined/supported this knowledge with terrestrial farming as a balancing strategy.



Figure 10.2: Locations and environmental positions of Hoca Çeşme and Aşağı Pınar in Edirne and Kırklareli areas.

Aşağı Pınar 7 (Kırklareli, 5950-5750 cal. BC)

Site character: Inland, plain area (altitude: 196.17, coordinate: 41°43'16"N 27°13'32"E), located south of the dry Haydar Dere creek, the site covered with forested areas and open lands, surrounded by Istranca Mountains in the north, and Ergene Basin in the south (Figure 10.2).

The location of the site is surrounded by a mosaic of forested (in the north) and open lands (in the south). This kind of ecological diversity would provide multiple resource patches (open-land cereals, semi-open land pulses, forest fruits, and possible patches for herding) like at Barcın Höyük.

- ❖ Ecological Niche Diversity?
    - o Broad range cereals (hulled barley, einkorn, emmer, bread/hard wheat) and pulses (lentil, grass pea, pea, bitter vetch) reflect different ecological tolerances that are discussed in Chapter 10.1.1.
    - o Gathered plants (bramble, cornelian cherry, possibly hazelnut, and some indeterminate nut shells) from different environmental zones.
    - o The diverse but non-storage wild taxa (weeds) indicate a disturbance of farming and weedy habitats around the fields, like at Barcın.
- ❖ Diet Breadth?
    - o Cereals look abundant in quantity and frequency. Pulses are also frequent, especially lentil, pea, and grass pea. This situation suggests intensive agriculture.
    - o From an Optimal Foraging perspective, the Aşağı Pınar inhabitants maintained a broad cereal and pulses spectrum, unlike sites that specialized later (there is a need to know about later phases). This indicates risk minimization through diversification: taking precaution against environmental fluctuations/stresses by cultivating multiple cereals and pulses with different tolerances.
    - o The rich spectrum of pulses suggests a balanced agricultural strategy (nutritional security)
        - ▪ Because the documented types of pulses (especially lentil and pea) are protein-rich pulses that are integrated into the agricultural system.
- ❖ Patch Choice Model
    - o Bramble, cornelian cherry, possible hazelnut, unidentified nuts, as gathered plants are classic forest-edge and scrub resources.
        - ▪ This presence signals use of surrounding forest patches and opportunistic gathering (seasonal supplements).

The plant remains of Aşağı Pınar 7 were obtained mainly from large ditches and related pits, not from domestic primary contexts or storage features. This situation complicates the picture in HBE terms. The plant remains were obtained from huge ditches (H1 and H2) and related pits, but there is a low number of samples from the structures (see Chapter 8). The ditches' function is not clear, but the archaeologists think that they were not made only for drainage/defensive purposes because many archaeological findings were also discovered in

these ditches (Akyol et al. 2022, 33-34). This community also might be a herder community (Aşağı Pınar 7 book in press). The high density of crops in the ditches may reflect communal or ritual uses of these contexts beyond defense, and without clear storage, subsistence security may have relied more on continuous production and diversification than on long-term storage.

As a result, these four occupations highlight the adaptive flexibility of early Neolithic communities in the region. At Barcın Höyük, owing to uninterrupted cultural sequences (VIe-VIa), it is possible to talk about a transition from broad-spectrum diversification to specialization. Bahçelievler reflects herding-centered risk management, Hoca Çeşme shows aquatic specialization with labor efficiency-high return cereal support, and Aşağı Pınar represents a balanced, broad spectrum strategy with cereals (emmer is abundant) (see Chapter 9.2.3.) and pulses (lentil and pea are abundant) (see Chapter 9.4.3.) which may show specialization in later phases. So, from an HBE perspective, these paths demonstrate how Neolithic communities calibrated their subsistence systems to local ecologies, weighing trade-offs between nutrition security, labor efficiency, and yield optimization. The optimization idea links together limits, goals, and the costs and benefits of different choices. It suggests that organisms usually pick the option that gives the best energy return. Even when food is not scarce, efficient foraging saves time and reduces risk. While behavior is not always perfectly optimal, this approach matches well with findings from ethnography and archaeology (Winterhalder and Kennett 2006, 14).

Another research question was about the use of local flora, which is also related to the above discussion: Is it possible to understand the adaptation of Neolithic settlements, where farming became the prominent form of subsistence, and how much of the local flora was utilized?

There is a wide range of wild plant taxa considered as field weeds that grow compatibly with crops. No documented wild plant storage was discovered at any site, so it is difficult to talk about the use of wild plants in the diet. I documented only some gathered fruits/seeds in small quantities, especially in Barcın Höyük (hazelnut, bramble, fig), Bahçelievler (terebinth, plum/almond?, grape?), and at Aşağı Pınar (bramble, cornelian cherry, indet. Nut). Therefore, these species can represent diverse ecological niche patches, but probably only seasonal supplementary foods (discussed above). On the other hand, the other weed taxa may represent the diverse ecological niches in which crops might be growing in these areas. These inputs show

that local flora may be used together with gathered plants, even though we do not know about the use of spring plants. Weed flora suggests that people used diverse ecological niches.

Another aim of the research was to utilize a range of archaeobotanical studies to achieve a thorough examination of the Neolithization process through the case sites and to understand how the Neolithic process was shaped based on each site by looking at the distribution and individual characteristics of each settlement in its own context, and this approach sets a case study for future archaeobotanical studies. We can ask whether plant use changed between the earliest pioneer communities and those generations later who lived in this context. What can the context in which we find the botanical remains tell us about the settlements in question? Can intra-site insights from the distribution provide information on the settlements and the variability that they display? Along with these questions, I investigated the botanical samples based on their contextual distribution in Chapters 6, 7, and 8.

All contexts across the sites may not directly represent plant use activities by the inhabitants; several animal impacts can also be efficient for the distribution of plant remains, such as people feeding their animals with discards of crops, or animals grazing in the farming fields and especially courtyard surfaces, and around pyrotechnic features. Although these are primary contexts, they could contain dung, which can also affect the taphonomy (see Pearsall 2016, 35-36). The other important discussable contexts are pits and layers, which are very critical and require careful excavation strategies. Another critical impact on the context is bioturbation, which means living organisms such as plants, animals, or microorganisms may influence the depositional process. We need to be very careful while considering the dataset with all these depositional and taphonomical situations. I tried to consider these depositional processes and situations while evaluating the archaeobotanical dataset as much as possible. The first considered contexts were basins/bins, surfaces (indoor and outdoor), platforms, and pyrotechnic features compared to the other contexts. In this context, single specimens that were not observed frequently were continually compared with generally accepted types, and attempts were made to confirm them from other sources. Non-charred remains, especially if not mineralized, have not been considered in any quantitative analyses. In any case, the plants were presented in these contexts, and I made some spatial assumptions for the sites.

At Barcın Höyük, for example, the early presence of both cereals and pulses in indoor and outdoor areas reflects a well-established agricultural practice, possibly brought in by experienced migrant farmer groups. The continued presence of wild plants with cereals and pulses over time further suggests an ongoing change of agricultural routines in response to environmental and social demands. These routines are more observable, especially during the 200 years in the earliest Phases VIe and VId1 (6600-6400 cal. BC) at Barcın Höyük. Especially in Phases VIe and VId1, significant data were recovered from 16 basins/bins, of which one was used as a lentil storage facility (see Chapter 6.3.1), yielding around 28,000 seeds in str2a in a burnt level of Phase VId1. Eight other basins/bins were probably empty (or the plants were not preserved), but cereal crops were documented in low numbers, suggesting that they were used for crop storage, which reflects long-term use of crops.

At Bahçelievler, the archaeobotanical data is less abundant but still informative. A diachronic comparison indicates slow changes in plant use, with early phases showing minimal diversity and later phases demonstrating more regular, though still uncertain, cultivation of cereals and pulses. The spatial distribution of remains with cereals in both indoor and outdoor areas, pulses mostly indoors, and gathered plants in courtyard areas, suggests a division of food-related activities in spatial use. The presence of terebinth points to an increased engagement with the surrounding landscape, reflecting possibly seasonal or opportunistic strategies in later phases 6 and 5, which are contemporary with phases VIe and VId1 at Barcın Höyük.

Aşağı Pınar presents another distinct pattern. Here, cereals and pulses are nearly equally represented (see chapter nine, sections 9.1.3 and 9.4.3), particularly in the lower levels of ditch contexts. The abundance of emmer wheat as a storage value and the density of pulse remains, such as lentil, grass pea, and pea, suggest a well-combined plant economy with clear storage potential. The limited presence of gathered plants and wild plants, often mixing incidentally with the crops, further underlines possibly advanced processing practices at the site. The contrast in plant densities and by-product ratios between the two ditch areas (H1 and H2) reveals inner variability even within the same site and supports the idea that different parts of a single site could reflect different activities or degrees of crop processing.

Another aim in my research was to bring new interpretations to contribute to the current discussions on the Neolithization process of Northwest Anatolia, which serves as a crossroads

between the Neolithization process of Anatolia and Europe through the plant-based data, if possible. What can we understand about the spread of the Neolithic in each of these four unique sites based on botanical data, and how do we furnish our interpretation of the Neolithization process of Northwest Türkiye with new first-hand archaeobotanical data, and were there any different manifestations of the adaptation process during the Neolithic in Northwest Türkiye?

Taken together, the studied sites demonstrate that Neolithization in Northwest Türkiye was not a process of simple replacement or passive diffusion of farming practices from core areas such as the Levant or Central Anatolia. Instead, it was a complex process linking active adoption and the addition of agricultural knowledge into distinct local contexts. Migrant farming groups may have played a role in this process, but the patterns observed suggest that local communities also adopted and reshaped incoming practices to suit their own environmental and cultural frameworks according to ecological niches in the surrounding environment.

The variability in plant selection, storage strategies, and the use of gathered plants reflects a dynamic relationship between tradition and improvement, migration and continuity, standardization and flexibility. In a regional perspective, understanding the dietary practices of local and migrant groups based on macro-botanical evidence is challenging. Aktopraklık, for instance, is a semi-coastal site, quite unlike inland settlements such as Ilıpınar, Menteşe, and Barcın. Its location suggests a preference for marine resources alongside agricultural activities. In this respect, Aktopraklık shows cultural and subsistence similarities with coastal Aegean sites like Ege Gübre and Yeşilova, northern Aegean settlements such as Hoca Çeşme, and Marmara coastal sites including Fikirtepe, Pendik, and Yenikapı. These parallels point to a combined cultural expression that reflects both local and migrant influences (Figure 10.3). On the other hand, the isotopic studies at Aktopraklık C suggest a dominant terrestrial and agrarian diet rather than a marine diet (Budd et al. 2013, 2018).

Regions	Sites	Sub-regions	Main Crops	Cultural Affinities	Other Notes
Northwest Türkiye	**Bahçelievler**	NW Anatolia (inland)	Cereals	Anatolian mixed local/migrant?	Pistacia well represented
	Barcın	NW Anatolia (inland)	Cereals, pulses	Anatolian	Well-studied Neolithic farming
	Menteşe	NW Anatolia (inland)	Cereals	Anatolian	Inland farming site
	Aktopraklık	NW Anatolia (coastal)	Cereals, pulses, fruits	Mixed local/migrant	Fish consumption evident
	Ilıpınar	NW Anatolia (inland)	Cereals	Anatolian	Inland farming site
	Fikirtepe	Marmara	Cereals?	Anatolian	Round-plan houses
	Pendik	Marmara	Cereals	Anatolian	Round-rectangular plan houses
	Yenikapı	Marmara	Cereals, pulses	Mixed	Comparable to Aşağı Pınar in plant assemblage
	Aşağı Pınar	Turkish Thrace	Einkorn, emmer, pulses	Northwest Türkiye+SE European	Grass pea well represented (~6000 cal. BC)
Northern Aegean	**Hoca Çeşme**	Coastal Northern Aegean-Turkish Thrace	Naked 6-row barley, Emmer, bread/hard wheat, lentil, pea	Anatolian + SE European	Round houses, fishing
	Uğurlu	Coastal	Cereals	Anatolian + SE European	Similarities with Marmara and Coastal Aegean sites
	Makri	Coastal-NE Greece	Mixed (Eastern European type)	SE European	Similar subsistence to Hoca Çeşme
Aegean	Ege Gübre	Aegean (coastal)	Cereals, pulses	Aegean	Architectural links to Hoca Çeşme
	Yeşilova	Aegean (coastal)	Cereals, pulses	Aegean	Similar to coastal Anatolian sites
	Ulucak Höyük	Aegean(inland)	Cereals	Anatolian	Rectangular houses, links with Barcın Höyük
Eastern Europe	Gălăbnik	Bulgaria (Struma Valley)	Emmer, einkorn, pulses	SE European	Parallels Aşağı Pınar Phase 7
	Koprivets	NE Bulgaria	Hulled barley, einkorn, emmer	SE European	Broad spectrum of gathered plants
	Orlovets	NE Bulgaria	Hulled barley, einkorn	SE European	Crop-focused economy
	Dzhulyunitsa	NE Bulgaria	Hulled barley, einkorn	SE European	Crop-focused economy
	Otzaki	Greece	Chickpea (notable), pulses	SE European	Chickpea well represented (~6000 cal. BC)

Figure 10.3: A summation of Neolithic Sites, which were mentioned as regional and site-specific interpretations of Neolithization.

The primary economic plants belong to the cereal and pulse groups. Among cereals, hulled barley, einkorn, emmer, and bread/hard wheat are commonly represented. Pulse crops include lentils (frequent), bitter vetch (frequent), peas (moderate abundance), and chickpeas (rare)

during the early phases of the Late Neolithic (Table 10.1). Flax is also present as possibly a cultivated crop. Besides crops, nuts/fruits such as hazelnut (Barcın Höyük) and terebinth (Bahçelievler, and as wood charcoal for the moment at Aktopraklık), along with small quantities of bramble, grape, and fig, were collected from the wild and possibly consumed. This indicates that while the inhabitants practiced agriculture and were familiar with their environment, subsistence strategies were applied with local variability. Despite the dominance of plant remains in archaeological contexts, recent studies suggest that animal products -meat and dairy- formed a significant portion of the diet. Although fishing is evident at some sites, such as Aktopraklık and Hoca Çeşme, it likely played a supplementary role.

Table 10.1: The comparison of economic plants of Neolithic and partly Chalcolithic sites in Northwest Türkiye and neighboring regions that were mentioned in the thesis.

Plant Latin Names	Northwest Türkiye (7000/6600 - 5700 BC) Late Neolithic - Early Chalcolithic														Aegean				Central Anat.	Plant common names
Poaceae	Bahçelievler 8-4	Bahçelievler 3-2	Barcın Höyük VIe-VIc	Barcın Höyük VIb-VIa	Barcın Höyük Chalc.	Aktopraklık C	Aktopraklık B	İlıpınar X-IX	İlıpınar X-VIII	İlıpınar VI-VB	Pendik	Yenikapı	Aşağı Pınar 7	Hoca Çeşme IV-III	Uğurlu VI-V	Ulucak VI-Vb-e	Yeşilova III	Ege Gübre IV-III	Çatalhöyük VIII-VI	Cereals
Hordeum vulgare ssp. *vulg.* (hulled)	+		+	+		+		+*	+*	+		+-	+		+	+			+	6-row barley (hulled)
Hordeum vulgare ssp. *vulg.* (naked)								+*	+*	+		+*		+*						6-row barley (naked)
Hordeum vulgare ssp. *vulg.* (naked/hulled)											+				+?					6-row barley (hulled/naked)
Hordeum vulg. ssp. *distichon*												+	+?							2-row barley
Triticum monococcum ssp. *monoc.*	+		+	+				+*	+	+		+*	+	+	+				+	Einkorn
Triticum tur. ssp. *dicoccum*	+		+	+		+		+*	+	+*	+?	+*	+*	+		+			+	Emmer
Triticum aestivum/durum	+		+	+				+*	+	+*		+*	+*	+*		+		+	+	Bread/hard wheat
Triticum compactum												+?	+?							Club wheat
Triticum timopheevi												+							+	New glume wheat
Triticum sp.				+				+												Small-sized naked wheat
Triticum spelt												+?								Dinkel wheat
Scale cereale												+							+	Rye
Fabaceae																				**Baklagiller**
Cicer arietinum				+						+-			+?					+	+	Chickpea
Lathyrus sativus								+-	+-	+*	+-		+						+	Grass pea
Lens culinaris	+	+	+	+		+		+	+	+*			+*	+		+		+	+	Lentil
Pisum sativum			+	+				+-	+-	+*	+-		+*	+*	+	+			+	Pea
Vicia ervilia		+	+	+		+		+	+*	+			+			+		+	+	Bitter vetch
Vicia faba										+-										Faba bean
Linaceae																				**Oily/Fibre Plants**
Linum usitatissimum			+	+		+		+			+	+	+?							Flax
Gathered plants																				**Gathered Plants**
Amygdalus																			+	Almond
Celtis sp.																			+	Hackberry
Cornus mas													+-							Cornelian cherry
Prunus/Amygdalus														+?					+	Plum/almond
Ficus carica			+	+				+		+		+*							+	Fig
Rubus fruticosus			+	+				+		+	+	+	+-							Bramble
Vitis vinifera	+?			+?								+								Grape
Malus/Pyrus										+										Apple/pear
Corylus avellana	+?		+?	+						+			+?							Hazelnut
Quercus		+?							+										+	Acorn
Pistacia sp.	+							+-											+	Terebinth/pistacia

Thracian sites exhibit material culture parallels with Anatolian and Northern Thrace sites. Thus, archaeobotanical studies in this region must exceed modern geographical boundaries to

better understand crop choices and morphological traits. At Hoca Çeşme, Phases IV–III feature round, semi-subterranean, wattle-and-daub structures. Material culture at the site resembles the Marmara region and reflects both Anatolian and Southeast European characteristics. Architecturally, Hoca Çeşme shows similarities with coastal Aegean sites like Uğurlu and Ege Gübre and recalls the round structures of NW Anatolia at Pendik, Fikirtepe, Aktopraklık C, and Bahçelievler. However, Hoca Çeşme's subsistence economy resembles to Eastern European contexts such as Makri in Greece (see Chapter 2.4.3). The economic plant data from Aşağı Pınar shows notable similarities with the Yenikapı Neolithic site (6400–5800 BC)[72], apart from the absence of broad beans (*Vicia faba* var. *minor*) and flax (*Linum usitatissimum*) (Ulaş 2020) and Ilıpınar VI-VIB (Cappers 2008) and Aktopraklık B (Kabukçu et al. 2022), which share contemporary levels with Aşağı Pınar 7 (Table 10.1). Yet, it remains unclear whether these data correspond to the early or later phases of Yenikapı, which may overlap chronologically with Aşağı Pınar Phase 7.

European Neolithization reveals two general subsistence models: one with a fully established Neolithic way of life and another combining foraging with agriculture. Recent subsistence research highlights a mosaic of adaptive strategies, challenging the outdated concept of a uniform 'Neolithic package.' Hoca Çeşme, located at the junctions of Eastern Thrace, the northern Aegean, and NW Anatolia, is key to understanding these interregional dynamics.

In Southeast Europe, especially in Greece and Bulgaria, Early Neolithic agriculture included a wide range of crops. In Greece, staples like einkorn, emmer, barley, and lentils were common (Kotzamani and Livarda 2018). In Northeast Bulgaria (6100–5700 cal. BC), hulled barley, einkorn, and, to a lesser extent, emmer dominated. In contrast, Southeastern Bulgarian sites like Aşağı Pınar 7 favored einkorn and emmer. Additional crops included lentils, peas, grass peas, and flax, alongside a wide variety of gathered plants (Marinova and Krauß 2014). No such diversity has yet been documented for Aşağı Pınar Phase 7, where only one chickpea seed has been found. Chickpeas are rarely attested in Southeastern Europe and the Balkans; a notable exception is Otzaki in Greece (~6000 cal. BC), where chickpeas are well represented

[72] The exact dates of contemporary levels of the site are not clear for comparison with Aşağı Pınar like as Ilıpınar.

(Marinova et al. 2013; Marinova and Popova 2008; Marinova and Valamoti 2014). Contemporary phases in the Struma Valley (e.g., Gălăbnik) offer parallels to Aşağı Pınar, showing a dominance of emmer, followed by einkorn and some barley. Pulses such as lentils, peas, bitter vetch, and chickpeas are also attested (Popova and Marinova 2007, 526), closely resembling the crop spectrum of Phase 7 at Aşağı Pınar. Nevertheless, further detailed comparisons are necessary. During the Early Neolithic in Northeast Bulgaria (6100–4800 cal. BC), hulled barley, einkorn, and emmer were the primary cereals. This differs from Southeastern Bulgaria, where einkorn and emmer were predominant. Lentils, peas, grass peas, and flax were among the cultivated pulses. A wide array of gathered plants -such as cornelian cherry, plums, hazelnut, raspberry, and elderberry- suggests intensive foraging within an open-forest environment likely influenced by human activity.

Although hulled wheat (einkorn and emmer) appears consistently across all four sites examined in the thesis, the presence of other species varies, especially in western Anatolia. While an agricultural "package" may be recognizable, its transmission appears to have been adapted according to existing local subsistence strategies. This variability suggests a more complex and regionally diverse transition to flexible subsistence practices (Figure 10.1). Each region provides its own interpretation for the development of farming practices, indicating that the transition was not a simple shift from foraging to farming. Instead, the process included hybridization. For example, findings from the Danube Gorges (e.g., Vlasac) indicate interaction between different population groups. Paleogenomic research by Hofmanová et al. on Neolithic individuals from northern Greece (e.g., Franchthi Cave, Knossos, Mauropigi) and northwestern Turkey (e.g., Menteşe, Barcın, Aktopraklık C, Çukuriçi, Ulucak) suggests that Neolithic lifeways (6600–6500 cal. BC) involved the adaptation and mobility of both indigenous and incoming groups.

10.2. Conclusion

In my opinion, people integrated their farming and herding knowledge when they migrated and settled in the region. They tried to apply farming strategies by using the diverse ecological niches. Along with that, they constructed new niches such as dairy products, the hunting of particular wild animals, fishing, etc. Moreover, sometimes flavor alone can be a motivator; the taste sensation/taste memory of a community sometimes can be a selective factor in plant choices such as New Glume Wheat (*Triticum timopheevii*) (see Chapter 5.2.2). In this respect,

how do we furnish our interpretation of the Neolithization process of Northwest Türkiye with new first-hand archaeobotanical data?

With the recent genetic research, most researchers now agree that the Neolithization of the Coastal Aegean, Northwest Türkiye, and Europe encompassed a stretched, dynamic process involving complex interactions between migrant farmers and indigenous foragers (Arbuckle 2025; Koptekin et al. 2025; Yüncü et al. 2025). In this respect, this thesis highlights the critical role of archaeobotanical data in reconstructing the complexities of early farming societies in Northwest Türkiye. By using detailed macro-botanical analyses in combination with site-scale spatial data, it is possible to uncover not just what was grown and consumed, but how, where, and perhaps even why particular decisions were made. It also highlights the importance of historical and intra-site analyses in taking chronological shifts and internal diversity that might otherwise be covered in broader regional generalizations.

In broader terms, this research contributes to a growing from of work that challenges the idea of a singular "Neolithic package" and instead emphasizes the diversity of trails leading into agriculture. The Neolithization of Northwest Türkiye was shaped by a combination of ecological opportunity, cultural memory, and strategic decision-making within diverse ecological niches. Plant-based subsistence strategies were not fixed but had some sustainable agricultural traditions (broad spectrum) and progressed alongside changing agrarian community structures and interactions with the environment.

Finally, the Neolithic in this region should be understood as an ongoing creative process of adaptation that was locally grounded yet regionally connected. The archaeobotanical outlines observed at Barcın Höyük, Bahçelievler, Aşağı Pınar, and Hoca Çeşme offer a rich testimony to this process, revealing how early communities involved with a new Neolithic way of life while navigating the limitations and possibilities of their specific ecological niches and social factors such as use of their environment (plains and mountain hills) and settlement organization. Through this perspective, Neolithization in Northwest Türkiye appears not as a transmission of a fixed model, but as a diverse and dynamic expression of human adaptation and flexibility.

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APPENDIX I

11.LIST OF SAMPLES STUDIED IN THIS RESEARCH

11.1. Barcın Höyük

Table 11.1: Investigated archaeobotanical samples in Phase VIe at Barcın Höyük.

Barcın Höyük - Phase VIe					
BH No	**Trench**	**Locus**	**Year**	**Context**	**Sample volume (liter of soil)**
37009	M11	446	2013	basin bin	2
37046	M11	403	2013	layer	2
34902	M11	430	2013	pyrotechnic feature	2
35630	M11	444	2013	other	0.25
35629	M11	443	2013	basin bin	0.10
44995	M11	685	2015	surface	4.25
45111	M11	690	2015	pyrotechnic feature	9
45123	M11	691	2015	pyrotechnic feature	2.70
45327	M11	691	2015	pyrotechnic feature	4
45124	M11	700	2015	pyrotechnic feature	4
45350	M11	709	2015	basin bin	2.10
45517	M11	717	2015	post hole	4
45519	M11	718	2015	post hole	4
45523	M11	657	2015	layer	4
45539	M11	680	2015	post hole	1
45854	M11	724	2015	post hole	3.65
45899	M11	728	2015	post hole	4.50
45900	M11	734	2015	post hole	3.75

45999	M11	738	2015	post hole	3.80
46052	M11	740	2015	post hole	4
46057	M11	742	2015	post hole	4
46082	M11	745	2015	post hole	4.75
46084	M11	746	2015	post hole	4.40
46320	M11	698	2015	surface	2.50
46322	M11	698	2015	surface	2
46323	M11	698	2015	surface	2.25
46324	M11	657	2015	layer	2
46340	M11	683	2015	layer	2
46343	M11	685	2015	surface	2
46344	M11	685	2015	surface	2
46348	M11	685	2015	surface	2
46349	M11	685	2015	surface	2
46368	M11	685	2015	layer	2
46341	M11	699	2015	layer	1.25
46360	M11	699	2015	layer	2
46363	M11	699	2015	layer	2
46365	M11	699	2015	layer	2
32461	M10	325	2013	post hole	4
44904	M10	491	2015	exploratory locus	4.50
44937	M10	500	2015	layer	2
44940	M10	500	2015	layer	4
45259	M10	502	2015	surface	3.50
45260	M10	501	2015	basin bin	3
45410	M10	510	2015	layer	5

45412	M10	510	2015	layer	1.50
45439	M10	511	2015	surface	4.50
45433	M10	512	2015	layer	3
45436	M10	512	2015	layer	2
45448	M10	512	2015	layer	3.50
45449	M10	512	2015	layer	2
45634	M10	512	2015	layer	2.25
45643	M10	512	2015	layer	2.30
45639	M10	516	2015	post hole	5
45640	M10	515	2015	surface	3.25
45645	M10	515	2015	surface	3.50
45903	M10	519	2015	surface	2.50
45906	M10	519	2015	surface	3
45908	M10	519	2015	surface	4
46250	M10	519	2015	surface	2
45912	M10	523	2015	exploratory locus	2.50
45913	M10	523	2015	exploratory locus	3.25
46248	M10	523	2015	exploratory locus	2
46302	M10	497	2015	layer	2
46321	M10	502	2015	surface	1.25
46329	M10	512	2015	layer	2
46339	M10	523	2015	exploratory locus	2.20
46350	M10	512	2015	layer	2
46359	M10	496	2015	surface	5.40
3555	M10	77	2007	exploratory locus sounding VIe/Vd1	4.50

36995	M13	182	2013	layer	4
43137	L10	326	2014	-	4
43147	L10	324	2014	surface	4
44683	L10	355	2015	layer	6
44685	L10	355	2015	layer	6.50
44691	L10	355	2015	layer	4
44708	L10	355	2015	layer	2.50
46356	L10	355	2015	layer	2.50
46358	L10	355	2015	layer	2.50
46366	L10	355	2015	layer	1
44710	L10	378	2015	pyrotechnic feature	2.35
44711	L10	378	2015	pyrotechnic feature	5
44717	L10	378	2015	pyrotechnic feature	2.50
45207	L10	378	2015	pyrotechnic feature	4
44856	L10	374	2015	surface	4
46369	L10	374	2015	surface	2
46371	L10	374	2015	surface	2.50
44860	L10	364	2015	layer	5.25
44897	L10	380	2015	layer	1
46364	L10	380	2015	layer	2
45205	L10	385	2015	pyrotechnic feature	4.25
45078	L10	386	2015	pyrotechnic feature	9
45080	L10	389	2015	surface	4
46372	L10	389	2015	surface	2
46373	L10	389	2015	surface	2
45453	L10	388	2015	post hole	5

45480	L10	407	2015	pyrotechnic feature	3.50
45663	L10	388	2015	post hole	4.50
46246	L10	389	2015	surface	2
46317	L10	389	2015	surface	2
46333	L10	389	2015	surface	2
46338	L10	389	2015	surface	2
45665	L10	401	2015	pos hole	4.25
45670	L10	402	2015	post hole	3.25
45673	L10	403	2015	post hole	4
45671	L10	404	2015	post hole	3.25
45758	L10	416	2015	layer	4
45759	L10	364	2015	layer	3.75
46318	L10	364	2015	layer	2
46303	L10	364	2015	layer	2
45760	L10	412	2015	ditch trench	3.20
45766	L10	417	2015	pyrotechnic feature	4
45767	L10	418	2015	pyrotechnic feature	4
45952	L10	423	2015	surface	?
46249	L10	423	2015	surface	1
46312	L10	423	2015	surface	1.5
46313	L10	423	2015	surface	1
46314	L10	423	2015	surface	1
46127	L10	433	2015	post hole	4.50
46511	L10	442	2015	layer	1
46512	L10	442	2015	layer	1
46517	L10	442	2015	layer	2

46266	L10	444	2015	ditch trench	2
46271	L10	443	2015	layer	4.25
46282	L10	445	2015	surface	5.25
46508	L10	445	2015	surface	1.25
46509	L10	445	2015	surface	1.25
46514	L10	445	2015	surface	1.50
46518	L10	445	2015	surface	1.50
46289	L10	446	2015	pyrotechnic feature	7.70
46294	L10	446	2015	pyrotechnic feature	6
46436	L10	446	2015	pyrotechnic feature	5.25
46330	L10	374	2015	surface	2.75
46332	L10	374	2015	surface	2.50
46352	L10	374	2015	layer	2
46337	L10	372	2015	layer	2
46347	L10	355	2015	layer	2
46351	L10	380	2015	layer	2
45019	L11	632	2015	pyrotechnic feature	2
45380	L11	635	2015	basin bin	3
45555	L11	635	2015	basin bin	2.75
46325	L11	635	2015	basin bin	2
46328	L11	636	2015	layer	2
46334	L11	636	2015	layer	2
46316	L11	637	2015	surface	2
46326	L11	637	2015	surface	2
46346	L11	647	2015	layer	2
46370	L11	647	2015	layer	2

45740	L11	649	2015	post hole	3.25
46310	L11	655	2015	virgin soil	1
46311	L11	655	2015	virgin soil	0.75
15185	L13	158	2011	layer	
15863	L13	158	2011	layer	
16302	L13	160	2011	basin bin	
16395	L13	161	2011	layer	
16955	L13	163	2011	surface	
17592	L13	170	2011	surface	
17700	L13	170	2011	surface	
17913	L13	170	2011	surface	
17599	L13	171	2011	surface	
17588	L13	174	2011	surface	
17589	L13	174	2011	surface	
17594	L13	174	2011	surface	
17979	L13	174	2011	surface	
17991	L13	177	2011	surface	
17999	L13	177	2011	surface	
18471	L13	177	2011	surface	
12695	L13	261	2010	exploratory locus	1.30

Table 11.2: Investigated archaeobotanical samples in Phase VId1 at Barcın Höyük.

Barcın Höyük - Phase VId1					
BH No	**Trench**	**Locus**	**Year**	**Context**	**Sample volume (liter of soil)**
28743	M11	355	2013	surface	0.75

38478	M11	360	2014	pyrotechnic feature	7.25
38480	M11	360	2014	pyrotechnic feature	7.25
34467	M11	417	2013	layer	4
38930	M11	500	2014	layer chs in database	?
38935	M11	510	2014	layer	6
38950	M11	510	2014	layer	6
39436	M11	511	2014	layer	5
39213	M11	532	2014	layer	5
40860	M11	549	2014	layer	5.25
40862	M11	549	2014	layer	6
40863	M11	549	2014	layer	4.50
40864	M11	549	2014	layer	3
39040	M11	563	2014	layer	2
40590	M11	563	2014	layer	2
40592	M11	563	2014	layer	1.50
40866	M11	578	2014	layer	4
40870	M11	578	2014	layer	4
40890	M11	579	2014	layer	4
41330	M11	515	2014	surface	3
41449	M11	557	2014	layer	4.5
42523	M11	507	2014	wall	complete hazelnut?
38461	M11	508	2014	burial	0.50
39221	M11	532	2014	surface	2
39246	M11	537	2014	layer	2
40004	M11	543	2014	layer	2.25

33498	M11	334	2013	layer	4
40956	M10	290	2014	surface	2
46331	M10	376	2015	wall	2.2
40952	M10	391	2014	surface	2
41123	M10	411	2014	platform bench ledge	6
41698	M10	411	2014	platform bench ledge	6.25
40756	M10	417	2014	pyrotechnic feature	?
41102	M10	423	2014	surface	2
40995	M10	426	2014	surface	1.25
40996	M10	426	2014	surface	2
40997	M10	426	2014	surface	2
40999	M10	427	2014	platform bench ledge	0.25
41000	M10	427	2014	platform bench ledge	ear of emmer
41101	M10	427	2014	platform bench ledge	9
41119	M10	427	2014	platform bench ledge	3.25
41358	M10	438	2014	layer	?
43902	M10	490	2015	pyrotechnic feature	1
45406	M10	508	2015	basin bin	3.75
45411	M10	508	2015	basin bin	1.25
12330	M10	202	2010	collapse	8
27284	M10	305	2013	layer	1
40839	L10	143	2014	pyrotechnic feature	2
39819	L10	143	2014	pyrotechnic feature	5
36876	L10	147	2013	basin bin 2a	3.25
31857	L10	148	2013	pyrotechnic feature	1.25

40226	L10	148	2014	pyrotechnic feature	2.25
37822	L10	152	2014	surface	2
36852	L10	185	2013	layer	3.25
36714	L10	185	2013	layer	8
36715	L10	185	2013	layer	4.50
36716	L10	185	2013	layer	5
36717	L10	185	2013	layer	4.50
36729	L10	185	2013	layer	7.50
36244	L10	185	2013	layer	3
36393	L10	185	2013	layer	3.10
36853	L10	185	2013	layer	5
36239	L10	185	2013	layer	1
36730	L10	185	2013	layer	1.50
39163	L10	185	2014	layer	5
39505	L10	186	2014	collapse	4
38876	L10	186	2014	collapse	2
39503	L10	186	2014	collapse	2.50
39504	L10	186	2014	collapse	3.50
39807	L10	186	2014	collapse	3
40230	L10	186	2014	collapse	1
40227	L10	186	2014	collapse	1
38877	L10	186	2014	collapse	5.75
39729	L10	208	2014	layer	1
39345	L10	220	2014	pyrotechnic feature	6
39823	L10	222	2014	collapse	2.25
46502	L10	229	2015	wall	2

46507	L10	229	2015	wall	2
39849	L10	232	2014	basin bin 2b	3
39850	L10	232	2014	basin bin	0.25
46513	L10	237	2015	wall	2.30
40225	L10	238	2014	surface 2b	0.75
40478	L10	267	2014	basin bin	3
40843	L10	269	2014	layer	2
40837	L10	273	2014	layer mda1?	2
41091	L10	274	2014	surface	2
41246	L10	289	2014	basin bin	0.75
42311	L10	304	2014	surface	2
42113	L10	307	2014	surface	4.75
42347	L10	309	2014	surface	5.25
42482	L10	315	2014	surface	4.50
42490	L10	304	2014	surface	3
42674	L10	313	2014	layer	4.75
42914	L10	313	2014	layer	5
43111	L10	313	2014	layer	5
43249	L10	313	2014	layer	4
44490	L10	317	2015	surface	6
44497	L10	317	2015	surface	6
42906	L10	321	2014	surface	6
42670	L10	321	2014	surface	5
43258	L10	330	2014	pyrotechnic feature	0.75

43256	L10	332	2014	layer	1.50
46336	L10	342	2015	ditch trench	2.50
44132	L10	353	2015	surface	7
44268	L10	353	2015	surface	7
44274	L10	353	2015	surface	10
46319	L10	353	2015	surface	2.50
46342	L10	353	2015	surface	2.50
46357	L10	353	2015	surface	2.35
46361	L10	353	2015	surface	2.50
44880	L10	383	2015	collapse	4
44890	L10	383	2015	collapse	6.50
44895	L10	383	2015	collapse	7
45234	L10	383	2015	collapse	4.25
45491	L10	383	2015	collapse	3
46345	L10	400	2015	surface	2.25
45944	L10	420	2015	platform bench ledge	4
46305	L10	420	2015	platform bench ledge	2
46306	L10	420	2015	platform bench ledge	2.50
46315	L10	420	2015	platform bench ledge	2
46515	L10	422	2015	layer	2
46516	L10	422	2015	layer	2
45951	L10	423	2015	platform bench ledge	9.50
45976	L10	426	2015	platform bench ledge	3.25
46301	L10	426	2015	platform bench ledge	2.25
46140	L10	434	2015	layer	0.75
45841	L10	435	2015	layer	4

46505	L10	437	2015	pyrotechnic feature	1.75
46382	L10	438	2015	surface	3
46501	L10	438	2015	surface	1.50
46503	L10	438	2015	surface	2
46504	L10	438	2015	surface	1.25
46510	L10	438	2015	surface	2
45406	L10	508	2015	basin bin	3.75
45411	L10	508	2015	basin bin	1.25
39281	L11	579	2014	basin bin	6
39285	L11	579	2014	basin bin	3
39284	L11	579	2014	basin bin	3.50
39455	L11	579	2014	basin bin	3
39990	L11	591	2014	layer	4
40380	L11	594	2014	basin bin	2.25
44509	L11	619	2015	surface	4
44513	L11	619	2015	surface hearth fill	4.25
46245	L11	619	2015	surface	1.75
46374	L11	619	2015	surface	1.50
46335	L11	623	2015	surface	2.75
46354	L11	623	2015	surface	1.50
46362	L11	623	2015	surface	2
46367	L11	623	2015	surface	2.25
44647	L11	628	2015	pyrotechnic feature	1.50
42219	L12	459	2014	layer	6.50
41636	L12	462	2014	surface	2
41637	L12	462	2014	surface	2

41865	L12	462	2014	surface	2
41886	L12	465	2014	surface	3.25
41887	L12	465	2014	surface	1.75
41888	L12	466	2014	surface	2
42206	L12	466	2014	surface	1.75
42243	L12	466	2014	surface	2.50
42240	L12	468	2014	surface	5
42612	L12	482	2014	pit	3.50
42637	L12	485	2014	surface	1.50
42645	L12	494	2014	layer	3
42823	L12	495	2014	surface	2.75
42832	L12	497	2014	surface	4.75
30441	L13	255	2013	basin bin	4
31123	L13	255	2013	basin bin	4
32120	L13	255	2013	basin bin	4
28337	L13	255	2013	basin bin	4
28351	L13	255	2013	basin bin	1.25
30419	L13	255	2013	basin bin	4
32117	L13	257	2013	surface	4
28323	L13	253	2013	basin bin	4
30437	L13	256	2013	surface	4
13744	L13	153	2011	layer	
17597	L13	156	2011	surface	
15101	L13	153	2011	layer	

Table 11.3: Investigated archaeobotanical samples in Phase VId2 at Barcın Höyük.

Barcın Höyük - Phase VId2					
BH No	**Trench**	**Locus**	**Year**	**Context**	**Sample volume (liter of soil)**
17342	M10	238	2011	pyrotechnic feature	
27284	M10	305	2013	layer	1
31385	M10	349	2013	surface	1.50
33498	M11	334	2013	layer	4
34920	M11	414	2013	pyrotechnic feature	1.75
34911	M11	414	2013	pyrotechnic feature	0.25
34678	M11	490	2013	layer	2
34889	L10	161	2013	pyrotechnic feature	1
34896	L10	161	2013	pyrotechnic feature	4
38316	L10	161	2013	pyrotechnic feature	1.75
38116	L10	161	2013	pyrotechnic feature	0.75
36237	L10	184	2013	layer	3
36222	L10	184	2013	layer	4
36223	L10	184	2013	layer	3.50
37848	L10	199	2014	surface	1.50
37871	L10	199	2014	surface	0.30
38115	L10	199	2014	surface	2.75
38522	L10	199	2014	surface	0.75
39058	L10	199	2014	surface	7
38591	L11	572	2014	layer	7
39289	L11	572	2014	layer	1
39290	L11	581	2014	pyrotechnic feature	1

44309	L11	610	2015	layer (courtyard fill)	3.25
44331	L11	615	2015	pyrotechnic feature	4
39142	L12	416	2014	layer	3.50
39907	L12	436	2014	surface	2.75
40138	L12	443	2014	Surface white	1.50
41643	L12	461	2014	surface	2
10597	L13	131	2010	surface	6
11119	L13	131	2010	surface	6.50
11122	L13	131	2010	surface	4.50
11171	L13	141	2010	surface	4
11196	L13	141	2010	pyrotechnic feature?	6
11198	L13	142	2010	pyrotechnic feature	4
11613	L13	143	2010	pyrotechnic feature	3
11650	L13	145	2010	surface	3.50
11839	L13	146	2010	surface	4
13118	L13	150	2011	other	
13145	L13	151	2011	surface	
13149	L13	151	2011	surface	
33913	M13	164	2013	layer	4

Table 11.4: Investigated archaeobotanical samples in Phase VId3 at Barcın Höyük.

Barcın Höyük - Phase VId3					
BH No	**Trench**	**Locus**	**Year**	**Context**	**Sample volume (liter of soil)**
17349	M10	236	2011	layer	
15255	M10	233	2011	surface	

36050	M11	395	2013	layer str10	
36751	M11	395	2013	layer str10	2
33869	M11	367	2013	wall	only hazel (10)
36759	M11	378	2013	surface str10	only hazel (62)
32200	M11	378	2013	surface str10	only hazel (30)
32943	M11	378	2013	surface str10	only hazel (5)
36792	M11	378	2013	surface str10	only hazel (9)
32184	M11	378	2013	surface str10	
33729	M11	378	2013	surface str10	
34121	M11	378	2013	surface str10	
33730	M11	378	2013	surface str10	
33878	M11	483	2013	surface	0.50
40842	L10	135	2014	platform bench ledge	2
36877	L10	145	2013	other	2.50
38112	L10	178	2014	ditch trench	1.25
37662	L11	558	2013	surface	1
37661	L11	558	2013	surface	1
38426	L12	402	2014	layer	0.75

38411	L12	404	2014	surface	6
38221	L12	409	2014	pyrotechnic feature str18 north	8
38227	L12	409	2014	pyrotechnic feature str18	8
38427	L12	410	2014	bot1 southwest	3
38428	L12	410	2014	layer bot2 center	3
38429	L12	410	2014	layer (bot 3 north)	3
38672	L12	410	2014	layer	3
38694	L12	413	2014	surface pebble	4
39105	L12	415	2014	surface white	2
39106	L12	415	2014	surface top	2.50
39107	L12	415	2014	surface bottom	4
40139	L12	420	2014	layer inside pot	1.50
39378	L12	421	2014	surface white	4
39132	L12	422	2014	pyrotechnic feature	4
39770	L12	427	2014	surface	2
39655	L12	427	2014	surface	5.25
39767	L12	428	2014	layer	2.50
40624	L12	449	2014	burial	3.25

8893	L13	123	2010	surface	6
8899	L13	123	2010	surface	6
10524	L13	123	2010	surface	4.50
8896	L13	123	2010	surface	6
12694	L13	123	2010	surface	0.75
11116	L13	137	2010	pyrotechnic feature	1.75

Table 11.5: Investigated archaeobotanical samples in Phase VIc at Barcın Höyük.

Barcın Höyük - Phase VIc					
BH No	**Trench**	**Locus**	**Year**	**Context**	**Sample volume (liter of soil)**
10750	M10	184	2010	pit	6
10748	M10	184	2010	pit	10
10747	M10	184	2010	pit	7.50
11575	M10	187	2010	layer	10
11893	M10	208	2010	surface	3.50
11894	M10	208	2010	surface	
12382	M10	213	2010	layer	6
12391	M10	213	2010	layer	7.25
12400	M10	213	2010	layer	8.75
12684	M10	214	2010	surface	0.75
12673	M10	214	2010	surface	1.75
12677	M10	214	2010	surface	0.85
12680	M10	214	2010	surface	1

12682	M10	214	2010	surface	1.50
12671	M10	215	2010	layer	3
11898	M10	215	2010	layer	charcoal
11895	M10	215	2010	layer	10
13591	M10	226	2011	pyrotechnic feature	
16677	M10	249	2011	pyrotechnic feature	
16919	M11	183	2011	layer	
18486	M11	183	2011	layer	
18491	M11	183	2011	layer	
26735	M11	302	2013	layer	4
28202	M11	325	2013	pyrotechnic feature	
28376	M11	327	2013	pit	4
31773	M11	340	2013	burial	2
44129	L10	347	2015	burial	4.75
31295	L10	146	2013	pyrotechnic feature	2
31496	L11	423	2013	layer	4
32228	L11	456	2013	pyrotechnic feature	1.25
35593	L11	471	2013	post hole	
35594	L11	471	2013	post hole	3.25
32375	L11	479	2013	pyrotechnic feature	0.30
33171	L11	486	2013	pyrotechnic feature	3
36090	L11	528	2013	surface	0.75
35567	L11	530	2013	pyrotechnic feature	0.25
36371	L11	535	2013	surface	1
36372	L11	535	2013	surface	1
36373	L11	535	2013	surface	1

36376	L11	536	2013	pyrotechnic feature	0.50
37080	L11	553	2013	pit	3
28074	L12	327	2013	layer	4
31543	L12	355	2013	surface white	4
33349	L12	355	2013	surface dark	4
33307	L12	355	2013	surface	2
30109	L12	339	2013	layer	4
36573	L12	367	2013	surface	1
36574	L12	367	2013	surface	2
33956	L12	376	2013	basin bin	4
38406	L12	379	2014	surface	7.25
36446	L12	379	2013	surface red	4
36195	L12	382	2013	surface	1
36193	L12	382	2013	surface	1
37788	L12	382	2014	surface	6
36196	L12	383	2013	layer	1
36197	L12	383	2013	layer	1
36198	L12	383	2013	layer	1
35765	L12	390	2013	other	4.15
5000	L13	105	2009	layer	4
9337	L13	105	2010	layer	1.50
9955	L13	130	2010	burial	0.30

Table 11.6: Investigated archaeobotanical samples in Phase VIb at Barcın Höyük.

Barcın Höyük - Phase VIb					
BH No	**Trench**	**Locus**	**Year**	**Context**	**Sample volume (liter of soil)**
5983	M10	103	2009	layer	5
6439	M10	110	2009	layer	5
5908	M10	118	2009	pyrotechnic feature	5
5911	M10	119	2009	layer	4.50
5975	M10	121	2009	pyrotechnic feature	4
6408	M10	130	2009	surface	1
8744	M10	130	2010	surface	6
8337	M10	133	2010	pyrotechnic feature	
8472	M10	133	2010	pyrotechnic feature	5.50
8751	M10	138	2010	layer	6
8791	M10	138	2010	layer	6
8376	M10	140	2010	layer	6
8373	M10	144	2010	layer	6
11515	M10	144	2010	layer	8
11500	M10	165	2010	surface	1.25
12402	M10	165	2010	surface	2
12404	M10	165	2010	surface	1.75
12651	M10	165	2010	surface	1.50
9613	M10	168	2010	layer	0.75
12385	M10	168	2010	layer	6
12397	M10	168	2010	layer	7

12401	M10	170	2010	surface	1.50
12661	M10	170	2010	surface	1
12679	M10	220	2010	surface	2
12678	M10	220	2010	surface	1.25
8207	M11	105	2010	pit	6
6900	M11	106	2009	layer	4
8471	M11	106	2010	layer	6
8931	M11	106	2010	layer	6
8933	M11	106	2010	layer	
8986	M11	106	2010	layer	wood charcoal
11400	M11	108	2010	layer	5.50
11379	M11	109	2010	post hole	
16860	M11	132	2011	pit	wood charcoal
9557	M11	133	2010	surface	6
9558	M11	133	2010	surface	wood charcoal
9597	M11	133	2010	surface	
10955	M11	142	2010	pyrotechnic feature	wood charcoal
10998	M11	148	2010	pyrotechnic feature	wood charcoal
12662	M11	154	2010	surface	1.25
12663	M11	154	2010	surface	2.20
12665	M11	154	2010	surface	2
12666	M11	154	2010	surface	1.75
12667	M11	154	2010	surface	2.40
12668	N11	154	2010	surface	1.50
12669	M11	154	2010	surface	0.75
15427	M11	154	2011	surface	

16076	M11	184	2011	surface	
18483	M11	187	2011	layer	
12664	M11	154	2010	surface	1.30
26709	M11	303	2013	ditch trench	4
38114	L10	107	2014	pit	5.25
2547	L11	212	2007	collapse	4
2548	L11	212	2007	collapse	5
2862	L11	218	2007	layer	5
5171	L11	230	2009	surface	2
5172	L11	230	2009	surface	
5173	L11	230	2009	surface	3.50
14481	L11	233	2011	post hole	
6775	L11	238	2009	layer	4
6773	L11	238	2009	layer	4
5639	L11	242	2009	layer	6
5666	L11	242	2009	layer	4.50
5696	L11	242	2009	layer	1.50
6051	L11	242	2009	layer	?
6613	L11	242	2009	layer	3
7219	L11	242	2009	layer	4
6612	L11	261	2009	other	3.50
6611	L11	263	2009	pit	6
7249	L11	263	2009	pit	5
7250	L11	263	2009	pit	6
7236	L11	263	2009	pit	6
7214	L11	264	2009	layer	5.50

6748	L11	270	2009	surface	4
6749	L11	270	2009	surface	6
6776	L11	270	2009	surface	4
6747	L11	275	2009	layer	6
6768	L11	277	2009	surface	6
14362	L11	312	2011	layer	
14364	L11	312	2011	layer	
14365	L11	312	2011	layer	
14378	L11	312	2011	layer	
14379	L11	312	2011	layer	
15012	L11	312	2011	layer	
15016	L11	312	2011	layer	
15044	L11	312	2011	layer	
16533	L11	312	2011	layer	
16568	L11	312	2011	layer	
16569	L11	312	2011	layer	
16570	L11	312	2011	layer	
14346	L11	321	2011	surface	
18480	L11	321	2011	surface	
18485	L11	327	2011	surface	
17259	L11	339	2011	pit	
17437	L11	343	2011	surface	
17439	L11	343	2011	surface	
17441	L11	343	2011	surface	
17445	L11	343	2011	surface	
17482	L11	343	2011	surface	

18481	L11	343	2011	surface	
18498	L11	343	2011	surface	
27567	L11	453	2013	pit	4
14481	L12	233	2011	post hole	
10659	L12	157	2010	pyrotechnic feature	4
35252	M13	170	2013	surface	0.25
46533	M13	45	2015	wall	2.75

Table 11.7: Investigated archaeobotanical samples in phase VIa at Barcın Höyük.

Barcın Höyük - Phase VIa					
BH No	**Trench**	**Locus**	**Year**	**Context**	**Sample volume (liter of soil)**
10003	M11	119	2010	layer	wood charcoal
5048	M11	71	2009	layer	5
13865	L12	160	2011	pit	
14908	L12	185	2011	pit	
10095	L12	170	2010	pit	4.50
10058	L12	169	2010	pit	6
11777	L12	189	2010	pit	6
10372	L12	163	2010	pit	1.50

Table 11.8: Investigated archaeobotanical samples from Phases Middle Chalcolithic to Early/Middle Bronze Age at Barcın Höyük.

Barcın Höyük - Phase Middle Chalcolithic					
BH No	**Trench**	**Locus**	**Year**	**Context**	**Sample volume (liter of soil)**
10375	L12	162	2010	pit	0.60

11795	L12	180	2010	layer	6.50
10606	L12	164	2010	pit	0.50
2240	L11	208	2007	pit	5
2238	L11	209	2007	pit	4.50
Barcın Höyük - Phase Late Chalcolithic					
2344	M10	62	2007	layer	5
2579	M11	12	2007	layer	5
5754	L12	97	2009	pyrotechnic feature	6
5709	L12	82	2009	surface	4.50
Barcın Höyük - Early Bronze Age II					
2031	M10	54	2007	pit	5
2040	M10	54	2007	pit	4.30
2174	M11	3	2007	pit	3.50
4040	M11	3	2009	pit	
5593	M11	3	2009	pit	6
6538	L12	106	2009	pit	4
6557	L12	107	2009	pit	6
6564	L12	107	2009	pit	6
Barcın Höyük - Early/Middle Bronze Age transitional					
8033	L13	108	2010	pit	6
8039	L13	113	2010	layer	6
12403	L13	113	2010	layer	1.25
12660	L13	113	2010	layer	1.25
12536	L13	117	2010	pit	7.25

11.2. Bahçelievler

Table 11.9: Investigated archaeobotanical samples in Phase 8 at Bahçelievler.

Bahçelievler - Phase 8						
Trench	**Unit**	**Sample no**	**FL no**	**Year**	**Context info**	**Sample volume (liter)**
A2	1	1	23	2021	top layer of the surface	2.80
A3	1	1	16	2021	burnt house. south side	2.80
A3	2	2	19	2021	the top layer of pit dwelling	4.00
A3	2	4	15	2021	the top layer of pit dwelling	2.20
A3	2	5	12	2021	the top layer of pit dwelling	2.60
A3	3	1	20	2021	inside of pit dwelling	2.75
A3	3	3	13	2021	inside of pit dwelling	3.25
A3	3	4	14	2021	inside of pit dwelling	5.00
A3	4	1	29	2021	inside of pit dwelling	5.25
B2	18	4	?	2020	?	?
B2	19	1	?	2020	?	?
B2	26	6	4	2021	?	4.00

Table 11.10: Investigated archaeobotanical samples in Phase 7 at Bahçelievler.

Bahçelievler - Phase 7a-b						
Trench	**Unit**	**Sample no**	**FL no**	**Year**	**Context info**	**Sample volume (liter)**
B2	9	2	2	2019	surface in the str (7b)	11.75
B2	27	2	10	2021	inside of str	3.50
B2	27	3	35	2021	surface in str	3.75
B2	27	4	55	2021	east side of str	3.25
B2	29	1	28	2021	pyrotechnic feature in str	2.25
B2	29	2	33	2021	pyrotechnic feature in str	3.10
B2	29	3	37	2021	top level of pyrotechnic feature	5.25
B2	29	4	36	2021	top of surface	3.25
B2	29	5	44	2021	north wall side of str	5.25
B2	29	6	39	2021	the southeast side of the rectangular area	3.25

B2	29	7	38	2021	near the northeast wall (platform?)	0.50
B2	29	11	62	2021	pyrotechnic feature	4.00
B2	29	12	60	2021	from the wall side of the pyrotechnic feature	6.50
B2	29	13	31	2021	general space of pyrotechnic feature 4th sample	2.25
B2	29	14	32	2021	under the surface of the pyrotechnic feature	5.30
B2	31	1	25	2021	clayish and burnt area near the west wall of the str	6.00
C2	19	1	8	2021	inside of str	1.50
C2	19	2	57	2021	inside of str	4.50
C2	20	4	46	2021	surface of courtyard	4.20
C2	22	5	48	2021	inside of str	4.25

Table 11.11: Investigated archaeobotanical samples in Phase 6 at Bahçelievler.

Bahçelievler - Phase 6						
Trench	**Unit**	**Sample no**	**FL no**	**Year**	**Context info**	**Sample volume (liter)**
B3	26	5	25	2020	inside of str	4.15
B3	26	6	57	2020	inside of str	2.50
B3	26	7	26	2020	inside of str	3.50
B3	27	2	29	2020	courtyard	12.00
B3	34	1	32	2020	burial	10.00
B3	34	4	33	2020	burial	13.25
B3	34	6	46	2020	burial	6.75
B3	36	1	54	2020	courtyard	3.60
B3	37	2	56	2020	inside of the str	2.50
B3	38	1	55	2020	courtyard	8.30
B3	54	2	51	2021	courtyard	5.75
B3	55	1	65	2021	inside of the str	9.00
B3	59	1	63	2021	inside of the str	4.00

B3	59	2	67	2021	inside of the str	3.75
B3	60	2	56	2021	courtyard	4.50
B3	68	2	70	2021	courtyard	8.50
B3	68	3	69	2021	surface of courtyard	8.10
B3	68	8	58	2021	surface of courtyard	7.00
B3	68	11	72	2021	surface of courtyard	4.00
B3	68	12	9	2021	surface of courtyard	5.25
B3	73	2	5	2021	pit in the str	4.00
B3	74	4	30	2021	soft part in the pit in the str	4.00
B3	74	5	43	2021	soft part in the pit in the str	2.00
B3-C3	9	3	64	2021	trash pit?	6.00
B3-C3	12	3	2	2021	the top 10 cm of soil of skeletons 3 and 5	5.50
B3-C3	13	2	11	2021	near to skeletons	?
B3-C3	13	3	1	2021	near to skeletons	9.25
C2	20	3	34	2021	top of the courtyard surface	3.50
C2	22	2	24	2021	surface in the str	4.00
C2	22	3	22	2021	inside of the str	2.00
C2	22	8	21	2021	inside of the str	5.25
C3	19	3	48	2020		12.60
C3	19	5	44	2020		2.00
C3	19	7	52	2020		2.75
C3	20	1	49	2020		6.25
C3	21	1	53	2020		2.75
C3	32	1	3	2021	south of the str	12.50
C3	32	2	68	2021	north of the str	8.75
C3	32	5	54	2021	inside of the str	8.00

C3	33	1	7	2021		8.60
C3	34	3	18	2021	surface of courtyard	4.00
C3	34	7	17	2021	interior of the door/entrance	1.50

Table 11.12: Investigated archaeobotanical samples in Phase 5 at Bahçelievler.

Bahçelievler - Phase 5						
Trench	**Unit**	**Sample no**	**FL no**	**Year**	**Context info**	**Sample volume (liter)**
B3	13	1	8	2020	courtyard	7.50
B3	13	4	50	2020	courtyard	3.00
B3	13	7	19	2020	courtyard	4.75
B3	14	1	13	2020	inside of str	4.75
B3	15	6	10	2020	courtyard	4.00
B3	15	8	34	2020	courtyard	1.75
B3	15	9	17	2020	courtyard	4.25
B3	16	2	37	2020	inside of str	4.00
B3	16	3	4	2020	inside of str	2.45
B3	17	3	6	2020	courtyard surround of pottery	2.50
B3	17	4	5	2020	courtyard top of surface	4.75
B3	17	7	?	2020	courtyard	5.00
B3	17	9	14	2020	courtyard surround of pottery	2.75
B3	17	11	15	2020	courtyard surround and bottom of pottery	3.75
B3	17	13	12	2020	courtyard inside of pottery	6.75
B3	17	14	7	2020	courtyard	9.50
B3	17	16	16	2020	courtyard surround of pottery	2.60
B3	21	1	38	2020	courtyard	3.50
B3	22	1	24	2020	east side of inside of str	2.75
B3	24	2	58	2020	inside of str	2.60
B3	24	8	22	2020	inside of str	3.50
B3	24	13	28	2020	inside of str	4.60
B3	24	16	23	2020	inside of str	5.00
B3	50	4	49	2021	courtyard surface	5.25
B3	50	5	71	2021	courtyard	4.75
B3	51	1	53	2021	courtyard	12

Table 11.13: Investigated archaeobotanical samples in Phase 4 at Bahçelievler.

Bahçelievler - Phase 4a-b						
Trench	**Unit**	**Sample no**	**FL no**	**Year**	**Context info**	**Sample volume (liter)**
B3	6	1	36	2020	inside of str 2 layer	3.00
B3	6	2	39	2020	inside of str room 2	2.10
B3	6	4	43	2020	inside of str 2 posthole	0.20
B3	7	1	40	2020	inside of str room 1	7.30
B3	8	6	42	2020		?
B3	9	1	51	2020	courtyard	3.60
B3	9	3	2	2020	courtyard	4.60
B3	9	6	3	2020	courtyard	1.25
B3	10	1	1	2020	courtyard	4.80
B3	66	1	26	2021	courtyard	4.25
B4	13	1	6	2021	outside of str	7.00
B4	15	1	66	2021	inside of str	9.25
B4	25	1	27	2021	courtyard surface	6.00
B4	25	3	41	2021	courtyard surface	3.50

Table 11.14: Investigated archaeobotanical samples in Phase 3 at Bahçelievler.

Bahçelievler - Phase 3						
Trench	**Unit**	**Sample no**	**FL no**	**Year**	**Context**	**Sample volume (liter)**
B3	4	3	45	2020	inside of str	3.25
B4	4	3	5	2020	inside of str top of surface	4.75
B3	4	4	9	2020	inside of str	6.00
B4	4	5	3	2020	inside of str	1.25
B4	5	2	9	2020	courtyard	?
B4	5	3	11	2020	courtyard	?
B4	5	7	8	2020	courtyard	?
B4	6	1	6	2020	courtyard	?

Table 11.15: Investigated archaeobotanical samples in Phase 2 at Bahçelievler.

Bahçelievler - Phase 2						
Trench	**Unit**	**Sample no**	**FL no**	**Year**	**Context info**	**Sample volume (liter)**
B5	1	3	20	2020	?	4.60

B5	2	1	27	2020	?	5.20
B5	3	2	4	2020	?	?
B5	4	1	7	2020	?	?
B5	8	4	40	2021	inside of str top layer	4.25
B5	8	5	61	2021	inside of str	4.00
B5	8	7	42	2021	corner of str?	2.25
B5	9	1	59	2021	2nd level from the surface?	4.00
B5	12	2	52	2021	outside of str/house	5.00
B5	14	1	47	2021	inside of str	4.00
B5	14	4	45	2021	inside of str	3.25
B5	19	2	50	2021	from pit phase uncertain?	5.00

11.3. Aşağı Pınar

Table 11.16: Investigated archaeobotanical samples in Layer 7 at Aşağı Pınar.

Aşağı Pınar - Layer 7						
Feature	**Context name**	**Fill**	**Trench**	**Unit**	**Analysis no**	**Year**
7-1 outdoor	Str layer		5U	166		2016
7-1 outdoor	Str layer		5U	166		2016
7-1 outdoor	Str layer		5U	172		2016
7-1 outdoor	Str layer		5U	172		2016
7-1	Str debries of the house		6U	209		
7-1	Str surface		6U	270	193	2014

7-1	Str surface		6U	290		
7-1	Str surface		6U	290		
7-1	Str surface		6U	290		
7-2	Str outdoor installation		6T	238		
7-2	Str outdoor		6T	273		
7-2/7-3	Str outdoor		6T	275		
7-3	str		6S	104		
7-3	str		6S	104		
7-3	str		6S	106		
7-3	Str installation		6T	197		
7-5	Str installation		7S	107		
H1-1	ditch	D	6L	74		2019
H1-1	ditch	D	6L	74-1		2019
H1-1 east	ditch	D	6M	100	77	2017
H1-1 east	ditch	D	6M	114	85	2017
H1-1 east	ditch	D	6M	114	81	2017
H1-1 east	ditch	D	6M	114	54	2017
H1-1 east	ditch	D	6M	114	85	2017
H1-1 east	ditch	D	6M	133	79	2017
H1-1 east	ditch	E	6M	134		

H1-1 east	ditch	E	6M	134		
H1-1 east	ditch	E	6M	134		
H1-1 east	ditch	D	6M	117	43	2017
H1-1 east	ditch	D	6M	117	38	2017
H1-1 west	ditch	D	6L	81		
H1-1 west	ditch	D	6L	86		
H1-1.H1-2	ditch	B1	6M	81		
H1-1a	pit	4	6L	83		2019
H1-1b	pit	2a	6L	77		2019
H1-1d	pit	4	6M	92		
H1-1d	Pit cleaning	4	6M	98	72	2017
H1-1d	pit	4	6M	121		
H1-1d	pit	4	6M	118	82	2017
H1-1d	pit	4	6M	118	40	2017
H1-1d	pit	4	6M	118	66	2017
H1-1d	pit	4	6M	118	48	2017
H1-1d	pit	4	6M	118	52	2017
H1-1d	pit	4	6M	115a	83	2017
H1-1d	pit	4	6M	121	55	2017
H1-1d	pit	4	6M	124	45	2017

H1-1d	pit	4	6M	124	51	2017
H1-1d	Pit layer	4	6M	103	74	2017
H1-1d	pit	4	6M	103	78	2017
H1-1d	pit	4	6M	108	75	2017
H1-1d	pit	4	6M	115	67	2017
H1-1d	pit	4	6M	115	65	2017
H1-1d	pit	4	6M	115	68	2017
H1-1d	pit	4	6M	115	69	2017
H1-1d	pit	4	6M	115	56	2017
H1-1d	pit	4	6M	116	46	2017
H1-1d	pit	4	6M	124	44	2017
H1-1e	pit	4	6M	107		
H1-1e	pit	4	6M	111	71	2017
H1-1e	pit	4	6M	111	57	2017
H1-1e	pit	4	6M	111	59	2017
H1-1e	pit	4	6M	111	58	2017
H1-1e	pit	4	6M	111	50	2017
H1-1e	pit	4	6M	111	64	2017
H1-1e	pit	4	6M	111	53	2017
H1-1e	pit	4	6M	120	61	2017

H1-1e	pit	4	6M	120	41	2017
H1-1e	pit	4	6M	120	60	2017
H1-1e	pit	4	6M	120	80	2017
H1-1g		5	6L	97		2019
H1-2	ditch	D	6N	141		
H1-2	ditch	D	6N	144		
H1-2	ditch	D	6N	144		
H1-2	ditch	D	6N	144		
H1-2	ditch	D	6N	146		
H1-2	ditch	D	6N	146		
H1-2	ditch	D	6N	146		
H1-2	ditch	D	6N	146		
H1-2	ditch	F	6N	147		
H1-2	ditch	F	6N	147		
H1-2	ditch	F	6N	147		
H1-2	ditch	F	6N	147		
H1-2	ditch	F	6N	147		
H1-2	ditch	F	6N	147		
H1-2	ditch	F	6N	147		
H1-2?	ditch	F	7P	374		

H1-2?	ditch	F	79	374		
H1-2a	pit	4	7N	184		
H1-2a	pit	4	7N	186		
H1-2a	pit	4	7N	187		
H1-2a	pit	4	7N	188		
H1-2a	pit	4	7N	205		
H1-2a	pit	4	7N	205		
H1-2a	pit	4	7N	205		
H1-2a	pit	6	7N	206	211	2015
H1-2a	pit	5	7N	211		
H1-2a	pit	5	7N	212		
H1-2a	pit	6	7N	215	214	2015
H1-2a	pit	4	7P	313		
H1-2a	pit	2b	7P	291		
H1-2a	pit	4	7P	294		
H1-2a	pit	4	7P	308		
H1-2a	pit	4	7P	309		
H1-2a	pit	4	7P	310		
H1-2a	pit	5	7P	369	210	2015
H1-2b	pit	4	7P	293		

H1-2c	pit	4	7P	368	208	2015
H1-3	ditch	D	7P	323		
H1-3	ditch	D	7P	323	105	2013
H1-3	ditch	D	7P	331	109	2013
H1-3	ditch	D	7P	324		
H1-3	ditch	C	7P	325		
H1-3	ditch	C	7P	325		
H1-3	ditch	D	7P	328	121	2013
H1-3	ditch	D	7P	329		
H1-3	ditch	D	7P	329		
H1-4	ditch	D	7S	133		
H1-4	ditch	C	7S	130		
H1-4	ditch	C	7S	130		
H1-4	ditch	F	7S	143		
H1-4c	pit	D	7T	181		
H1-5	ditch	D	7T	198		
H2	ditch	D?	6U	212		
H2	ditch		6U	240		
H2	ditch surface		6U	270		
H2	ditch	D	6U	271	194	2014

	surface					
H2	ditch	D	6V	308		2018
H2	ditch	D	6V	308		218
H2	ditch	D	6V	308		2018
H2	ditch	E	6V	310	24	2018
H2	ditch	E	6V	310		2018
H2	ditch	F	6V	317	22	2018
H2	ditch	D	7T	162		
H2	ditch	D	7T	222		
H2	ditch	D	7U	262		
H2	ditch	D	7U	262		
H2	ditch	E	7U	287		
H2	ditch	E	7U	289		
H2	ditch	E	7U	289		
H2	ditch	D	7U	258		
H2	ditch	E	7U	289		
H2	ditch	F	8K	321		2019
H2	ditch	F	8K	321		2019
H2	ditch	E	8K	317		2019
H2	ditch	D	8L	74		

H2	ditch	D	8S	230		
H2	ditch	D	8S	234		
H2	ditch	D	8S	234		
H2	ditch	D	8S	239		
H2	ditch	D	8S	239		
H2	ditch	B1	8P	199		
H2	ditch	F	9M	220		
H2	ditch	C	9P	257		
H2	ditch	C	9P	257		
H2	ditch	C	9P	257		
H2	ditch	D	9P	279		
H2	ditch	D	9P	279		
H2-a		4	8K	267		2019
H2-a		4	8K	286		2019
H2-a		4	8K	306		2019
H2-a		4	8K	310		2019
H2-a		4	8K	312		2019
H2-a		4	8K	307		2019
H2-a		4	8K	307		2019
H2-b		4	8K	246		2019

H2-c		4	8K	297	45	2019
H2-c		4	8K	280		2019
H2-c		5/6	8K	299		2019
H2-c		4	8K	275		2019
H2-c		4	8K	279		2019
H2-c		4	8K	284	27	2019
H2-c		4	8K	284	24	2019
H2-c		4	8K	285	25	2019
H2-c		4	8K	285		2019
H2-c		4	8K	293		2019
H2-c		4	8K	293		2019
H2-c		4	8K	293		2019
H2-c		4	8K	293		2019
H2-c		4	8K	294	22	2019
H2-c		4	8K	295	21	2019
H2-d		4	8K	302		2019
H2-d		4	8K	302		2019
H2-g			9M	245		
H2-h		5	9M	210		
H2-h		5/6	9M	211		

H2-h		5	9M	247		
H2-h		4	9N	204		
H2-t			7U	238		
H2-t			7U	238		
H2-t			7U	238		
H2-t		6	7U	282		
H2-u		4	7U	248		
H2-u		4	7U	248		
H2-u		6	7U	272		
H2-u		5	7U	274		
H2-u		5	7U	274		
H2-u		6	7U	280		
H2-u above		2B	7U	222		
H2-u above		5	7U	259		
H2-u above		2B	7U	234		
H2-v		4	7U	268		
H2-v		4	7U	268		
H2-z		4	6V	306		2018
H2-z		4	6V	306		2018
H2-z		4	6V	306	26	2018

H2-z		5	6V	314	25	2018

Table 11.17: Investigated archaeobotanical samples in Layer 7 mixed and later levels at Aşağı Pınar.

Aşağı Pınar - Layer 7 mixed						
Feature	**Context name**	**Fill**	**Trench**	**Unit**	**Analysis no**	**Year**
H1-1d	pit	4	6M	98	72	2017
H2	ditch		6U	227		
H2	ditch		6U	228		
H2	ditch		6V	245	32	2016
H2	ditch	E	6V	311		2018
H2	ditch	E	6V	311	23	2018
H2	ditch	E	6V	311		2018
H2	ditch	B2	6V	291	4	2018
H2	ditch	B1	8L	61.62		
H2	ditch	B1	8L	68		
H2	ditch	B1	8L	68		
H2	ditch	B1	8L	71		
H2	ditch	B1	8L	71		
H2	ditch	B1	8L	71		
H2	ditch	B1/D	8L	73		
H2	ditch		8L	75		
H2-r	pit	4	7T	240	99	2013
H2-z	pit	5	6V	314	25	2018
Layer 6						

			8K	242		2019
str 6.6	pit in str		8K	205		2019
str 6.21	layer		5U	110	26	2015
Layer 6/5						
			6U	206	103	2013
	POT		6U	71	213	2015
	POT		6U	71	216	2015
	POT		6U	217.1	100	2013
above H4		A0	7U	157	192	2014
above H2		A0	7U	157	200	2014
above H3		A0	7U	157	201	2014
Layer 5. 5a.5b						
str 5.22	south room		6V	157	87	2015
	pit areas		6V	170	86	2015
	ashy pit		6V	181	212	2015
str 5.22	POT	A0	6V	126.1	197	2014
str 5.22	north-mid surface		6V	186	85	2015
Layer 4						
			10P	71	44	2005
	storage pit		6V	125	199	2014
Layer 4/3						
	possibly storage		9P	91		2000
	possibly mudbrick		9P	96		2000

	wall					
Layer NO INFO						
			7V	192	218	2015
			7V	101	116	2013
	pot		6V	111	111?	2013
	pit		6V	41	102	2013
	pit		6V	41	104	2013
	pit		6V	41	114	2013
	pot		6V	41.13	120	2013
	pot		6V	41.16	98	2013
	pot		6V	41.19	122	2013
	pot		6V	41.20	123	2013
	pot		6V	41.21	115	2013
	pot		6V	41.31	107	2013
	pot		6V	41.32	119	2013
	pot		6V	41.33	118	2013
	pot		6V	41.34	113	2013
	pot		6V	41.35	106	2013
	pot		6V	41.36	117	2013
	pot		6V	41.38	110	2013
	pot		6V	41.43	112	2013
	pot		6V	41.46	108	2013
	pit		7V	108	101	2013
			7V	136	196	2014
			7V	139	198	2014
	pot		7V	144.2	195	2014

			7V	156	209	2015
			8K	273	23	2019
			8K	242		2019

APPENDIX II

12. PLANT DISTRIBUTION ACCORDING TO THE CONTEXTS IN KEY SITES

12.1. Barcın Höyük

Table 12.1: The plant distribution according to the contexts in Structure 25 in Phase VIe at Barcın Höyük.

The Distribution of Plant Groups in Phase VIe at Barcın Höyük									
Indoor Areas	Trench, locus, liters of soil, subphase	BA	HW (einkorn/ emmer)	HW-RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Structure 25									
layer below Δ698	M11, Δ699, 7.25 lt, VIe1	2.5	4.5	52	2	109			52
surface below Δ649	M11, Δ698, 6.75 lt, VIe2	1.5		0.5		6			1
basin bin cut by ditch Δ711	M11, Δ709, 2.1 lt, VIe2		0.5			1	0.5		
pyrotechnic feature contemp. Δ690	M11, Δ690, 9 lt, VIe2		0.5		1	2	0.5		7

Table 12.2: The plant distribution according to the indoor contexts in Structure 24 in Phase VIe at Barcın Höyük.

The Distribution of Plant Groups in Phase VIe at Barcın Höyük									
Indoor Areas (Northwest)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW-RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Structure 24 (middle of str?)									
layer ashy	L10, Δ442, 19 lt, VIe1		1	4		7			2
pyrotechnic feature in Δ442	L10, Δ446, 19 lt, VIe1		2			11	1.5		
surface white below Δ364	L10, Δ423, 8 lt, VIe1		10	9		11			
layer ashy same Δ332	L10, Δ364, 19 lt, VIe1	1	21	55		62	0.5		41, 40r ?
pyrotechnic feature in layer Δ364	L10, Δ378, 14 lt, VIe2	1	4	1		7			22
Structure 24 - Western side									
pyrotechnic feature	L10, Δ418, 4 lt, VIe1			5		4			37
surface white below Δ443	L10, Δ445, 10.5 lt, VIe1					4			
layer	L10, Δ443, 4.25 lt, VIe2						0.5		

below surf. Δ438 (str21)									

Table 12.3: The plant distribution according to the contexts in Structure 24 in Phase VIe at Barcın Höyük (continued).

The Distribution of Plant Groups in Phase VIe at Barcın Höyük									
Indoor Areas (Northwest)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW-RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Structure 24 – Northeast side									
pyrotechnic feature resemblance Δ378, Δ385, Δ386	L10, Δ417, 4 lt, VIe1					1			
layer below Δ355	L10, Δ416, 4 lt, VIe1	0.5				1			1
layer ashy and sandy	L10, Δ355, 28.5 lt, VIe2	4.5	18	279	1	71		3.5	73
Structure 24 - Northwest side									
pyrotechnic feature	L10, Δ407, 3.5 lt, VIe1	1				8			
ditch trench	L10, Δ412, 3.2 lt, VIe2	3	4.5	15		5			0.5
layer yellow	L10, Δ372, 2 lt, VIe2	1		0.5					3
pyrotechnic feature (indoor/outdoor?)	L10, Δ385, 4.24 lt, VIe2		1			4			

Table 12.4: The plant distribution according to the contexts in Structure 24 in Phase VIe at Barcın Höyük (continued).

The Distribution of Plant Groups in Phase VIe at Barcın Höyük									
Indoor Areas (Northwest)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW-RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Structure 24 - Southwest side									
layer black below str 2b layers	L10, Δ380, 7 lt, VIe2					3			
Structure 24 - Southern side									
surface grey/white below Δ374	L10, Δ389, 16 lt, VIe2	4.5	7	59		36			14
surface white possib. rela. Δ355	L10, Δ374, 16.25 lt, VIe2	0.5		0.5		4			14, 2r
pyrotechnic feature white ashy	L10, Δ386, 3 lt, VIe2								134 r?
pyrotechnic feature cuts Δ328, Δ331	L10, Δ326, 4 lt, VIe/VId1?		4.5	27	2	13			14
surface below str2b layers	L10, Δ324, 4 lt, VIe/VId1?	4							

Table 12.5: The plant distribution according to the contexts in front of the structures (south) in Phase VIe at Barcın Höyük.

The Distribution of Plant Groups in Phase VIe at Barcın Höyük									
Outdoor Area (in front of the structures)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW-RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
South of structures									
In front of structure 25?									
basin bin	M11, Δ446, 2 lt, VIe1	5	23	43	1, 1 rn	73			12.5
layer charcoal	M11, Δ657, 6 lt, VIe1	4.5	8	247		52	1		40
pyrotechnic feature white ashy in Δ657	M11, Δ691, 6.7 lt, VIe2	4	2			2			30
basin bin in Δ431	M11, Δ444, 0.25 lt, VIe1					2			
basin bin in Δ431	M11, Δ443, 0.10 lt, VIe1					1			
In front of structure 24									
pyrotechnic feature	M11, Δ430, 2 lt, VIe1	12	9	3	4	24		3.5	16
pyrotechnic feature white ash contemp. Δ685	M11, Δ700, 4 lt, VIe1		1						7

surface	M11, Δ685, 14.25 lt, VIe1	1	3.5	6		11			13.5
layer crumbly	M11, Δ683, 2 lt, VIe2		3	5		3			

Table 12.6: The plant distribution according to the context in the central courtyard of Phase VIe at Barcın Höyük.

The Distribution of Plant Groups in Phase VIe at Barcın Höyük									
Outdoor Area (Central courtyard)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW-RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
East side									
layer brown below Δ496	M10, Δ500, 6 lt, VIe1					4	1.5		
surface (N) bluish white possible relation Δ502	M10, Δ496, 5.4 lt, VIe1		12		16	25			
basin bin several white surfaces	M10, Δ501, 3 lt, VIe1					2			
surface (S) blueish white	M10, Δ502, 4.75 lt, VIe1		4			1			
layer (S)	M10, Δ497, 2 lt, VIe1								

Table 12.7: The plant distribution according to the context in the central courtyard of phase VIe at Barcın Höyük (continued).

The Distribution of Plant Groups in Phase VIe at Barcın Höyük									
Outdoor Area (Northernmost)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW-RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
West side									
surface white, ashy	M10, Δ515, 3.75 lt, VIe1		1			1	1		
surface multi-colored	M10, Δ511, 4.5 lt, VIe1			0.5		1			
layer partly reddish	M10, Δ512, 18.5 lt, VIe1		1			4	0.5		3.5
layer charcoaly, loamy, and clayey	M10, Δ510, 6.5 lt, VIe1	1		0.5	1	1			12r ?
surface (the southwest side of the outdoor area)	M10, Δ519, 11,5 lt, VIe1 (possible relation with Δ355, str24, L10)	1	3	0,5		4	0,5		1
Central courtyard (south)									
layer above virgin soil	L11, Δ647, 4 lt, VIe1								
surface white ashy below Δ636	L11, Δ637, 4 lt, VIe1								1?

basin bin ashy	L11, Δ635, 7.75 lt, VIe1	1.5	5.5	4	1	35	1		18
layer yellowish	L11, Δ636, 4 lt, VIe2			1					
pyrotechnic feature cut byΔ627, Δ630	L11, Δ632, 2 lt, VIe/VId1?		2	0.5					

Table 12.8: The plant distribution according to the contexts of the South Outdoor Area in Phase VIe at Barcın Höyük.

The Distribution of Plant Groups in Phase VIe at Barcın Höyük									
Outdoor Area **Southernmost**	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW-RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
The Midden Deposits in South									
exploratory_locus_sounding	L13, Δ261, 1.30 lt, VIe1						1		2
pit started top of Δ175	L13, Δ176, 50 lt, VIe1						1		
surface white plastered sealed by Δ174, probably seals Δ173	L13, Δ177, 6 lt, VIe2	1	2						
surface limy, plastered	L13, Δ174, 10 lt, VIe2	1	2		2	4			

below Δ171									
surface white, plastered lime below Δ170	L13, Δ171, 2 lt, VIe2		1				1		
surface white limy sealed by Δ163, cut by Δ162	L13, Δ170, 6 lt, VIe2					3		1.2	
surface sealed by Δ161, cut by Δ162, Δ166	L13, Δ163, 6 lt, VIe2					1			
layer cut by Δ160	L13, Δ161,4 lt, VIe2					1	2		
basin bin small and shallow sealed by Δ158	L13, Δ160, 3 lt, VIe2					4			
layer sealed by 153 and 156. seals 161 and 160	L13, Δ158, 12 lt, VIe/VId1?		3			1			

Table 12.9: The plant distribution according to the contexts of the Northernmost Outdoor Area in Phase VId1 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId1 at Barcın Höyük									
Outdoor Area (Northernmost)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW-RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
North									
basin bin partly white plastered built on post-hole Δ513	M10, Δ508, 5 lt, VId1 pre-fire		1			3			
pyrotechnic feature	M10, Δ490, 1 lt, VId1 pre-fire	1				2			
Annex									
surface Str 19/17 related below Δ414	M10, Δ426, 5.25 lt, VId1 pre-fire		1		2	8	0.5		2
pyrotechnic feature in Δ416	M10, Δ417, 1 lt, VId1 pre-fire		5						
surface white	M10, Δ416, 3 lt, VId1 pre-fire		3			2			6
surface	M10, Δ363, 1 lt, VId1 pre-fire								

Table 12.10: The plant distribution according to the contexts of Structure 19 in Phase VId1 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId1 at Barcın Höyük									
Indoor Areas (structures from the east to the west side)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW-RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Structure 19									
surface red	M11, Δ515, 3 lt, VId1 early 3 unburnt					2			
layer under Δ361, above red surface Δ515 assoc. Δ510	M11, Δ511, 5 lt, VId1 late 1 fill		1			3		0.2	
layer above red surface Δ515 assoc. Δ511	M11, Δ510, 12 lt, VId1 late 1 fill	0.2	12			5			0.5
surface thin layer ash sealed by Δ300	M11, Δ380, 2 lt, VId1 early 3 unburnt					2			
pyrotechnic feature in Δ359	M11, Δ360, 14.5 lt, VId1 early 3 unburnt	1				11			1
surface white-greyish-yellowish	M11, Δ355, 0.75 lt, VId1			1		3			

	early 3 unburnt								
layer	M11, Δ578, 4 lt, VId1 late 1 fill	1.5	1			3			
layer	M11, Δ549, 18.75 lt, VId1 late 1 fill	4	6.5	11		21	1		11.5
layer similar to Δ549	M11, Δ543, 2.25 lt, VId1 late 1 fill		0.5	3		4			

Table 12.11: The plant distribution according to the contexts of Structure 2a in Phase VId1 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId1 at Barcın Höyük									
Indoor Areas (structures from the east to the west side)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW-RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Structure 2a									
layer seals Δ439	M10, Δ438, 1 lt, VId1 late 1 fill layer								127
surface grey above surface Δ439 below fill layer Δ413	M10, Δ423, 2 lt, VId1 late 1 fill layer					2			

platform bench ledge above surface Δ439	M10, Δ427, 13.75 lt, VId1 late 3 burnt phase	40	65	11.5	161	27	88		32
surface burnt below burnt surface Δ372	M10, Δ411, 12.25 lt, VId1 late 3 burnt phase		1	2				4.2	115
layer southwest part	M10, Δ408, 5.25 lt, VId1 late 3 burnt phase		2	1		5	2	2	124
surface close to door	M10, Δ391, 11 lt, VId1 late 3 burnt phase		20	41	1	11	12	0.5	50
surface burnt stamped earth floor	M10, Δ290, 7.01 lt, VId1 late 3 burnt phase	4	10		8	5	3.5	15	26
platform bench ledge NE side, thin posts covered by a loam layer	M10, Δ261, 5 lt, VId1 late 3 burnt phase		2			2	0.5		51
basin bin might be wooden box against the partition wall 193	L10, Δ147, 5.5 lt, VId1 late 3 burnt phase	3	5	12	7	8	200 86		450
collapse	M10, Δ289, 2 lt, VId1		2	1		8		1.3	3

chunky S part	late 4 burnt collapse								
collapse	M10, Δ202, 8 lt, VId1 late 4 burnt collapse					1	2		
layer below Δ184	L10, Δ185, 5 lt, VId1 late 4 burnt collapse	18	193	103	11.5	68	8019	6	187

Table 12.12: The plant distribution according to the contexts of Structure 2b in Phase VId1 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId1 at Barcın Höyük									
Indoor Areas (structures from the east to the west side)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW-RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Structure 2b									
surface yellow-greyish beneath Δ294, Δ295	L10, Δ307, 4.75 lt, VId1 early		2			7	4.5		1.5
ditch trench beneath Δ193	L10, Δ342, 2.5 lt, VId1 early 2 construction				1	1	1		1
layer black ashy below Δ313	L10, Δ332, 1.5 lt, VId1 early 1 foundation	1	2			4			

surface white beneath Δ304	L10, Δ317, 12 lt, VId1 early 1 foundation								1
layer orange beneath Δ284	L10, Δ313, 18.75 lt, VId1 early 1 foundation	2	2.5		2.5	4			
surface white W side of Δ284	L10, Δ304, 5 lt, VId1 early 1 foundation		1	0.5	1	8	1		1
surface **Str?** white below Δ324, Δ346	L10, Δ353, 34 lt, VId1 early 1 foundation		3.5			5			
layer sealed by Δ266	L10, Δ273, 4 lt, VId1 late 1 fill layer		0.5			1			
layer	L10, Δ269, 2 lt, VId1 late 1 fill layer	1				2			
layer below yellow-reddish surface Δ152	L10, Δ208, 1 lt, VId1 late 1 fill layer					2			
Wall S wall yellow plaster	L10, Δ229, 4 lt, VId1 early 2 construction		1			5			2

pyrotechnic feature ashy-orangey bottom surface Δ324	L10, Δ330, 0.75 lt, VId1 pre-fire		0.5	1		2			65
surface below red surface Δ309	L10, Δ315, 4.5 lt, VId1 pre-fire						0.5	0.1	
surface red beneath Δ254	L10, Δ309, 5.25 lt, VId1 pre-fire					3			
surface south	L10, Δ274, 2 lt, VId1 pre-fire					1		2	1
basin bin center shallow, place for basket? within layer Δ284	L10, Δ289, 0.75 lt, VId1 early 3 unburnt phase	2	4	31		6			
basin bin center filled red pigment covered white plaster stops in layer Δ284	L10, Δ267, 3 lt, VId1 early 3 burnt phase	0.5		1		2	0.5		
surface center	L10, Δ238, 0.75 lt, VId1								

black	late 3 burnt phase								
basin bin white plaster crushed red stones in the bottom	L10, Δ232, 3.25 lt, VId1 late 3 burnt phase			1	2.5	2			1
pyrotechnic feature filled with stones and clay in Δ208	L10, Δ220, 6 lt, VId1 late 3 burnt phase		12	21					1
surface yellow plaster turns to reddish E of Δ123, Δ139, W of Δ131	L10, Δ152, 2 lt, VId1 late 3 burnt phase	0.5	1			2			
pyrotechnic feature center of Δ131	L10, Δ143, 7 lt, VId1 late 3 burnt phase	1	1			3	1		
pyrotechnic feature charcoal, burnt stones, bones	L10, Δ148, 3.5 lt, VId1 late 3 burnt phase				0.5	2			

Table 12.13: The plant distribution according to the contexts of Structure 21 in Phase VId1 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId1 at Barcın Höyük									
Indoor Areas (structures from the east to the west side)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Structure 21									
surface dirt walls Δ237 W wall Δ393	L10, Δ438, 6.5 lt, VId1 early 3 unburnt		2			3	1		4
pyrotechnic feature SE sits on Δ438	L10, Δ437, 1.75 lt, VId1 early 3 unburnt	2	4	1.5		8			11
layer W wall deposited on surface Δ393	L10, Δ435, 4 lt, VId1 early 3 unburnt					1			
layer black related oven Δ425	L10, Δ434, 0.75 lt, VId1 early 3 unburnt					2			
platform bench ledge wooden beams black const. layer below Δ421	L10, Δ426, 5.5 lt, VId1 late 2 refurbishment				2				

layer below Δ420	L10, Δ422, 4 lt, VId1 late 2 refurbishment	2		98		7			3
platform bench ledge wooden beams	L10, Δ420, 10.50 lt, VId1 late 2 refurbishment	2	1.5	14.5	10	1	0.5	1.1	13
collapse	L10, Δ383, 25 lt, VId1 late 4 burnt collapse	4	17	85	14	129	1.5	4.1	76
collapse wall collapse from 2b	L10, Δ222, 2.25 lt, VId1 late 4 burnt collapse					10			

Table 12.14: The plant distribution according to the contexts of Central Courtyard (East) in Phase VId1 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId1 at Barcın Höyük									
Outdoor Areas	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
East Courtyard									
layer related with Δ526	M11, Δ537, 2 lt, VId1 late 1 fill	1				2			
surface	M11, Δ532, 4.5 lt, VId1 burnt phase					2			
East Annex									
layer	M11, Δ563, 5,5 lt, VId1								

greenish below Δ560	early 1 foundation								
layer green-charcoal contemp. Δ563	M11, Δ557, 4,5 lt, VId1 early 1 foundation								
burial two babies	M11, Δ508, 0,5 lt, VId1 early					3	0.5		
layer north courtyard	M11, Δ579, 4 lt, VId1 late	2	3.5	0.5					
layer	M11, Δ500, VId1 later 1 fill layer		2	1					
layer south courtyard	M11, Δ417, 4 lt, VId1 late						1		

Table 12.15: The plant distribution according to the contexts of Central Courtyard (West) in Phase VId1 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId1 at Barcın Höyük									
Outdoor Areas	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
West Courtyard (in front of str 2b?)									
surface annex black below Δ319, Δ277	L10, Δ321, 11 lt, VId1 pre-fire	0.5	1.5	1		2			

collapse str 2b north annex? roof?	M10, Δ357, 4.5 lt, VId1 late 4 burnt collapse	8	60	93	116	154	22		188
collapse annex ashy burnt below Δ166	L10, Δ186, 22.75 lt, VId1 late 4 burnt collapse	11	19	26	2	32	4.5	3	4
Courtyard (in front of str 21)									
surface white	L11, Δ623, 6.5 lt, VId1 early		0.5		1	3			2.5
basin bin white surface south courtyard	L11, Δ579, 15.5 lt, VId1 early	5	3	0.5	9	25	4		84
surface	L11, Δ594, 2.25 lt, VId1 late		3	1.5		1			
layer str21	L10, Δ397, 3 lt, VId1 burnt phase			0.5					
layer underneath lime green	L11, Δ591, 4 lt, VId1 burnt phase	0.5				4			
surface black burnt, white	L11, Δ619, 11.5 lt, VId1 late	5	2.5	1	2	20	2		7.5
pyrotechnic feature	L11, Δ628, 1.5 lt, VId1	1		0.5					5

cuts Δ623	late 4 burnt collapse								

Table 12.16: The plant distribution according to the contexts of South Courtyard in Phase VId1 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId1 at Barcın Höyük									
Outdoor Areas (Southernmost)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
South courtyard									
surface S reddish below Δ497	L12, Δ497, 4.75 lt, VId1 early	4	2	1.5		23		0.1	9.5
surface blackish below Δ494	L12, Δ495, 2.75 lt, VId1 early	3	9	7	15	200	5		78
layer yellowish-sticky below wh. surf. Δ493	L12, Δ494, 3 lt, VId1 early	2		1.5	10	40	1.5		8
surface SE blackish-ashy below Δ484	L12, Δ485, 1.5 lt, VId1 early	11	3		4	65	0.5		64
pyrotechnic feature disturbs Δ481	L12, Δ483, 4.5 lt, VId1 early	3	15	1	12	42	9.5	0.5	5

pit mixed, yellowish cuts Δ473	L12, Δ482, 3,5 lt, VId1 early		2		1	8			2
surface SW red below Δ459	L12, Δ468, 5 lt, VId1 early	2	5		6	40	9		7
surface ashy below hutkom	L12, Δ475, 6 lt, VId1 late	5	13	3	19	200	3		6.5
surface partly white, partly blackish below Δ464	L12, Δ466, 6.25 lt, VId1 late	8.5	7.5	2.5	4	94	1		181
surface partly white, partly blackish below Δ462	L12, Δ465, 5 lt, VId1 late	3	17		1	23	2		76
surface ashy below Δ441	L12, Δ462, 6 lt, VId1 late	15.5	17	7	6	270	24		18
surface	L12, Δ459, 6.5 lt, VId1 late	11	33	1	15	200	8		9

Table 12.17: The plant distribution according to the contexts of South Courtyard in Phase VId1 at Barcın Höyük (continued).

The Distribution of Plant Groups in Phase VId1 at Barcın Höyük									
Outdoor Areas (Southernmost)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Southernmost courtyard									
surface pebbly around pit Δ255	L13, Δ257, 4 lt, VId1 early	1				7	2		
surface black goes to Δ255	L13, Δ256, 4 lt, VId1 early	2			2	4			
basin bin multiple surfaces	L13, Δ255, 25,5 lt, VId1 early	3.5	5		2	3	1	0.4	
basin bin sloping black surface	L13, Δ253, 4 lt, VId1 early		2			6			0.5
surface E white lime sealed by Δ153	L13, Δ156, VId1								
layer deposit seals Δ156	L13, Δ153, VId1				2				
burial	M13, Δ181, 5.25 lt, VId1				3		1		

Table 12.18: The plant distribution according to the contexts of north and central indoor and outdoor areas in Phase VId2 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId2 at Barcın Höyük									
Outdoor-Indoor Areas (structures from the east to the west side)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Courtyard (north)									
pyrotechnic feature	M10, Δ238, VId2					1	1 fab.		
Annex (north)									
surface	M10, Δ349, 1.5 lt, VId2	1				4			3
Indoor (east)									
layer last (earliest?) layer of str4?	M11, Δ490, 2, VId2	1	96			169	1		
Annex (southeast)									
pyrotechnic feature	M11, Δ414, 2 lt, VId2					3			
Indoor (west)									
surface W white plastered	L10, Δ199, 12,3 lt, VId2			1		10			3 2 fish
layer grey, patchy above Δ185 (VId1)	L10, Δ184, 10.5 lt, VId2	0.5				12			1

pyrotechnic feature predate of str15?	L10, Δ161, 7.5 lt, VId2	7	20	3	6	25	5	0.2	4.5
pyrotechnic feature S	L11, Δ615, 4 lt, VId2		1			5			2
Courtyard (west-central)									
layer 15-20 cm deep fill	L11, Δ610, 3.25 lt, VId2				2			0.5	
pyrotechnic feature	L11, Δ581, 1 lt, VId2					2	0.5		
layer S surfaces front N 27?	L11, Δ572, 0.75 lt, VId2	2				2			

Table 12.19: The plant distribution according to the contexts of central-southern outdoor areas in phase VId2 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId2 at Barcın Höyük									
Outdoor-Indoor Areas (structures from the east to the west side)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Courtyard (Central-South)									
surface red front of str22?	L12, Δ461, 2 lt, VId2 early	2	13	3	4	2			2.5

surface white below Δ345	L12, Δ443, 1.5 lt, VId2								0.5
surface white/grey below Δ435	L12, Δ436, 2.75 lt, VId2	1				8			
layer below Δ397	L12, Δ416, 3,5 lt, VId2			1					6
surface loam patches sealed by Δ149, seals Δ152	L13, Δ151, VId2 early				2	5	5		
other depression front into 2?	L13, Δ150, VId2 early	1	13		10	20	2		
surface front deposit 24?	L13, Δ146, 4 lt, VId2 early	1	7		21	73	7		3
surface	L13, Δ145, 3.5 lt, VId2 late					2	1		2
pyrotechnic feature contemp. Δ145	L13, Δ143, 3 lt, VId2 late					3			
pyrotechnic feature contemp. Δ141	L13, Δ142, 4 lt, VId2 late				1	0.5	1		2
surface	L13, Δ141, 10 lt, VId2 late					2			2

surface front top 26?	L13, Δ131, 17 lt, VId2 late					3	4		1
layer front this 24? below red s. Δ163	M13, Δ164, 4 lt, VId2 early			0.5		15			

Table 12.20: The plant distribution according to the contexts of north-central indoor and outdoor areas in Phase VId3 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId3 at Barcın Höyük									
Outdoor-Indoor Areas (structures from the east to the west side)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
North courtyard									
layer	M10, Δ236, VId3								
surface related with pyrotechnic activity	M10, Δ233, VId3					1			
Northern indoors									
surface red? str 10	M11, Δ378, VId3 early							122	
surface str 4	M11, Δ483, 0.5 lt, VId3								

wall str 4	M11, Δ367, VId3 early							10	
Northwest indoors									
ditch trench S wall of str 15 cut by S wall of str14	L10, Δ178, 1.25 lt, VId3		1	0.5		7			0.5
other chunk of mud str 15 related to Δ147 (VId1)?	L10, Δ145, 2.5 lt, VId3		1	1		6	101 lens		2
platform bench ledge str 15	L10, Δ135, 2 lt, VId3		2			1			
surface N front of L21?	L11, Δ558, 3 lt, VId3					1			1

Table 12.21: The plant distribution according to the contexts of the central-southern indoor area in Phase VId3 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId3 at Barcın Höyük									
Outdoor-Indoor Areas (structures from the east to the west side)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Central-South Indoor area (Trench L12)									
layer inside vessel	L12, Δ420, 1.5 lt, VId3				1	2	1 lens		5

str 22									
burial baby assoc. str 20	L12, Δ449, 3.25 lt, VId3								
surface white below Δ421 str 18	L12, Δ427, 9,5 lt, VId3		0.5	1	0.5	4	0.5		7.5
surface white str 18 below Δ415	L12, Δ421, 4 lt, VId3		1			3			
surface white str 18 exposed to Δ410	L12, Δ415, 8.5 lt, VId3	4.5	1	1		6			0.5
pyrotechnic feature str 18 below in NE of Δ415	L12, Δ422, 4 lt, VId3	4							1
layer str 18 below Δ406	L12, Δ410, 12 lt, VId3					2	2		2
pyrotechnic feature (north) str 18	L12, Δ409, 8 lt, VId3 (BH38221)	6	5	3	2	23	83	1	20

pyrotechnic feature str 18	L12, Δ409, 8 lt, VId3 (38227)		4				4		

Table 12.22: The plant distribution according to the contexts of the central-southern indoor and outdoor areas in Phase VId3 at Barcın Höyük.

The Distribution of Plant Groups in Phase VId3 at Barcın Höyük									
Outdoor-Indoor Areas (structures from the east to the west side)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Outdoor? South of Trench L12?									
layer white below Δ413	L12, Δ428, 2.5 lt, VId3					4			
surface pebble above Δ428	L12, Δ413, 4 lt, VId3								2
surface	L12, Δ404, 6 lt, VId3		1			2			1
layer	L12, Δ402, 0.75 lt, VId3								1
Southernmost area (Trench L13)									
pyrotechnic feature bottom 3-4 cm white plastered	L13, Δ137, 1.75 lt, VId3								

surface	L13, Δ123, 23.25 lt, VId3	1	1		2	2			4

Table 12.23: The plant distribution according to the contexts of North Outdoor and Indoor Areas in Phase VIc at Barcın Höyük.

The Distribution of Plant Groups in Phase VIc at Barcın Höyük									
Outdoor-Indoor Areas (from the E-W, N-S directions)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
North courtyard									
layer along E baulk	M10, Δ215, 13 lt, VIc1						1	Oak charc oal	2
surface seals by Δ187	M10, Δ214, 5.85 lt, VIc1					2			
layer	M10, Δ213, 22 lt, VIc2	2		6	4	8	4		5
surface extends to E bulk later of Δ214	M10, Δ208, 3.5 lt, VIc3								381
layer	M10, Δ187, 10 lt, VIc3					2			1
pit cuts surface Δ200	M10, Δ184, 23.5 lt, VIc3	1	3		1	2	6		7
Indoor									

pyrotechnic feature str 15	M10, Δ249, VIc1	2	2			7			
pyrotechnic feature str 9? possible relation Δ220 (VIb, str 1)	M10, Δ226, VIc3								

Table 12.24: The plant distribution according to the contexts of Central-South Outdoor and Indoor Areas in Phase VIc at Barcın Höyük.

The Distribution of Plant Groups in Phase VIc at Barcın Höyük									
Outdoor-Indoor Areas (from the E-W, N-S directions)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
Outdoor (central-eastern)									
burial	M11, Δ340, 2 lt, VIc					2			
pyrotechnic feature	M11, Δ325, VIc2								
pit	M11, Δ327, 4 lt, VIc3	1	5	1	6	30	2		42
layer grey surf. layer	M11, Δ302, 4 lt, VIb trans.				4				
Central-western area – front indoor? - south courtyard									
pyrotechnic feature assoc. S wall of str 14?	L10, Δ146, 2 lt, VIc1			0.5					2

pyrotechnic feature NE corner	L11N, Δ536, 0.5 lt, VIc1			0.5		4		4	5
pit ash	L11W, Δ553, 3 lt, VIc1	1			1	2			
surface white-greyish middle of tr. betw. Δ528-pebble Δ540	L11N, Δ535, 3 lt, VIc1				1	3	1	1	3
surface white/greyish	L11N, Δ528, 0.75 lt, VIc2								
pyrotechnic feature filled with yellow layer	L11S, Δ486, 3 lt, VIc2	1				4			
pyrotechnic feature contemp. pyro. Δ456	L11N, Δ530, 0.25 lt, VIc3	1				4	0.5	0.2	8
pyrotechnic feature	L11N, Δ456, 1.25 lt, VIc3			1		2			3
layer above white surf. Δ454	L11N, Δ423, 4 lt, VIc3					10			3
pyrotechnic feature	L11S, Δ479, 0.3 lt, VIc3								0.5

basin bin	L11W, Δ515, 2 lt, VIc3				1	5			2

Table 12.25: The plant distribution according to the contexts of South Outdoor and Indoor Areas in Phase VIc at Barcın Höyük.

The Distribution of Plant Groups in Phase VIc at Barcın Höyük									
Outdoor-Indoor Areas (from the E-W, N-S directions)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
South area									
other	L12, Δ390, 4.15 lt, VIc1	4	1.5	1		14	1.5	0.5	8.5
layer front 21?	L12, Δ383, 3 lt, VIc1					6			1
surface	L12, Δ382, 9 lt, VIc1	1	1	1		7			2
surface S pebble	L12, Δ379, 11.25 lt, VIc1	2			2	3	4.5		4.5
basin bin black surface with front oven 24?	L12, Δ376, 4 lt, VIc1					4			
surface slanting	L12, Δ367, 3 lt, VIc1					3			
surface sloping, white	L12, Δ355, 10 lt, VIc1					4			2

surface front no 22? below Δ327									
layer came down onto a white plant-material surface and changed to Δ355	L12, Δ327, 4 lt, VIc2			0.5		4			
layer about E-W part of wall Δ380	L12, Δ339, 4 lt, VIc2								
Southernmost									
surface	M13, Δ134, 4 lt, VIc3				3	10			
burial	L13, Δ130, 0.75 lt, VIc1								
layer small sequence of layers	L13, Δ105, 5.5 lt, VIc1					1	1		

Table 12.26: The plant distribution according to the contexts of North Area in Phase VIb at Barcın Höyük.

The Distribution of Plant Groups in Phase VIb at Barcın Höyük									
Outdoor-Indoor Areas (from the E-W, N-S directions)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
North courtyard									
surface	M10, Δ170, 2.5 lt, VIb1			0.5					

near to str 1? contemp. with Δ165									
surface contemp. with Δ170	M10, Δ165, 6 lt, VIb1			1	1	2			3
pyrotechnic feature multiple phases	M10, Δ133, 5.5 lt, VIb1	1				5	2		6
surface white, clayey	M10, Δ130, 7 lt, VIb1		1	3.5		5			5
pyrotechnic feature red burnt	M10, Δ121, 4 lt, VIb1								
layer **S** cleaning	M10, Δ140, 6 lt, VIb2		1		2	3			1
layer N cleaning	M10, Δ138, VIb2					3		1	7
layer above Δ120	M10, Δ119, 4.5 lt, VIb2	1					2		2
pyrotechnic feature below Δ110?	M10, Δ118, 5 lt, VIb1		7	4	5	30	5		51
layer	M10, Δ110, 5 lt, VIb2					2	1		2
Structure 1									

surface NW corner below Δ168	M10, Δ220, 3.25 lt, VIb1	8	1	12	1	39			12
layer fill layer above Δ220	M10, Δ168, 13.75 lt, VIb1	2	2	51	9 4 rn	70	2		11
layer top of ash surf. Δ210	M10, Δ144, 14 lt, VIb1	1	1	1		5			5
layer **room fill?**	M10, Δ103, VIb2	1		1					2

Table 12.27: The plant distribution according to the contexts of Central Area in Phase VIb at Barcın Höyük.

The Distribution of Plant Groups in Phase VIb at Barcın Höyük									
Outdoor-Indoor Areas (from the E-W, N-S directions)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
In front of str 2/11?									
layer W expose to Δ184	M11, Δ187, 4 lt, VIb1						1		
surface W-SW seals Δ187	M11, Δ184, 4 lt, VIb1		7			4	4		8
pyrotechnic feature NE	M11, Δ148, charcoal, VIb1								

pyrotechnic feature NE	M11, Δ142, charcoal, VIb2								
Structure 11									
ditch trench	M11, Δ303, 4 lt, VIb1			0.5		7	1		1
surface sealed by Δ109, Δ108	M11, Δ154, 12.60 lt, VIb2		1	3	5	2	1		5
layer different layers	M11, Δ108, 5.5 lt, VIb2		1		1				1
Outdoor									
surface against E wall of str 5	M11, Δ133, 6 lt, VIb2 and VIb3			1		2			
pit center of trench	M11, Δ132, VIb					2			
layer NW	M11, Δ117, 5 lt, VIb2	4	5	23	4	27	1		34
layer deposit, green color	M11, Δ106, 16 lt, VIb/a					5	1		6
pit	M11, Δ105, 6 lt, VIb		1	1					2

Table 12.28: The plant distribution according to the contexts of the Central Indoor Area in Phase VIb at Barcın Höyük.

The Distribution of Plant Groups in Phase VIb at Barcın Höyük									
Outdoor-Indoor Areas (from the E-W, N-S directions)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
pit **?**	L10, Δ107, 5.25, VIb		1.5	1		2	0.5		
Structure 5									
surface	L11, Δ343, VIb1	1			1	7	4	1	
pit	L11, Δ339, VIb2		2				1		
surface white, ashy	L11, Δ327, VIb2					1			
layer fill layer, mixed	L11, Δ312, (9 lots) VIb2		4		3	9	2.5		
surface SE corner related Δ157	L11, Δ321, VIb3				1		1		
pyrotechnic feature	L12, Δ157, 5 lt, VIb3		5	1		4			1

Table 12.29: The plant distribution according to the contexts of the Central Outdoor Area in Phase VIb at Barcın Höyük.

The Distribution of Plant Groups in Phase VIb at Barcın Höyük									
Outdoor-Indoor Areas	Trench, locus, liters of	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP

(from the E-W, N-S directions)	soil, subphase								
outdoor??									
layer **collapse**	L11, Δ275, 6 lt, VIb1	1	1	1	1	1	1		1
surface	L11, Δ277, 6 lt, VIb3		1			2		1	2
surface	L11, Δ270, 14 lt, VIb			2		4			5
layer	L11, Δ264, 5.5 lt, VIb		4	3		17	6		6
pit	L11, Δ263, 22 lt, VIb	4		0.5	1	30	87		36
layer	L11, Δ242, 19 lt, VIb	4	3	4	4	13	47		17
layer	L11, Δ238, 8 lt, VIb		2		1	9	1		1
pit	L11, Δ453, 4 lt, VIb			1	1	10	1		2
surface dark, grey, white	L11, Δ230, 5.5 lt, VIb3				1	1			1
collapse	L11, Δ212, 9 lt, VIb3					3			3
layer	L11, Δ218, 5 lt, VIb/a		1		1				1
pit	L12, Δ105, 5 lt, VIb					1		1	
surface	M12, Δ10, VIb1		1						

surface inside sherd family	M13, Δ170, 0.25 lt, VIb1								
wall str 12	M13, Δ45, 2.75 lt, VIb2					1			

Table 12.30: The plant distribution according to the contexts of Phase VIa at Barcın Höyük.

The Distribution of Plant Groups in Phase VIa at Barcın Höyük									
Outdoor-Indoor Areas (from the E-W, N-S directions)	Trench, locus, liters of soil, subphase	BA	HW (einkorn /emmer)	HW -RN	NW	Fragm. Wh/Ba	PU	O-GP	WP
layer	M11, Δ119, VIb/Va								
layer	M11, Δ71, 5 lt, VIa					0.5	1		
pit **NW corner**	L12, Δ189, 6 lt, VIa	1					1		
pit cuts pebbled-red loam area Δ379	L12, Δ185, VIa				1	1			
pit	L12, Δ170, 4.5 lt, VIa		0.5			2	2		1
pit	L12, Δ169, 6 lt, VIa					1	1		3
pit	L12, Δ163, 1.5 lt, VIa								
pit	L12, Δ160, VIa						2		

APPENDIX III

13.EXCEL WORKSHEETS SAMPLE BY SAMPLE OF THE SITES

13.1. Barcın Höyük

Table 13.1: Archaeobotanical investigation on per sample at Barcın Höyük.

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle
	BH NO	45912	45913	46248	46339	45903	45906	45908	46250	45639	45645	45640	45634	45643	45648	45449	45433	45436	46329	46350	45439	45410	45412	45259	46321	45260	44937	44940	46302	46359	44904	32461	46084	46082	46057	46052
	Trench	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10E	M11	M11	M11	M11
	Locus	523	523	523	523	519	519	519	519	516	515	515	512	512	512	512	512	512	512	512	511	510	510	502	502	501	500	500	497	496	491	325	746	745	742	740
	Lot																																			
	subphasing					Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle2	Vle1	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2
	str																									south courtyard							25	25	24
	Context	iry_locus_	iry_locus_	iry_locus_	iry_locus_	surface	surface	surface	surface	post_hole	surface	surface	layer	layer	layer	layer	layer	layer	layer	layer	surface	layer	layer	surface	surface	basin_bin	layer	layer	layer	surface	iry_locus_	post_hole	post_hole	post_hole	post_hole	post_hole
	Year	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2013	2015	2015	2015	2015
	GIA number																																			
	liter of soil	2.5	3.25	2	2.2	2.5	3	4	2	5	3.5	3.25	2.25	2.3	3.5	2	3	2	2	2	4.5	5	1.5	3.5	1.25	3	2	4	2	5.4	4.5	4	4.4	4.75	4	4
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK	1	3			2		2				1	2		1		1				1		1	1		2	2	2			1	4	1	1	1	
Hordeum vulgare	floret/fruit	1																																0.5		
Hordeum vulgare ssp. vulgare	fruit																																			
Hordeum vulgare ssp. vulgare	floret					1																1														
Hordeum vulgare	rachis node																																			
T. monococcum ssp. monococcum	fruit												0.5																				1			
T. cf. monococcum	fruit																																			
T.monococcum/dicoccum	fruit																																			
T.mono c2grained/dicoccum	fruit																																			
T. turgidum ssp. dicoccum	fruit						1	2				1							0.5					4						12	0.5	1		2.5		
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node																																			
T. monococcum/dicoccum	rachis node	0.5	0.5					0.5													0.5	0.5											1	2	0.5		
T. turgidum ssp. dicoccum	rachis-twisted																																			
T. turgidum ssp. dicoccum	rachis node																																			
Triticum	fruit																													25						
T. aestivum/durum	fruit																					1								16		1				
Triticum	rachis																																			
T. aestivum/durum	rachis																																			
Pulses																																				
Cicer arietinum	seed																																			
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed					0.5																						1.5							1	
cf. Lens	seed																																			
Pisum sativum	seed											1																								
Vicia ervilia	seed																																		1	
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																																			
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed																																			
Corylus avellana	fruit																																			
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed																																			
Amaranthus	seed																																			
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit									9r?		3r?										12r?												6r?		
Avena	fruit																																		0.5	
Bolboschoenum cf. glaucus	fruit																																			
Bolboschoenum cf. maritimus	fruit																																			
Boraginaceae	fruitlet																																			
Brassicaceae	seed																																			
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/Fruit																																			
cf. cephalaria	seed/Fruit																																			
Chenopodium cf. album	fruit				2																															
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																																			
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Ecballium	seed																																			
Echium vulgare	fruitlet																																			
Fabaceae	seed													0.5																						
Fallopia	fruit																																			
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet																																			
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit																																	2		
Nepta-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																																			
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. Lithos.	fruitlet																																			
cf. lolium	fruit																																			
Malvaceae	finslet																																			
cf. malva	finslet																																			
Medicago	finsit																																			
Onobrychis	finsit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	finsit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret													0.5				2														1	2			
Poaceae	RN																																			
Poaceae	Spike piece																																			
Poaceae	culm																																			
Polygonaceae	fruit					1				2r?		1r?	1																							
Polygonum	fruit																																			
Rosaceae	fruit																																			
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret																																			
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelvria media	seed																																			
Thymelaeaceae	fruit																										1									
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/Fruit																																			
Type 1-asteraceae? Recent?	seed/Fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/Fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit						1					2						3						1		1.5										
Other Remains																																				
Wood charcoal quantity		******	******		******	******	*****			*****	******		******		******	******	*****	*****	******	******	*****			****	*****	******		******	****	******	******	**	**	**	**	**
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores			50																																	
Animal Remains																																				
Animal bone																																1				
Dung																																				
Fish bone																																				
Mouse bone																																				

Table 13.1.1: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie	Vie
	BH NO	45999	45900	45899	45854	45519	45517	45350	45124	46360	46363	46341	46365	46320	46322	46323	45327	45123	45111	44995	46343	46348	46349	46344	46368	46340	45539	46324	45523	42536	37009	35630	35629	34902	37046	46289
	Trench	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	L10
	Locus	738	734	728	724	718	717	709	700	699	699	699	699	698	698	698	691	691	690	685	685	685	685	685	685	683	680	657	657	645	446	444	443	430	403	446
	Lot																														2703					
	subphasing	Vie2	Vie2	Vie2	Vie2	Vie2	Vie2	Vie2	Vie1	Vie1	Vie1	Vie1	Vie1	Vie2	Vie2	Vie2	Vie2	Vie2	Vie2	Vie1	Vie1	Vie1	Vie1	Vie1	Vie1	Vie2	Vie2	Vie1	Vie1	Vie2	Vie1	Vie1	Vie1	Vie1	Vie2	Vie1
	str	2S	2S	2S	24	2S	2S	2S		2S	2S	2S	2S	2S	2S	2S	24	24	2S	?	?	?	?	?	?	24	24									
	Context	post_hole	post_hole	post_hole	post_hole	post_hole	post_hole	basin_bin	echnic_fe	layer	layer	layer	layer	surface	surface	surface	echnic_fe	echnic_fe	echnic_fe	surface	surface	surface	surface	surface	surface	surface	layer	post_hole	layer	layer	ry_locus_	basin_bin	basin_bin	basin_bin	echnic_fe	layer	echnic_fe
	Year	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2014	2013	2013	2013	2013	2013	2015
	GIA number																																			
	liter of soil	3.8	3.75	4.5	3.65	4	4	2.1	4	2	2	1.25	2	2.5	2	2.25	4	2.7	9	4.25	2	2	2	2	2	2	1	2	4	4	2	0.25	0.1	2	2	7.7
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK	2		3	11		1	1		30		75	4	2	3	1			2	2	8		1			3	1	2	50		70	2	1	24	15	4
Hordeum vulgare	floret/fruit				1								0.5	1			4																			
Hordeum vulgare ssp. vulgare	fruit																																			
Hordeum vulgare ssp. vulgare	floret	1										2		0.5							1								4.5		5			12	8	
Hordeum vulgare	rachis node																																			
T. monococcum ssp. monococcum	fruit				1				1				0.5								2.5					3		5	3		11			1		
T. cf. monococcum	fruit																																			
T. monococcum/dicoccum	fruit							0.5																												
T.mono c2grained/dicoccum	fruit																																			
T. turgidum ssp. dicoccum	fruit									2		2					2		0.5	1				1					3	2	12			8	3	
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node																												21							
T. monococcum/dicoccum	rachis node				3					32		19	1			0.5					6					5		4	222		43			3	3	
T. turgidum ssp. dicoccum	rachis-twisted																																			
T. turgidum ssp. dicoccum	rachis node																																			
Triticum	fruit											0.5					2														3				2	
T. aestivum/durum	fruit									1									1								2				1			4		
Triticum	rachis																																			
T. aestivum/durum	rachis											1																			1					
Pulses																																				
Cicer arietinum	seed																																			
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed						0.5																					1								
cf. Lens	seed																																			
Pisum sativum	seed																																			
Vicia ervilia	seed						1	0.5											0.5																	0.5
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																																			
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed																																	2.5		
Corylus avellana	fruit																																	1		
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed																																			
Amaranthus	seed																																			
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit																																			
Avena	fruit																											2								
Bolboschoenum cf. glaucus	fruit																																			
Bolboschoenum cf. maritimus	fruit																																			
Boraginaceae	fruitlet																																			
Brassicaceae	seed																																			
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit				1										1		24		5	9														5		
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																																			
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet											3					1														0.5					
Fabaceae	seed									0.5		4																	3		1			1		
Fallopia	fruit								4																											
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet																		2																2	
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit			1								15																	2.5					9		
Nepta-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																																			
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. Lithos.	fruitlet																																			
cf. lolium	fruit																																			
Malvaceae	fruitlet																																			
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret				1	1			3	2							3.5				4	0.5							32.5						5	
Poaceae	RN																														11					
Poaceae	Spike piece																																			
Poaceae	culm																																			
Polygonaceae	fruit																1																			
Polygonum	fruit																																			
Rosaceae	fruit																																			
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret											27																								
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelleria media	seed																																			
Thymeleaeceae	fruit																																	1		
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit				2				2								2		10	4									10		2			2		
Other Remains																																				
Wood charcoal quantity		****	**	*	***	**	**	***	***	**	****	**	**	****	*****	**	*****	**	*******	*******	**	***	****	*****	***		**	****	***	***		*	*	******	*	****
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone																																				
Dung																																				
Fish bone																																				
Mouse bone																																				

Table 13.1.2: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle
	BH NO	46294	46436	46282	46509	46508	46514	46518	46266	46271	46511	46512	46517	46127	46312	46313	46314	45952	46247	46249	46304	45767	45766	45758	45760	45480	45671	45673	45670	45665	46333	46338	46246	45080	46372	46373
	Trench	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10
	Locus	446	446	445	445	445	445	445	444	443	442	442	442	433	423	423	423	423	423	423	423	418	417	416	412	407	404	403	402	401	389	389	389	389	389	389
	Lot																																			
	subphasing	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle2	Vle2	Vle1	Vle1	Vle1	Vle2	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle2	Vle1	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2
	str													24													24	24	24	24	24	24	24	24	24	24
	Context	echnic_fe	echnic_fe	surface	surface	surface	surface	surface	tch_trenc	layer	layer	layer	layer	post_hole	surface	surface	surface	surface	surface	surface	surface	echnic_fe	echnic_fe	layer	tch_trenc	echnic_fe	post_hole	post_hole	post_hole	post_hole	surface	surface	surface	surface	surface	surface
	Year	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
	GIA number																																			
	liter of soil	6	5.25	5.25	1.25	1.25	1.5	1.5	2	4.25	**	1	2	4.5	1.5	1	1	2	1.5	1	1	4	4	4	3.2	3.5	3.25	4	3.25	4.25	2	2	2	4	2	2
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK	4	3	1		2	1				1	2	4		4	2	1		2	1	1	4	1	1	5	5	3	1		1	13		13	8	1.5	
Hordeum vulgare	floret/fruit																								3											
Hordeum vulgare ssp. vulgare	fruit																									1										1
Hordeum vulgare ssp. vulgare	floret																							0.5									0.5		1	2
Hordeum vulgare	rachis node																																			
T. monococcum ssp. monococcum	fruit												1		1			0.5							2.5						2			1		1
T. cf. monococcum	fruit																																			
T. monococcum/dicoccum	fruit																			0.5																
T.mono-Cigrained/dicoccum	fruit																																			
T. turgidum ssp. dicoccum	fruit	2													1			6	1						2		1	1.5	1				3			
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node																																			
T. monococcum/dicoccum	rachis node											1.5	2.5		0.5	3	1.5	2.5		1.5		5			15						43	1		13.5		
T. turgidum ssp. dicoccum	rachis-twisted																																			
T. turgidum ssp. dicoccum	rachis node																																			
Triticum	fruit																																			
T. aestivum/durum	fruit																																			
Triticum	rachis																									3										
T. aestivum/durum	rachis																																			
Pulses																																				
Cicer arietinum	seed																																			
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed								1	0.5																				1						
cf. Lens	seed																																			
Pisum sativum	seed																																			
Vicia ervilia	seed	1																											1							
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																																			
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed																																			
Corylus avellana	fruit																																			
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed																																			
Amaranthus	seed																					5														
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit																																			
Avena	fruit												1									0.5														
Bolboschoenus cf. glaucus	fruit																																			
Bolboschoenus cf. maritimus	fruit																																			
Boraginaceae	fruitlet																																			
Brassicaceae	seed																																	7		
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																					1														
cf. cephalaria	seed/fruit																																			3
Chenopodium cf. album	fruit												0.5									3														
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																																			
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet																																			
Fabaceae	seed																																	1		
Fallopia	fruit																																			
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet																																			
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit																																	1		2
Nepta-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																																			
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. Lithos.	fruitlet																																			
cf. lolium	fruit																																			
Malvaceae	fruitlet																																			
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret										0.5			0.5											0.5					1				5		3
Poaceae	RN																																			
Poaceae	Spike piece																																			
Poaceae	culm																																			
Polygonaceae	fruit																																			
Polygonum	fruit																																			
Rosaceae	fruit																							1?foto												
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret																					27														
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelleria media	seed																																			
Thymeleaeceae	fruit																																			
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1 -sideraceae? Recent?	seed/fruit																												82							
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit										5	2				2		1			1	9							2.5				2			
Other Remains																																				
Wood charcoal quantity		******	*****	****	**	**	***	****	*	****	**	*	*	**	*	*	*	**	*	*	*	****	****	***	*	**	**		***	**	***	**	**	**	*		
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone																																				
Dung										1																										
Fish bone																																				
Mouse bone							5																													

Table 13.1.3: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle	Vle
	BH NO	46317	45453	45663	45078	45205	46351	46364	46355	44897	44710	44711	44717	45207	46330	46332	46352	44856	46369	46371	46337	44860	45759	46318	46327	46303	46307	46308	46309	46347	46353	46356	46358	46366	44683	44685
	Trench	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10
	Locus	389	388	388	386	385	380	380	380	380	378	378	378	378	374	374	374	374	374	374	372	364	364	364	364	364	364	364	364	355	355	355	355	355	355	355
	Lot																																			
	subphasing	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle1	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2	Vle2
	str	24	24	24			24	24	24	24					24	24	24	24	24	24	24									24	24	24	24	24	24	24
	Context	surface	post_hole	post_hole	achnic_fe	achnic_fe	layer	layer	layer	layer	achnic_fe	achnic_fe	achnic_fe	achnic_fe	surface	surface	surface	surface	surface	surface	layer	layer	layer	layer	layer	layer	layer	layer	layer	layer	layer	layer	layer	layer	layer	layer
	Year	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015
	GIA number																																			
	liter of soil	2	5	4.5	3	4.25	2	2	2	1	2.35	5	2.5	4	2.75	2.5	2.5	4	2	2.5	2	5.25	3.75	2	2	2	2	2	2	2	2	2.5	2	1	6	6.5
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK		3	1		4		1		2	1	2		4	2	1		1					2	1	4	4		40	2		2	1	1		50	13
Hordeum vulgare	floret/fruit																				1								0.5				1.5			2
Hordeum vulgare ssp. vulgare	fruit																																			
Hordeum vulgare ssp. vulgare	floret											1							0.5							0.5									1	
Hordeum vulgare	rachis node																																			
T. monococcum ssp. monococcum	fruit					1								2											3	2	0.5	4	1					3	4
T. cf. monococcum	fruit																																			
T. monococcum/dicoccum	fruit																																			
T.mono c2grained/dicoccum	fruit																																			
T. turgidum ssp. dicoccum	fruit													2								2	1		2		1	3.5	1					11	
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node																							1												10.5
T. monococcum/dicoccum	rachis node	1.5												1	0.5									11	23.5	3		12			2			128.5	138
T. turgidum ssp. dicoccum	rachis-twisted																																			
T. turgidum ssp. dicoccum	rachis node																						4.5													
Triticum	fruit																																			
T. aestivum/durum	fruit																																			
Triticum	rachis		2																		0.5							9							
T. aestivum/durum	rachis																																		1	
Pulses																																				
Cicer arietinum	seed																																			
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed																							0.5												
cf. Lens	seed																																			
Pisum sativum	seed																																			
Vicia ervilia	seed																																			
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																																			
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed																																			
Corylus avellana	fruit																																			
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed																						1													
Amaranthus	seed																																			
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit		6r?															7					17													
Avena	fruit																								1									0.5		
Bolboschoenum cf. glaucus	fruit																																			
Bolboschoenum cf. maritimus	fruit																																			
Boraginaceae	fruitlet																																			
Brassicaceae	seed																	2																2	13
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit		3									7	12								1			1	2			6						2	9
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																																			
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet																																	1		
Fabaceae	seed											1											1													
Fallopia	fruit																			1																
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																2r																			
Galium	fruitlet																																			
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit			1											0.5								2													2
Nepta Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																																			
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. Lithos.	fruitlet																																			
cf. lolium	fruit																																			
Malvaceae	fruitlet																																			
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret		3.5											2	3					0.5	2			20											1	
Poaceae	RN																																			
Poaceae	Spike piece																																			
Poaceae	culm																																			
Polygonaceae	fruit																																			
Polygonum	fruit																																			
Rosaceae	fruit																																			
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret																							6	1											
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelaria media	seed																																			
Thymelaeaceae	fruit																																		1	
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit				134																							40								
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit		1									1		1	1						3		4	3		5	6	5	3					4	
Other Remains																																				
Wood charcoal quantity		***	**	*	***	**	***	***	****	**	*	**	*	*	****	****	*****	*****	****	*****	****	*******	**	**	*	**	**	*	*	**	**	**	**	****		
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone																																				
Dung																																				
Fish bone																																				
Mouse bone																																				

Table 13.1.4: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe	VIe
	BH NO	44691	44708	43137	43147	46310	46311	45740	46346	46370	46316	46326	46328	46334	45380	45555	46325	45019	36995	12695	17991	17999	18471	18856	17588	17589	17594	17979	17599	17592	17700	17913	16955	16395	16302	15185
	Trench	L10	L10	L10	L10	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	M13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13
	Locus	355	355	326	324	655	655	649	647	647	637	637	636	636	635	635	635	632	182	261	177	177	177	176	174	174	174	174	174	171	170	170	170	163	161	160	158
	Lot																			132	483	487	483	501	474			478	464	460	461	461	448	433			392
	subphasing	VIe2	VIe2	VIe3	VIe3	VIe1	VIe1	VIe1	VIe1	VIe1	VIe1	VIe1	VIe2	VIe2	VIe1	VIe1	VIe1	VIe3	VIe2	VIe1	VIe2	VIe2	VIe2	VIe1	VIe2	VIe2	VIe2	VIe2	VIe2	VIe2	VIe2	VIe2	VIe2	VIe2	VIe2	VIe3
	str	24	24																																	
	Context	layer	layer	echnic_fe	surface	virgin_soil	virgin_soil	post_hole	layer	layer	surface	surface	layer	layer	asin_bin	basin_bin	basin_bin	echnic_fe	layer	ry_locus_	surface	surface	surface	pit	surface	surface	surface	surface	surface	surface	surface	surface	surface	surface	layer	basin_bin	layer
	Year	2015	2015	2014	2014	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2013	2010	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011
	GIA number																			35126																
	liter of soil	4	2.5	4	4	1	0.75	3.25	2	2	2	2	2	2	3	2.75	2	2	4	1.3																
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK	2	2	13	4										18	15	2	2	4						2	2			1		2	1	1	4	1
Hordeum vulgare	floret/fruit																																			
Hordeum vulgare ssp. vulgare	fruit																																			
Hordeum vulgare ssp. vulgare	floret															0.5	1				1					1										
Hordeum vulgare	rachis node																																			
T. monococcum ssp. monococcum	fruit			4.5											2														1							
T. cf. monococcum	fruit																																			
T. monococcum/dicoccum	fruit																	2																		
T.mono-c2grained/dicoccum	fruit																																			
T. turgidum ssp. dicoccum	fruit														1	1	1.5		1		1		1				1	1							1	
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node																																			
T. monococcum/dicoccum	rachis node			27									1		3	1		0.5																		
T. turgidum ssp. dicoccum	rachis-twisted																																			
T. turgidum ssp. dicoccum	rachis node																																			
Triticum	fruit																																			
T. aestivum/durum	fruit			2											1										1			1								
Triticum	rachis																																			
T. aestivum/durum	rachis																																			
Pulses																																				
Cicer arietinum	seed																																			
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed															1																				
cf. Lens	seed																																			
Pisum sativum	seed																																			
Vicia ervilia	seed																			1									1							
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																							1										2	17	
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed		3.5																																	
Corylus avellana	fruit																															1	0.2			
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed																																			
Amaranthus	seed																																			
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit		397																																	
Avena	fruit															1																				
Bolboschoemum cf. glaucus	fruit																																			
Bolboschoemum cf. maritimus	fruit																																			
Boraginaceae	fruitlet																1																			
Brassicaceae	seed							3r																												
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit														1																					
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																																			
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet																																			
Fabaceae	seed			1.5																																
Fallopia	fruit		3													1																				
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet																																			
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit			11																																
Nepta-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																																			
Lithospermum tenuiflorum	fruitlet																																			
Buglosseides arvensis syn. Lithos.	fruitlet																																			
cf. lolium	fruit																																			
Mahaceae	fruitlet																																			
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret			2											2	10	0.5			2																
Poaceae	RN																																			
Poaceae	Spike piece																1																			
Poaceae	culm																																			
Polygonaceae	fruit																																			
Polygonum	fruit														1																					
Rosaceae	fruit																																			
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret															1																				
Silene	seed											17																								
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelleria media	seed																																			
Thymeleaeceae	fruit																																			
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit		8	4				1						1		2	1					1		1								1				
Other Remains																																				
Wood charcoal quantity		*******		***	***	*	*	*****	*	****	****	****	**	***	****	****	**		****																	
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone																			1																	
Dung																																				
Fish bone																																				
Mouse bone					16																															

Table 13.1.5: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vle	Vle/Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1
	BH NO	15863	3555	45406	45411	43902	41358	40999	41000	41101	41119	40995	40996	40997	41102	40756	40757	41123	41698	40800	36632	40168	40952	36346	36345	46331	36942	35700	33850	33396	35413	36609	40956	36610	40529	12330
	Trench	L13	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10
	Locus	158	77	508	508	490	438	427	427	427	427	426	426	426	423	417	416	411	411	408	391	391	391	380	380	376	363	357	357	357	290	290	290	289	261	202
	Lot	408	288					ear of emmer																							1584	1643				816
	subphasing	Vle3	Vld1 pre-fir	Vld1 pre-fir	Vld1 pre-fir	Vld1 pre-fir	late 1 fill	Vle 3 burnt phase			Vld1 pre-fir	Vld1 pre-fir	Vld1 pre-fir	late 1 fill	Vld1 pre-fir	Vld1 pre-fir	Vld1 pre-fir	te 3 burnt	te 3 burnt	te 3 burnt	te 3 burnt	te 3 burnt	te 3 burnt	te 3 burnt	te 3 burnt	rly 2 const	Vld1 pre-fir	4 burnt ce	4 burnt ce	4 burnt ce	te 3 burnt	te 3 burnt	te 3 burnt	4 burnt c	te 3 burnt	te 4 burnt c
	str			annex	annex		2a	2a	2a	2a	2a	Annex	Annex	Annex	2a	Annex	Annex	2a	2a	2a	2a	2a	2a	2a	19	19	2a	Annex	Annex	Annex	Annex	2a	2a	2a	2a	2a	2a
	Context	layer	exploratory ex. trench	basin_bin	basin_bin	ichnic_fe	layer	m_bench	m_bench	m_bench	m_bench	surface	surface	surface	surface	ichnic_fe	surface	m_bench	m_bench	layer	surface	surface	surface	surface	surface	surface	wall	surface	collapse	collapse	collapse	surface	surface	surface	collapse	m_bench	collapse
	Year	2011	2007	2015	2015	2015	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2013	2014	2014	2013	2013	2015	2013	2013	2013	2013	2013	2013	2014	2013	2014	2010
	GIA number		35005																																	35058
	liter of soil		4.5	3.75	1.25	1	1	0.25		9	3.25	1.25	2	2	2	1	3	6	6.25	5.25	4	5	2	1	1	2.2	1	2.5	2	2	5	0.1	2	2	5	8
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK		4	2	1	2		2			25	4	2	2	2		2			5	9		2		2	1		150	4		3	2		8	2	1
Hordeum vulgare	floret/fruit					1																														
Hordeum vulgare ssp. vulgare	fruit									1																										
Hordeum vulgare ssp. vulgare	floret							5.5		14	20																	6	2		3	1				
Hordeum vulgare	rachis node									7																		5								
T. monococcum ssp. monococcum	fruit									8	8		0.5			5				2	6							18			3	3		2	2	
T. cf. monococcum	fruit									6																										
T. monococcum/dicoccum	fruit																																			
T.mono c2grained/dicoccum	fruit									9																										
T. turgidum ssp. dicoccum	fruit	3		1				20			6	0.5					3		1		13	1						41	1		2	2			2	
T. turgidum ssp. dicoccum	rachillate spikelet								7																											
T. monococcum ssp.monococcum	rachis node																			1																
T. monococcum/dicoccum	rachis node									95	15										41							88	5					1		
T. turgidum ssp. dicoccum	rachis-twisted									2																										
T. turgidum ssp. dicoccum	rachis node							0.5											2																	
Triticum	fruit							8		50			1																1							
T. aestivum/durum	fruit							19		34	50		1								1							115			2	6				
Triticum	rachis																		2									1								
T. aestivum/durum	rachis																																			
Pulses																																				
Cicer arietinum	seed																					2														
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed									2										2	5	1				0.5		3				1				
cf. Lens	seed																																			
Pisum sativum	seed									2																										
Vicia ervilia	seed									21.5	2.5			0.5							6							19			2.5				0.5	2
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed									60																										
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed																														3		8	1		
Corylus avellana	fruit																	0.2	4	2	0.5											4		0.3		
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed									2								8		1																
Amoranthus	seed																																			
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit																			5r?																
Avena	fruit																			1																
Bolboschoenum cf. glaucus	fruit																				1							9								
Bolboschoenum cf. maritimus	fruit																																			
Boraginaceae	fruitlet																4.5		1																	
Brassicaceae	seed																									1										
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																				3							1								
Carex cf. divulsa	fruit																											29								
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit																		20									4			9					
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																		12																	
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																											1								
Cyperus cf.	fruit																											1								
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet																																			
Fabaceae	seed												1				1											5								
Fallopia	fruit							1													6	3													20	
cf. Ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet																		1			1													21	
Galium aparine	fruitlet																																			
Geranium	seed																											1								
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit									15	6								1															3		
Nepta-Ocimum	fruit																				10							127								
Lamiaceae	fruit/seed																			5?																
Lepidium	seed																																			
Lithospermum	fruitlet						127																								9r?					
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. Lithos.	fruitlet																																			
cf. lolium	fruit																																			
Malvaceae	fruitlet																		1		14														4	
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																											5								
Phaloris	fruit/floret																				1							1								
cf. plantago	seed																																			
Poaceae	fruit/floret										2		1						1	35		1									4				6	
Poaceae	RN																																			
Poaceae	Spike piece																																			
Poaceae	culm																																			
Polygonaceae	fruit									4	3								3	2						1					3		1			
Polygonum	fruit																	4		1		1														
Rosaceae	fruit																																			
Rumex	fruit																		12									4								
Sambucus nigra?	fruit																																			
Setaria pumila	floret																																			
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelleria media	seed																																			
Thymeleaeaceae	fruit																																			
T. monococcum ssp. aegilopoides	fruit								1												1.5															
Triticum	culm									1																										
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																					30														
Type 2	fruit																			1																
Type 3 -Cyperaceae?	seed/fruit																		50	50	7															
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit		2					4					5						14	28		2				1			2		2	1	3	9	1	1
Other Remains																																				
Wood charcoal quantity				****	*****		****		*****	*******	*	*	*	**		****			****	*****	**	***	*	**	*****	*	***	****	***	*	****	*******	***	**		
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone											6			2	4				5														5			
Dung																		oat5	1																	
Fish bone													1				1																			
Mouse bone																															3	41			2	

Table 13.1.6: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	**Vld1**	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1
	BH NO	40890	40866	40870	39040	40590	40592	41449	40860	40862	40863	40864	40004	39246	39213	39221	41330	**39436**	38935	38950	38461	42523	38930	34467	38478	38480	28743	46382	46501	46503	46504	46506	46510	46505	45841	46140
	Trench	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**M11**	**L10**	**L10**	**L10**	**L10**	**L10**	**L10**	**L10**	**L10**	**L10**
	Locus	**579**	**578**	**578**	**563**	**563**	**563**	**557**	**549**	**549**	**549**	**549**	**543**	**537**	**532**	**532**	**515**	**511**	**510**	**510**	**508**	**507**	**500**	**417**	**360**	**360**	**355**	**438**	**438**	**438**	**438**	**438**	**438**	**437**	**435**	**434**
	Lot																					complete hazel	chs													
	subphasing	Vld1 late	late 1 fill	late 1 fill	arly 1 fourir	rly 1 fourir	rly 1 fourir	rly 1 four	late 1 fill	late 1 fill	late 1 fill	late 1 fill	late 1 fill	late 1 fill	burnt p	burnt ply	3 unbur	**late 1 fill**	late 1 fill	late 1 fill	Vld1 early	arly 2 constr	late 1 fill	Vld1 late	te 3 burnt	te 3 burnt	te 3 burnt	y 3 unbur	y 3 unbur	y 3 unbur	y 3 unbur	y 3 unbur	y 3 unbur	y 3 unbur	y 3 unbur
	str	rth courtyd	19	19	Annex	Annex	Annex	Annex	19	19	19	19	19				19	**19**	19	19	Annex	19	Annex	ith courtyd	19	19	19	21	21	21	21	21	21	21	21
	Context	layer	layer	layer	layer	layer	layer	layer	layer	layer	layer	layer	layer	layer	surface	surface	surface	**layer**	layer	layer	burial	wall	layer	layer	echnic_fe	echnic_fe	surface	surface	surface	surface	surface	surface	surface	echnic_fe	layer	layer
	Year	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	**2014**	2014	2014	2014	2014	2014	2013	2014	2014	2013	2015	2015	2015	2015	2015	2015	2015	2015	2015
	GIA number																																			
	liter of soil	4	4	4	2	2	1.5	4.5	5.25	6	4.5	3	2.25	2	2.5	2	3	**5**	6	6	0.5			4	7.25	7.25	0.75	3	1.5	2	1.25	1.5	2	1.75	4	0.75
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK			3				4	2	15	2	2		2	2		2	**3**	3	2	3					11	3		2		1			8	1	2
Hordeum vulgare	floret/fruit	2																																		
Hordeum vulgare ssp. vulgare	fruit																																			
Hordeum vulgare ssp. vulgare	floret		1	0.5				1		2.5	0.5	1							0.2							1								2		
Hordeum vulgare	rachis node																																			
T. monococcum ssp. monococcum	fruit	1.5								1.5									3															2		
T. cf. monococcum	fruit																																			
T. monococcum/dicoccum	fruit			1						1									7	2																
T.mono c2grained/dicoccum	fruit																																			
T. turgidum ssp. dicoccum	fruit	2	1					2		2	0.5	1.5	0.5					**1**					2					1		1				2		
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node																																			
T. monococcum/dicoccum	rachis node	0.5						1.5	0.5	8	0.5	2	3										1				1							1.5		
T. turgidum ssp. dicoccum	rachis-twisted																																			
T. turgidum ssp. dicoccum	rachis node																																			
Triticum	fruit												4																							
T. aestivum/durum	fruit																																			
Triticum	rachis																																			
T. aestivum/durum	rachis																																			
Pulses																																				
Cicer arietinum	seed																																			
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed							1													0.5															
cf. Lens	seed																																			
Pisum sativum	seed																																			
Vicia ervilia	seed							0.5		1														1				1								
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																																			
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed							3																												
Corylus avellana	fruit																	**0.2**				17														
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed																																			
Amaranthus	seed																																			
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit																																			
Avena	fruit																																			
Bolboschoenum cf. glaucus	fruit																																			
Bolboschoenum cf. maritimus	fruit																																			
Boraginaceae	fruitlet																																			
Brassicaceae	seed																																			
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit																																			
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																																			
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet																																			
Fabaceae	seed																																			
Fallopia	fruit																																			
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet																																			
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit									0.5		2		1					0.5															11		
Nepta-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																																			
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. Lithos.	fruitlet																																			
cf. lolium	fruit																																			
Malvaceae	fruitlet																																			
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret								1	8																1							4			
Poaceae	RN																																			
Poaceae	Spike piece																																			
Poaceae	culm																																			
Polygonaceae	fruit																																			
Polygonum	fruit																																			
Rosaceae	fruit																																			
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret																																			
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelleria media	seed																																			
Thymelaeaceae	fruit																																			
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit								1										2	1		1	1													
Other Remains																																				
Wood charcoal quantity		***	***	**	**	****	*	******	****	****	**	***	**	**	**	*	*	***	**	***	*			**	*****	****	**	***	**	**	**	*	**	*	***	*
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone					1		2		2	3		1	4		10																					
Dung																																				
Fish bone																																				
Mouse bone								4										**4**	1																	

Table 13.1.7: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1
	BH NO	45976	46301	45951	46515	46516	45944	46305	46306	46315	46345	45230	44880	44890	44895	45234	45491	46319	46342	46357	46361	44132	44268	44274	46336	43256	43258	42906	42670	44490	44497	42482	42674	42914	43111	43249
	Trench	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10
	Locus	426	426	423	422	422	420	420	420	420	400	397	383	383	383	383	383	353	353	353	353	353	353	353	342	332	330	321	321	317	317	315	313	313	313	313
	Lot																																			
	subphasing	e 2 refurbi	te 2 refurbis	Vie	e 2 refurbi	2 refurbi	2 refurbi	2 refurbi	e 2 refurbi	e 2 refurbishment	Vid1 burnt pha	e 4 burnt cr	te 4 burnt cr	te 4 burnt cr	e 4 burnt cr	e 4 burnt cr	e 4 burnt cr	rly 1 fourt	rly 1 fourt	rly 1 fourt	rly 1 fourt	rly 1 fourt	rly 1 fourt	rly 1 fourt	rly 2 consi	rly 1 fourt	d1 pre-firi	d1 pre-firi	d1 pre-firi	d1 pre-firi	rly 1 fourt	d1 pre-firi	rly 1 fourt	rly 1 fourt	rly 1 fourt	rly 1 four
	str	21	21		21	21	21	21	21	21		Annex	21	21	21	21	21									2b			Annex	Annex			2b?	2b	2b	2b	2b
	Context	rm_bench	rm_bench	surface	layer	layer	rm_bench	rm_bench	m_bench	m_bench	surface	layer	collapse	collapse	collapse	collapse	collapse	surface	surface	surface	surface	surface	surface	surface	tch_trenc	layer	echnic_fe	surface	surface	surface	surface	surface	layer	layer	layer	layer
	Year	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2015	2014	2014	2014	2014	2015	2015	2014	2014	2014	2014	2014
	GIA number																																			
	liter of soil	3.25	2.25	9.5	2	2	4	2	2.5	2	2.25	3	4	6.5	7	4.25	3	2.5	2.5	2.35	2.5	7	7	10	2.5	1.5	0.75	6	5	6	6	4.5	4.75	5	5	4
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK			30	6	1				1			20	91	3	2	13	1	1			2	1		1	4	2	1	1						2	2
Hordeum vulgare	floret/fruit			2.5						2	1																0.5		0.5						2	
Hordeum vulgare ssp. vulgare	fruit													1												1										
Hordeum vulgare ssp. vulgare	floret				2		1						2	1																						
Hordeum vulgare	rachis node			22?foto										1																						
T. monococcum ssp. monococcum	fruit			6						0.5			3.5		1.5	1	6					1				2		0.5	0.5							
T. cf. monococcum	fruit																																			
T. monococcum/dicoccum	fruit																																0.5			
T.mono c2grained/dicoccum	fruit																																			
T. turgidum ssp. dicoccum	fruit									1					2		3	1		0.5				1				0.5					2			
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node													1																						
T. monococcum/dicoccum	rachis node			17	76		5.5	9				0.5	45	31.5	2.5		3										1	1								
T. turgidum ssp. dicoccum	rachis-twisted																																			
T. turgidum ssp. dicoccum	rachis node													2																						
Triticum	fruit	2																							1											
T. aestivum/durum	fruit												4	3	1		6																	2.5		
Triticum	rachis							10																												
T. aestivum/durum	rachis													1																						
Pulses																																				
Cicer arietinum	seed																																			
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed						0.5										1.5								1											
cf. Lens	seed																																			
Pisum sativum	seed																																			
Vicia ervilia	seed																															0.5				
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																																			
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed							1									4																			
Corylus avellana	fruit							0.1						0.1																		0.1				
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed																																			
Amaranthus	seed																																			
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit																																			
Avena	fruit												2.5																							
Bolboschoenum cf. glaucus	fruit																																			
Bolboschoenum cf. maritimus	fruit																																			
Boraginaceae	fruitlet							4																												
Brassicaceae	seed							1									1																			
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit			2										12													61									
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																																			
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet																																			
Fabaceae	seed							1																												
Fallopia	fruit																																			
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet																																			
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit													17	7	2	29																			
Nepta-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																																			
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. Lithos.	fruitlet																																			
cf. talium	fruit																																			
Malvaceae	fruitlet																																			
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret			2	1		3	2																	1											
Poaceae	RN																																			
Poaceae	Spike piece																																			
Poaceae	culm																																			
Polygonaceae	fruit				2			1									6										4			1						
Polygonum	fruit																																			
Rosaceae	fruit																																			
Rumex	fruit																																			
Sambucus nigra?	fruit											100üzerirecent																								
Setaria pumila	floret							1																												
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelleria media	seed																																			
Thymeleaeceae	fruit																																			
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit						4	4				4	2	2									2	0.5			12					1	13			
Other Remains																																				
Wood charcoal quantity		**	**	*****	**	**	***	*	**	***	**	****	*	**	***	*******	****	**	****	***	*****	****	*****	**	*		***	**	******	****	****	****	*****	***	****	
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone																											1									
Dung																																				
Fish bone																																1				
Mouse bone			30					100											1																	

Table 13.1.8: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1
	BH NO	42347	42113	42490	42311	41246	41091	40841	40837	40843	40478	40225	46513	39849	39850	46507	46502	39823	39345	39729	38877	39505	38876	39503	39504	39807	40230	40227	39163	36715	36729	36716	36717	36244	36714	36393
	Trench	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10	L10
	Locus	309	307	304	304	289	274	273	273	269	267	238	237	232	232	229	229	222	220	208	186	186	186	186	186	186	186	186	185	185	185	185	185	185	185	185
	Lot							mda3	mda1																										
	subphasing	Vid1 pre-fire	Vid1 early	Vid1 early	Vid1 late	Vid1 early	Vid1 pre-fire	Vid1 late 1 fill	Vid1 late 1 fill	Vid1 late 1 fill	Vid1 late 3 burnt	Vid1 late 3 burnt	Vid1 early 2 constr	Vid1 late 3 burnt	Vid1 late 3 burnt	Vid1 early 2 constr	Vid1 early 2 constr	Vid1 late 4 burnt	Vid1 late 3 burnt	Vid1 late 1 fill	Vid1 late 4 burnt	Vid1 late 4 burnt	Vid1 late 4 burnt	Vid1 late 4 burnt	Vid1 late 4 burnt	Vid1 late 4 burnt	Vid1 late 4 burnt	Vid1 late 4 burnt	Vid1 late 4 burnt	Vid1 late 4 burnt	Vid1 late 4 burnt	Vid1 late 4 burnt	Vid1 late 4 burnt	Vid1 late 4 burnt
	str			2b7	2b7	2b	2b7	2b	2b	2b	2b	2b	21	2b	2b	2b	2b	21	2b	2b	Annex	Annex	Annex	Annex	Annex	Annex	Annex	Annex	2a	2a	2a	2a	2a	2a	2a	2a
	Context	surface	surface	surface	surface	basin_bin	surface	layer	layer	layer	basin_bin	surface	wall	basin_bin	basin_bin	wall	wall	collapse	ochnic_fe	layer	collapse	collapse	collapse	collapse	collapse	collapse	collapse	collapse	layer	layer	layer	layer	layer	layer	layer	layer
	Year	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2015	2014	2014	2015	2015	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2013	2013	2013	2013	2013	2013	2013
	GIA number																																			
	liter of soil	5.25	4.75	3	2	0.75	2	2	2	2	3	0.75	2.3	3	0.25	2	2	2.25	6	1	5.75	4	2	2.5	3.5	3	1	1	5	4.5	7.5	5	4.5	3	8	3.1
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK	3	7	8	0.5	6	1	1		2	2		1	2		4	1	10		2	9	4	2	2	4	4	7		18	9	3	4	2	6	10	3
Hordeum vulgare	floret/fruit					2																														
Hordeum vulgare ssp. *vulgare*	fruit																																			
Hordeum vulgare ssp. *vulgare*	floret									1	0.5		0.5								1	4	2		2		2	10		1			2	0.5	1
Hordeum vulgare	rachis node																																			
T. monococcum ssp. *monococcum*	fruit					3													1			3		2.5	5.5	1.5	4		18.5	4		2	1		1	1
T. cf. monococcum	fruit																																			
T. monococcum/dicoccum	fruit																		9										90							
T.mono C2grained/dicoccum	fruit																																			
T. turgidum ssp. *dicoccum*	fruit		1	1		1		0.5								1			2		2						0.5	60	3		3	1	1	1	
T. turgidum ssp. *dicoccum*	rachillate spikelet																																			
T. monococcum ssp.*monococcum*	rachis node																																			
T. monococcum/dicoccum	rachis node					31					1			1					21		1						20	5	11	16		9	5	5	18	12
T. turgidum ssp. *dicoccum*	rachis-twisted																																			
T. turgidum ssp. *dicoccum*	rachis node			0.5																																
Triticum	fruit			1										2.5										1								1			2.5
T. aestivum/durum	fruit																											1					4			
Triticum	rachis																																			
T. aestivum/durum	rachis																																			
Pulses																																				
Cicer arietinum	seed																																1			
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed			1																					0.5		2	5				1		1	
cf. Lens	seed																																			
Pisum sativum	seed		2								0.5																									
Vicia ervilia	seed		0.5										0.5												1	1		5.5					0.5		
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed		2																																	
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed						2																				1	2						3	
Corylus avellana	fruit																													1				0.5	
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed																																			
Amaranthus	seed																																			
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit																																			
Avena	fruit																																			
Bolboschoenum cf. glaucus	fruit																																			
Bolboschoenum cf. maritimus	fruit																																			
Boraginaceae	fruitlet		1																																	
Brassicaceae	seed																																			
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit																																1			
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																												1					1		
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet																																			
Fabaceae	seed				1											2																				
Fallopia	fruit																																			
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet																													1		1				
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit						1																	0.5					2	1				3	
Nepta-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																																			
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. Lithos.	fruitlet																																			
cf. lolium	fruit																																			
Malvaceae	fruitlet																																			
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret															1										1										
Poaceae	RN																																			
Poaceae	Spike piece		0.5																																	2
Poaceae	culm																													4						
Polygonaceae	fruit																										3		1	3		4		1		
Polygonum	fruit																																			
Rosaceae	fruit																																			
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret																																			
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelaria media	seed																																			
Thymeleaceaeae	fruit																																			
T. monococcum ssp. *aegilopoides*	fruit																		1																	
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit				2		2	1													5	2						2	2	6			1	2	3	2
Other Remains																																				
Wood charcoal quantity		***	****	****	***	*	**	**	****	**	***	*	**	*****	*	**	*	**	***	**	****	*****	**	****	***	******		**	****	***	**	**		****	***	**
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone																																1				
Dung																																				
Fish bone													1	82																						
Mouse bone			6																1				1													

Table 13.1.9: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1	Vid1
	BH ND	36853	36239	36730	36852	37822	40226	31857	36876	40839	39819	44647	46335	46354	46362	46367	44509	44513	46245	46374	40380	39990	39455	39285	39281	39284	42832	42823	42645	42637	42430	42612	42403	42240	41888	42206
	Trench	L10	L10	L10E	L10	L10	L10	L10	L10	L10	L10	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12
	Locus	185	185	185	185	152	148	148	147	143	143	628	623	623	623	623	619	619	619	619	594	591	579	579	579	579	497	495	494	485	483	482	475	468	466	466
	Lot																																			
	subphasing	e 4 burnt r	e 4 burnt r	e 4 burnt c	e 4 burnt c	e 3 burnt	e 3 burnte	e 3 burnte	e 3 burnte	e 3 burnt	e 3 burnt	e 3 burnt/	Vid1 early	Vid1 early	Vid1 early	Vid1 early	Vid1 late	Vid1 late	Vid1 late	Vid1 early	burnt ph	Vid1 early	Vid1 early	Vid1 early	Vid1 early	Vid1 early	Vid1 early	Vid1 early	Vid1 early	Vid1 early	Vid1 late	Vid1 early	Vid1 late	Vid1 late
	str	2a	2a	2a	2a	2b	2b	2b	2a	2b	2b									south courtyard		south courtyi	th courtyi	th courtyi	th courtyi	th courtyard									
	Context	layer	layer	layer	layer	surface	echnic_fe	echnic_fe	asin_bin	echnic_fe	echnic_fe	echnic_fe	surface	surface	surface	surface	surface	surface	surface	surface	basin_bin	layer	basin_bin	basin_bin	basin_bin	basin_bin	surface	surface	layer	surface	echnic_fea	pit	surface	surface	surface	surface
	Year	2013	2013	2013	2013	2014	2014	2013	2013	2014	2014	2015	2015	2015	2015	2015	2015	2015	2015	2015	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014
	GIA number																																			
	liter of soil	5	1	1.5	3.25	2	2.25	1.25	5.5	2	5	1.5	2.75	1.5	2	2.25	4	4.25	1.75	1.5	2.25	4	3	3	6	3.5	4.75	2.75	3	1.5	4.5	3.5	6	5	2	1.75
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK	3			10	2	2			2	1			1	1	1	5	12		3	1	4	11	2	12		23	200	40	65	42	8	200	40	2	90
Hordeum vulgare	floret/fruit																	3				0.5				4								2		
Hordeum vulgare ssp. vulgare	fruit				1																															
Hordeum vulgare ssp. vulgare	floret			0.5	2	0.5			8		1	1					1.5	1					2		3			3	2	11	3		5			7
Hordeum vulgare	rachis node								3																								2			
T. monococcum ssp. monococcum	fruit	3				0.5			2									1													1		1		
T. cf. monococcum	fruit																																			
T. monococcum/dicoccum	fruit																0.5				3		1													2
T.mono-/2grained/dicoccum	fruit																																			
T. turgidum ssp. dicoccum	fruit		2		1	0.5			3							0.5		1					1		1	2	9		3	7	2	13	4		5
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node																																			
T. monococcum/dicoccum	rachis node		11	1	15				12	1		0.5								1	1.5			0.5		1.5			1.5			3			4
T. turgidum ssp. dicoccum	rachis-twisted																																			
T. turgidum ssp. dicoccum	rachis node																											7			1					
Triticum	fruit	2	1					0.5	1																	1		3								
T. aestivum/durum	fruit	1							6						1			2					8	1			15	7	4	12	1	15	6	1	2
Triticum	rachis																																			
T. aestivum/durum	rachis																															4				
Pulses																																				
Cicer arietinum	seed		2	1																																
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed			1	8000				20080									1										2	1	0.5	7			9		1
cf. Lens	seed																						3													
Pisum sativum	seed																														2.5		2			
Vicia ervilia	seed				2				6		1						1								1			3	0.5				1			
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																																			
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed			0.5																																
Corylus avellana	fruit		0.5	0.2	0.2																					0.1									
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																														0.5					
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed								3																28											
Amaranthus	seed																																			
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit																																			
Avena	fruit																													1						
Bolboschoenum cf. glaucus	fruit																1																			
Bolboschoenum cf. maritimus	fruit																																			
Boraginaceae	fruitlet																												1							
Brassicaceae	seed								2																											
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit																							10		1										
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed				54				154																											
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet															0.5									1								2			
Fabaceae	seed				14				78								0.5										2		1		2				0.5
Fallopia	fruit																										2						3			
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet				90				191																					0.5			1			
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit																						12	11	8		75	6	27	1	1				70
Herpla-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																										3			3.5	2			5		
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. Lithos.	fruitlet																																			
cf. lolium	fruit																																			
Malvaceae	fruitlet																											1								
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret											5	2					2		1							2.5			9			2.5		9	100
Poaceae	RN																																			
Poaceae	Spike piece								2																											
Poaceae	culm																													24						
Polygonaceae	fruit				3																		1		11											
Polygonum	fruit								18																			2				1				
Rosaceae	fruit																	2																		
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret																																			
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelleria media	seed																																			
Thymelaeaceae	fruit																																			
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet								1																											
Unidentified	seed/fruit	2		2		1						7	1					2		4			1	2	17		1	7		18	3				1	4
Other Remains																																				
Wood charcoal quantity		*	***	**	*	*	*******		***	*	**	***	**	***	***	******	******	******	**	**	****	***	***	****	***	*		*****	******		***	***	***	****	**	****	
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone					3		9															2						1							
Dung																																				
Fish bone				1																																1
Mouse bone				10					3																											

Table 13.1.10: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1	Vld1 or Vld2	Vld1/ Vld2	Vld1/ Vld2	Vld2	Vld2	Vld2	Vld2	Vld2	Vld2	Vld2	Vld2	Vld2	Vld2
	BH NO	42243	41886	41887	41636	41637	41865	42219	37249	36998	32117	30437	30441	31123	32120	28337	28351	30419	28323	17597	13744	15101	27284	12556	33498	31385	17342	34678	34920	34911	37848	37871	38115	38522	39058	36237
	Trench	L12	L12	L12	L12	L12	L12	L12	M13	M13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	M10	L14	M11	M10	M10	M11	M11	M11	L10	L10	L10	L10	L10	L10
	Locus	466	465	465	462	462	462	459	181	181	257	256	255	255	255	255	255	255	253	156	153	153	305	126	334	349	238	490	414	414	199	199	199	199	199	184
	Lot												749	752	760	742	743	745		371				161											
	subphasing	Vld1 late	Vld1 late	Vld1 late	Vld1 late	Vld1 late	Vld1 late	Vld1 late	Vld1	Vld1	Vld1 earl	Vld1 early	Vld1 early	Vld1 early	Vld1 early	Vld1 early	Vld1 earl	Vld1 earl	Vld1 early	Vld1	Vld1	Vld1				Vld2	Vld2	Vld2	Vld2	Vld2	Vld2	Vld2	Vld2	Vld2	Vld2
	str																									Annex	th courtyard		Annex	Annex						
	Context	surface	surface	surface	surface	surface	surface	layer	burial	burial	surface	surface	basin_bin	basin_bin	basin_bin	basin_bin	basin_bin	basin_bin	basin_bin	surface	layer	layer	layer	pit	layer	surface	chnic_fe	layer	echnic_fe	echnic_fe	surface	surface	surface	surface	surface	layer
	Year	2014	2014	2014	2014	2014	2014	2014	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2011	2011	2011	2013	2010	2013	2013	2011	2013	2013	2013	2014	2014	2014	2014	2014	2013
	GIA number																							35139												
	liter of soil	2.5	3.25	1.75	2	2	2	6.5	1.25	4	4	4	4	4	4	4	1.25	4	4				1	7.5	4	1.5		2	1.75	0.25	1.5	0.3	2.75	0.75	7	3
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK	2		21	2	100	150	20	200	3	3	7	4		3				6				14		7	4	1	169	3		1	2	3		4	3
Hordeum vulgare	floret/fruit				1		3	2																				1								
Hordeum vulgare ssp. *vulgare*	fruit				3																															
Hordeum vulgare ssp. *vulgare*	floret	1.5					1	7.5	11			1	2		1		1.5	1					5			1										2	
Hordeum vulgare	rachis node																																			
T. monococcum ssp. *monococcum*	fruit																1		1.5	1																
T. cf. monococcum	fruit																							1												
T. monococcum/dicoccum	fruit	0.5														1																				
T.mono-2grained/dicoccum	fruit																																			
T. turgidum ssp. *dicoccum*	fruit			11	6	8	7	2	33								1.5		1									96								
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node																																			
T. monococcum/dicoccum	rachis node																						1		2								1			
T. turgidum ssp. *dicoccum*	rachis-twisted																																			
T. turgidum ssp. *dicoccum*	rachis node						3	4	1																											
Triticum	fruit	3										2						2																		
T. aestivum/durum	fruit	1		1			5	1	15												2			2				1								
Triticum	rachis																																			
T. aestivum/durum	rachis																																			
Pulses																																				
Cicer arietinum	seed						1																													
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed		0.5	1		10	9	3	1		1																									
cf. Lens	seed																																			
Pisum sativum	seed							4			1																									
Vicia ervilia	seed		0.5		3		1										1							2	1			1								
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																										1									
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed																																			
Corylus avellana	fruit													0.2				0.2																		
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed																																			
Amaranthus	seed																																			
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit																																			
Avena	fruit																																			
Bolboschoemum cf. glaucus	fruit																																			
Bolboschoemum cf. maritimus	fruit																																			
Boraginaceae	fruitlet																						3													
Brassicaceae	seed																																		1	
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit				1																					3										
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																																			
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet		1.5				8																													
Fabaceae	seed			1	5																														2	
Fallopia	fruit				0.5																															
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet							1																1												
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit			70				1											0.5																	
Nepta-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet		2		3			6																												
Lithospermum tenuiflorum	fruitlet																																			
Buglosseides arvensis syn. *Lithos.*	fruitlet																																			
cf. lolium	fruit																																			
Malvaceae	fruitlet																																			
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret	0.5					1																													1
Poaceae	RN																																			
Poaceae	Spike piece																																			
Poaceae	culm																																			
Polygonaceae	fruit																																			
Polygonum	fruit							1																												
Rosaceae	fruit																																			
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret																																			
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelaria media	seed																																			
Thymeleaeceae	fruit																																			
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit	1		2	1	1		4			7									1	1	1	5	1				2	2		1					
Other Remains																																				
Wood charcoal quantity		***	**	**	***	****	*****		**	***	***	***	**	****	*****	***	**	**	**				*		*	**		**	*	***	*	*	*	**	***	***
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone											2															1										
Dung																																				
Fish bone																																		2		
Mouse bone																												1								

Table 13.1.11: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2/Vid3	Vid2/Vid3	Vid3	Vid3	Vid3	Vid3	Vid3
	BH NO	36222	36223	34889	34896	38316	38116	44331	44309	39290	38591	39289	41643	40138	39907	39142	13145	13149	13118	11839	11650	11613	11198	11171	11196	10597	11119	11122	33913	36050	36751	17349	15255	33878	36759	32200
	Trench	L10	L10	L10	L10	L10	L10	L11	L11	L11	L11	L11	L12	L12	L12	L12	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	L13	M13	M11	M11	M10	M10	M11	M11	M11
	Locus	184	184	161	161	161	161	615	610	581	572	572	461	443	436	416	151	151	150	146	145	143	142	141	141	131	131	131	164	395	395	236	233	483	378	378
	Lot		bot2	bot 1	bot 3			courtyard fill												302	292	285	283	279	282	263	270	272		2041	2041	1027	935		2043	1750
	subphasing	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2	Vid2 early	Vid2	Vid2	Vid2	/Id2 early	Vid2 early	/Id2 earl	Vid2 early	Vid2 late	Vid2 late	Vid2 late	Vid2 late	Vid2 late	Vid2 late	Vid2 late	Vid2 late	Vid2 late	d2 early				Vid3	Vid3	Vid2?	Vid2?
	str																																	4	10	10
	Context	layer	layer	echnic_fe	echnic_fe	echnic_fe	echnic_fe	chnic_fe	layer	chnic_fe	layer	layer	surface	surface	surface	layer	surface	surface	other	surface	surface	echnic_fe	echnic_fe	surface	echnic_fe	surface	surface	surface	layer	layer	layer	layer	surface	surface	surface	surface
	Year	2013	2013	2013	2013	2014	2014	2015	2015	2014	2014	2014	2014	2014	2014	2014	2011	2011	2011	2010	2010	2010	2010	2010	2010	2010	2010	2010	2013	2013	2013	2011	2011	2013	2013	2013
	GIA number																			35063	35140	35128	35137	35135	35136	35059	35138	35130								
	liter of soil	4	3.5	1	4	1.75	0.75	4	3.25	1	7	0.25	2	1.5	2.75	3.5				4	3.5	3	4	4	6	6	6.5	4.5	4		2			0.5			
Plant Latin Names	**Plant parts**																																					
Cereals																																						
Hordeum/Triticum	fragmented GK	7	2		8	15	2	5		2		2	2		8		5		20	73	2	3	0.5	1	1	1	2		15				1				
Hordeum vulgare	floret/fruit												2																									
Hordeum vulgare ssp. *vulgare*	fruit					1																																
Hordeum vulgare ssp. *vulgare*	floret		0.5		2	2	2					2			1				1	1																		
Hordeum vulgare	rachis node																																					
T. monococcum ssp. *monococcum*	fruit				5								3						1																			
T. cf. monococcum	fruit																																					
T. monococcum/dicoccum	fruit																																					
T.mono c2grained/dicoccum	fruit																																					
T. turgidum ssp. *dicoccum*	fruit		1		8	7		1			1.5		10						12	7																	
T. turgidum ssp. dicoccum	rachillate spikelet																																					
T. monococcum ssp.monococcum	rachis node																																					
T. monococcum/dicoccum	rachis node					2	1						3			1													0.5								
T. turgidum ssp. *dicoccum*	rachis-twisted																																					
T. turgidum ssp. *dicoccum*	rachis node																																					
Triticum	fruit																			7																		
T. aestivum/durum	fruit				6				2				4				2		10	14			1														
Triticum	rachis																																					
T. aestivum/durum	rachis																																					
Pulses																																						
Cicer arietinum	seed																																					
Cicer/Lathyrus	seed																																					
Lathyrus sativus	seed																																					
Lens culinaris	seed				3	1											2	2		2						2?				1							
cf. Lens	seed																																					
Pisum sativum	seed																																					
Vicia ervilia	seed				1					0.5									2	4	1		1				2										
cf. Vicia	seed																																					
Vicia faba	seed																																					
Fabaceae	seed																1			1																		
Nuts-Fiber Plants-Gathered Plants																																						
Linum usitatissimum	seed					1	1																															
Corylus avellana	fruit				0.2				0.5																							0.3				62	30
Ficus carica	fruit																																					
Rubus fruticosus	fruitlet (endocarp)																																					
Quercus	seed																																					
Wild Plant																																						
Aegilops	fruit																																					
Aethusa cynapium	seed/fruit																																					
Adonis	fruitlet																																					
Amaranthaceae	seed																																					
Amaranthus	seed																								1													
Androsace maxima	seed/fruit																																					
Apiaceae	fruitlet																				1		1recent														
Asteraceae	fruit																																					
Astragalus	seed																																					
Atriplex patula	seed/fruit																																					
Avena	fruit																				1?dicoccoides?																
Bolboschoenum cf. glaucus	fruit																																					
Bolboschoenum cf. maritimus	fruit																																					
Boraginaceae	fruitlet												2																									
Brassicaceae	seed																																					
Bromus	fruit																																					
Bromus sterilis	fruit																																					
Carex	fruit																																					
Carex cf. divulsa	fruit																																					
Caryophyllaceae	seed/fruit																																					
cf. cephalaria	seed/fruit																																					
Chenopodium cf. album	fruit							1								2							2				1										
Chenopodium cf. polyspermum	fruit																																					
Chrozophora tinctoria	fruit																																					
Convolvulus	seed																																					
Fallopia convolvulus	fruit																																					
Cyperaceae	fruit																																					
Cyperus cf.	fruit																																					
cf. datura	seed																																					
Echallium	seed																																					
Echium vulgare	fruitlet															1																						
Fabaceae	seed						0.5		1																													
Fallopia	fruit																																					
cf. ficus	fruit																																					
Fumaria densiflora	fruit																																					
Fumaria officinalis	fruit																						4recent?														
Galium	fruitlet												0.5																									
Galium aparine	fruitlet																							1														
Geranium	seed																																					
Heliotropium	fruitlet																																					
Hippocrepis	fruitlet				1																																	
Hordeum spontaneum cf. marinum	fruit													0.5																								
Nepta-Ocimum	fruit																																					
Lamiaceae	fruit/seed																																					
Lepidium	seed																																					
Lithospermum	fruitlet																																					
Lithospermum tenuiflorum	fruitlet																																					
Buglosseides arvensis syn. *Lithos.*	fruitlet																																					
cf. lolium	fruit																																					
Malvaceae	fruitlet																																					
cf. malva	fruitlet																																					
Medicago	fruit				1															1																	
Onobrychis	fruit																																					
Papaveraceae	seed																																					
Papaver	seed																																					
Persicaria cf. maculosa	fruit																																					
Persicaria tinctoria	fruit																																					
Phalaris	fruit/floret																																					
cf. plantago	seed																																					
Poaceae	fruit/floret																																					
Poaceae	RN																																					
Poaceae	Spike piece																																					
Poaceae	culm																																					
Polygonaceae	fruit				2											3																						
Polygonum	fruit																				1																
Rosaceae	fruit																																					
Rumex	fruit																			2																	
Sambucus nigra?	fruit																																					
Setaria pumila	floret																																					
Silene	seed																																					
cf. solanum	seed																																					
Solanum nigrum	seed																																					
Spergula arvensis	seed																																					
Stelaria media	seed																																					
Thymelaeaceae	fruit																																					
T. monococcum ssp. *aegilopoides*	fruit																																					
Triticum	culm																																					
Trifolium	fruit																																					
cf. Trigonella	seed/fruit																																					
Type 1-asteraceae? Recent?	seed/fruit																																					
Type 2	fruit																																					
Type 3 -Cyperaceae?	seed/fruit																																					
Veronica	seed																																					
Vitaceae	seed/fruit/fruitlet																																					
Unidentified	seed/fruit						6						3							2	2				1		1		1					1			
Other Remains																																						
Wood charcoal quantity		**	***	**	******	***		****	*****	***	*	*	***	*	*	***													**				*				
Prepared food																																						
Wood charcoal																																						
Oak																																						
Fungal spores																																						
Animal Remains																																						
Animal bone			2																																			
Dung																																						
Fish bone																																						
Mouse bone																																						

Table 13.1.12: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3
	BH NO	32943	36792	32184	33729	34121	33730	33869	38112	36877	40842	37662	37663	37661	40624	39767	39770	39655	39768	39132	39378	40139	39105	39106	39107	38694	38427	38428	38429	38672	38221	38227	38411	38426	11116	10524
	Trench	M11	M11	M11	M11	M11	M11	M11	L10	L10	L10	L11	L11	L11	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L13	L13
	Locus	378	378	378	378	378	378	367	178	145	135	558	558	558	449	428	427	427	427	422	421	420	415	415	415	413	410	410	410	410	409	409	404	402	137	123
	Lot	1773	2057	1747	1780	1793	1778				mda	mda	mda	mda							white surfa	aside vess	white surfac	top	bottom	pebble surface	Botanical (number	Botanical	Botanical	str	18 north	str18			268	247
	subphasing	Vld2?	Vld2?	Vld2?	Vld2?	Vld2?	Vld2?	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3	Vld3
	str	10	10	10	10	10	10	4	15	15	15						18	18	18	18	18	22	18	18	18		18	18	18	18	18	18				
	Context	surface	surface	surface	surface	surface	surface	wall	ch_tren	other	m_bench	surface	surface	surface	burial	layer	surface	surface	surface	chnic_fe	surface	layer	surface	surface	surface	surface	layer	layer	layer	layer	chnic_fe	chnic_fe	surface	layer	chnic_fe	surface
	Year	2013	2013	2013	2013	2013	2013	2013	2014	2013	2014	2013	2013	2013	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2010	2010
	GIA number																																		35093	35089
	liter of soil								1.25	2,5	2	1	1	1	3.25	2.5	2	5.25	2.25	4	4	1.5	2	2.5	4	4	3	3	3	3	8	8	6	0.75	1.75	4.5
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK								7	6	1		1		2	4		2	2		3	2	2	3	1		1			1	23		2			1
Hordeum vulgare	floret/fruit																														6					
Hordeum vulgare ssp. vulgare	fruit																							3												
Hordeum vulgare ssp. vulgare	floret																			4					1.5											
Hordeum vulgare	rachis node																																			
T. monococcum ssp. monococcum	fruit								1	1	2										1			1												
T. cf. monococcum	fruit																																			
T. monococcum/dicoccum	fruit																	0.5				2														
T.mono c2grained/dicoccum	fruit																																			
T. turgidum ssp. dicoccum	fruit																														1	4	1			
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node																																			
T. monococcum/dicoccum	rachis node								0.5	1							1						1													
T. turgidum ssp. dicoccum	rachis-twisted																																			
T. turgidum ssp. dicoccum	rachis node																														3					
Triticum	fruit																0.5																			
T. aestivum/durum	fruit														1																2					
Triticum	rachis																																			
T. aestivum/durum	rachis																																			
Pulses																																				
Cicer arietinum	seed																																			
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed									101					1													1				4				
cf. Lens	seed																																			
Pisum sativum	seed																														5					
Vicia ervilia	seed																	0.5										1			31					
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																														43					
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed																																			
Corylus avellana	fruit	5	9		9	4	3	10																								1				
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																														1					
Quercus	seed																															2?				
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																														6r					
Adonis	fruitlet																																			
Amaranthaceae	seed																												1							
Amaranthus	seed																																			
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit																																			
Avena	fruit																																			
Bolboschoenum cf. glaucus	fruit																																			
Bolboschoenum cf. maritimus	fruit																																			
Boraginaceae	fruitlet														1							0.5														
Brassicaceae	seed																																			
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit														2					2											13			1		
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed									2																										
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Ecballium	seed																																			
Echium vulgare	fruitlet														1																2					
Fabaceae	seed																1																			
Fallopia	fruit																																			
cf. ficus	fruit																																			
Fumaria densiflora	fruit																															2r?				
Fumaria officinalis	fruit																														22r					
Galium	fruitlet																	1																		
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit								0.5						2		0.5												1				1			
Nepta Ozimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																														2					
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. Lithos.	fruitlet																																			
cf. lolium	fruit																																			
Malvaceae	fruitlet																																			
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret																							0.5		1										
Poaceae	RN																																			
Poaceae	Spike piece																																			
Poaceae	culm																																			
Polygonaceae	fruit																1	3	1												2					
Polygonum	fruit																									1										
Rosaceae	fruit																																			
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret																														1					
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																														3r?					
Spergula arvensis	seed																																			
Stelleria media	seed																																			
Thymeleaeceae	fruit																																			
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit								1		1				2		1			1		1			3			1		3		1			
Other Remains																																				
Wood charcoal quantity								*	**	**	**	*	**	*	*	*	**	*	**	****	*	*			**	***	*	***	**	*	****	******	****	*		
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone									2						1							4														
Dung																																				
Fish bone																	1																			
Mouse bone																		1																		

Table 13.1.13: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	Vid3	Vid3	Vid3	Vid3	Vic/Vid3	Vid3/ Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic	Vic
	BH NO	12694	8896	8899	8893	39144	44129	16677	13591	11898	11895	12671	12680	12682	12684	12677	12673	12400	12382	12391	11893	11894	11575	10750	10748	10747	16919	18486	18491	31773	28376	28202	26735	31295	36376	36372
	Trench	L13	L13	L13	L13	L12	L10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M11	M11	M11	M11	M11	M11	M11	L10	L11N	L11N
	Locus	123	123	123	123	345	347	249	226	215	215	215	214	214	214	214	214	213	213	213	208	208	187	184	184	184	183	183	183	340	327	325	302	146	536	535
	Lot	212	196	192	189	renaming of the		1014		854	854	865	864	864	864	864	864	837	827	827	853	853	766	722	722	722	872	876	877						charcoal sam	mda
	subphasing	Vid3	Vid3	Vid3	Vid3	I3 and Vic1		Vic1	Vic3	Vic1	Vic1	Vic1	Vic1	Vic1	Vic1	Vic1	Vic1	Vic1	Vic2	Vic2	Vic3	Vic3	Vic3	Vic3	Vic3	Vic3	Vic1	/Ib transi	/Ib transition		Vic3	Vic2	/Ib transi	Vic1	Vic1	Vic1
	str							15	9	th courty	th courty	th courty	th courty	th courty	th courty	th courty	th courty	th courty	th courty	th courty	th courty	h courtyard	North courty	th courty	th courty	th courty	th courty	11	11						south courty	
	Context	surface	surface	surface	surface	layer	burial	chnic_fe	chnic_f	layer	layer	layer	surface	surface	surface	surface	surface	layer	layer	layer	surface	surface	layer	pit	pit	pit	layer	layer	layer	burial	pit	echnic_fe	layer	chnic_fe	chnic_fe	surface
	Year	2010	2010	2010	2010	2014	2015	2011	2011	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2011	2011	2011	2013	2013	2013	2013	2013	2013	2013
	GIA number	35124	35088	35084	35092					35073	35075	35159	35158	35155	35157	35156	35082	35153	35154	35112	35052	35180	35079	35077	35078	35150										
	liter of soil	0.75	6	6	6	5	4.75			CHARCOA	10	3	1	1.5	0.75	0.85	1.75	8.75	6	7.25	3.5		10	6	10	7.5				2	4		4	2	0.5	1
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK		1			2		7					1				1	1	4	3			2		2				2		30				4	
Hordeum vulgare	floret/fruit																	2										1								
Hordeum vulgare ssp. *vulgare*	fruit																																			
Hordeum vulgare ssp. *vulgare*	floret			1				2																	1						1					
Hordeum vulgare	rachis node																																			
T. monococcum ssp. *monococcum*	fruit																														2					
T. cf. monococcum	fruit																																			
T. monococcum/dicoccum	fruit					0.5																														
T.mono-2grained/dicoccum	fruit																																			
T. turgidum ssp. *dicoccum*	fruit			1				2																1	2						3					
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.*monococcum*	rachis node																																			
T. monococcum/dicoccum	rachis node					4																									1			0.5	0.5	
T. turgidum ssp. *dicoccum*	rachis-twisted																																			
T. turgidum ssp. *dicoccum*	rachis node																	4	1	1																
Triticum	fruit					1																														
T. aestivum/durum	fruit			1	1													2	1	1				1							6		4			
Triticum	rachis																																			
T. aestivum/durum	rachis																																			
Pulses																																				
Cicer arietinum	seed																																			
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed										1																				2					
cf. Lens	seed																																			
Pisum sativum	seed																																			
Vicia ervilia	seed																		3	1				1	1				1							1
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																							4			1									
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed																																		4	
Corylus avellana	fruit																																			
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed																																			
Amaranthus	seed											1							2		1															
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit				cf.picris modern?																															
Astragalus	seed																																			
Atriplex patula	seed/fruit																																			
Avena	fruit																																			
Bolboschoemum cf. glaucus	fruit																																			
Bolboschoemum cf. maritimus	fruit			2																																
Boraginaceae	fruitlet					1																														
Brassicaceae	seed																																			
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																		1	
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit					8													1		89	290									2					
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																	2		
Convolvulus	seed																																			
Fallopia convolvulus	fruit																	1																		
Cyperaceae	fruit			2																																
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet																														16					
Fabaceae	seed																																			
Fallopia	fruit																																			
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet																						1													
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																				1															
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit																																		4	
Nepta-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																														24					
Lithospermum tenuiflorum	fruitlet																																			
Buglosseides arvensis syn. *Lithos.*	fruitlet																							2	3											
cf. lolium	fruit																																			
Malvaceae	fruitlet																																			
cf. malva	fruitlet																							1												
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret										1																									
Poaceae	RN																																			
Poaceae	Spike piece																																			
Poaceae	culm																																			
Polygonaceae	fruit					16																														
Polygonum	fruit																							1												
Rosaceae	fruit																	1																		
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret																																			
Silene	seed																																			
cf. solanum	seed																					1														
Solanum nigrum	seed											2?											1recent?													
Spergula arvensis	seed																																			
Stelleria media	seed																																			
Thymeleaeceae	fruit																																			
T. monococcum ssp. *aegilopoides*	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit			2	2	1			1			3recent?	1					3	2			1	1								6		1	2	2	
Other Remains																																				
Wood charcoal quantity						****	***																							******	****		****		*****	*
Prepared food																																				
Wood charcoal																																				
Oak										1probably dosn't loose leaves in the winter																										
Fungal spores																																				
Animal Remains																																				
Animal bone																																				
Dung																																				
Fish bone																																				
Mouse bone																														1						

Table 13.1.14: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIc	VIb
	BH NO	36371	36373	35567	36090	35593	35594	32228	31496	33171	32375	37080	34956	35765	36196	36197	36198	36195	36195	36193	37788	38406	36446	33956	36573	36674	33307	31543	33349	30109	28074	31681	9955	5000	9337	12679
	Trench	L11N	L11N	L11N	L11N	L11N	L11N	L11N	L11N	L11S	L11S	L11W	L11W	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	L12	M13	L13	L13	L13	M10
	Locus	535	535	530	528	471	471	456	423	486	479	553	515	390	383	383	383	382	382	382	382	379	379	376	367	367	355	355	355	339	327	134	130	105	105	220
	Lot	mda	mda	charcoal sample											mda1	mda2	mda3	mda5	mda6	mda4	over pebble su		bone in d	ack surfa	mda2	mda1	white surfa		ark surface			plastered	232	118	207	866
	subphasing	VIc1	VIc1	VIc3	VIc2	VIc	VIc	VIc3	VIc3	VIc2	VIc3	VIc1	VIc3	VIc1	VIc1	VIc1	VIc1	VIc1	VIc1	VIc1	VIc1	VIc1	VIc1	VIc1	VIc1	VIc1	VIc1	VIc1	VIc1	VIc1	VIc2	VIc2	VIc3	VIc1	VIc1	VIc1	VIb1
	str	th courty	h courtyard	south courtyard			South courtyard																													1
	Context	surface	surface	echnic_fe	surface	ost_hol	ost_hol	chnic_fe	layer	chnic_fe	chnic_fe	pit	basin_bin	other	layer	layer	layer	surface	surface	surface	surface	surface	od surfac	basin_bin	surface	surface	surface	surface	surface	layer	layer	surface	burial	layer	layer	surface
	Year	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2014	2014	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2010	2009	2010	2010
	GIA number																																35096	35048	35090	35080
	liter of soil	1	1	0.25	0.75		3.25	1.25	4	3	0.3	3	2	4.15	1	1	1	1	1	1	6	7.25	4	4	1	2	2	4	4	4	4	4	0.275	4	1.5	2
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK	3		4			10	2	10	4		2	5	14	3		3		3		4		3	4		3		4			4	10		1		37
Hordeum vulgare	floret/fruit																																			4
Hordeum vulgare ssp. vulgare	fruit																																			1
Hordeum vulgare ssp. vulgare	floret			1						1		1		4						0.5	0.5		2													3
Hordeum vulgare	rachis node																																			
T. monococcum ssp. monococcum	fruit													0.5																						
T. cf. monococcum	fruit																																			
T. monococcum/dicoccum	fruit																																			
T.mono-c2grained/dicoccum	fruit																																			
T. turgidum ssp. dicoccum	fruit													1							0.5															
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node																																			
T. monococcum/dicoccum	rachis node						2	1						1							1										0.5					
T. turgidum ssp. dicoccum	rachis-twisted																																			
T. turgidum ssp. dicoccum	rachis node																																			12
Triticum	fruit	1										1	1									2														
T. aestivum/durum	fruit																															3				1
Triticum	rachis																																			
T. aestivum/durum	rachis																																			
Pulses																																				
Cicer arietinum	seed																					1														
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed																																			
cf. Lens	seed																																			
Pisum sativum	seed																						2													
Vicia ervilia	seed			0.5										0.5								1	0.5													
cf. Vicia	seed																																			
Vicia faba	seed																																	1		
Fabaceae	seed													1																						
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed													0.5																						
Corylus avellana	fruit			0.2																																
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)	1																																		
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Anthusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed																					1														
Amaranthus	seed																																			
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit																																			
Avena	fruit																																			
Bolboschoemum cf. glaucus	fruit																																			
Bolboschoemum cf. maritimus	fruit																																			
Boraginaceae	fruitlet								1				1	0.5	1								1													
Brassicaceae	seed																																			
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit	1	1	7				2						3																						3
Chenopodium cf. polyspermum	fruit																																			2
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																																			
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet																																			
Fabaceae	seed								1												2															
Fallopia	fruit																																			
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet			1									1																							
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet													1																						4recent?
Hordeum spontaneum cf. marinum	fruit																						0.5													2
Nepta-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																																			
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. Lithos.	fruitlet																																			1
cf. tolium	fruit																																			
Malvaceae	fruitlet																																			
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret										0.5											1														
Poaceae	RN																																			
Poaceae	Spike piece																																			
Poaceae	culm																																			
Polygonaceae	fruit	1						1	1					4																						1
Polygonum	fruit																					1														
Rosaceae	fruit																																			
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret																																			
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelaria media	seed																																			
Thymeleaeceae	fruit																																			
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit			2	1	1	1	3	1														1				1	2			1				2maybe basket mate	
Other Remains																																				
Wood charcoal quantity		*	*	***	****		**	***	***	****	**	***	***	***	*	*	*	*	**	*	***	****	***	***	*	*	*	***	*	***	***					
Prepared food														2																						
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone			2					1																			2									
Dung																																				
Fish bone																																				
Mouse bone																																				

Table 13.1.15: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb
	BH NO	126787778	12401	12661	12397	9613	12385	12651	11500	12402	12404	8373	11515	8376	8751	8791	8472	8337	8744	6408	5975	5911	5908	6439	5983	26709	18483	16076	15427	12665	12669	12664	12667	12663	12662	12668
	Trench	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11
	Locus	220	170	170	168	168	168	165	165	165	165	144	144	140	138	138	133	133	130	130	121	119	118	110	103	303	187	184	154	154	154	154	154	154	154	154
	Lot	866	642	642	835	640	822	641	641	641	641	526	747	522	553	564	541	511	547	466	452	415	414	477	456		873	858	809	694	694	694	694	694	694	694
	subphasing	VIb1	VIb1	VIb1	VIb1	VIb1	VIb1	VIb1	VIb1	VIb1	VIb1	VIb1	VIb1	VIb2	VIb2	VIb2	VIb1	VIb1	VIb1	VIb1	VIb1	VIb2	VIb1	VIb2	VIb2	VIb1	VIb1	VIb1	VIb2	VIb2	VIb2	VIb2	VIb2	VIb2	VIb2	VIb2
	str	1	th courtyard	th courtyard	1	1	1	th courtyard	th courtyard	th courtyard	th courtyard	1	1	th courtyard	th courtyard	th courtyard	th courtyard	th courtyard	north courtyard and trials locus NB in M10E (exc. 2006).							11			11	11	11	11	11	11	11	11
	Context	surface	surface	surface	layer	layer	layer	surface	surface	surface	surface	layer	layer	layer	layer	layer	technic_fe	technic_fe	surface	surface	technic_fe	layer	technic_fe	layer	layer	itch_trenc	layer	surface	surface	surface	surface	surface	surface	surface	surface	surface	surface
	Year	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2010	2009	2009	2009	2009	2009	2009	2013	2011	2011	2011	2010	2010	2010	2010	2010	2010	2010
	GIA number	35085	35164	35081	35074	35076	35161	35133	35148	35086	35147	35145	35131	35146	35050	35170	35056	35167	35169	35011	35042	35030	35023	35016	35017					35103	35104	36098	35110	35113	35105	35162
	liter of soil	1.25	1.5	1	7	0.75	6	1.5	1.25	2	1.75	6	8	6	6	6	5.5		6	1	4	4.5	5	5	5	4				2	0.75	1.3	2.4	2.2	1.25	1.5
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK	2			45	1	24		1	1		2	3	3	1	2	5		4	1			30	2		7		4				2		1		
Hordeum vulgare	floret/fruit						1					1										1			1											
Hordeum vulgare ssp. vulgare	fruit																																			
Hordeum vulgare ssp. vulgare	floret				1												1																			
Hordeum vulgare	rachis node				4																															
T. monococcum ssp. monococcum	fruit												1																							
T. cf. monococcum	fruit																																			1
T. monococcum/dicoccum	fruit	1																																		
T.mono c2grained/dicoccum	fruit																																			
T. turgidum ssp. dicoccum	fruit						2							1					1				7					7								
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node																																			
T. monococcum/dicoccum	rachis node			0.5					2																	0.5									2	
T. turgidum ssp. dicoccum	rachis-twisted																																			
T. turgidum ssp. dicoccum	rachis node				21		30						1						3.5				4		1								1			
Triticum	fruit															2																		1		
T. aestivum/durum	fruit				4		5				1			2				1					5						1	1					2	
Triticum	rachis						2																													
T. aestivum/durum	rachis				2																															
Pulses																																				
Cicer arietinum	seed																																			
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed																						3	1			1		1							
cf. Lens	seed																																			
Pisum sativum	seed																																			
Vicia ervilia	seed				1		1										2					2	2			1		4							
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																																			
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed																																			
Corylus avellana	fruit																																			
Ficus carica	fruit															1																				
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed													1			2		1	1																
Amaranthus	seed						2reecent	1				1																									
Androsace maxima	seed/fruit																																			
Apiaceae	fruitlet																																			
Asteraceae	fruit															1recent																				
Astragalus	seed												3recent																							
Atriplex patula	seed/fruit																																			
Avena	fruit																																			
Bolboschoenum cf. glaucus	fruit																						7													
Bolboschoenum cf. maritimus	fruit																																			
Boraginaceae	fruitlet																																			
Brassicaceae	seed																																			
Bromus	fruit																																			
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit	2			3											5							3										2		1	
Chenopodium cf. polyspermum	fruit				1							1			1							1													
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																																			
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet																																			
Fabaceae	seed																									1										
Fallopia	fruit											1																						1		
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																																			
Galium	fruitlet				1																															
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet						11recent?										5recent?																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit				Savena?																															
Nepta-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																						2													
Lithospermum	fruitlet																							1	2											
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. Lithos.	fruitlet				1			1			1						4					1	38					8								
cf. lolium	fruit						2												1					1												
Malvaceae	fruitlet																																			
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit						cf.1																													
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit																																			
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret						1																													
cf. plantago	seed																																			
Poaceae	fruit/floret	1																	2														1			
Poaceae	RN																																			
Poaceae	Spike piece																																			
Poaceae	culm																																			
Polygonaceae	fruit											1																								
Polygonum	fruit																																			
Rosaceae	fruit	1																																		
Rumex	fruit				1		1								1		1						1													
Sambucus nigra?	fruit																																			
Setaria pumila	floret																																			
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed									1recent																										
Spergula arvensis	seed																																			
Stellaria media	seed	1modern																																		
Thymelaeaceae	fruit												1																							
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit						2recent?																													
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit				3					1		1	2		2	1	1		2		2	1	3		1			2						2		2
Other Remains																																				
Wood charcoal quantity																										**										
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone																																				
Dung																																				
Fish bone																																				
Mouse bone																																				

Table 13.1.16: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb
	BH NO	12666	10998	10955	9557	9597	9558	16860	9592	11379	11400	6900	8933	8986	8471	8931	8207	38114	17439	17441	17445	17482	18481	18498	17437	17259	18485	14346	18480	14362	14364	14365	14378	14379	15012	15016
	Trench	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	M11	L10	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11
	Locus	154	148	142	133	133	133	132	117	109	108	106	106	106	106	106	106	105	107	343	343	343	343	343	343	343	339	327	321	321	312	312	312	312	312	312
	Lot	694	659	643	557	557	557	869	564	684	690	399	509	522	520	509	447			728	731	743	719	719	727	710	641	595	612	603	606	606	608	609	621	626
	subphasing	VIb2	VIb1	VIb2	>2 and VI	IIb2 and VI	IIb2 and VI	>2 and VI	VIb	VIb2	VIb2	VIb/a	VIb/a	VIb/a	VIb/a	VIb/a	VIb/a	VIb	VIb	VIb1	VIb1	VIb1	VIb1	VIb1	VIb1	VIb1	VIb2	VIb2	VIb3	VIb3	VIb2	VIb2	VIb2	VIb2	VIb2	VIb2
	str	11																	5	5	5	5	5	5	5	5	5			5	5	5	5	5	5	5
	Context	surface	technic_fe	technic_fe	surface	surface	surface	pit	layer	post-hole	layer	layer	layer	Layer	layer	layer	pit	pit	surface	surface	surface	surface	surface	surface	surface	pit	surface	surface	surface	layer	layer	layer	layer	layer	layer	layer
	Year	2010	2010	2010	2010	2010	2010	2011	2010	2010	2010	2009	2010	2010	2010	2010	2010	2014	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011	2011
	GIA number	35149	35114	35115	35106	35107	35165		35109	35117	35108	35047	35097	35051	35166	35168	35111																			
	liter of soil	1.75	charcoal	charcoal	HARCOA	6	charcoal		5		5.5	4		wood	6	6	6	5.25																		
Plant Latin Names	**Plant parts**																																			
Cereals																																				
Hordeum/Triticum	fragmented GK					2		2	27				1		2	2		2	1			1		1	4		1					1			2	1
Hordeum vulgare	floret/fruit																																			
Hordeum vulgare ssp. *vulgare*	fruit																																			
Hordeum vulgare ssp. *vulgare*	floret								4												1															
Hordeum vulgare	rachis node																																			
T. monococcum ssp. *monococcum*	fruit																	1.5														1				
T. cf. monococcum	fruit								1		1																									
T. monococcum/dicoccum	fruit																																			
T.mono-2grained/dicoccum	fruit																																			
T. turgidum ssp. *dicoccum*	fruit								4								1									2							1	1		
T. turgidum ssp. dicoccum	rachillate spikelet																																			
T. monococcum ssp.monococcum	rachis node																																			
T. monococcum/dicoccum	rachis node					1												1																		
T. turgidum ssp. *dicoccum*	rachis-twisted																																			
T. turgidum ssp. *dicoccum*	rachis node								23								1																			
Triticum	fruit																				1								1	1						
T. aestivum/durum	fruit								4		1						1									1					1					
Triticum	rachis																																			
T. aestivum/durum	rachis																																			
Pulses																																				
Cicer arietinum	seed																	0.5																		
Cicer/Lathyrus	seed																																			
Lathyrus sativus	seed																																			
Lens culinaris	seed								1																1											
cf. Lens	seed																																			
Pisum sativum	seed																																			
Vicia ervilia	seed											2								1		2				1			1		1				0.5	
cf. Vicia	seed																																			
Vicia faba	seed																																			
Fabaceae	seed																																			
Nuts-Fiber Plants-Gathered Plants																																				
Linum usitatissimum	seed																																			
Corylus avellana	fruit																		0.5						0.5											
Ficus carica	fruit																																			
Rubus fruticosus	fruitlet (endocarp)																																			
Quercus	seed																																			
Wild Plant																																				
Aegilops	fruit																																			
Aethusa cynapium	seed/fruit																																			
Adonis	fruitlet																																			
Amaranthaceae	seed																																			
Amaranthus	seed																																			
Androsace maxima	seed/fruit														1																					
Apiaceae	fruitlet																																			
Asteraceae	fruit																																			
Astragalus	seed																																			
Atriplex patula	seed/fruit																																			
Avena	fruit																																			
Bolboschoemum cf. glaucus	fruit																																			
Bolboschoemum cf. maritimus	fruit								1																											
Boraginaceae	fruitlet																																			
Brassicaceae	seed																																			
Bromus	fruit								1																											
Bromus sterilis	fruit																																			
Carex	fruit																																			
Carex cf. divulsa	fruit																																			
Caryophyllaceae	seed/fruit																																			
cf. cephalaria	seed/fruit																																			
Chenopodium cf. album	fruit								1																											
Chenopodium cf. polyspermum	fruit																																			
Chrozophora tinctoria	fruit																																			
Convolvulus	seed																																			
Fallopia convolvulus	fruit																																			
Cyperaceae	fruit																																			
Cyperus cf.	fruit																																			
cf. datura	seed																																			
Echallium	seed																																			
Echium vulgare	fruitlet																																			
Fabaceae	seed																																			
Fallopia	fruit								1																											
cf. ficus	fruit																																			
Fumaria densiflora	fruit																																			
Fumaria officinalis	fruit																1recent?																			
Galium	fruitlet								1																											
Galium aparine	fruitlet																																			
Geranium	seed																																			
Heliotropium	fruitlet																																			
Hippocrepis	fruitlet																																			
Hordeum spontaneum cf. marinum	fruit								1								1																			
Nepta-Ocimum	fruit																																			
Lamiaceae	fruit/seed																																			
Lepidium	seed																																			
Lithospermum	fruitlet																																			
Lithospermum tenuiflorum	fruitlet																																			
Buglossoides arvensis syn. *Lithos.*	fruitlet								27						4	1	1																			
cf. lolium	fruit																																			
Malvaceae	fruitlet																																			
cf. malva	fruitlet																																			
Medicago	fruit																																			
Onobrychis	fruit																																			
Papaveraceae	seed																																			
Papaver	seed																																			
Persicaria cf. maculosa	fruit										1																									
Persicaria tinctoria	fruit																																			
Phalaris	fruit/floret																																			
cf. plantago	seed																																			
Poaceae	fruit/floret														1																					
Poaceae	RN																																			
Poaceae	Spike piece																																			
Poaceae	culm																																			
Poligonaceae	fruit																																			
Polygonum	fruit																																			
Rosaceae	fruit								1																											
Rumex	fruit																																			
Sambucus nigra?	fruit																																			
Setaria pumila	floret																																			
Silene	seed																																			
cf. solanum	seed																																			
Solanum nigrum	seed																																			
Spergula arvensis	seed																																			
Stelleria media	seed																																			
Thymeleaeceae	fruit																																			
T. monococcum ssp. aegilopoides	fruit																																			
Triticum	culm																																			
Trifolium	fruit																																			
cf. Trigonella	seed/fruit																																			
Type 1-asteraceae? Recent?	seed/fruit																																			
Type 2	fruit																																			
Type 3 -Cyperaceae?	seed/fruit																																			
Veronica	seed																																			
Vitaceae	seed/fruit/fruitlet																																			
Unidentified	seed/fruit					2			1		2				4			3																		
Other Remains																																				
Wood charcoal quantity																		**																		
Prepared food																																				
Wood charcoal																																				
Oak																																				
Fungal spores																																				
Animal Remains																																				
Animal bone																																				
Dung																																				
Fish bone																																				
Mouse bone																																				

Table 13.1.17: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb
	BH NO	15044	16533	16568	16569	16570	6768	6747	6749	6748	6776	7214	7250	7249	7236	6611	6612	6613	5639	7219	6051	5696	5666	6773	6775	5171	5172	5173	2862	2547	2548	27567
	Trench	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L11	L115
	Locus	312	312	312	312	312	277	275	270	270	270	264	263	263	263	263	261	242	242	242	242	242	242	238	238	230	230	230	218	212	212	453
	Lot	628	668	681	681	681	490	487	486	486	694	526	542	542	531	478	482	479	414	530	441	433	420	496	496	394	394	394	263	242	242	
	subphasing	VIb2	VIb2	VIb2	VIb2	VIb2	VIb3	VIb1	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb	VIb3	VIb3	VIb3	VIb/a	VIb3	VIb3	VIb
	str	5	5	5	5	5																										
	Context	layer	layer	layer	layer	layer	surface	layer	surface	surface	surface	layer	pit	pit	pit	pit	other	layer	layer	layer	layer	layer	layer	layer	layer	surface	surface	surface	layer	collapse	collapse	pit
	Year	2011	2011	2011	2011	2011	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009	2007	2007	2007	2013
	GIA number						35040	35031	35014	35018	35038	35041	35022	35036	35037	35049	35027	35028	35025	35046	35015	35044	35024	35021	35045	35029	35043	35034	35003	35000	35001	
	liter of soil						6	6	6	4	4	5.5	5	5	6	6	3.5	3	6	4		1.5	4.5	4	4	2		3.5	5	4	5	4
Plant Latin Names	**Plant parts**																															
Cereals																																
Hordeum/Triticum	fragmented GK	2		1		2	2	1	1	1	2	17	5	14	7	4	2		5	5		3		7	2			1		3		10
Hordeum vulgare	floret/fruit												1		3																	
Hordeum vulgare ssp. *vulgare*	fruit																															
Hordeum vulgare ssp. *vulgare*	floret							1											1			1	2									
Hordeum vulgare	rachis node																															
T. monococcum ssp. *monococcum*	fruit																															
T. cf. monococcum	fruit																															
T. monococcum/dicoccum	fruit																															
T.mono-t2grained/dicoccum	fruit																															
T. turgidum ssp. *dicoccum*	fruit		1					1				4							1		1		1	1	1				1			
T. turgidum ssp. dicoccum	rachillate spikelet																															
T. monococcum ssp.*monococcum*	rachis node																															
T. monococcum/dicoccum	rachis node															0.5	3															1
T. turgidum ssp. *dicoccum*	rachis-twisted																															
T. turgidum ssp. *dicoccum*	rachis node						1	1	2			3							4														
Triticum	fruit				1																			1					1			
T. aestivum/durum	fruit							1					1										4			1						1
Triticum	rachis																															
T. aestivum/durum	rachis																															
Pulses																																
Cicer arietinum	seed														1																	
Cicer/Lathyrus	seed																															
Lathyrus sativus	seed																															
Lens culinaris	seed			1											2	0.5			2				2	1								
cf. Lens	seed																															
Pisum sativum	seed																															1
Vicia ervilia	seed							1				6	4	31	46	1			24	1	1	12	4									
cf. Vicia	seed																															
Vicia faba	seed																															
Fabaceae	seed														1						3											
Nuts-Fiber Plants-Gathered Plants																																
Linum usitatissimum	seed																															
Corylus avellana	fruit																															
Ficus carica	fruit						1																									
Rubus fruticosus	fruitlet (endocarp)																															
Quercus	seed																															
Wild Plant																																
Aegilops	fruit																															
Aethusa cynapium	seed/fruit																															
Adonis	fruitlet																		1													
Amaranthaceae	seed																															
Amaranthus	seed														3											1						
Androsace maxima	seed/fruit																															
Apiaceae	fruitlet													1recent																		
Asteraceae	fruit																															
Astragalus	seed																															
Atriplex patula	seed/fruit																															
Avena	fruit																															
Bolboschoenum cf. glaucus	fruit																1															
Bolboschoenum cf. maritimus	fruit																															
Boraginaceae	fruitlet																															2
Brassicaceae	seed																															
Bromus	fruit																															
Bromus sterilis	fruit																															
Carex	fruit																															
Carex cf. divulsa	fruit																															
Caryophyllaceae	seed/fruit																															
cf. cephalaria	seed/fruit													1																		
Chenopodium cf. album	fruit														2	1	1															
Chenopodium cf. polyspermum	fruit																1	1														
Chrozophora tinctoria	fruit																															
Convolvulus	seed																															
Fallopia convolvulus	fruit																			1												
Cyperaceae	fruit								1							1				1												
Cyperus cf.	fruit																															
cf. datura	seed																															
Ecballium	seed																															
Echium vulgare	fruitlet												3																			
Fabaceae	seed																															
Fallopia	fruit																															
cf. ficus	fruit																															
Fumaria densiflora	fruit																															
Fumaria officinalis	fruit						1																									
Galium	fruitlet											4																				
Galium aparine	fruitlet																															
Geranium	seed																															
Heliotropium	fruitlet																															
Hippocrepis	fruitlet																															
Hordeum spontaneum cf. marinum	fruit												1						1													
Nepta Ocimum	fruit																															
Lamiaceae	fruit/seed																															
Lepidium	seed																															
Lithospermum	fruitlet								2	1																						
Lithospermum tenuiflorum	fruitlet																												1	3		
Buglossoides arvensis syn. *Lithos.*	fruitlet							1						2	5	4		1	2	3				7								
cf. lolium	fruit									1																						
Malvaceae	fruitlet																															
cf. malva	fruitlet																															
Medicago	fruit											1																				
Onobrychis	fruit																															
Papaveraceae	seed																									1recent						
Papaver	seed																															
Persicaria cf. maculosa	fruit																															
Persicaria tinctoria	fruit																		1													
Phalaris	fruit/floret																															
cf. plantago	seed																															
Poaceae	fruit/floret														2				2	1		1										
Poaceae	RN																															
Poaceae	Spike piece																															
Poaceae	culm																															
Polygonaceae	fruit																															
Polygonum	fruit																		1													
Rosaceae	fruit																															
Rumex	fruit						1			1recent				4	7		1		1					1								
Sambucus nigra?	fruit																															
Setaria pumila	floret																															
Silene	seed																															
cf. solanum	seed																															
Solanum nigrum	seed																			1recent?												
Spergula arvensis	seed											1																				
Stelleria media	seed																															
Thymeleaeceae	fruit																		1													
T. monococcum ssp. aegilopoides	fruit																															
Triticum	culm																															
Trifolium	fruit																															
cf. Trigonella	seed/fruit							1recent?																								
Type 1-asteraceae? Recent?	seed/fruit																															
Type 2	fruit																															
Type 3 -Cyperaceae?	seed/fruit																															
Veronica	seed																															
Vitaceae	seed/fruit/fruitlet																															
Unidentified	seed/fruit							2				3	2	3	3	4	1recent	2	1	2			2	1	2	1			1	2	2	5
Other Remains																																
Wood charcoal quantity																															**	
Prepared food																																
Wood charcoal																																
Oak																																
Fungal spores																																
Animal Remains																																
Animal bone																																1
Dung																																
Fish bone																																
Mouse bone																																

Table 13.1.18: Archaeobotanical investigation on per sample at Barcın Höyük (continued).

BARCIN HÖYÜK ARCHAEOBOTANICAL DATA	Phase	VIb	VIb	VIb	VIb	VIb	VIb / VIa	VIa	VIa	VIa	VIa	VIa	VIa	VIa	VIa/MC	VIa/MC	MC	MC	MC	LC	LC	LC	EBA II	EBA II	EBA II	EBA II	EBA II	EBA II	EBA II	EBA II	E/M BA	E/M BA	E/M BA	E/M BA	E/M BA	n/a	mixed periods/cleaning			
	BH NO	14481	10659	7083	18758	35252	46533	10003	5048	11777	14908	10095	10058	10372	13865	10375	11795	2240	2238	10606	2344	2579	5754	5709	2031	2040	2174	4040	5593	6557	6564	6538	8039	12403	12660	8033	12536	46534	15765	12298	10725	12720
	Trench	L12	L12	L12	M12	M13	M13	M11	M11	L12	L12	L12	L12	L12	L12	L12	L12	L11	L11	L12	M10	M11	L12	L12	M10	M10	M11	M11	M11	L12	L12	L12	L13	L13	L13	L13	L14	M10	L12	L13	M10	L13
	Locus	233	157	105	10	170	45	119	71	189	185	170	169	163	160	162	180	208	209	164	62	12	97	82	54	54	3	3	3	107	107	106	113	113	113	108	117	999	241	n NE corr	146	E corner c
	Lot	834	611	423	34	shard family		576	233	669	841	584	574	563	778	555	670	223	224	587	236	52	351	341	211	214	20	110	267	383	383	378	135	208	208	131	149		862		713	
	subphasing	VIb2	VIb3	Via?	VIb1	VIb1	VIb2																																			
	str		5				12																									8										
	Context	ost_hol	chnic_fa	pit	surface	surface	wall	layer	layer	pit	pit	pit	pit	pit	pit	layer	layer	pit	pit	pit	layer	layer	chnic_fa	surface	pit	pit	pit	pit	pit	pit	pit	layer	layer	layer	pit	pit	y_locus	y_locus	nposition	y_locus	soundin
	Year	2011	2010	2009	2011	2013	2015	2010	2009	2010	2011	2010	2010	2010	2011	2010	2010		2007	2010	2007	2007	2009	2009	2007	2007	2007	2009	2009	2009	2009	2009	2010	2010	2010	2010	2010	2015	2011	2010	2010	2010
	GIA number		35064	35039				35083	35013	35066		35069	35068	35061		35060	35070	35007	35009	35062	35010	35006	35033	35035	35002	35008	35004	35012	35020	35019	35026	35032	35132	35118	35095	35091	35141			35094	35057	35215
	liter of soil		4	5		0.25	2.75	charcoal	5	6		4.5	6	1.5		0.6	6.5	5	4.5	0.5	5	5	6	4.5	5	4.3	3.5		6	6	6	4	6	1.25	1.25	6	7.25	2			10	
Plant Latin Names	**Plant parts**																																									
Cereals																																										
Hordeum/Triticum	fragmented GK		4	1			1		0.5		1	2	1				2	3	4		7	4		9	30	31	3	1		10	18		4				3	3			1	
Hordeum vulgare	floret/fruit																										2				2											
Hordeum vulgare ssp. vulgare	fruit																																									
Hordeum vulgare ssp. vulgare	floret									1								1			2				1													1				
Hordeum vulgare	rachis node																																									
T. monococcum ssp. monococcum	fruit																		1		1					3																
T. cf. monococcum	fruit																																									
T. monococcum/dicoccum	fruit											0.5																									1					
T.mono c2grained/dicoccum	fruit																																									
T. turgidum ssp. dicoccum	fruit	1	5		1													2			2	3	2		6	9	2	1			7							4		1	
T. turgidum ssp. dicoccum	rachillate spikelet																																									
T. monococcum ssp.monococcum	rachis node																																									
T. monococcum/dicoccum	rachis node																																	0.5			1					
T. turgidum ssp. dicoccum	rachis-twisted																																									
T. turgidum ssp. dicoccum	rachis node		1																			1	1	2	4.5			1	6	116		1									
Triticum	fruit										1														7				7													
T. aestivum/durum	fruit																		2		1				6	10		1			2		1								
Triticum	rachis																																									
T. aestivum/durum	rachis																																				2					
Pulses																																										
Cicer arietinum	seed																								cf. 17																	
Cicer/Lathyrus	seed																					3																				
Lathyrus sativus	seed																																									
Lens culinaris	seed								1			2	1								6	2				2	2	1		3	2										
cf. Lens	seed																																									
Pisum sativum	seed																																									
Vicia ervilia	seed																								9	2	3			1			2				1				
cf. Vicia	seed									1																																
Vicia faba	seed																										1															
Fabaceae	seed														2																											
Nuts-Fiber Plants-Gathered Plants																																										
Linum usitatissimum	seed																				1																					
Corylus avellana	fruit																																									
Ficus carica	fruit			1																													1mineralized								
Rubus fruticosus	fruitlet (endocarp)																																									
Quercus	seed																																									
Wild Plant																																										
Aegilops	fruit																								17																	
Aethusa cynapium	seed/fruit																																									
Adonis	fruitlet												1																													
Amaranthaceae	seed																																				2					
Amaranthus	seed																						1recent								4recent						2					
Androsace maxima	seed/fruit																																									
Apiaceae	fruitlet																																									
Asteraceae	fruit																																									
Astragalus	seed																								2	1																
Atriplex patula	seed/fruit																																									
Avena	fruit																																									
Bolboschoenum cf. glaucus	fruit																																									
Bolboschoenum cf. maritimus	fruit																				2																					
Boraginaceae	fruitlet																																									
Brassicaceae	seed																																									
Bromus	fruit																																									
Bromus sterilis	fruit																																				2recent?					
Carex	fruit																																									
Carex cf. divulsa	fruit																																									
Caryophyllaceae	seed/fruit																																									
cf. cephalaria	seed/fruit																																									
Chenopodium cf. album	fruit																							1						1	1										
Chenopodium cf. polyspermum	fruit																										2										1					
Chrozophora tinctoria	fruit																																									
Convolvulus	seed																																									
Fallopia convolvulus	fruit																																									
Cyperaceae	fruit																																									1
Cyperus cf.	fruit																																									
cf. datura	seed																								2																	
Echallium	seed																													2												
Echium vulgare	fruitlet																																									
Fabaceae	seed																																									
Fallopia	fruit																																									
cf. ficus	fruit													1recent?																												
Fumaria densiflora	fruit																																				1recent?					
Fumaria officinalis	fruit																													1												
Galium	fruitlet																																2									
Galium aparine	fruitlet																																									
Geranium	seed																																									
Heliotropium	fruitlet																							7																		
Hippocrepis	fruitlet																																									
Hordeum spontaneum cf. marinum	fruit																																									
Nepta-Ocimum	fruit																																									
Lamiaceae	fruit/seed																																									
Lepidium	seed																																									
Lithospermum	fruitlet																																									
Lithospermum tenuiflorum	fruitlet																										3															
Buglossoides arvensis syn. Lithos.	fruitlet											1																			1	2	1								
cf. lolium	fruit																																				1					
Malvaceae	fruitlet																																									
cf. malva	fruitlet																																									
Medicago	fruit																																									
Onobrychis	fruit																													1												
Papaveraceae	seed																																									
Papaver	seed																																				1recent?					
Persicaria cf. maculosa	fruit																																									
Persicaria tinctoria	fruit																																									
Phalaris	fruit/floret																										1							1				1				
cf. plantago	seed																																	1								
Poaceae	fruit/floret												2												2													1				
Poaceae	RN																								1																	
Poaceae	Spike piece																																									
Poaceae	culm																																									
Polygonaceae	fruit																																									
Polygonum	fruit																													2												
Rosaceae	fruit																																									
Rumex	fruit		1																		2									1											1
Sambucus nigra?	fruit																																									
Setaria pumila	floret																																									
Silene	seed																																									
cf. solanum	seed																																									
Solanum nigrum	seed																																2recent?		1recent	1recent?					
Spergula arvensis	seed																																									
Stelleria media	seed																																				1					
Thymelaeaceae	fruit																								1																
T. monococcum ssp. aegilopoides	fruit																																									
Triticum	culm																																									
Trifolium	fruit																																									
cf. Trigonella	seed/fruit																																									
Type 1-asteraceae? Recent?	seed/fruit																																									
Type 2	fruit																																									
Type 3 -Cyperaceae?	seed/fruit																																									
Veronica	seed																																				1recent?					
Vitaceae	seed/fruit/fruitlet																							3																		
Unidentified	seed/fruit									1		2	2			1	1				2	2	3		2	3	2			1	5			3		1	2		3		2
Other Remains																																										
Wood charcoal quantity					*	*																																				
Prepared food																																										
Wood charcoal																																										
Oak																																										
Fungal spores																																										
Animal Remains																																										
Animal bone																																										
Dung																																										
Fish bone																																										
Mouse bone																																										

13.2. Bahçelievler

Table 13.2: Archaeobotanical investigation on per sample at Bahçelievler.

Bahçelievler Archaeobotanical Samples		Trench	A2	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
		Unit-sample no	1/1	1/1	2/2	2/4	2/4	2/5	3/1	3/3	3/3	3/4	4/1	18/4	19/1	26/6	9/2	27/2	27/2	27/3	27/4	29/1	29/2	29/3	29/4	29/5	29/6	29/7	29/11	29/12	29/13	29/14	31/1
		Year	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	2021	2019	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021
		phase	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7b	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
		Unit name	ıban üstv	güneyin üst	ıvin üst	ıvin üst	ıvin üst	ıvin üst	ukur ev	ukur ev	ukur ev	ukur ev	ukur ev	ukur ev içi			eviçi	Ev içi	Ev içi	alınan (	n doğu	v içi oca	Ocak	süpürüld	süpürüld	duvarın	ndan al	landan	kinin GE	nel duv	l alanı (	alt tabaına	yakı
		Unit interpretation															Taban üstü																
		Flotation no	23	16	19	15	15	12	20	13	13	14	29	?	?	4	2	10	10	35	55	28	33	37	36	44	39	38	62	60	31	32	25
		Fraction Type	LM	LM	LM	LM	HM	LM	LM	LM	HM	LM	LM	LM	LM	LM	LM	LM	HM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM
		Liter of soil	2.8	2.8	4	2.2	2.2	2.6	2.75	3.25	3.25	5	5.25	3	3	4	11.75	3.5	3.5	3.75	3.25	2.25	3.1	5.25	3.25	5.25	3.25	0.5	4	6.5	2.25	5.3	6
Plant Latin Names	**Plant Parts**	**Comment**															photo																
Cereals																																	
Hordeum vulgare	floret/fruit																1																
Hordeum vulgare	rachis																																
Hordeum vulgare	floret																																
Hordeum vulgare ssp. *vulgare*	fruit																																
Hordeum vulgare	rachis																																
T. monococcum	fruit																																
T. monococcum	rachis node																																
T. aestivum/durum	fruit																																
T. aestivum/durum	rachis																																
T. monococcum ssp. *boeiticum*	fruit																																
T. monococcum/dicoccum	fruit																																
T. monococcum/dicoccum	rachis node																																
T. monococcum/dicoccum	floret fragments																																
T. turgidum ssp. *dicoccum*	fruit								1																								
T. turgidum ssp. *dicoccum*	rachillate spikelet																																
T. turgidum ssp. *dicoccum*	rachis node																																
Triticum	culm																																
Triticum	fruit									1												1		2								
Triticum	rachis																																
Triticum/Hordeum	fruit	fragmented										0.5	0.3			0.5	1	0.1				1		1.5		2	3	1		0.5		2	2
Triticum/Hordeum	rachis																																
Triticm/Hordeum	awn																																
Triticum/Fabaceae	seed/fruit	fragmented												0.2																			
Pulses																																	
Fabaceae	seed	fragmented															1																
Cicer arietinum	seed																																
Lathyrus sativus	seed																																
Lens culinaris	seed																							0.5									
Lens/Pisum	seed	fragmented																															
Pisum sativum	seed																		1?														
Vicia ervilia	seed																																
Fabaceae sp. domesticated?																																	
Fibre plants/Nuts																																	
Linum usitatissimum	seed																																
Celtis	fruit																																
Corylus avelana	fruit																												0.3				
Pistachia	fruit																																
Juglans regia	shell																																
Nutshell indet.	fruit/seed																																
Rubus fruticosus agg.	fruitlet																																
Vitaceae	seed																																
Quercus fruit	fruitshell																																
Wild plants																																	
Amaranthaceae	fruit																																
Amaranthus	fruit																																
Apiaceae	fruit																																
Asteraceae	seed/fruit																																
Atriplex	fruit	modern?																															
Avena	fruit																																
Bolboschoemum cf. *glaucus*	fruit																																
Boraginaceae	endocarp																																
Brassicaceae	seed																																
Carex	fruit																																
Carex cf. *divulsa*	fruit																																
Caryophyllaceae	seed fr. multi-seeded dry fruit																																
Chenopodiaceae	fruit																																
Chenopodium cf. *album*	fruit											1				7	5							6				1				11
Chrozophora tinctoria	fruit	modern																															
Cyperaceae	fruit/seed																																
Cyperus cf.	fruit																																
Echium vulgare	fruitlet																																
Fabaceae	seed																																
Fallopia	fruit																																
Galium	fruit																																
Geranium	seed																																
Hordeum spontaneum/marinum	floret																																
Lamiaceae	fruit																																
Lamiaceae- *Nepta/Ocimum*	fruit																																
Lithospermum	fruitlet																																
Malvaceae	fruitlet												1											1								
Medicago lupulina	seed																																
Persicaria	fruit																																
Phalaris	seed/fruit																																
Poaceae	fruit																																
Poaceae	Spike piece																																
Polygonaceae	fruit																																
Polygonum	fruit																																
Prunus	fruit	shell piece																															
Quercus	wood	fragmented																															
Rumex?	fruit	2x kind																															
Setaria pumila	fruit																																
Galiopsis/Convolvulus	fruit																																
Hippocrepis																																	
Unidentified									3																								
Charcoal quantity	pieces		**		*	****	***		*	***	***	**	*			***		****	****	***	***	****	**	*****	****	**			***	*****	***	***	**
Animal remains																																	
Animal bone		small pieces																															
Dung																																	
Fish bone																																	
Mouse bone		small pieces																															
Burnt mouse bone		small pieces																															
Shell		small pieces																															
Coprolite/food remain?																																	

Table 13.2.1: Archaeobotanical investigation on per sample at Bahçelievler (continued).

Bahçelievler Archaeobotanical Samples		Trench	C2	C2	C2	C2	C2	C2	C2	C3	C3	C3	C3	C3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3
		Unit-sample no	19/1	19/1	19/2	20/4	20/4	22/5	22/5	19/3	19/5	19/7	20/1	21/1	26/5	26/6	26/7	27/2	34/1	34/4	34/6	36/1	37/2	38/1	38/1	54/2	55/1	59/1	59/2	59/2	60/2	68/3	68/2	68/8
		Year	2021	2021	2021	2021	2021	2021	2021	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021
		phase	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		Unit name	Ev içi	Ev içi	ev içi	/lu taba	/lu taba	ev içi	ev içi						eviçi	eviçi	eviçi	avlu	iskelet	iskelet	iskelet	avlu	eviçi	avlu	avlu	avlu	ev içi	ev içi	ev içi	ev içi	avu	/lu taba	avu	/lu taba
		Unit interpretation																																
		Flotation no	8	8	57	46	46	48	48	48	44	52	49	53	25	57	26	29	32	33	46	54	56	55	55	51	65	63	67	67	56	69	70	58
		Fraction Type	LM	HM	LM	LM	HM	LM	HM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	HM	LM	LM	LM	LM	HM	LM	LM	LM	LM
		Liter of soil	1.5	1.5	4.5	4.2	4.2	4.25	4.25	12.6	2	2.75	6.25	2.75	4.15	2.5	3.5	12	10	13.25	6.75	3.6	2.5	8.3	8.3	5.75	9	4	3.75	3.75	4.5	8.1	8.5	7
Plant Latin Names	**Plant Parts**	**Comment**																photo					photo	photo										
Cereals																																		
Hordeum vulgare	floret/fruit																							1										
Hordeum vulgare	rachis																																	
Hordeum vulgare	floret																	2																
Hordeum vulgare ssp. *vulgare*	fruit																																	
Hordeum vulgare	rachis																																	
T. monococcum	fruit																							1										
T. monococcum	rachis node																																	
T. aestivum/durum	fruit																			1			1	2				2						
T. aestivum/durum	rachis																																	
T. monococcum ssp. *boeiticum*	fruit																																	
T. monococcum/dicoccum	fruit																																	
T. monococcum/dicoccum	rachis node																																	
T. monococcum/dicoccum	floret fragments																																	
T. turgidum ssp. *dicoccum*	fruit																																	
T. turgidum ssp. *dicoccum*	rachillate spikelet																																	
T. turgidum ssp. *dicoccum*	rachis node																																	
Triticum	culm																																	
Triticum	fruit						1	1.5																										0.5
Triticum	rachis																																	
Triticum/Hordeum	fruit	fragmented	0.3	1	0.3	2										1	0.4	1	10	3	4	2		0.7			6		0.2		0.5	2	0.3	
Triticum/Hordeum	rachis																																	
Triticm/Hordeum	awn																																	
Triticum/Fabaceae	seed/fruit	fragmented																																
Pulses																																		
Fabaceae	seed	fragmented																																
Cicer arietinum	seed																																	
Lathyrus sativus	seed																																	
Lens culinaris	seed				1	0.5		4	5											1														
Lens/Pisum	seed	fragmented																																
Pisum sativum	seed																																	
Vicia ervilia	seed																																	
Fabaceae sp. domesticated?																																		
Fibre plants/Nuts																																		
Linum usitatissimum	seed																																	
Celtis	fruit																																	
Corylus avelana	fruit																								0.5									
Pistachia	fruit																																	
Juglans regia	shell																																	
Nutshell indet.	fruit/seed																																	
Rubus fruticosus agg.	fruitlet																																	
Vitaceae	seed																																	
Quercus fruit	fruitshell																														0.3			
Wild plants																																		
Amaranthaceae	fruit																																	
Amaranthus	fruit																																	
Apiaceae	fruit																																	
Asteraceae	seed/fruit																																	
Atriplex	fruit	modern?																	1															
Avena	fruit																																	
Bolboschoemum cf. glaucus	fruit																																	
Boraginaceae	endocarp																																	
Brassicaceae	seed																																	
Carex	fruit																																	
Carex cf. divulsa	fruit																																	
Caryophyllaceae	seed fr. multi-seeded	dry fruit																																
Chenopodiaceae	fruit																																	
Chenopodium cf. album	fruit																																	
Chrozophora tinctoria	fruit	modern																																
Cyperaceae	fruit/seed																																	
Cyperus cf.	fruit																																	
Echium vulgare	fruitlet																																	
Fabaceae	seed																																	
Fallopia	fruit																																	
Galium	fruit																																	
Geranium	seed																																	
Hordeum spontaneum/marinum	floret																																	
Lamiaceae	fruit																																	
Lamiaceae- *Nepta/Ocimum*	fruit																																	
Lithospermum	fruitlet																																	
Malvaceae	fruitlet																																	
Medicago lupulina	seed																																	
Persicaria	fruit																																	
Phalaris	seed/fruit																																	
Poaceae	fruit																																	
Poaceae	Spike piece																																	
Polygonaceae	fruit																																	
Polygonum	fruit																																	
Prunus	fruit	shell piece																																
Quercus	wood	fragmented																																
Rumex?	fruit	2x kind																																
Setaria pumila	fruit																																	
Galiopsis/Convolvulus	fruit																																	
Hippocrepis																																		
Unidentified																			3			1		1										
Charcoal quantity	pieces		**	**		*	**	***				***			***														**	**	**			***
Animal remains																																		
Animal bone		small pieces																																
Dung																																		
Fish bone																																		
Mouse bone		small pieces																																
Burnt mouse bone		small pieces																																
Shell		small pieces																																
Coprolite/food remain?																													2?					

Table 13.2.2: Archaeobotanical investigation on per sample at Bahçelievler (continued).

Bahçelievler Archaeobotanical Samples		Trench	B3	B3	B3	B3	B3	B3	B3	B3-C3	B3-C3	B3-C3	B3-C3	B3-C3	B3-C3	B3-C3	C2	C2	C2	C2	C2	C2	C3	C3	C3	C3	C3	C3	C3	C3	B3	B3
		Unit-sample no	68/8	68/11	68/12	73/2	73/2	74/4	74/5	9/3	9/3	12/3	12/3	13/2	13/3	13/3	20/3	22/2	22/2	22/3	22/3	22/8	32/1	32/1	32/2	32/5	33/1	33/1	34/3	34/3	34/7	34/7	13/1	13/4
		Year	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020
		phase	6	6	6	6	6	6	6	?	?	6	6		6	6	6	6		6		6	6b	6b	6b	6b	6b	6b	6	6	6	6	5	5
		Unit name	/lu taba	avlu	/lu taba	indeki	çindeki	çdaki yu	rdaki yu	up çukuı	up çukuı	e 5'in 1	ne 5'in 1				nduğu	nduğu	ı taban	taban	üzeri	Ev içi		Ev içi	in güne	in güne	in kuze	ev içi			Avlu taba	vlu taba	Kapı içi	Kapı içi	avlu	avlu
		Unit interpretation						5. evreye açılmış çıçılmış çöp çukuru																											
		Flotation no	58	72	9	5	5	30	43	64	64	2	2	11	1	1	34	24	24	22	22	21	3	3	68	54	7	7	18	18	17	17	8	50
		Fraction Type	HM	LM	LM	LM	HM	LM	LM	LM	HM	LM	HM	LM	LM	HM	LM	LM	HM	LM	HM	LM	LM	HM	LM	LM	LM	HM	LM	HM	LM	HM	LM	LM
		Liter of soil	7	4	5.25	4	4	4	2	6	6	5.5	5.5		9.25	9.25	3.5	4	4	2	2	5.25	12.5	12.5	8.75	8	8.6	8.6	4	4	1.5	1.5	7.5	3
Plant Latin Names	**Plant Parts**	**Comment**																															
Cereals																																	
Hordeum vulgare	floret/fruit																																
Hordeum vulgare	rachis																																
Hordeum vulgare	floret																																
Hordeum vulgare ssp. *vulgare*	fruit																																
Hordeum vulgare	rachis																																
T. monococcum	fruit																																
T. monococcum	rachis node																																
T. aestivum/durum	fruit									2	1																		1				
T. aestivum/durum	rachis																																
T. monococcum ssp. *boeiticum*	fruit																																
T. monococcum/dicoccum	fruit											1			0.5																		
T. monococcum/dicoccum	rachis node																																
T. monococcum/dicoccum	floret fragments																																
T. turgidum ssp. *dicoccum*	fruit											7										1											
T. turgidum ssp. *dicoccum*	rachillate spikelet																																
T. turgidum ssp. *dicoccum*	rachis node																																
Triticum	culm																																
Triticum	fruit		0.5																1														
Triticum	rachis																																
Triticum/Hordeum	fruit	fragmented		0.5	6				0.5			36	3	0.5	0.3					0.5		1		0.3	0.2		1			1	2		0.2	
Triticum/Hordeum	rachis																																
Triticm/Hordeum	awn																																
Triticum/Fabaceae	seed/fruit	fragmented																															
Pulses																																	
Fabaceae	seed	fragmented																															
Cicer arietinum	seed																																
Lathyrus sativus	seed																																
Lens culinaris	seed								1										5	2												1	
Lens/Pisum	seed	fragmented																2															
Pisum sativum	seed																																
Vicia ervilia	seed								1															0.5									
Fabaceae sp. domesticated?										0.2												0.2											
Fibre plants/Nuts																																	
Linum usitatissimum	seed																																
Celtis	fruit																										0.3?						
Corylus avelana	fruit																		0.3														
Pistachia	fruit											2	3																				
Juglans regia	shell																																
Nutshell indet.	fruit/seed														0.5																		
Rubus fruticosus agg.	fruitlet																																
Vitaceae	seed																																
Quercus fruit	fruitshell																																
Wild plants																																	
Amaranthaceae	fruit																																
Amaranthus	fruit																																
Apiaceae	fruit																																
Asteraceae	seed/fruit																																
Atriplex	fruit	modern?																															
Avena	fruit																																
Bolboschoenum cf. *glaucus*	fruit																																
Boraginaceae	endocarp																																
Brassicaceae	seed																																
Carex	fruit																																
Carex cf. *divulsa*	fruit																																
Caryophyllaceae	seed fr. multi-seeded	dry fruit																															
Chenopodiaceae	fruit																																
Chenopodium cf. album	fruit																																
Chrozophora tinctoria	fruit	modern																															
Cyperaceae	fruit/seed																																
Cyperus cf.	fruit																																
Echium vulgare	fruitlet																																
Fabaceae	seed																																
Fallopia	fruit																																
Galium	fruit																																1
Geranium	seed																																
Hordeum spontaneum/marinum	floret																															2	
Lamiaceae	fruit																																
Lamiaceae- *Nepta/Ocimum*	fruit																																
Lithospermum	fruitlet																																
Malvaceae	fruitlet																																
Medicago lupulina	seed																																
Persicaria	fruit																																
Phalaris	seed/fruit																																
Poaceae	fruit											2																					
Poaceae	Spike piece																																
Polygonaceae	fruit																																
Polygonum	fruit																																
Prunus	fruit	shell piece																															
Quercus	wood	fragmented																															
Rumex?	fruit	2x kind																															
Setaria pumila	fruit																																
Galiopsis/Convolvulus	fruit																																
Hippocrepis																																	
Unidentified												1								1													
Charcoal quantity	pieces					**	*	*	***	*	**		****		*	*	***	**						*			*			**	***	***		
Animal remains																																	
Animal bone		small pieces																															
Dung																																	
Fish bone																																	
Mouse bone		small pieces										1.00																					
Burnt mouse bone		small pieces																															
Shell		small pieces																															
Coprolite/food remain?																					1.00										4.00		

Table 13.2.3: Archaeobotanical investigation on per sample at Bahçelievler (continued).

Bahçelievler Archaeobotanical Samples		Trench	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3
		Unit-sample no	13/7	13/7	14/1	15/6	15/8	15/9	16/2	16/2	16/3	17/3	17/4	17/7	17/9	17/11	17/14	17/16	17/13	17/13	21/1	22/1	24/2	24/8	24/13	24/16	50/4	50/5	51/1	6/1	6/2	6/4	7/1	8/6?
		Year	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2021	2021	2021	2020	2020	2020	2020	2020
		phase	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4a	4a	4a	4a	7
		Unit name	avlu	avlu	eviçi	avlu	avlu	avlu	eviçi	eviçi	eviçi	avlu	avlu	avlu	avlu	avlu	avlu	avlu	avlu	avlu	avlu	eviçi	eviçi	eviçi	eviçi	eviçi	/lu taba	avlu	avlu	nolu evi	eviçi	nolu evi	eviçi	
		Unit interpretation	Çömlek etrban üstü											çömlek etrn çevresi ve altı				çömlek çevi	ömlek içi	ömlek içey profile göre evin doğusu										dolgu	nolu odp	direk iolu	oda içi	
		Flotation no	19	19	13	10	34	17	37	37	4	6	5	?	14	15	7	16	12	12	38	24	58	22	28	23	49	71	53	36	39	43	40	42
		Fraction Type	LM	HM	LM	LM	LM	LM	LM	HM	LM	LM	LM	LM	LM	LM	LM	LM	LM	HM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM
		Liter of soil	4.75	4.75	4.75	4	1.75	4.25	4	4	2.45	2.5	4.75	5	2.75	3.75	9.5	2.6	6.75	6.75	3.5	2.75	2.6	3.5	4.6	5	5.25	4.75	12	3	2.1	0.25	7.3	
Plant Latin Names	**Plant Parts**	**Comment**	photo										photo						photo							photo								
Cereals																																		
Hordeum vulgare	floret/fruit		0.5												1																			
Hordeum vulgare	rachis																																	
Hordeum vulgare	floret																		3						1modern?								
Hordeum vulgare ssp. *vulgare*	fruit																																	
Hordeum vulgare	rachis																																	
T. monococcum	fruit								0.5				0.5																					
T. monococcum	rachis node																																	
T. aestivum/durum	fruit		10					2					1						3		0.5	2												1
T. aestivum/durum	rachis																																	
T. monococcum ssp. *boeiticum*	fruit																																	
T. monococcum/dicoccum	fruit		0.5																															
T. monococcum/dicoccum	rachis node														3					0.5														
T. monococcum/dicoccum	floret fragments																																	
T. turgidum ssp. *dicoccum*	fruit		4								0.5								0.5															
T. turgidum ssp. *dicoccum*	rachillate spikelet																																	
T. turgidum ssp. *dicoccum*	rachis node																																	
Triticum	culm																																	
Triticum	fruit																																	
Triticum	rachis																																	
Triticum/Hordeum	fruit	fragmented	56			0.2	0.2	5	0.3			2	1		2	0.5	2	1	37		3	4	2		7				0.2	0.2					
Triticum/Hordeum	rachis					1																17modern												
Triticm/Hordeum	awn																																	
Triticum/Fabaceae	seed/fruit	fragmented																																
Pulses																																		
Fabaceae	seed	fragmented																																
Cicer arietinum	seed																																	
Lathyrus sativus	seed																																	
Lens culinaris	seed		2																															
Lens/Pisum	seed	fragmented																																
Pisum sativum	seed																																	
Vicia ervilia	seed																																	
Fabaceae sp. domesticated?															0.5																			
Fibre plants/Nuts																																		
Linum usitatissimum	seed																																	
Celtis	fruit																																	
Corylus avelana	fruit									0.2																0.5								
Pistachia	fruit		71	32			0.2						1						3	1								1						
Juglans regia	shell																																	
Nutshell indet.	fruit/seed														0.2																			
Rubus fruticosus agg.	fruitlet																																	
Vitaceae	seed		1																1															
Quercus fruit	fruitshell																																	
Wild plants																																		
Amaranthaceae	fruit																																	
Amaranthus	fruit																																	
Apiaceae	fruit																																	
Asteraceae	seed/fruit		1																															
Atriplex	fruit	modern?																			2		2							1				
Avena	fruit																																	
Bolboschoemum cf. *glaucus*	fruit																																	
Boraginaceae	endocarp																																	
Brassicaceae	seed																																	
Carex	fruit																																	
Carex cf. *divulsa*	fruit																																	
Caryophyllaceae	seed fr. multi-seeded	dry fruit						1																										
Chenopodiaceae	fruit		1																															
Chenopodium cf. *album*	fruit											5													1									
Chrozophora tinctoria	fruit	modern																																
Cyperaceae	fruit/seed																																	
Cyperus cf.	fruit																																	
Echium vulgare	fruitlet																																	
Fabaceae	seed																																	
Fallopia	fruit																																	
Galium	fruit						2																											
Geranium	seed																																	
Hordeum spontaneum/marinum	floret																																	
Lamiaceae	fruit																																	
Lamiaceae- *Nepta/Ocimum*	fruit																																	
Lithospermum	fruitlet																																	
Malvaceae	fruitlet																																	
Medicago lupulina	seed																																	
Persicaria	fruit																																	
Phalaris	seed/fruit																																	
Poaceae	fruit																																	
Poaceae	Spike piece																																	
Polygonaceae	fruit		1																															
Polygonum	fruit																																	
Prunus	fruit	shell piece																																
Quercus	wood	fragmented																																
Rumex?	fruit	2x kind																																
Setaria pumila	fruit																																	
Galiopsis/Convolvulus	fruit																																	
Hippocrepis																																		
Unidentified			5			1							1	1		2									1									
Charcoal quantity	pieces									poor						poor	poor		poor-mid									***					**
Animal remains																																		
Animal bone		small pieces																1 bird?																
Dung																																		
Fish bone																																		
Mouse bone		small pieces														1			3															
Burnt mouse bone		small pieces																																
Shell		small pieces																																
Coprolite/food remain?																																		1

Table 13.2.4: Archaeobotanical investigation on per sample at Bahçelievler (continued)

Bahçelievler Archaeobotanical Samples		Trench	B3	B3	B3	B3	B3	B3	B3	B3	B4	B4	B4	B4	B4	B4	B4	B3	B3	B4	B4	B4	B4	B4	B4	B4	B4	B5	B5	B5	B5	B5
		Unit-sample no	9/1	9/3	9/6	9/6	10/1	10/1	66/1	66/1	13/1	13/1	25/1	25/3	15/1	15/1	4/3	4/4	4/3	4/5	4/5	5/2	5/2	5/3	5/3	5/7	6/1	1/3	2/1	3/2	4/1	8/4
		Year	2020	2020	2020	2020	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2020	2021
		phase	4a	4b	4b	4b	4b	4b	4a	4a	4b	4b	4b	4b	4b	4b	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2
		Unit name	avlu	avlu	avlu	avlu	avlu	avlu	içi çuku	içi çuku	ev dışı	ev dışı	vlu taba	vlu taba	ev içi	ev içi	eviçi	eviçi	eviçi	eviçi	eviçi	avlu	avlu	avlu	avlu	avlu	eviçi				Yapı içi üst se	
		Unit interpretation	taban üstü																													
		Flotation no	51	2	3	3	1	1	26	26	6	6	27	41	66	66	45	9	5	3	3	9	9	11	11	8	6	20	27	4	7	40
		Fraction Type	LM	LM	LM	HM	LM	HM	LM	HM	LM	HM	LM	LM	LM	HM	LM	LM	LM	LM	HM	LM	HM	LM	HM	LM	LM	LM	LM	LM	LM	LM
		Liter of soil	3.6	4.6	1.25	1.25	4.8	4.8	4.25	4.25	7	7	6	3.5	9.25	9.25	3.25	6	4.75	1.25	1.25	3	3	3	3	3	3	4.6	5.2	2	2	4.25
Plant Latin Names	**Plant Parts**	**Comment**			photo	photo									took modern reference																	
Cereals																																
Hordeum vulgare	floret/fruit										0.5																					
Hordeum vulgare	rachis																															
Hordeum vulgare	floret				1?modern?																											
Hordeum vulgare ssp. *vulgare*	fruit																															
Hordeum vulgare	rachis																															
T. monococcum	fruit																															
T. monococcum	rachis node																															
T. aestivum/durum	fruit				1										2																	
T. aestivum/durum	rachis																															
T. monococcum ssp. *boeiticum*	fruit																															
T. monococcum/dicoccum	fruit																															
T. monococcum/dicoccum	rachis node																															
T. monococcum/dicoccum	floret fragments																															
T. turgidum ssp. *dicoccum*	fruit																															
T. turgidum ssp. *dicoccum*	rachillate spikelet																															
T. turgidum ssp. *dicoccum*	rachis node																															
Triticum	culm																															
Triticum	fruit																															
Triticum	rachis																															
Triticum/Hordeum	fruit	fragmented	1			0.5	2		2	0.5	5	1	0.5	1	0.5						0.5	1	0.5			0.1					4
Triticum/Hordeum	rachis																															
Triticm/Hordeum	awn																															
Triticum/Fabaceae	seed/fruit	fragmented																								0.3				0.2		
Pulses																																
Fabaceae	seed	fragmented																												2		
Cicer arietinum	seed								0.5?																							
Lathyrus sativus	seed																															
Lens culinaris	seed									1																						0.5
Lens/Pisum	seed	fragmented																														
Pisum sativum	seed																															
Vicia ervilia	seed																					1										
Fabaceae sp. domesticated?																																
Fibre plants/Nuts																																
Linum usitatissimum	seed																															
Celtis	fruit																															
Corylus avelana	fruit																															
Pistachia	fruit					0.5		1								0.1																
Juglans regia	shell																															
Nutshell indet.	fruit/seed						0.5					0.2																				
Rubus fruticosus agg.	fruitlet																															
Vitaceae	seed																															
Quercus fruit	fruitshell																								0.4							
Wild plants																																
Amaranthaceae	fruit																															
Amaranthus	fruit					1																										
Apiaceae	fruit																															
Asteraceae	seed/fruit																															
Atriplex	fruit	modern?																4														
Avena	fruit																															
Bolboschoemum cf. glaucus	fruit																															
Boraginaceae	endocarp																	1														
Brassicaceae	seed				1																											
Carex	fruit																															
Carex cf. divulsa	fruit																															
Caryophyllaceae	seed fr. multi-seeded dry fruit																															
Chenopodiaceae	fruit																															
Chenopodium cf. album	fruit										7														4							
Chrozophora tinctoria	fruit	modern																														
Cyperaceae	fruit/seed																															
Cyperus cf.	fruit																															
Echium vulgare	fruitlet																															
Fabaceae	seed																															
Fallopia	fruit																															
Galium	fruit				1										3	1				1												
Geranium	seed																															
Hordeum spontaneum/marinum	floret																															
Lamiaceae	fruit																															
Lamiaceae- *Nepta/Ocimum*	fruit																															
Lithospermum	fruitlet																															
Malvaceae	fruitlet																															
Medicago lupulina	seed																															
Persicaria	fruit																															
Phalaris	seed/fruit																															
Poaceae	fruit																										1					
Poaceae	Spike piece																															
Polygonaceae	fruit					1																										
Polygonum	fruit																															
Prunus	fruit	shell piece																														
Quercus	wood	fragmented																														
Rumex?	fruit	2x kind																														
Setaria pumila	fruit																															
Galiopsis/Convolvulus	fruit																															
Hippocrepis																																
Unidentified											1		3		3											1	8			2		
Charcoal quantity	pieces			none			**	*	*	*	*	**		****	**	***				**	**			**	*						****	
Animal remains																																
Animal bone		small pieces																														
Dung																																
Fish bone																																
Mouse bone		small pieces																														
Burnt mouse bone		small pieces																														
Shell		small pieces																														
Coprolite/food remain?																																

Table 13.2.5: Archaeobotanical investigation on per sample at Bahçelievler (continued).

Bahçelievler Archaeobotanical Samples		Trench	B5	B5	B5	B5	B5	B5	B5	B5	B5	B5	C3	C3	B2	B2	B2	B2	B3	B3	B3	B3	B3	C3	B3
		Unit-sample no	8/5	8/5	8/7	9/1	12/2	14/1	14/1	14/4	19/2	19/2	6/1	13/2	4/2	11/1	8/5	8/5	8/6	20/1	35/3	35/4	35/5	2/1	42/1
		Year	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2021	2020	2019	2019	2020	2020	2020	2020	2020	2020	2020	2020
		phase	2	2	2	2	2	2	2	2	?	?	1	?	?	?	?	?	?	?	?	?	?	?	
		Unit name	yapı içi	yapı içi	ının kö	ndan 2.	ev dışı	yapı içi	yapı içi	yapı içi	ukurda	ukurdan		?											
		Unit interpretation																		iskeletin çevresinda çukurun tabanı					
		Flotation no	61	61	42	59	52	47	47	45	50	50	21	11	41	3	4	11	42	18	30	31	47	35	
		Fraction Type	LM	HM	LM	LM	LM	LM	HM	LM	LM	HM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	LM	HM
		Liter of soil	4	4	2.25	4	5	4	4	3.25	5	5	4	7	3	4.25	5.25	8	5	3.5	17.5	3	4	0.75	
Plant Latin Names	**Plant Parts**	**Comment**																			photo		photo		
Cereals																									
Hordeum vulgare	floret/fruit																				2				
Hordeum vulgare	rachis																								
Hordeum vulgare	floret																								
Hordeum vulgare ssp. *vulgare*	fruit																								
Hordeum vulgare	rachis																								
T. monococcum	fruit																								
T. monococcum	rachis node																								
T. aestivum/durum	fruit																		1	0.5	1				
T. aestivum/durum	rachis																								
T. monococcum ssp. *boeiticum*	fruit																								
T. monococcum/dicoccum	fruit																								
T. monococcum/dicoccum	rachis node		1																						
T. monococcum/dicoccum	floret fragments																								
T. turgidum ssp. *dicoccum*	fruit																				1		1		
T. turgidum ssp. *dicoccum*	rachillate spikelet																								
T. turgidum ssp. *dicoccum*	rachis node																								
Triticum	culm																								
Triticum	fruit																								
Triticum	rachis																								
Triticum/Hordeum	fruit	fragmented	0.5	1			1		2			1				0.5	3			2	7		7		
Triticum/Hordeum	rachis																								
Triticm/Hordeum	awn																								
Triticum/Fabaceae	seed/fruit	fragmented												2											
Pulses																									
Fabaceae	seed	fragmented																							
Cicer arietinum	seed																								
Lathyrus sativus	seed																								
Lens culinaris	seed																								
Lens/Pisum	seed	fragmented																							
Pisum sativum	seed																								
Vicia ervilia	seed							0.5																	
Fabaceae sp. domesticated?																									
Fibre plants/Nuts																									
Linum usitatissimum	seed																								
Celtis	fruit																								
Corylus avelana	fruit																								0.3
Pistachia	fruit																								
Juglans regia	shell																								
Nutshell indet.	fruit/seed																								
Rubus fruticosus agg.	fruitlet																								
Vitaceae	seed																								
Quercus fruit	fruitshell																								
Wild plants																									
Amaranthaceae	fruit																								
Amaranthus	fruit																								
Apiaceae	fruit																								
Asteraceae	seed/fruit																								
Atriplex	fruit	modern?														1			1	2					
Avena	fruit																								
Bolboschoemum cf. *glaucus*	fruit																								
Boraginaceae	endocarp																								
Brassicaceae	seed																								
Carex	fruit																								
Carex cf. *divulsa*	fruit																								
Caryophyllaceae	seed fr. multi-seeded dry fruit																								
Chenopodiaceae	fruit																								
Chenopodium cf. *album*	fruit															1									
Chrozophora tinctoria	fruit	modern																							
Cyperaceae	fruit/seed																								
Cyperus cf.	fruit																								
Echium vulgare	fruitlet																								
Fabaceae	seed																								
Fallopia	fruit																								
Galium	fruit																								
Geranium	seed																								
Hordeum spontaneum/marinum	floret																								
Lamiaceae	fruit																								
Lamiaceae- *Nepta/Ocimum*	fruit																								
Lithospermum	fruitlet																								
Malvaceae	fruitlet																								
Medicago lupulina	seed																								
Persicaria	fruit																								
Phalaris	seed/fruit																								
Poaceae	fruit																				1				
Poaceae	Spike piece																								
Polygonaceae	fruit																								
Polygonum	fruit																								
Prunus	fruit	shell piece																							
Quercus	wood	fragmented																							
Rumex?	fruit	2x kind																							
Setaria pumila	fruit																								
Galiopsis/Convolvulus	fruit																								
Hippocrepis																									
Unidentified																									
Charcoal quantity	pieces		****	**	***			*	**	*****	***	**													
Animal remains																									
Animal bone		small pieces																							
Dung																									
Fish bone																									
Mouse bone		small pieces																							
Burnt mouse bone		small pieces																							
Shell		small pieces																							
Coprolite/food remain?																									

13.3. Aşağı Pınar

Table 13.3: Archaeobotanical investigation on per sample at Aşağı Pınar.

| Aşağı Pınar Archaeobotanical Samples | | |

Table 13.3.1: Archaeobotanical investigation on per sample at Aşağı Pınar (continued).

Aşağı Pınar Archaeobotanical Samples																																								
		trench	6M	6M	6L	6L	6M	6L	6L	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M	6M
		unit no	134	134	81	86	81.-	83	77	92	124	124	124	121	121	118	118	118	118	118	116	115a	115	115	115	115	115	115	108	103	103	107	111								
		context code	E	E	D	D	Bi	4	2a	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4								
		context name	ditch	ditch				pit					pit						pit	pit	pit		pit	pit	pit	pit	pit	pit		layer		pit	pit								
		str	I1-1 (east	I1-1 (east	H1-1west	H1-1west	I1-1,H1-2	H1-1a	H1-1b	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1d	H1-1e	H1-1e								
		Analysis no									45	51	A44	A55		82	40	66	48	52	46	83	67	65	68	69	56	75	74	78			71								
		year						2019	2019		2017	2017	2017	2017		2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017		2017								
		phase	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7								
Plant Latin Names	**plant part**	**comment**																																							
Cereals																																								
Triticum/Hordeum	floret/fruit	fragmented	117	105	30	62	50	10	8	9	22	10	32	261	6	2	6	4	18	15	23	2	30	7	16	26	16	21	8	42	64	18									
Triticum/Hordeum/Fabaceae	fruit/seed	fragmented																						16			45			35											
Hordeum distichon	floret								1					11																											
Hordeum distichon	single rachis segment																																							
Hordeum vulgare ssp. *vulgare*	floret		2										3												1.5	1														
Hordeum vulgare ssp. *vulgare*	fruit																																							
Hordeum vulgare ssp. *vulgare*	fruit/floret																																							
Hordeum vulgare ssp. *vulgare*	rachis nodes																																							
Hordeum vulgare undiff.	floret						150		2																															
Hordeum vulgare undiff.	fruit																																							
Hordeum vulgare undiff.	rachis nodes																																							
Hordeum vulgare undiff.	single rachis segment																																							
Hordeum distichon/vulgare	floret/fruit										1														2			2	4	3											
Hordeum distichon/vulgare	single rachis segment																																							
Triticum dicoccum	fruit		4				73		3	6		1	3	7			2		1							2	1		3	1										
Triticum dicoccum	rachis nodes						4																																	
Triticum dicoccum	lemma base																																							
Triticum monococcum	fruit						4		1			2					1																							
Triticum monococcum	rachis nodes																																							
Triticum cf. *monococcum*	fruit																																							
Triticum monococcum, 2-grained	fruit																																							
Triticum monococcum/dicoccum	fruit																																							
Triticum monococcum/dicoccum	rachis nodes		1				16		1	11	1	1	4	4	2						1	3	1		2	5	1.5			4	5									
Triticum monococcum/dicoccum	single rachis segment																																							
Triticum compactum s.str.	fruit																																							
Triticum durum/aestivum	fruit		8				1		2				4	10		1	2		2						4			5	1		3	4								
Triticum durum/aestivum	rachis																																							
Triticum durum s.str.	fruit																																							
Triticum durum s.str.	single rachis segment																																							
Triticum spec.	fruit																							3																
Triticum spec.	rachis nodes						19				1																			1			2							
Scale cereale	fruit																																							
Cerealia indet.	embryo						2																																	
Cerealia indet.	culm																																							
Pulses																																								
Lathyrus sativus	seed						1 39					1																												
Lens culinaris	seed		3	2	5	5	4	2	1		10	17	7	15			2		4	4			1	4	1		1		4	3	3								
Pisum sativum	seed		2	3					1			1	1	9						1		3		2			3			3	1								
Vicia ervilia	seed									1																				2	1	2								
Cicer arietinum	seed													0.5																										
Fabaceae (kult.)	seed			8			19	4			2	1		10	0.2			1	1		2					2	0.5	2	1	3	3	2								
Gathered Plants																																								
Vitis vinifera	seed																																							
Cornus mas	fruit/endocarp																																							
Corylus avellana	fruit																																							
Linum cf. bienne	seed																																							
Nutshell indet.	fruit/endocarp										1																													
Nut	fruit/seed																																							
Pistacia	fruit																																							
Prunus spec.	fruit/endocarp																																							
Rubus fruticosus	fruitlet																																							
Indet fruit	fruit																																							
Wild Plants																																								
Amaranthaceae	seed/fruit																																							
Anchusa arvensis	fruitlet																						1																	
Asteraceae	seed/fruit				1r																																			
Avena spec.	fruit																																							
Avena spec.	awn																																							
Boraginaceae	fruitlet																												2r											
Bromus spec.	floret																																							
Brassicaceae	seed						4		1r																				1r											
Carex spec.	fruit		4																																					
Chenopodiaceae	seed/fruit				1			3														2								3										
Chenopodium spec.	fruit		13	13	5				70r						3																									
Cyperaceae	fruit																																							
Digitaria spec.	rachillate spikelet																																							
Echium vulgare	fruitlet		1	92	2			2	8					1												1	1		1r	17r			1							
Fabaceae	seed							1	1											1r																				
Fallopia	fruit						1																																	
Fumaria spec.	fruit			70m		4r			12r									3r					1						8r	13r?									
Galium spec.	fruitlet		1											1																									
Hordeum spec.	fruit/floret																																							
Hordeum spec.	rachis																																							
Lamiaceae	seed/fruit																																							
cf. *Lathyrus*	seed																																							
Linum cf. *bienne*	seed																																							
Lithospermum	fruitlet			9				1						1							1		1			2	1			10r?		4							
Malvaceae	fruitlet																																							
Malvaceae	fruitlet/seed														2																									
Medicago	seed								71r																		1		5r		1	1r								
Papaveraceae	seed																																							
Poaceae	floret/fruit		2																																					
Poaceae	awn																																							
Polygonaceae	fruit													1															1		1								
Polygonum convolvulus	fruit						2																																	
Polygonum spec.	fruit		2	2																	1																		
Rosaceae	fruit																																							
Rumex acetosella agg.	fruit																																							
Rumex cf. *acetosella* agg.	fruit																																							
Rumex spec.	fruit																																							
Sambucus	fruit																																							
Setaria	spikelet													7													1												
Setaria spec./Panicum	floret																																							
Silene vulgaris	seed																																							
Vicia spec.	seed																																							
Tilia platyphyllos	fruit													1r																									
Thymeleaceae	fruit																																							
Trifolium	seed								48r																															
Trigonella	seed/fruit								2r																															
Ziziphora	seed/fruit																								1?															
Unidentified	Fruit/seed		14	7m	1	12		3	20r		6		1		2				1		3	2	4	1					7r	4r			4							
Unidentified	Fruit																																							
Unidentified	fruit/seed	fragmented																																						
Unidentified	shell/chuff																																							
Indet Type 1	seed/fruit			14m							1			1																									
Indet Type 2	seed/fruit																																							
Indet Type 3	seed/fruit																																							
charcoal quantity				******		****			*****		*****	****			***	*	****	***	****	****			*****		***	****	*****	****	**	******	****	***								
prepared food											5																7foto												
Dung or food remains													1																										
Animal Remains																																							
Bone					2	1			1				3																										
Dung																															1								
Fish bone				1																																			
Mouse bone				5							4	2		1																1									
Mouse bone burnt																											1												
Sell																																							

Table 13.3.2: Archaeobotanical investigation on per sample at Aşağı Pınar (continued).

| Aşağı Pınar Archaeobotanical Samples | | |

Table 13.3.3: Archaeobotanical investigation on per sample at Aşağı Pınar (continued).

Aşağı Pınar Archaeobotanical Samples																																		
		trench	7N	7N	7N	7N	7N	7N	7N	7N	7N	7P	7P	7P	7P	7P	7P	7P	7P	7P	7P	7P	7P	7P	7P	7P	7P	7P	7P	7S	7S	7S
		unit no	187	188	205	205	205	206	211	212	215	313	291	294	308	309	310	369	293	368	323	323	331	324	325	325	328	329	329	133	130	130
		context code	4	4	4	4	4	6	5	5	6	4	2b	4	4	4	4	5	4	4	D	D	4	D	C	C	D	D	D	D	C	C
		context name						pit			pit							pit		pit		under of sh		pit,ashy				kalkerli doğu					
		str	H1-2a	H1-2a	H1-2a	H1-2a	H1-2a	H1-2a	H1-2a	H1-2a	H1-2a	H1-2a	H1-2a	H1-2a	H1-2a	H1-2a	H1-2a	H1-2a	H1-2b	H1-2c	H1-3	H1-3	H1-3	H1-3	H1-3	H1-3	H1-3	H1-3	H1-3	H1-4	H1-4	H1-4
		Analysis no						211			214							210		208		105	109				121					
		year						2015			2015							2015		2015		2013	2013				2013					
		phase	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Plant Latin Names	**plant part**	**comment**																														
Cereals																																
Triticum/Hordeum	floret/fruit	fragmented			15	9	10	105	13	5								5		14		1	6				2					
Triticum/Hordeum/Fabaceae	fruit/seed	fragmented																				2										
Hordeum distichon	floret																															
Hordeum distichon	single rachis segment																															
Hordeum vulgare ssp. *vulgare*	floret																	1														
Hordeum vulgare ssp. *vulgare*	fruit																															
Hordeum vulgare ssp. *vulgare*	fruit/floret																															
Hordeum vulgare ssp. *vulgare*	rachis nodes																															
Hordeum vulgare undiff.	floret				1	4																										
Hordeum vulgare undiff.	fruit																															
Hordeum vulgare undiff.	rachis nodes																															
Hordeum vulgare undiff.	single rachis segment																															
Hordeum distichon/vulgare	floret/fruit																					0.5										
Hordeum distichon/vulgare	single rachis segment																															
Triticum dicoccum	fruit			6	6			3		3			3			1				1												
Triticum dicoccum	rachis nodes			2						2																						
Triticum dicoccum	lemma base																															
Triticum monococcum	fruit			5	4			3																								
Triticum monococcum	rachis nodes									4																						
Triticum cf. *monococcum*	fruit												2																			
Triticum monococcum, 2-grained	fruit																															
Triticum monococcum/dicoccum	fruit								1																							
Triticum monococcum/dicoccum	rachis nodes					1				4								1														
Triticum monococcum/dicoccum	single rachis segment																															
Triticum compactum s.str.	fruit																															
Triticum durum/aestivum	fruit																															
Triticum durum/aestivum	rachis																															
Triticum durum s.str.	fruit																															
Triticum durum s.str.	single rachis segment																															
Triticum spec.	fruit																			1												
Triticum spec.	rachis nodes																															
Scale cereale	fruit																															
Cerealia indet.	embryo																															
Cerealia indet.	culm																															
Pulses																																
Lathyrus sativus	seed									1																						
Lens culinaris	seed				1	2		6																								
Pisum sativum	seed							2																								
Vicia ervilia	seed			1																												
Cicer arietinum	seed																															
Fabaceae (kult.)	seed				1																						1					
Gathered Plants																																
Vitis vinifera	seed																															
Cornus mas	fruit/endocarp																															
Corylus avellana	fruit							3?																								
Linum cf. bienne	seed																															
Nutshell indet.	fruit/endocarp																															
Nut	fruit/seed																															
Pistacia	fruit																															
Prunus spec.	fruit/endocarp			1																												
Rubus fruticosus	fruitlet																															
Indet fruit	fruit																															
Wild Plants																																
Amaranthaceae	seed/fruit			1						1																						
Anchusa arvensis	fruitlet																															
Asteraceae	seed/fruit																															
Avena spec.	fruit																															
Avena spec.	awn																															
Boraginaceae	fruitlet																															1
Bromus spec.	floret																															
Brassicaceae	seed																															
Carex spec.	fruit																															
Chenopodiaceae	seed/fruit																															
Chenopodium spec.	fruit																															
Cyperaceae	fruit																															
Digitaria spec.	rachillate spikelet																															
Echium vulgare	fruitlet																															
Fabaceae	seed			3		1			1	2																					1	
Fallopia	fruit																															
Fumaria spec.	fruit							2m												4r												
Galium spec.	fruitlet																															
Hordeum spec.	fruit/floret																															
Hordeum spec.	rachis																															
Lamiaceae	seed/fruit																															
cf. *Lathyrus*	seed																															
Linum cf. *bienne*	seed																															
Lithospermum	fruitlet																															
Malvaceae	fruitlet																															
Malvaceae	fruitlet/seed																															
Medicago	seed																															
Papaveraceae	seed																															
Poaceae	floret/fruit					4		1		2																	1					
Poaceae	awn																															
Polygonaceae	fruit																			1r												
Polygonum convolvulus	fruit				1																											
Polygonum spec.	fruit																															
Rosaceae	fruit																															
Rumex acetosella agg.	fruit																															
Rumex cf. *acetosella* agg.	fruit																															
Rumex spec.	fruit																															
Sambucus	fruit																															
Setaria	spikelet																															
Setaria spec./Panicum	floret																															
Silene vulgaris	seed																															
Vicia spec.	seed																															
Tilia platyphyllos	fruit																															
Thymeleaceae	fruit																															
Trifolium	seed																															
Trigonella	seed/fruit																															
Ziziphora	seed/fruit																															
Unidentified	Fruit/seed				3		1	2																								
Unidentified	Fruit																															
Unidentified	fruit/seed	fragmented			2																											
Unidentified	shell/chuff						3																									
Indet Type 1	seed/fruit																															
Indet Type 2	seed/fruit																															
Indet Type 3	seed/fruit																															
charcoal quantity								*****												*****												
prepared food																																
Dung or food remains																																
Animal Remains																																
Bone																				2												
Dung																																
Fish bone																																
Mouse bone																																
Mouse bone burnt																																
Sell																																

Table 13.3.4: Archaeobotanical investigation on per sample at Aşağı Pınar (continued).

Aşağı Pınar Archaeobotanical Samples	trench	7S	7T	7T	8K	8K	8K	8L	9M	8P	9P	9P	9P	9P	9P	8S	8S	8S	8S	8S	7T	7T	7U	7U	7U	7U	7U	7U	7U	6U	6U
	unit no	143	181	198	321	321	317	74	220	199	257	257	257	279	279	230	234	234	239	239	162	222	258	262	262	287	289	289	289	212	240
	context code	F	D	D	F	F	E	D	F	B1	C	C	C	D	D	D	D	D	F	F	D	D	D	D	D	E	E	E	E	D?	
	context name																														
	str	H1-4	H1-4C	H1-5	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2
	Analysis no																														
	year				2019	2019	2019																								
	phase	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Plant Latin Names	**plant part**	**comment**																													
Cereals																															
Triticum/Hordeum	floret/fruit	fragmented				1	1	2						3								1	26	10	100	30	1	7			
Triticum/Hordeum/Fabaceae	fruit/seed	fragmented																													
Hordeum distichon	floret																														
Hordeum distichon	single rachis segment																														
Hordeum vulgare ssp. *vulgare*	floret																														
Hordeum vulgare ssp. *vulgare*	fruit																														
Hordeum vulgare ssp. *vulgare*	fruit/floret																														
Hordeum vulgare ssp. *vulgare*	rachis nodes																														
Hordeum vulgare undiff.	floret																						7	51	3						
Hordeum vulgare undiff.	fruit																														
Hordeum vulgare undiff.	rachis nodes																														
Hordeum vulgare undiff.	single rachis segment																														
Hordeum distichon/vulgare	floret/fruit																														
Hordeum distichon/vulgare	single rachis segment																														
Triticum dicoccum	fruit							65		15							1		1				3	10	60	29					
Triticum dicoccum	rachis nodes							2																2		4					
Triticum dicoccum	lemma base																														
Triticum monococcum	fruit							3																8	40	2					
Triticum monococcum	rachis nodes																									4					
Triticum cf. *monococcum*	fruit																														
Triticum monococcum, 2-grained	fruit																														
Triticum monococcum/dicoccum	fruit																														
Triticum monococcum/dicoccum	rachis nodes					1		0.5	14														8	33	13	60					
Triticum monococcum/dicoccum	single rachis segment																								1						
Triticum compactum s.str.	fruit																								5						
Triticum durum/aestivum	fruit						1																								
Triticum durum/aestivum	rachis																														
Triticum durum s.str.	fruit																														
Triticum durum s.str.	single rachis segment																														
Triticum spec.	fruit																														
Triticum spec.	rachis nodes						2																								
Scale cereale	fruit																														
Cerealia indet.	embryo																							2							
Cerealia indet.	culm																														
Pulses																															
Lathyrus sativus	seed																								17	2					
Lens culinaris	seed					1																	6	2	5						
Pisum sativum	seed																														
Vicia ervilia	seed						1											1					1						1		
Cicer arietinum	seed																														
Fabaceae (kult.)	seed																								19						
Gathereed Plants																															
Vitis vinifera	seed																									1					
Cornus mas	fruit/endocarp																														
Corylus avellana	fruit																														
Linum cf. bienne	seed																														
Nutshell indet.	fruit/endocarp																														
Nut	fruit/seed																														
Pistacia	fruit																														
Prunus spec.	fruit/endocarp																														
Rubus fruticosus	fruitlet							1																1		2					
Indet fruit	fruit																														
Wild Plants																															
Amaranthaceae	seed/fruit																							2							
Anchusa arvensis	fruitlet																														
Asteraceae	seed/fruit																														
Avena spec.	fruit																														
Avena spec.	awn																														
Boraginaceae	fruitlet																														
Bromus spec.	floret																														
Brassicaceae	seed																														
Carex spec.	fruit																								1						
Chenopodiaceae	seed/fruit						1																								
Chenopodium spec.	fruit						1																		3						
Cyperaceae	fruit																														
Digitaria spec.	rachillate spikelet																						1	5	3						
Echium vulgare	fruitlet																														
Fabaceae	seed																						3	6	1	2	1	2			
Fallopia	fruit																														
Fumaria spec.	fruit																														
Galium spec.	fruitlet																						1		7	1					
Hordeum spec.	fruit/floret										1																				
Hordeum spec.	rachis																														
Lamiaceae	seed/fruit																														
cf. *Lathyrus*	seed																														
Linum cf. bienne	seed																								3						
Lithospermum	fruitlet																														
Malvaceae	fruitlet																								1						
Malvaceae	fruitlet/seed																							2	1						
Medicago	seed																														
Papaveraceae	seed																														
Poaceae	floret/fruit																						2								
Poaceae	awn																														
Polygonaceae	fruit																														
Polygonum convolvulus	fruit																						1	1	13						
Polygonum spec.	fruit																														
Rosaceae	fruit																														
Rumex acetosella agg.	fruit																														
Rumex cf. *acetosella* agg.	fruit																														
Rumex spec.	fruit																														
Sambucus	fruit																														
Setaria	spikelet																														
Setaria spec./Panicum	floret																														
Silene vulgaris	seed																														
Vicia spec.	seed																														
Tilia platyphyllos	fruit																														
Thymeleaceae	fruit																														
Trifolium	seed																														
Trigonella	seed/fruit																														
Ziziphora	seed/fruit																														
Unidentified	Fruit/seed																								5	9	1		1		
Unidentified	Fruit																														
Unidentified	fruit/seed	fragmented																													
Unidentified	shell/chaff																														
Indet Type 1	seed/fruit																														
Indet Type 2	seed/fruit																														
Indet Type 3	seed/fruit																														
charcoal quantity																															
prepared food																															
Dung or food remains																															
Animal Remains																															
Bone							4																								
Dung																															
Fish bone																															
Mouse bone																															
Mouse bone burnt																															
Seil							1																								

Table 13.3.5: Archaeobotanical investigation on per sample at Aşağı Pınar (continued).

Aşağı Pınar Archaeobotanical Samples																																	
			trench	6U	6U	6V	6V	6V	6V	6V	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K	8K
			unit no	271	270	308	308	308-?	310	310	267	286	306	307	307	310	312	246	299	294	297	295	293	293	293	293	285	285	284	284	280	279	275	
			context code	D		D	D	D	E	E	4	4	4	4	4	4	4	4	5 or 6	6	4	4	4	4	4	4	4	4	4	4	4	4	4	
			context name	surface	surface	ditch	ditch	ditch	ditch	ditch																								
			str	H2	?	H2	H2	H2	H2	H2	H2-a	H2-a	H2-a	H2-a	H2-a	H2-a	H2-a	H2-b	H2-c	H2-c	H2-c	H2-c	H2-c	H2-c	H2-c	H2-c	H2-c	H2-c	H2-c	H2-c	H2-c	H2-c	H2-c	H2-c
			Analysis no	194					24	7			26	19	20	18				22	45	21					2.torba	25		27	24				
			year	2014		2018	2018	2018	2018	2018	2019	2019	2019	2019	2019	2019	2019	2019		2019	2019	2019			2019	2019	2019	2019	2019	2019	2019	2019	2019		
			phase	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Plant Latin Names	**plant part**	**comment**																															
Cereals																																	
Triticum/Hordeum	floret/fruit	fragmented			3	6	14	23	30	16	7	4	37	39	5	28	16	1	83	16		170	14	72	0.5	44	107	68	114	80	160	4	20	
Triticum/Hordeum/Fabaceae	fruit/seed	fragmented													7																		
Hordeum distichon	floret						2								1		5		3					3									1	
Hordeum distichon	single rachis segment																																
Hordeum vulgare ssp. *vulgare*	floret																																
Hordeum vulgare ssp. *vulgare*	fruit																																
Hordeum vulgare ssp. *vulgare*	fruit/floret																																
Hordeum vulgare ssp. *vulgare*	rachis nodes																																
Hordeum vulgare undiff.	floret																										2	4			0.5		
Hordeum vulgare undiff.	fruit																																
Hordeum vulgare undiff.	rachis nodes																														1		
Hordeum vulgare undiff.	single rachis segment																																
Hordeum distichon/vulgare	floret/fruit																																
Hordeum distichon/vulgare	single rachis segment																																
Triticum dicoccum	fruit								3		3	3		2	4		3	1	15		1	180	9	16			16	15	2		7		1
Triticum dicoccum	rachis nodes																																
Triticum dicoccum	lemma base																																
Triticum monococcum	fruit								2						1													2	2		4		
Triticum monococcum	rachis nodes																																
Triticum cf. *monococcum*	fruit																																
Triticum monococcum, 2-grained	fruit																																
Triticum monococcum/dicoccum	fruit																									9							
Triticum monococcum/dicoccum	rachis nodes				2		1	0.5	1.5	2	7			13	2	2			23	4		14	4	16		8	31	45	2	23	86		
Triticum monococcum/dicoccum	single rachis segment																																
Triticum compactum s.str.	fruit																																
Triticum durum/aestivum	fruit					1	2				2		1	2		3	1							6				2			4		
Triticum durum/aestivum	rachis													2													3	3					
Triticum durum s.str.	fruit																																
Triticum durum s.str.	single rachis segment																																
Triticum spec.	fruit		1												4																		2
Triticum spec.	rachis nodes																																
Scale cereale	fruit						1																										
Cerealia indet.	embryo																																
Cerealia indet.	culm																																
Pulses																																	
Lathyrus sativus	seed																1		3			1					2	1		1			
Lens culinaris	seed						4	2	5	1	1		2	1		4			1			2		3			8	7		3	2	1	
Pisum sativum	seed							1	1				1				1		1			1								1			
Vicia ervilia	seed																							2				3					
Cicer arietinum	seed																																
Fabaceae (kult.)	seed								2	3	2	1			2	3					1			2				2	0.5	2	2	1	1
Gathered Plants																																	
Vitis vinifera	seed																																
Cornus mas	fruit/endocarp																																
Corylus avellana	fruit																																
Linum cf. bienne	seed																																
Nutshell indet.	fruit/endocarp																												0.1		0.2		
Nut	fruit/seed																											0.1					
Pistacia	fruit																																
Prunus spec.	fruit/endocarp														1																		
Rubus fruticosus	fruitlet																										1	1					
Indet fruit	fruit																																
Wild Plants																																	
Amaranthaceae	seed/fruit																														2		
Anchusa arvensis	fruitlet																																
Asteraceae	seed/fruit																														1r		
Avena spec.	fruit																																
Avena spec.	awn																																
Boraginaceae	fruitlet																																
Bromus spec.	floret																																
Brassicaceae	seed									1							1										1						1
Carex spec.	fruit																														1		
Chenopodiaceae	seed/fruit								6														1	1			1			1			
Chenopodium spec.	fruit													2												3	3	1				1	
Cyperaceae	fruit																																
Digitaria spec.	rachillate spikelet																																
Echium vulgare	fruitlet																																
Fabaceae	seed																1																
Fallopia	fruit																																
Fumaria spec.	fruit																				30r												
Galium spec.	fruitlet												1														1						
Hordeum spec.	fruit/floret																					1											
Hordeum spec.	rachis																																
Lamiaceae	seed/fruit																										2						
cf. *Lathyrus*	seed																																
Linum cf. bienne	seed																																
Lithospermum	fruitlet													1																			
Malvaceae	fruitlet																																
Malvaceae	fruitlet/seed																									1	1						
Medicago	seed																										1						
Papaveraceae	seed																																
Poaceae	floret/fruit										1					3			1			1					2				1		
Poaceae	awn																														10+		
Polygonaceae	fruit											1					1										2		1				
Polygonum convolvulus	fruit																																
Polygonum spec.	fruit																					2						1					
Rosaceae	fruit																																
Rumex acetosella agg.	fruit																																
Rumex cf. *acetosella* agg.	fruit																																
Rumex spec.	fruit																																
Sambucus	fruit																																
Setaria	spikelet																														1		
Setaria spec./Panicum	floret										1																1						
Silene vulgaris	seed																														2		
Vicia spec.	seed																																
Tilia platyphyllos	fruit																																
Thymeleaceae	fruit																																
Trifolium	seed																																
Trigonella	seed/fruit																																
Ziziphora	seed/fruit																																
Unidentified	Fruit/seed				1		1	16	5		3		2	10					3	4		15		4		2	23	2	8		4		
Unidentified	Fruit																																
Unidentified	fruit/seed	fragmented																										5					
Unidentified	shell/chuff																																
Indet Type 1	seed/fruit																																
Indet Type 2	seed/fruit																																
Indet Type 3	seed/fruit																																
charcoal quantity						***	****	****	***	***	****	****		*****	*****		******	**	*****	***		*****	***	***	***		*****	*****	*****	*****	*******	**	*****	
prepared food																																	
Dung or food remains																																	
Animal Remains																																	
Bone								9							5	2	1		1			1	1					1			2		
Dung																																	
Fish bone																																	
Mouse bone							1				1				8			1	1							1			6		1		1
Mouse bone burnt										4																							
Sell																																	

Table 13.3.6: Archaeobotanical investigation on per sample at Aşağı Pınar (continued).

Aşağı Pınar Archaeobotanical Samples																																
	trench		8K	8K	9M	9M	9M	9M	9N	7U	7U	7U	7U	7U	7U	7U	7U	7U	7U	7U	7U	7U	7U	6V	6V	6V	6V	6M	6U	6U	6V
	unit no		302	302	245	210	211	247	204	238	238	238	282	280	272	274	274	259	248	248	234	222	268	268	306	306	306	314	98	227	228	245
	context code		4	4		5	5 or 6	5	4				6	6	6	5	5	5	4	4	2B	2B	4	4	4	4	4	4	5	4			
	context name		control et																						pit	pit	pit	pit	cleaning			ditch
	str		H2-d	H2-d	H2-st	H2-h	H2-h	H2-h	H2-h	H2-t	H2-t	H2-t	H2-t	H2-u	H2-u	H2-u	H2-u	H2-u,	H2-u	H2-u	H2-u,	H2-u,	H2-v	H2-v	H2-z	H2-z	H2-z	H2-z	H1-1d	H2	H2	H2
	Analysis no																										26	25	72			32
	year		2019	2019																					2018	2018	2018	2018	2017			2016
	phase		7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7 mixed	7mixed	6-7 mixed	6-7 mixed	7mixed
Plant Latin Names	**plant part**	**comment**																														
Cereals																																
Triticum/Hordeum	floret/fruit	fragmented	130	437				3	2	10	35	26	7	7	9	2	3	5		20	2	11	25	5	16	18	16	3	2			
Triticum/Hordeum/Fabaceae	fruit/seed	fragmented																														
Hordeum distichon	floret		1																													
Hordeum distichon	single rachis segment																															
Hordeum vulgare ssp. *vulgare*	floret																															
Hordeum vulgare ssp. *vulgare*	fruit																															
Hordeum vulgare ssp. *vulgare*	fruit/floret																															
Hordeum vulgare ssp. *vulgare*	rachis nodes																															
Hordeum vulgare undiff.	floret							1		5	3		1							1	7	1	4			2	1					
Hordeum vulgare undiff.	fruit																															
Hordeum vulgare undiff.	rachis nodes																															
Hordeum vulgare undiff.	single rachis segment																															
Hordeum distichon/vulgare	floret/fruit																								1				1			
Hordeum distichon/vulgare	single rachis segment																															
Triticum dicoccum	fruit		8	152				1		1	7	6	2	3			4	1	4	3			17		2	4	4					
Triticum dicoccum	rachis nodes									2	6																					
Triticum dicoccum	lemma base																															
Triticum monococcum	fruit										1	1		3	1		3			3	1		4		0.5	1						
Triticum monococcum	rachis nodes									2							4															
Triticum cf. *monococcum*	fruit																															
Triticum monococcum, 2-grained	fruit										1																					
Triticum monococcum/dicoccum	fruit																															
Triticum monococcum/dicoccum	rachis nodes		6	8						17	3	11		11			11			2		3	86			0.5						
Triticum monococcum/dicoccum	single rachis segment																															
Triticum compactum s.str.	fruit																															
Triticum durum/aestivum	fruit			3																					1							
Triticum durum/aestivum	rachis																															
Triticum durum s.str.	fruit																															
Triticum durum s.str.	single rachis segment																															
Triticum spec.	fruit																			3												
Triticum spec.	rachis nodes																												1			
Scale cereale	fruit																															
Cerealia indet.	embryo									1																						
Cerealia indet.	culm		4																													
Pulses																																
Lathyrus sativus	seed			1							6	1	3					2					18		1							
Lens culinaris	seed									1	10			2			2		5		2		22			2						
Pisum sativum	seed																			1						2						
Vicia ervilia	seed																															
Cicer arietinum	seed																															
Fabaceae (kult.)	seed										40			2	1								14		4	3	0.5					
Gathered Plants																																
Vitis vinifera	seed																															
Cornus mas	fruit/endocarp										2																					
Corylus avellana	fruit																															
Linum cf. bienne	seed																															
Nutshell indet.	fruit/endocarp																															
Nut	fruit/seed																															
Pistacia	fruit																															
Prunus spec.	fruit/endocarp																															
Rubus fruticosus	fruitlet																															
Indet fruit	fruit																															
Wild Plants																																
Amaranthaceae	seed/fruit																						2									
Anchusa arvensis	fruitlet																															
Asteraceae	seed/fruit																															
Avena spec.	fruit									10																						
Avena spec.	awn																															
Boraginaceae	fruitlet																															
Bromus spec.	floret									1																						
Brassicaceae	seed																															
Carex spec.	fruit																															
Chenopodiaceae	seed/fruit																															
Chenopodium spec.	fruit																															
Cyperaceae	fruit																															
Digitaria spec.	rachillate spikelet																						15									
Echium vulgare	fruitlet																															
Fabaceae	seed		2							6		1		4				2	4	1												
Fallopia	fruit									1																						
Fumaria spec.	fruit									1																			1r			
Galium spec.	fruitlet									27	1	17		3									2	1								
Hordeum spec.	fruit/floret						1																									
Hordeum spec.	rachis																															
Lamiaceae	seed/fruit																															
cf. *Lathyrus*	seed																															
Linum cf. bienne	seed																															
Lithospermum	fruitlet		1																													
Malvaceae	fruitlet																															
Malvaceae	fruitlet/seed																															
Medicago	seed																															
Papaveraceae	seed																															
Poaceae	floret/fruit																			2												
Poaceae	awn																															
Polygonaceae	fruit																						5		2				1			
Polygonum convolvulus	fruit									1																						
Polygonum spec.	fruit																															
Rosaceae	fruit																															
Rumex acetosella agg.	fruit																															
Rumex cf. *acetosella* agg.	fruit																															
Rumex spec.	fruit																															
Sambucus	fruit																															
Setaria	spikelet																															
Setaria spec./Panicum	floret									1																						
Silene vulgaris	seed																															
Vicia spec.	seed																				2											
Tilia platyphyllos	fruit																															
Thymeleaceae	fruit																															
Trifolium	seed																															
Trigonella	seed/fruit																															
Ziziphora	seed/fruit																															
Unidentified	Fruit/seed			2						1	9	4		3			1	1	1	2					3		3					
Unidentified	Fruit																															
Unidentified	fruit/seed	fragmented	5											2																		
Unidentified	shell/chaff		2							1				1																		
Indet Type 1	seed/fruit																															
Indet Type 2	seed/fruit																															
Indet Type 3	seed/fruit																															
charcoal quantity			*****	*****																					****	***	***	****	***			
prepared food																																
Dung or food remains																																
Animal Remains																																
Bone				3																												
Dung																																
Fish bone																																
Mouse bone																												1				
Mouse bone burnt																									17							
Sell																																

Table 13.3.7: Archaeobotanical investigation on per sample at Aşağı Pınar (continued).

Aşağı Pınar Archaeobotanical Samples	trench	6V	6V	6V	6V	6V	8L	8L	8L	8L	8L	8L	8L	8L	7T	8K	8K	5U	6U	6U	6U	6U	7U	7U	7U	6V	6V	6V	6V	6V	10P
	unit no	311	311	311	317	291	61.62	68	68	71	71	71	73	75	240	242	205	110.26	206	71	71	217.1	157	157	157	157	126.1	186	170	181	71
	context code	E	E	E	F	B2	B1	B1	B1	B1	B1	B1	B1 or D		4								AO	AO	AO		A0				
	context name		ditch		dirch	ditch											yapı çukur i	layer		POT	POT	pot				south room	POT	north-mi	pit areas	ashy pit	
	str	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2	H2-r		6.6 str	6.21					above H4	above H2	above H3	5.22 str	5.22	5.22 str			
	Analysis no		23		22	4									99				103	213	216	100	192	200	201	87	197	85	86	212	44
	year	2018	2018	2018	2018	2018									2013	2019	2019	2015	2013	2015	2015	2013	2014	2014	2014	2015	2014	2015	2015	2015	2005
	phase	7 mixed	7 mixed	7 mixed	7	5-7 mixed	?? Mixed	?? Mixed	?? Mixed	?? Mixed	?? Mixed	?? Mixed	?? Mixed	??	7 mixed		6	6	5/6	576	576	5/6	5/6	5/6	5/6	5	5b	5b	5a	5a	4
Plant Latin Names	**plant part**	**comment**																													
Cereals																															
Triticum/Hordeum	floret/fruit	fragmented	4	17	66		2								7	18	38	2			2	3			1	2	0.5	27	48		1
Triticum/Hordeum/Fabaceae	fruit/seed	fragmented																													
Hordeum distichon	floret				1																										
Hordeum distichon	single rachis segment																														
Hordeum vulgare ssp. *vulgare*	floret						3																						2		
Hordeum vulgare ssp. *vulgare*	fruit																														
Hordeum vulgare ssp. *vulgare*	fruit/floret																														
Hordeum vulgare ssp. *vulgare*	rachis nodes																														
Hordeum vulgare undiff.	floret																														
Hordeum vulgare undiff.	fruit																														
Hordeum vulgare undiff.	rachis nodes																														
Hordeum vulgare undiff.	single rachis segment																														
Hordeum distichon/vulgare	floret/fruit				0.5																										
Hordeum distichon/vulgare	single rachis segment																														
Triticum dicoccum	fruit				6		2610	2450	2915	72	1200	10100	37	125														1	3		
Triticum dicoccum	rachis nodes										40	12	6																		
Triticum dicoccum	lemma base																														
Triticum monococcum	fruit				2		5 108	205	152	3	3	860	2	8															3		
Triticum monococcum	rachis nodes												2																		
Triticum cf. *monococcum*	fruit																														
Triticum monococcum, 2-grained	fruit							75		3																					
Triticum monococcum/dicoccum	fruit						4		210	145																					
Triticum monococcum/dicoccum	rachis nodes		7	44				3	53		108	8	27	42		4						1						2	14		
Triticum monococcum/dicoccum	single rachis segment																														
Triticum compactum s.str.	fruit																														
Triticum durum/aestivum	fruit				2		2										6												1		
Triticum durum/aestivum	rachis				5																										
Triticum durum s.str.	fruit																														
Triticum durum s.str.	single rachis segment																														
Triticum spec.	fruit										1480																				
Triticum spec.	rachis nodes																									1					
Scale cereale	fruit																														
Cerealia indet.	embryo																														
Cerealia indet.	culm																														
Pulses																															
Lathyrus sativus	seed																														
Lens culinaris	seed		11	1		1																									
Pisum sativum	seed			3		3																									
Vicia ervilia	seed											1																0.5			
Cicer arietinum	seed																														
Fabaceae (kult.)	seed			3																											
Gathered Plants																															
Vitis vinifera	seed																														
Cornus mas	fruit/endocarp																														
Corylus avellana	fruit																														
Linum cf. bienne	seed																														
Nutshell indet.	fruit/endocarp																														
Nut	fruit/seed																														
Pistacia	fruit																											0.2			
Prunus spec.	fruit/endocarp																														
Rubus fruticosus	fruitlet																														
Indet fruit	fruit																														
Wild Plants																															
Amaranthaceae	seed/fruit																														
Anchusa arvensis	fruitlet																														
Asteraceae	seed/fruit																														
Avena spec.	fruit																														
Avena spec.	awn																														
Boraginaceae	fruitlet		1																												
Bromus spec.	floret										3																				
Brassicaceae	seed																														
Carex spec.	fruit																														
Chenopodiaceae	seed/fruit																														
Chenopodium spec.	fruit																212									1					
Cyperaceae	fruit																														
Digitaria spec.	rachillate spikelet																														
Echium vulgare	fruitlet																														
Fabaceae	seed																														
Fallopia	fruit																														
Fumaria spec.	fruit																														
Galium spec.	fruitlet																														
Hordeum spec.	fruit/floret																														
Hordeum spec.	rachis																														
Lamiaceae	seed/fruit																														
cf. *Lathyrus*	seed																														
Linum cf. bienne	seed																														
Lithospermum	fruitlet																			1											
Malvaceae	fruitlet																														
Malvaceae	fruitlet/seed																														
Medicago	seed																														
Papaveraceae	seed																														
Poaceae	floret/fruit			2												1															
Poaceae	awn																10+														
Polygonaceae	fruit																														
Polygonum convolvulus	fruit																														
Polygonum spec.	fruit																														
Rosaceae	fruit																														
Rumex acetosella agg.	fruit						1																								
Rumex cf. *acetosella* agg.	fruit																														
Rumex spec.	fruit								1		1			1																	
Sambucus	fruit																														
Setaria	spikelet																														
Setaria spec./Panicum	floret																														
Silene vulgaris	seed																														
Vicia spec.	seed																														
Tilia platyphyllos	fruit																														
Thymeleaceae	fruit																														
Trifolium	seed																														
Trigonella	seed/fruit																														
Ziziphora	seed/fruit																														
Unidentified	Fruit/seed		20	4											2	4										1		5	5		
Unidentified	Fruit																														
Unidentified	fruit/seed	fragmented																													
Unidentified	shell/chaff																									50foto?					
Indet Type 1	seed/fruit																														
Indet Type 2	seed/fruit																														
Indet Type 3	seed/fruit																														
charcoal quantity		***	******	****	**	***									***				*		*****		**	*			****		******	**	
prepared food																															
Dung or food remains																															
Animal Remains																															
Bone			7																												
Dung																															
Fish bone																															
Mouse bone																16															
Mouse bone burnt																															
Sell																															

Table 13.3.1: Archaeobotanical investigation on per sample at Aşağı Pınar (continued).

| Aşağı Pınar Archaeobotanical Samples | | |

APPENDIX IV

14.CROP RATIOS BASED ON ABSOLUTE COUNTS FOR RELATIVE FREQUENCY

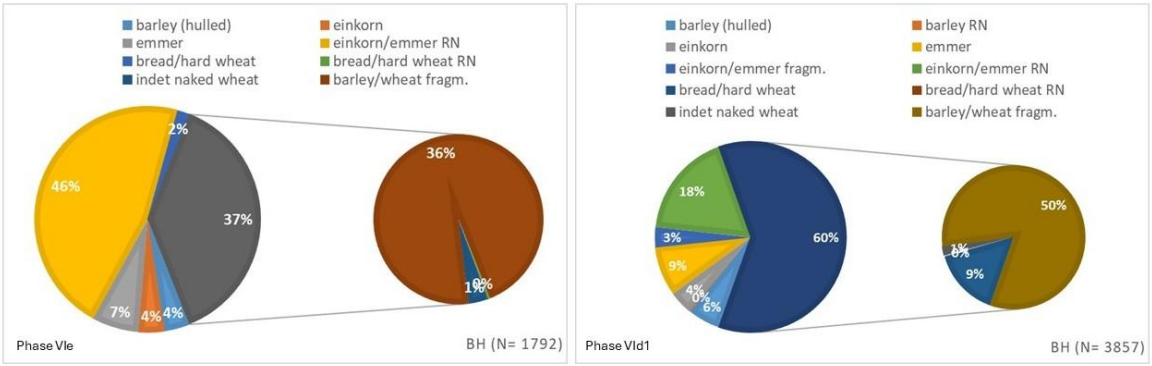


Figure 14.1: Cereals in Phases VIe and VId1 at Barcın Höyük.

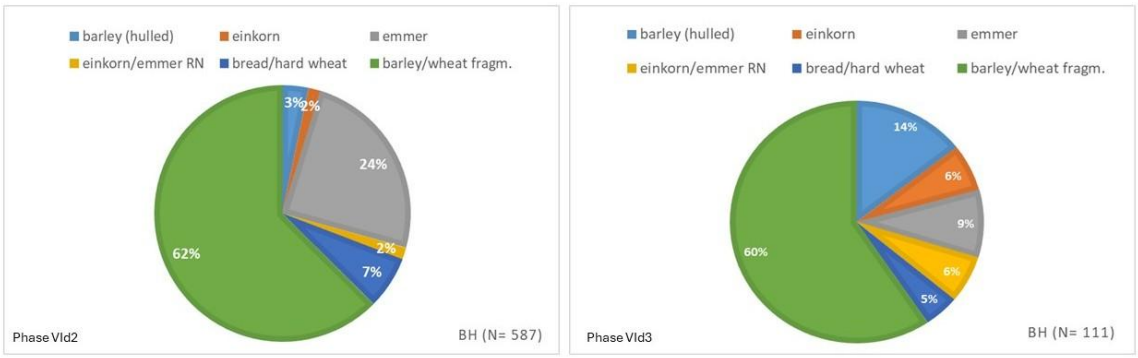


Figure 14.2: Cereals in Phases VId2 and VId3 at Barcın Höyük.

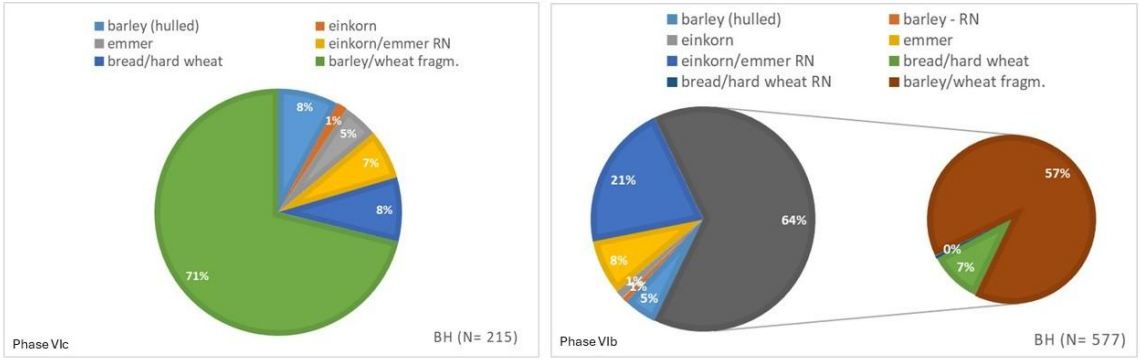


Figure 14.3: Cereals in Phases VIc and VIb at Barcın Höyük.

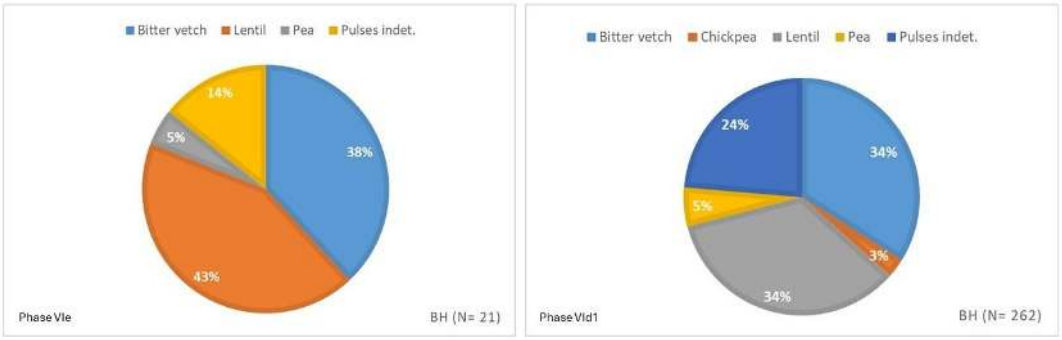


Figure 14.4: Pulses in Phases VIe and VId1 at Barcın Höyük.



Figure 14.5: Pulses in Phases VId2 and VId3 at Barcın Höyük.

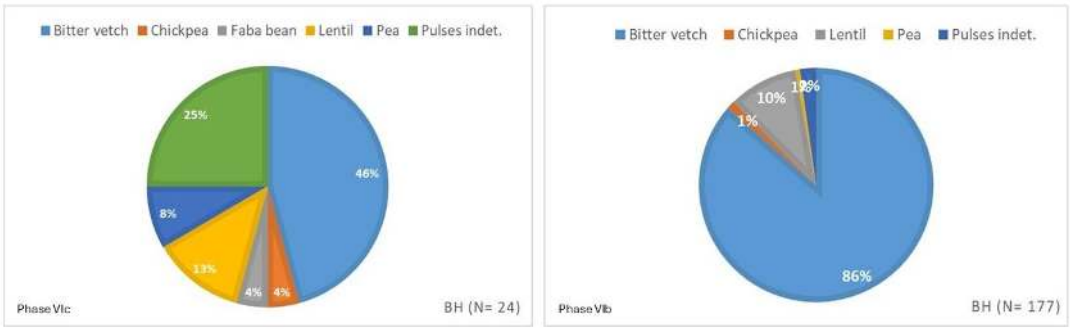


Figure 14.6: Pulses in Phases VIc and VIb at Barcın Höyük.

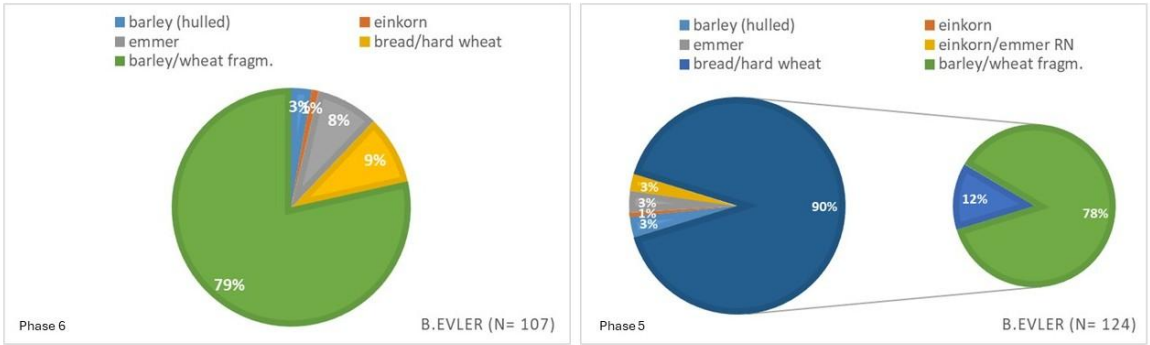


Figure 14.7: Cereals in Phases 6 and 5 at Bahçelievler.

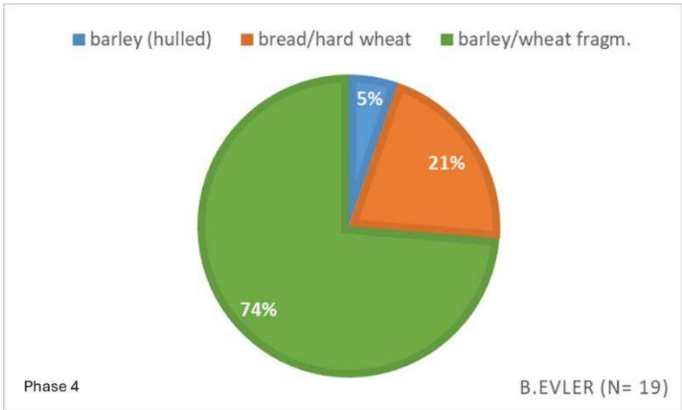


Figure 14.8: Cereals in Phase 4 at Bahçelievler.

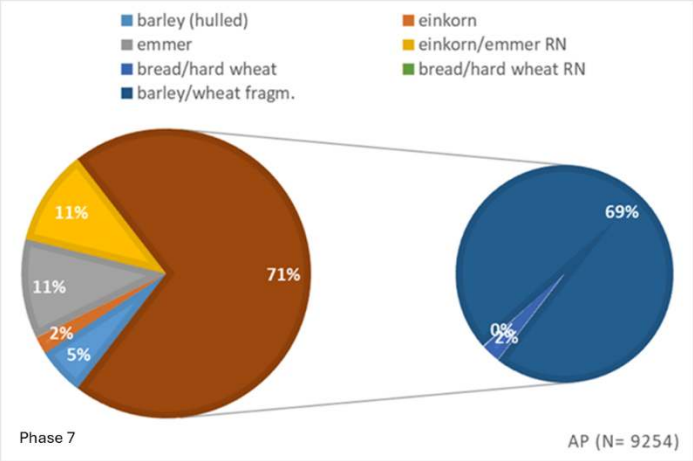


Figure 14.9: Cereals in Phase 7 at Aşağı Pınar.

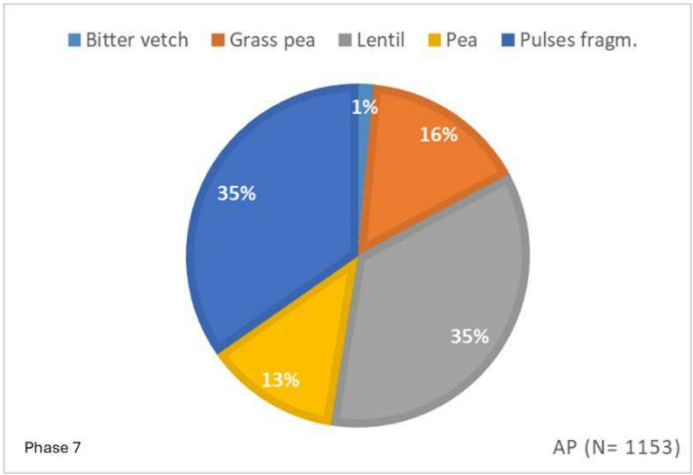


Figure 14.10: Pulses in Phase 7 at Aşağı Pınar.