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Research Article

Prehistoric and Medieval Plant Remains from Two Sites on the Euphrates, South-eastern Turkey

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Abstract: The results of the archaeobotanical examination of 2 sites, namely Mezraa Höyük and Gre Virike, on the Euphrates in the Karkamış (Carchemish) area, near Birecik (Şanlıurfa) in south-east Turkey are given. The cultural levels that yielded carbonised plant remains date from the Early Bronze Age (3000-2000 BC), Middle Bronze Age (2000-1500 BC) and Medieval period (11^{th} – 13^{th} centuries AD).

The plant assortment in the Bronze Age did not differ essentially from that during the Medieval period. The major crop plant of the farmers was *Hordeum* L. (barley, hulled). Other cereal crops included *Triticum dicoccum* Schübl. (emmer wheat), *T. monococcum* L. (einkorn wheat) and *T. aestivum* L./*T. durum* Desf. (bread wheat/macaroni wheat) (naked wheat). The latest became important and replaced the hulled wheats in Medieval times.

Hulled barley was also favoured by the visitors to Gre Virike, which was used as a common sanctuary of the Karkamış area in the Early Bronze Age, in ritual ceremonies and probably in food preparation.

Domesticated legumes recorded in the study area are *Lens culinaris* Medik. (lentil), *Lathyrus sativus* L./*L. cicera* L. (grass pea) and *Pisum sativum* L. (garden pea), *Vicia ervilia* (L.) Willd. (bitter vetch) and *Cicer arietinum* L. (chickpea). The legumes played a minor part in plant husbandry. *Vitis vinifera* L. (grape) would have been grown, but *Olea europaea* L. (olive) was probably imported. A single fruit remain of *Coriandrum sativum* L. (coriander) found at Medieval Mezraa Höyük is recorded as a condiment. The plants of grazing lands, including *Trifolium* L. (clover), are associated with animal husbandry. Weed seeds, such as *Aegilops* L. (goat grass), *Galium* L. (bedstraw) and *Lolium* L. (rye grass), provided information on crop field weeds of both Bronze Age and Medieval times.

Key Words: Prehistoric, Medieval, plant remains, the Euphrates, Turkey

Güneydoğu Türkiye'de Fırat Nehri Yakınındaki İki Yerleşim Yerinde Bulunan Tarih Öncesi ve Ortaçağ Dönemi Bitki Kalıntıları

Özet: Bu çalışmada, Birecik (Şanlıurfa) yakınındaki Karkamış bölgesinde, Fırat Nehri kıyısında bulunan iki eski yerleşim yeri Mezraa Höyük ve Gre Virike'de gerçekleştirilen arkeobotanik çalışmanın sonuçları verilmektedir. Kömürleşmiş bitki kalıntısı bulunan kültür tabakaları Erken Tunç Çağı (MÖ 3000-2000), Orta Tunç Çağı (MÖ 2000-1500) ve Ortaçağ'a (MS 11.-13. yüzyıllar) tarihlendirilmektedir.

Tunç Çağı'nın bitki kompozisyonu, Ortaçağı'nkinden çok farklı değildir. Bölge çiftçilerinin bu dönemlerde yetiştirdikleri temel tarla bitkisinin *Hordeum* L. (arpa, kabuklu) olduğu belirlenmiştir. Diğer tahıl bitkileri *Triticum dicoccum* Schübl. (çatal siyez buğdayı/karıklı buğday/emmer), *T. monococcum* L. (kaplıca buğdayı/einkorn) ve *T. aestivum* L./*T. durum* Desf. (ekmeklik buğday/sert buğday) (çıplak buğday)'dur. Ekmeklik/sert buğday Ortaçağ'da önem kazanmış ve kabuklu buğdayların yerini almıştır.

Kabuklu arpayı, Karkamış bölgesinde, Erken Tunç Çağı'nda kutsal bir alan olarak işlev gören Gre Virike'nin ziyaretçileri de, törensel etkinliklerinde ve belki yemek hazırlığında tercih etmişlerdir.

Çalışma alanında belirlenen evcilleştirilmiş baklagiller *Lens culinaris* Medik. (mercimek), *Lathyrus sativus* L./*L. cicera* L. (mürdümük) and *Pisum sativum* L. (bezelye), *Vicia ervilia* (L.) Willd. (burçak) and *Cicer arietinum* L. (nohut)'dur. Tarla tarımı etkinliklerinde baklagillere daha az yer verilmiştir. *Vitis vinifera* L. (asma) yetiştirilmiş olmalıdır. *Olea europaea* L. (zeytin) ise muhtemelen ithal edilmiştir. Mezraa Höyük'ün Ortaçağ tabakalarında *Coriandrum sativum* L. (kişniş)'un meyve parçası bulunmuştur ve lezzet verici bitki olarak kaydedilmiştir. *Trifolium* L. (yonca)'un da dahil olduğu otlak bitkilerinin kalıntıları hayvan yetiştiriciliği ile ilişkilendirilmiştir. Yaygın olarak bulunan *Aegilops* L. (yabani buğday), *Galium* L. (yoğurt otu) ve *Lolium* L. (delice) meyveleri tahıl tarlalarını işgal eden yabani otlar ile ilgili bilgi sağlamaktadır.

Anahtar Sözcükler: Tarih Öncesi, Ortaçağ, bitki kalıntıları, Fırat, Türkiye

Introduction

This paper deals with archaeobotanical analyses of carbonised plant remains secured from the prehistoric and Medieval levels of 2 sites situated on the east bank of the Euphrates, near Birecik (Şanlıurfa), in south-eastern Turkey, namely Mezraa Höyük and Gre Virike (Figure 1). Both sites lie within the Ilısu and Karkamış (Carchemish) Dam reservoirs area. They are close to the Turkish-Syrian border, where several salvage excavations have been undertaken as part of the project organised by METU-TAÇDAM (Middle East Technical University – Centre for Research and Assessment of the Historic Environment) for the purpose of recording the archaeological evidence before the area is flooded by the dam lake.

The study sites were first investigated by Guillermo Algaze and his team in 1989 during surveys in the Karkamış Dam region (Algaze et al., 1994). Later, in 1998, further surface surveys were carried out at Mezraa Höyük by A. Tuba Ökse and V. Macit Tekinalp (Ökse & Tekinalp, 1999) and at Gre Virike by Ökse (1999). Derya Yalçıklı and Tekinalp have conducted salvage excavations at the former site since 2000 (Yalçıklı & Tekinalp, 2002). Salvage excavations at the latter site were started in 1999 and completed in 2001 under the direction of Ökse (Ökse & Bucak, 2001, 2003; Ökse, 2002a).

The aim of this archaeobotanical study is to understand patterns of ancient agricultural practices and plant use at Mezraa Höyük and Gre Virike. It also aims to make some contribution to the archaeobotany of the Upper Euphrates basin, which has received increasing attention in recent years.

The Study Area

Today, a nearly treeless steppe vegetation constitutes the natural plant cover of the study area. Among the main elements of the steppe there are *Acanthophyllum verticillatum* (Willd.) Hand.-Mazz., *Alhagi maurorum* Medic., *Bromus macrostachys* Desf., *Convolvulus reticulatus* Choisy and *Thymus syriacus* Boiss. (Atalay,

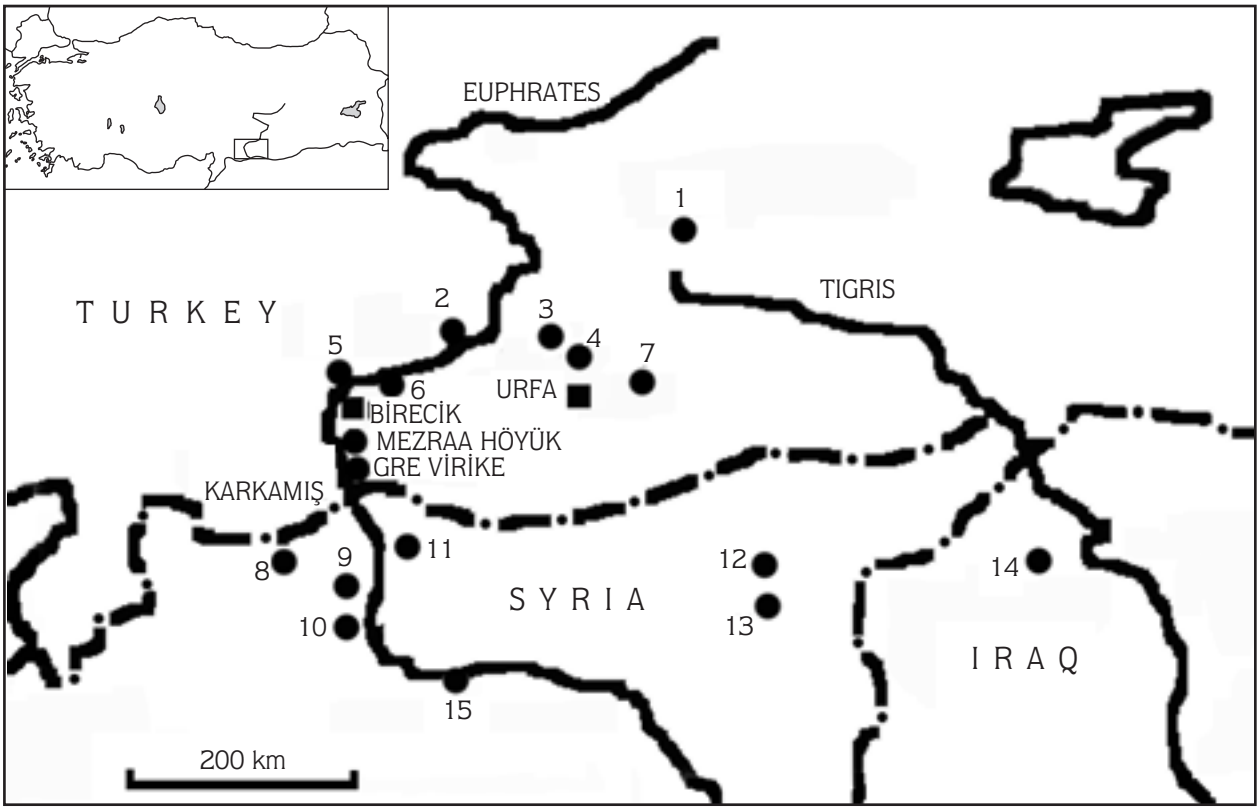

Figure 1. Location map of Mezraa Höyük and Gre Virike within the rectangle given in the top left and some of the sites mentioned in the text. The site numbers: 1. Çayönü, 2. Gritille, 3. Nevali Çori, 4. Titriş Höyük, 5. Yarım Höyük, 6. Kurban Höyük, 7. Kazane Höyük, 8. Jerablus-Tahtani, 9. Hadidi, 10. Selenkahiye, 11. Tell Es-Sweyhat, 12. Tell al-Raqa, 13. Tell Bderi, 14. Tell Taya, 15. Tell Abu Hureyra.

1983). However, some relict patches of Mediterranean woodland climax dominated by *Quercus* L. (oak) trees could be seen on the uplands of Birecik, about 7 km from the study area (Zohary, 1973). Palynological evidence from the Ghab valley of north-west Syria, about 200 km south of the study area, shows that forest vegetation dominated by oak expanded rapidly between 11,000-10,000 BP and reached its greatest expansion in the early Holocene (10,000-8000 BP), signalling an increase in humidity, and decreasing again to some extent after 8000 BP (van Zeist & Bottema, 1982). This pollen evidence also indicates a marked decline in oak dominated woodlands 3500-4500 years ago, which is thought to be caused by large-scale clearence of forest by man. A pollen core taken near Bozova, 70 km north-east of Birecik, suggests that the nearly treeless vegetation of the region today has been in place for at least 2500 years (van Zeist et al., 1968/1969).

Geomorphological and pedological data from south-eastern Turkey and northern Syria have shed some light on environmental conditions throughout the Middle to Late Holocene occupation in the region (Ergenzinger et al., 1988; Courty, 1994; Rosen & Goldberg, 1995; Rosen, 1997). The data indicate increased stream flow, alluviation and soil formation suggestive of a moister climate regime during the Middle Holocene that mainly coincided with the later Chalcolithic occupations of these regions. At some time in the third millennium BC or shortly afterwards (EBA) drier environmental conditions set in. A second distinct Holocene amelioration took place in Medieval times and finally human-induced deforestation led to a major disequilibrium in the hydrological regime.

According to Miller (1986), the present treeless vegetational landscape of the Upper Euphrates basin is the product of a combination of natural forces, such as climate and phytogeography, and cultural practices. She claims that continuous modification by human settlement over millennia has irreversibly changed the vegetation. A recent study by Wilkinson (1999) in Holocene valley fills of southern Turkey and north-western Syria also suggests that in the Upper Euphrates during the last 4000-5000 years the impact of the human population on the landscape increased and climatic desiccation, which limited tree growth, albeit at fluctuating levels, had become more pronounced.

Today, a continental type climate, with dry summers, prevails in the Şanlıurfa district (Atamov et al., 2004). Average annual temperature is 40 °C in July, the warmest month, increasing to 46 °C. The coldest month is February and temperature decreases below 0 °C. In the Karkamış Dam reservoirs area average annual precipitation is about 250 mm (Ökse, 1999).

The Sites

Mezraa Höyük

The site, c. 7 km downstream from Birecik, is located on a terrace of the floodplain of the Euphrates. It is situated at an altitude of 335 m, rising 13 m above the surrounding floodplain where today various vegetables and cotton are grown by irrigation. The mound measures about 180 by 140 m (Algaze et al., 1994). Earth has been removed from an area of about 40 m on the east end of the mound by local farmers in order to enlarge the agricultural land.

The results of the archaeological studies of the site are given in Yalçıklı and Tekinalp (2002, 2003). The site was occupied continuously from the late fourth millennium BC (Uruk period) to the middle of the second millennium BC (Middle Bronze Age - MBA). The archaeological finds suggest that Mezraa Höyük was a small settlement as part of the Uruk colonisation, like other small settlements along the Euphrates in the Uruk period. It then became an important settlement, characterised by larger buildings constructed on the south-eastern and north-western slopes of the mound in the early and late phases of the third millennium BC (Early Bronze Age - EBA). After an interruption during the late phase of MBA, it was occupied again in the Iron Age (IA) (the first millennium BC) and in Medieval times (11^{th}-13^{th} centuries AD). The MBA and IA are represented only by few structures and remains found on the eastern slope and north-western slope of the mound respectively. In Medieval times, the eastern slope was settled densely, whereas the south-eastern slope was used only for grain storage in silos. Yalçıklı and Tekinalp (2003) stress the fact that in the 11^{th}-14^{th} centuries the town of Birecik assumed strategic importance between Urfa and Antakya, which were 2 important military and trading centres. The authors suggest that the wars between the Christians and Muslim rulers did not interrupt the rural life at Mezraa Höyük and other settlements lying on the fertile plains of Birecik in Medieval times.

Gre Virike

The site, at an altitude of 330-340 m, is 12 km south of Mezraa Höyük. It is a 15 m high mound, lying on a terrace of the Euphrates of Late Pleistocene formation. The mound measures 70 by 60 m (Algaze et al., 1994). The slopes have been damaged by erosion and removal of soil.

Based on the archaeological finds, Ökse (2002b, 2004a) suggests that the mound was used as a common sanctuary of the surrounding settlements, including Mezraa Höyük, for a fertility cult and cult of the dead in the third millennium BC (EBA). Excavations and surveys have revealed several buildings located in the north, dating from EBA I-II (3000-2600 BC), such as a large mud-brick terrace with pools, a basalt water channel in association with sacrificial pits and a stairway for an underground spring. The major remains found above the level of EBA I-II include limestone chamber tomb complexes with several types of burials, an open-air kitchen and offering chambers, all of which are dated to EBA III-IV (2600-2000 BC). Ökse and Bucak (2003) write that the mound was abandoned at the end of the third millennium, and later used mainly as a storage complex built on the southern slope in Medieval times.

Materials and Methods

Mezraa Höyük: During the summer of 1999, flotation samples were preliminarily taken from several levels and contexts of the profile exposed due to the removal of soil on the east terrace of the mound. Sampling of a number of contexts of different periods was undertaken from 2000 to 2002 during which the mound was excavated systematically. A total of about 2500 l from 91 contexts was floated. Forty-eight samples produced carbonised seeds; half of these are not included here because they were very poor in plant remains.

Gre Virike: During the excavation seasons 1999-2001, 196 contexts were sampled and some 600 l of soil was floated. Thirty samples produced carbonised seeds, 12 of which were very poor in seed quantity and are not included in this study.

Most samples taken from both sites were rich in charcoal. The frequency of charcoal, when present, was recorded during flotation. Charcoal pieces larger than 1 mm were separated and deposited for examination. Only the Gre Virike charcoal material has been studied by Dr Ünal Akkemik of İstanbul University (pers. comm.).

Dating for the samples has been provided by the directors of the excavations.

Sample numbers for each site have been given by the author of this paper according mainly to the chronology of the contexts.

Plant remains were identified using the reference collections in the Department of Biology at Hacettepe University and at the British Institute of Archaeology in Ankara and also identification manuals. The rachis internodes and the spikelet forks of wheats found in some samples have been measured according to the criteria given by Jacomet (1987) and Nesbitt (1993) respectively.

The remains were measured using a zoom stereomicroscope. Photographs were taken with a digital camera connected to the stereomicroscope in the Department of Biology at Hacettepe University.

Results

The results of the analyses of the prehistoric and Medieval plant remains are presented in Tables 1 and 2. The plant remains are described below:

Cereals

Hordeum L. (barley): The majority of the barley grains from both sites are of the hulled type (Figure 2a). Most are rather poorly preserved, especially those recovered from Mezraa Höyük. The mean dimensions of well-preserved grains of barley dating from EBA (II) (2800-2600 BC) from Gre Virike are 6.23 (length) x 3.06 (width) x 2.2 (thickness) mm while the mean dimensions of the Medieval barley grains from both sites are 6.05-6.14 x 2.72-3.28 x 1.92-2.5 mm.

Only 2 rachis fragments were found at Medieval Mezraa Höyük (Figure 2b). They were identified as *Hordeum distichum* L.-type (2-rowed barley) characterised by the bases of the side florets being somewhat stunted. The dimensions are 2.5-2.8 (rachis segment length) x 1 (basal width) x 1.5-1.8 (maximum width) mm.

Triticum L. (wheat): Most of the wheat grains in the Mezraa Höyük samples are naked wheat, either bread wheat or macaroni wheat (*Triticum aestivum* L./*T. durum*

Table 1. Prehistoric and Medieval plant remains from Mezraa Höyük.

Sample no.	1	4	6	7	8	11
Trench	P-14	P-15	P-16	P-16	R-15	S-13
Context	floor (House 816)	floor (House 120)	floor (House 203)	floor (House 217)	oven 1030	working place
Period	EBA I (3000-2800 BC)	EBA I	EBA I	EBA I	EBA I	EBA III/IV (2600-2000 BC)
Charcoal	some	some	some	some	many	some
Cereals						
Hordeum barley (grain)	15	7	4	23	126	18
Hordeum (rachis segment)	-	-	-	-	-	-
Triticum aestivum/durum bread/macaroni wheat (grain)	1	-	1	2	3	-
T. aestivum (rachis segment)	-	-	-	-	-	-
T. monococcum einkorn (grain)	-	-	-	1	-	-
T. monococcum (spikelet fork)	-	-	-	1	-	-
T. dicoccum emmer (grain)	2	-	-	3	7	-
T. dicoccum (spikelet fork)	-	-	-	-	-	-
T. monococcum/dicoccum (glume base)	-	-	-	-	5	-
Triticum sp. wheat (grain)	-	-	-	3	4	-
Poaceae cereals (grain)	4	-	-	2	122	36
Legumes (seed)						
Lens culinaris lentil	4	-	-	-	19	2
Lathyrus sativus/cicera grass pea	1	-	-	-	2	2
Pisum sativum garden pea	-	-	-	-	-	-
Vicia ervilia bitter vetch	-	-	-	-	1	-
Cicer arietinum chickpea	-	-	-	-	-	-
Trifolium clover	-	-	-	-	-	-
Trifolieae (clover tribe)	1	-	-	4	50	-
Fabaceae legumes	3	-	-	-	6	-
Fruits						
Vitis vinifera grape (seed)	1	-	1	-	3	1
V. vinifera (fruit fragment)	-	-	-	-	-	-
Condiments (fruit)						
Coriandrum sativum coriander	-	-	-	-	-	-

Table 1. continued

Sample no.	1	4	6	7	8	11
Trench	P-14	P-15	P-16	P-16	R-15	S-13
Context	floor (House 816)	floor (House 120)	floor (House 203)	floor (House 217)	oven 1030	working place
Period	EBA I	EBA I	EBA I	EBA I	EBA I	EBA III/IV
Charcoal	some	some	some	some	many	some
Wild and weedy (fruit/seed)						
Aegilops goat grass	3	-	-	10	33	-
Aegilops (spikelet base)	1	-	-	-	4	-
Galium bedstraw	2	7	-	5	193	-
Lolium rye grass	1	1	-	6	88	2
Adonis pheasant's-eye	-	-	-	-	1	-
Ajuga (bugle)	-	-	-	-	-	-
Asteraceae daisy family	-	-	-	-	1	-
Astragalus milk-vetch	-	-	-	-	-	-
Avena byzantina-type wild oat	-	-	-	-	-	-
Bromus brome grass	-	-	-	-	3	-
Centaurea	-	-	-	1	-	-
Cephalaria	-	-	-	-	-	-
Chenopodium (goosefoot)	-	-	-	-	-	-
Filipendula ulmaria meadow-sweet	-	-	-	-	-	-
Fumaria fumitory	-	-	-	-	2	1
Malva mallow	-	-	-	-	-	-
Medicago radiata calvary clover	-	-	-	-	-	-
Neslia	-	-	-	-	-	-
Poaceae grass family	-	-	-	-	-	-
Potentilla cinquefoil	-	-	-	-	-	-
Salvia syriaca sage	-	-	-	-	1	-
Triticum boeoticum/dicoccoides wild einkorn/emmer	-	-	-	-	3	-
Unspecified taxa	-	3	-	-	-	-

Table 1. continued

Sample no.	15	16	17	18	21	26
Trench	-	-	R-12	-	L-11	P-15
Context	Profile; 68	Profile; 65	vessel (Grave 16)	Profile; 66	Pit 503	refuse pit 113
Period	EBA III/IV	EBA III-IV/MBA (2600-1500 BC)	MBA (2000-1500 BC)	MBA	Medieval (11^{th}-13^{th} centuries AD)	Medieval
Charcoal	many	many	-	many	many	many
Cereals						
Hordeum barley (grain)	-	51	-	25	2	21
Hordeum (rachis segment)	-	-	-	-	1	-
Triticum aestivum/durum bread/macaroni wheat (grain)	25	2	-	-	34	7
T. aestivum (rachis segment)	1	-	-	-	-	-
T. monococcum einkorn (grain)	-	-	-	-	-	-
T. monococcum (spikelet fork)	-	-	-	-	-	-
T. dicoccum emmer (grain)	-	-	-	-	-	-
T. dicoccum emmer (spikelet fork)	-	-	-	-	-	-
T. monococcum/dicoccum (glume base)	-	-	-	-	-	-
Triticum sp. wheat (grain)	-	-	-	-	-	-
Poaceae cereals (grain)	30	14	-	12	8	-
Legumes (seed)						
Lens culinaris lentil	-	2	-	2	-	-
Lathyrus sativus/cicera grass pea	-	2	-		-	-
Pisum sativum garden pea	-	1	-	6	-	-
Vicia ervilia bitter vetch	-	-	-	-	-	-
Cicer arietinum chickpea	-	-	-	-	-	-
Trifolium clover	-	-	-	-	-	-
Trifolieae (clover tribe)	83	1	-	-	-	14
Fabaceae legumes	-	13	-	17	-	-
Fruits						
Vitis vinifera grape (seed)	1	-	22	-	1	-
V. vinifera (fruit fragment)	-	-	-	-	-	-
Condiments (fruit)						
Coriandrum sativum coriander	-	-	-	-	-	-

Table 1. continued

Sample no.	15	16	17	18	21	26
Trench	-	-	R-12	-	L-11	P-15
Context	Profile; 68	Profile; 65	vessel (Grave 16)	Profile; 66	pit 503	refuse pit 113
Period	EBA III/IV	EBA III-IV/MBA	MBA	MBA	Medieval	Medieval
Charcoal	many	many	-	many	many	many
Wild and weedy (fruit/seed)						
Aegilops goat grass	2	-	-	-	-	-
Aegilops (spikelet base)	-	-	-	-	-	-
Galium bedstraw	-	-	-	1	-	-
Lolium rye grass	8	-	-	-	-	1
Adonis pheasant's-eye	-	1	-	-	-	-
Ajuga (bugle)	1	-	-	-	-	-
Asteraceae daisy family	-	-	-	-	-	-
Astragalus milk-vetch	-	-	-	-	-	-
Avena byzantina-type wild oat	1	-	-	-	-	-
Bromus brome grass	-	-	-	-	-	-
Centaurea	-	-	-	-	-	-
Cephalaria	-	-	-	-	-	-
Chenopodium (goosefoot)	1	-	-	-	-	-
Filipendula ulmaria meadow-sweet	2	-	-	-	-	-
Fumaria fumitory	-	-	-	-	-	-
Malva mallow	-	-	-	-	-	-
Medicago radiata calvary clover	-	-	-	-	-	-
Neslia	-	-	-	-	-	-
Poaceae grass family	-	-	-	-	-	-
Potentilla cinquefoil	1	-	-	-	-	-
Salvia syriaca sage	-	-	-	-	-	-
Triticum boeoticum/dicoccoides wild einkorn/emmer	-	-	-	-	-	-
Unspecified taxa	-	-	-	-	-	1

Table 1. continued

Sample no.	27	31	32	33	34	38	39
Trench	P-15	R-15	R-15	S-12	S-12	-	-
Context	pit 121	refuse pit 1005	refuse pit 1013	pit 4	vessel 5	Profile; pit D	Profile; pit F
Period	Medieval	Medieval	Medieval	Medieval	Medieval	Medieval	Medieval
Charcoal	many	many	many	many	-	many	many
Cereals							
Hordeum barley (grain)	62	24	10	64	56	90	25
Hordeum (rachis segment)	-	-	-	-	-	-	-
Triticum aestivum/durum bread/macaroni wheat (grain)	5	4	27	5	12	2423	-
T. aestivum (rachis segment)	-	-	-	-	-	-	-
T. monococcum einkorn (grain)	-	-	-	-	-	-	-
T. monococcum (spikelet fork)	-	-	-	-	-	-	-
T. dicoccum emmer (grain)	-	-	-	-	-	-	-
T. dicoccum (spikelet fork)	-	-	-	-	-	-	-
T. monococcum/dicoccum (glume base)	-	-	-	-	-	-	-
Triticum sp. wheat (grain)	-	-	-	-	1	-	-
Poaceae cereals (grain)	-	2	18	-	19	-	21
Legumes (seed)							
Lens culinaris lentil	-	1	-	2	-	-	-
Lathyrus sativus/cicera grass pea	-	-	-	-	1	-	-
Pisum sativum garden pea	-	-	-	-	-	-	-
Vicia ervilia bitter vetch	-	-	-	-	-	-	-
Cicer arietinum chickpea	-	-	-	-	1	-	-
Trifolium clover	-	-	-	-	-	-	-
Trifolieae (clover tribe)	-	13	-	1	-	-	-
Fabaceae legumes	-	-	1	-	-	1	10
Fruits							
Vitis vinifera grape (seed)	-	1	-	-	9	-	-
V. vinifera (fruit fragment)	-	-	-	-	1	-	-
Condiments (fruit)							
Coriandrum sativum coriander	-	-	-	-	-	1	-

Table 1. continued

Sample no.	27	31	32	33	34	38	39
Trench	P-15	R-15	R-15	S-12	S-12	-	-
Context	pit 121	refuse pit 1005	refuse pit 1013	pit 4	vessel 5	Profile; pit D	Profile; pit F
Period	Medieval	Medieval	Medieval	Medieval	Medieval	Medieval	Medieval
Charcoal	many	many	many	many	-	many	many
Wild and weedy (fruit/seed)							
Aegilops goat grass	-	-	1	-	-	-	-
Aegilops (spikelet base)	-	-	-	-	-	-	2
Galium bedstraw	-	-	-	-	-	-	-
Lolium rye grass	-	1	5	1	2	5	-
Adonis pheasant's-eye	-	-	-	-	-	-	1
Ajuga (bugle)	-	-	-	-	-	-	-
Asteraceae daisy family	-	-	-	-	-	-	-
Astragalus milk-vetch	-	-	-	-	-	-	-
Avena byzantina-type wild oat	-	-	-	-	-	-	-
Bromus brome grass	-	-	-	-	-	-	-
Centaurea	-	-	-	-	-	-	-
Cephalaria	-	-	-	-	-	4	-
Chenopodium (goosefoot)	-	-	-	-	-	-	-
Filipendula ulmaria meadow-sweet	-	-	-	-	-	-	-
Fumaria fumitory	-	-	-	-	-	-	-
Malva mallow	-	-	-	-	-	1	-
Medicago radiata calvary clover	-	-	-	-	-	-	-
Neslia	-	-	-	-	-	-	-
Poaceae grass family	-	-	-	-	-	-	-
Potentilla cinquefoil	-	-	-	-	-	-	-
Salvia syriaca sage	-	-	-	-	-	-	-
Triticum boeoticum/dicoccoides wild einkorn/emmer	-	-	-	-	-	-	-
Unspecified taxa	-	-	-	-	1	-	-

Table 1. continued

Sample no.	40	42	44	46	47
Trench	-	-	-	-	-
Context	Profile; 45	Profile; pit M	Profile; pit O	Profile; hearth A	Profile; hearth E
Period	Medieval	Medieval	Medieval	Medieval	Medieval
Charcoal	many	many	many	many	many
Cereals					
Hordeum barley (grain)	75	38	138	11	8
Hordeum (rachis segment)	-	-	1	-	-
Triticum aestivum/durum bread/macaroni wheat (grain)	-	-	2	7	24
T. aestivum (rachis segment)	-	-	-	-	-
T. monococcum einkorn (grain)	-	-	-	-	-
T. monococcum (spikelet fork)	-	-	-	-	-
T. dicoccum emmer (grain)	-	-	2	-	-
T. dicoccum (spikelet fork)	-	-	4	-	-
T. monococcum/dicoccum (glume base)	-	-	-	-	-
Triticum sp. wheat (grain)	-	-	-	-	-
Poaceae cereals (grain)	81	4	22	13	16
Legumes (seed)					
Lens culinaris lentil	2	1	8	-	-
Lathyrus sativus/cicera grass pea	-	-	3	-	-
Pisum sativum garden pea	-	-	2	-	-
Vicia ervilia bitter vetch	-	-	-	-	-
Cicer arietinum chickpea	-	-	-	-	-
Trifolium clover	-	-	15	-	-
Trifolieae (clover tribe)	-	-	5	-	-
Fabaceae legumes	11	1	13	1	4
Fruits					
Vitis vinifera grape (seed)	-	-	9	-	-
V. vinifera (fruit fragment)	-	-	-	-	-
Condiments (fruit)					
Coriandrum sativum coriander	-	-	-	-	-

Table 1. continued

Sample no.	40	42	44	46	47
Trench	-	-	-	-	-
Context	Profile; 45	Profile; pit M	Profile; pit O	Profile; hearth A	Profile; hearth E
Period	Medieval	Medieval	Medieval	Medieval	Medieval
Charcoal	many	many	many	many	many
Wild and weedy (fruit/seed)					
Aegilops goat grass	-	-	-	-	-
Aegilops **(spikelet base)**	13	-	-	-	-
Galium bedstraw	-	-	8	-	-
Lolium rye grass	-	1	46	-	-
Adonis pheasant's-eye	2	-	1	-	-
Ajuga (bugle)	-	-	1	-	-
Asteraceae daisy family	-	-	-	-	-
Astragalus milk-vetch	-	-	5	5	-
Avena byzantina-type wild oat	-	-	-	-	-
Bromus brome grass	-	-	-	-	-
Centaurea	-	-	-	-	1
Cephalaria	-	-	-	-	-
Chenopodium (goosefoot)	-	-	1	-	-
Filipendula ulmaria meadow-sweet	-	-	14	-	-
Fumaria fumitory	2	-	4	1	-
Malva mallow	-	-	-	-	-
Medicago radiata calvary clover	-	-	1	-	-
Neslia	-	-	2	-	-
Poaceae grass family	-	-	-	-	-
Potentilla cinquefoil	-	-	-	-	-
Salvia syriaca sage	-	-	-	-	-
Triticum boeoticum/dicoccoides wild einkorn/emmer	-	-	-	-	-
Unspecified taxa	-	-	1	-	-

Table 2. Early Bronze Age and Medieval plant remains from Gre Virike.

Sample no.	1	2	3	5	6	7
Trench	K-9	K-9/L-9	I-8	I-8	I-9	K-9
Context	mud-brick platform	pool floor	channel	sacrificial pit 024	sacrificial pit	pit 013
Period	EBA I (3000-2800 BC)	EBA I/II (3000-2600 BC)	EBA I/II	EBA II (2800-2600 BC)	EBA II	EBA II
Charcoal	many	-	some	some	some	some
Cereals						
Hordeum barley (grain)	54	13	63	621	162	41
Triticum aestivum/durum bread/macaroni wheat (grain)	-	-	-	-	-	-
T. dicoccum emmer (grain)	1	-	103	4	46	6
T. monococcum/dicoccum (glume base)	-	14	-	-	1	-
Triticum sp. wheat (grain)	-	-	23	-	40	-
Legumes (seed)						
Lens culinaris lentil	1	-	2	5	2	1
Lathyrus sativus/cicera grass pea	-	-	-	-	-	-
Pisum sativum garden pea	-	-	-	-	-	-
Trifolium clover	-	10	-	-	-	-
Trifolieae clover tribe	-	-	-	-	-	-
Fabaceae legumes	1	2	-	13	3	-
Fruits						
Vitis sylvestris/vinifera grape (seed)	1	1	-	1	-	1
V. sylvestris/vinifera (fruit fragment)	-	-	-	-	-	-
V. sylvestris/vinifera (peduncle)	-	-	-	-	-	-
Olea europaea olive (stone)	-	-	-	-	-	1
O. europaea (stone fragments)	-	-	-	-	-	-
Wild and weedy (fruit/seed)						
Aegilops goat grass	-	2	-	2	3	1
Aegilops (spikelet base)	-	-	-	-	-	-
Galium bedstraw	1	4	2	18	7	1
Lolium rye grass	1	8	1	2	3	1
Adonis pheasant's-eye	-	-	-	-	1	-
Astragalus milk-vetch	-	-	-	-	-	-
Avena byzantina-type wild oat	-	-	-	-	-	-
Chenopodium goosefoot	-	-	-	-	-	-
Filipendula ulmaria meadow-sweet	-	-	-	-	-	-
Medicago radiata calvary clover	-	-	-	-	-	-
Neslia	-	-	-	-	-	-
Polygonum knotweed	-	-	-	-	1	-
Rumex dock	-	-	-	1	1	-
Triticum boeoticum/dicoccoides wild einkorn/emmer	-	-	-	-	-	-

Table 2. continued

Sample no.	8	10	11	15	18
Trench	J-9	L-8	I-8	J-8	J-9
Context	ash layer	pit 015	room floor	pit	grave 028
Period	EBA II/III (2800-2250 BC)	EBA III (2600-2250 BC)	EBA III/IV (2600-2000 BC)	EBA III/IV	EBA III/IV
Charcoal	some	some	some	some	-
Cereals					
Hordeum barley (grain)	-	33	14	3	33
Triticum aestivum/durum bread/macaroni wheat (grain)	-	2	-	-	-
T. dicoccum emmer (grain)	-	-	-	1	-
T. monococcum/dicoccum (glume base)	-	-	-	-	-
Triticum sp. wheat (grain)	-	-	-	1	-
Legumes (seed)					
Lens culinaris lentil	-	9	-	2	1
Lathyrus sativus/cicera grass pea	2	4	-	-	1
Pisum sativum garden pea	-	-	-	-	-
Trifolium clover	-	3	-	-	-
Trifolieae clover tribe	-	1	-	-	-
Fabaceae legumes	6	10	-	1	3
Fruits					
Vitis sylvestris/vinifera grape (seed)	-	8	-	4	-
V. sylvestris/vinifera (fruit fragment)	-	-	-	-	-
V. sylvestris/vinifera (peduncle)	-	5	-	-	-
Olea europaea olive (stone)	-	-	-	-	-
O. europaea (stone fragments)	3	-	-	-	-
Wild and weedy (fruit/seed)					
Aegilops goat grass	1	-	-	-	-
Aegilops (spikelet base)	1	1	-	-	-
Galium bedstraw	2	11	-	1	-
Lolium rye grass	2	16	-	1	-
Adonis pheasant's-eye	-	1	-	-	-
Astragalus milk-vetch	-	1	-	-	-
Avena byzantina-type wild oat	1	-	-	-	-
Chenopodium goosefoot	-	-	-	-	-
Filipendula ulmaria meadow-sweet	-	1	-	-	-
Medicago radiata calvary clover	-	-	-	1	-
Neslia	-	1	-	-	-
Polygonum knotweed	-	1	-	-	-
Rumex dock	-	-	-	-	-
Triticum boeoticum/dicoccoides wild einkorn/emmer	1	-	-	-	-

Table 2. continued

Sample no.	20	24	25	27	28	29	30
Trench	K-8	K-8	E-9	F/E-7	F-7	F-7	F-8
Context	ash layer	ash layer	ash layer	pit	room floor	room floor	floor deposit
Period	EBA III/IV	EBA III/IV	Medieval (11th-13th centuries AD)	Medieval	Medieval	Medieval	Medieval
Charcoal	many	many	many	some	some	some	some
Cereals							
Hordeum barley (grain)	3	10	18	24	575	89	5
Triticum aestivum/durum bread/macaroni wheat (grain)	-	-	-	-	-	-	-
T. dicoccum emmer (grain)	1	1	-	-	1	-	-
T. monococcum/dicoccum (glume base)	1	-	-	-	-	-	-
Triticum sp. wheat (grain)	2	-	-	-	-	-	7
Legumes (seed)							
Lens culinaris lentil	-	1	-	-	2	-	-
Lathyrus sativus/cicera grass pea	-	-	-	-	29	8	-
Pisum sativum garden pea	-	-	-	-	19	10	-
Trifolium clover	3	-	-	1	-	-	-
Trifolieae clover tribe	-	-	-	-	-	5	-
Fabaceae legumes	-	3	-	16	146	42	2
Fruits							
Vitis sylvestris/vinifera grape (seed)	-	9	-	-	2	-	1
V. sylvestris/vinifera (fruit fragment)	-	1	-	-	-	-	-
V. sylvestris/vinifera (peduncle)	-	-	-	-	-	-	-
Olea europaea olive (stone)	-	2	-	-	-	-	-
O. europaea (stone fragments)	-	16	-	-	-	-	-
Wild and weedy (fruit/seed)							
Aegilops goat grass	-	-	-	-	1	-	-
Aegilops (spikelet base)	-	-	-	-	1	-	-
Galium bedstraw	-	1	-	-	9	1	-
Lolium rye grass	3	-	-	-	-	-	-
Adonis pheasant's-eye	-	-	-	-	-	-	-
Astragalus milk-vetch	-	-	-	-	-	-	-
Avena byzantina-type wild oat	-	-	-	-	-	-	-
Chenopodium goosefoot	-	-	-	-	1	-	-
Filipendula ulmaria meadow-sweet	-	-	-	-	-	-	-
Medicago radiata calvary clover	-	-	-	-	-	-	-
Neslia	-	-	-	-	-	-	-
Polygonum knotweed	-	-	-	-	-	-	-
Rumex dock	-	-	-	-	-	-	-
Triticum boeoticum/dicoccoides wild einkorn/emmer	-	-	-	-	-	-	-

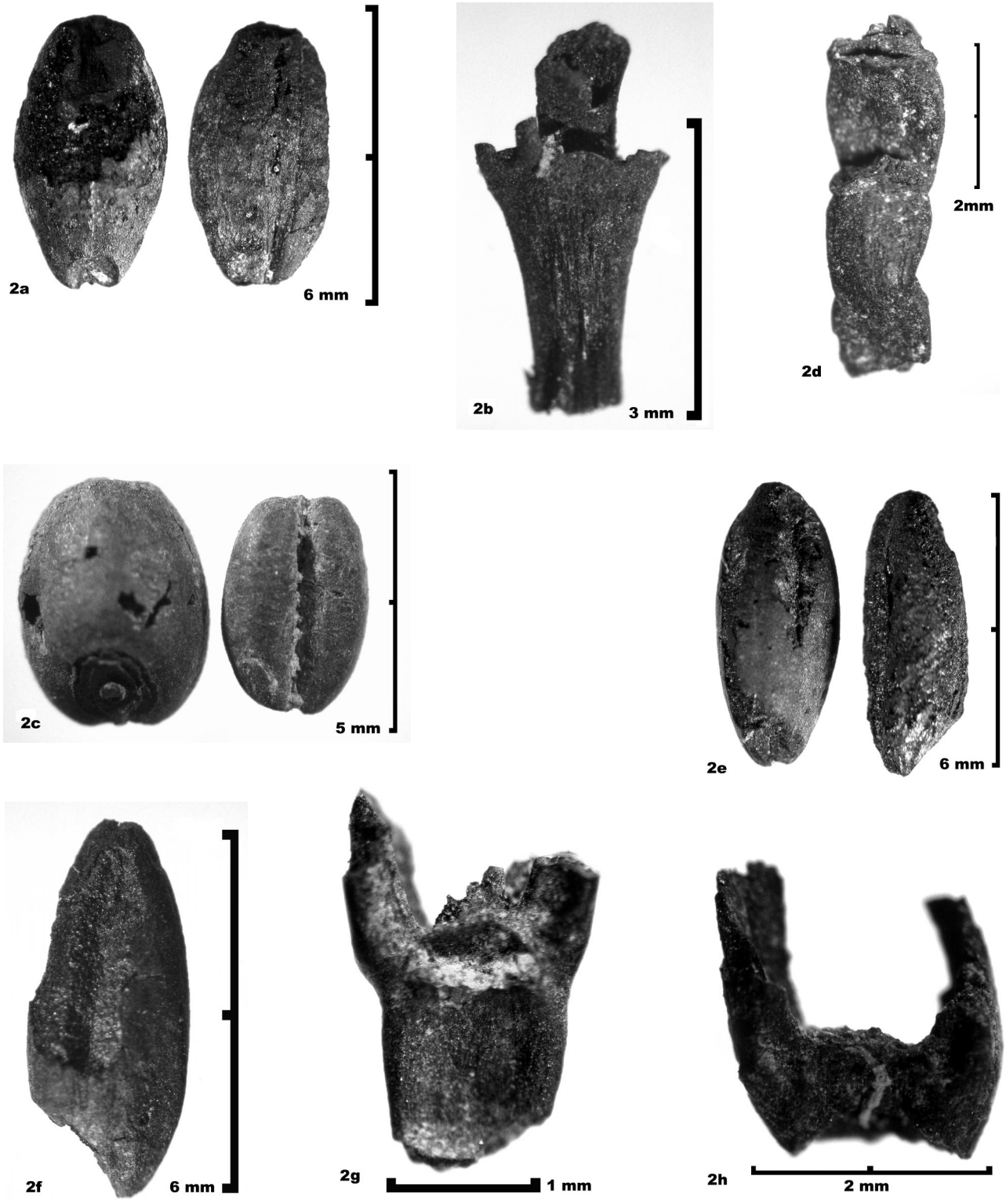

Figure 2. Remains of cereals: a. grains of barley (Gre Virike - EBA), b. rachis internode of 2-rowed barley (Mezraa Höyük - Medieval), c. grains of bread/macaroni wheat (Mezraa Höyük - Medieval), d. rachis internode of bread wheat (Mezraa Höyük - EBA), e. grains of emmer wheat (Gre Virike - EBA), f. grain of einkorn wheat (Mezraa Höyük - EBA), g. spikelet fork of emmer wheat (Mezraa Höyük - Medieval), h. spikelet fork of einkorn wheat (Mezraa Höyük - EBA).

Desf.) (Figure 2c). The naked wheat grains present at both sites have rounded, uncreased flanks, being rounded in cross section. Many of the grains have a compact form. The dimensions of the EBA grains could not be measured because they are not intact. The grains are more abundant at Medieval Mezraa Höyük and their mean average dimensions are 4.6 x 3.19 x 2.58 mm.

A rachis internode found in an EBA (III/IV) (2600-2000 BC) sample at Mezraa Höyük is obovate with thin lips left below the glume bases, pointing to bread wheat (*Triticum aestivum* sensu stricto) (Figure 2d). The dimensions are 2 (rachis internode length) x 1 (basal width) x 1.8 (maximum width) mm.

The grains of the hulled (glume) wheats, *Triticum dicoccum* Schübl. (emmer wheat) and *T. monococcum* L. (einkorn wheat) are recorded for Mezraa Höyük. At Gre Virike only the grains of the former are present.

The ventral side of the grains of emmer wheat is longitudinally straight or concave, and the dorsal side is distinctly curved (Figure 2e). The mean dimensions of the EBA grains from the sites are 5.3-5.7 x 2.63-2.67 x 2.2-2.25 mm.

The dorsal and ventral sides of the grains of einkorn wheat are longitudinally curved (Figure 2f). The grains could not be measured due to either deformation or fragmentation.

In addition to the grains of the hulled wheats, other remains in the form of spikelet forks and glume bases were secured from the sites. In front view, the glumes in the spikelet forks of emmer wheat are sinuous and gracefully curved (Figure 2g), while the glumes of einkorn wheat have straighter lines and merge imperceptibly with the rachis (Figure 2h). The dimensions of well-preserved spikelet forks of emmer wheat from the EBA layers of Gre Virike range from 1.4 (spikelet width) x 0.6 (scar width) x 0.7 (glume width) mm to 1.5 x 0.7 x 0.8 mm and relative scar width is 0.43-0.5 mm. A single spikelet fork of emmer wheat found at Medieval Mezraa Höyük measures 2.2 x 0.9 x 1 mm and its relative scar width is 0.41 mm. The dimension of the EBA spikelet fork of einkorn wheat is 1.7 x 0.9 x 0.9 mm and its relative scar is 0.53 mm.

The fragmented glume bases of both emmer and einkorn wheats are scored as *T. dicoccum/monococcum* (emmer/einkorn wheat).

The wheat grains which had been seriously affected by carbonisation were identified as *Triticum* sp. (wheat).

Other Cereals (Poaceae)

Deformed and fragmented grains of cereals were not further distinguished, although they are almost certainly barley or wheat.

Legumes

At both sites, *Lens culinaris* Medik. (lentil), *Lathyrus sativus* L./*L. cicera* L. (grass pea) and *Pisum sativum* L. (garden pea) have been ascertained. *Vicia ervilia* (L.) Willd. (bitter vetch) and *Cicer arietinum* L. (chickpea) were represented by only a single specimen at Mezraa Höyük. The seeds of the taxa can be described as follows:

Lens culinaris (lentil): The seeds are strongly flattened and edges are angled (Figure 3a). Measurements: 2-4 mm (EBA) and 2.1-3.3 mm (Medieval).

Lathyrus sativus /L. cicera (grass pea): The seeds are shaped like the head of an axe (Figure 3b). They are almost triangular in cross section. Measurements: 3.6-4.9 (length) x 3.2-4.2 (width) x 3.5-5 (thickness) mm (EBA) and 3.3-4.5 x 3.5-4 x 3.4-4.7 mm (Medieval).

Pisum sativum (garden pea): The seeds are spherical with some angular-flattened types (Figure 3c). Measurements: 3.8-4.4 x 4-4.8 x 3.8-4.5 mm (MBA) and 3.8-5 x 3.7-4.8 x 3.5-5.5 mm (Medieval).

Vicia ervilia (bitter vetch): The seed is rounded and triangular, sloping in side view (Figure 3d). Measurements: 2.6 x 2.6 x 2.7 mm.

Cicer arietinum (chickpea): The seed is angular with a prominent beak (Figure 3e). Measurements: 6 x 5.8 x 5.2 mm.

Other Legumes

In addition to the diaspores of domesticated legumes mentioned above, small-seeded leguminous types (maximum dimension usually 2 mm) were found and scored together under the tribe Trifolieae (clover tribe) with the exception of *Trifolium* L. (clover). All these types are either rectangular or cylindrical or oval-ovate (Figure 3f-g).

Some legume grains could not be determined because of deformations due to carbonisation. They were determined as Fabaceae.

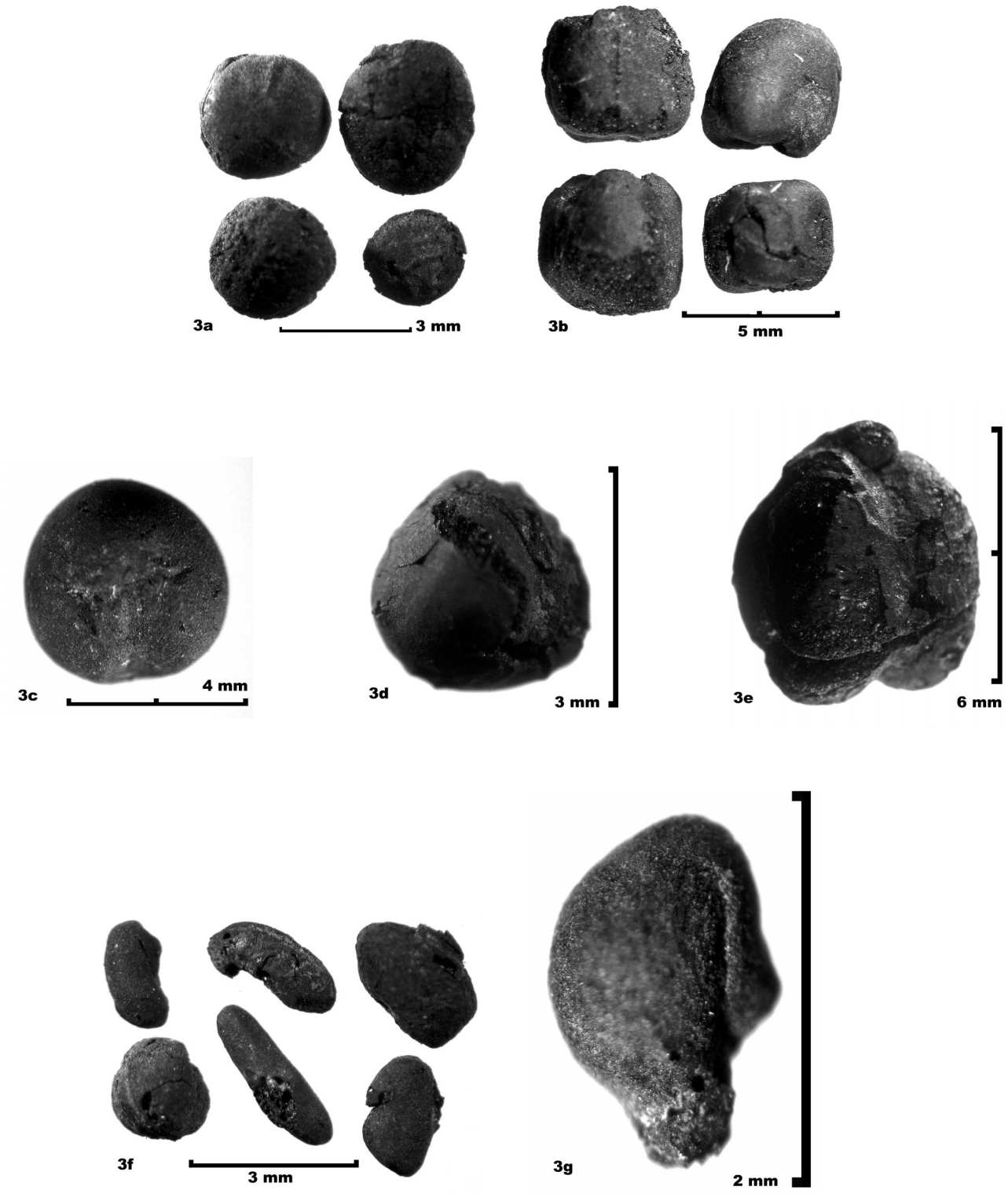

Figure 3. Remains of legumes: a. seeds of lentil (Mezraa Höyük - EBA), b. seeds of grass pea (Gre Virike - Medieval), c. seed of garden pea (Gre Virike - Medieval), d. seed of bitter vetch (Mezraa Höyük - EBA), e. seed of chickpea (Mezraa Höyük - Medieval), f. seeds of small-seeded legumes (Mezraa Höyük - EBA), g. seed of clover (Mezraa Höyük - EBA).

Fruits

Vitis vinifera L. (grape): The usual grape seeds and fruit fragments occur in small numbers at the sites (Figure 4a-b). In addition to these remains, a few peduncles are preserved at Gre Virike (Figure 4c). All the grape parts recovered are carbonised with the exception of mineralised seeds found in a grave jar at Mezraa Höyük (Figure 4d). Measurements: 4.1-4.8 (length) x 2.9-3.8 (width) mm (EBA), 4.2-7.3 x 3.4-4.1 mm (MBA), 4.2-5.2 x 3.2-4.2 mm (Medieval).

Olea europaea L. (olive): Stones and stone fragments of olive in low density come from the layers of Gre Virike. The stones show a pattern of lengthwise oriented grooves (Figure 4e). Measurements: 7.8-8.1 (length) x 5-5.5 (width) mm.

Condiments

Coriandrum sativum L. (coriander): A single half-fruit was found at Medieval Mezraa Höyük (Figure 5). It is spherical and sharply pointed below. There are distinct vein traces running along the meridian. Measurements: 3 x 3 mm.

Wild and Weedy Plant Taxa

A variety of wild and weedy plants have been recorded, mostly from Mezraa Höyük. The common weed taxa include *Aegilops* L. (goat grass), *Galium* L. (bedstraw) and *Lolium* L. (rye grass) and they are described as follows:

Aegilops L. (goat grass): The samples from the sites contained grains and spikelet bases of goat grass. The grains are oval in cross-section. All the flanks are convex and the ventral crease is tight (Figure 6a). Measurements: 3.6-5.1 x 2-2.8 x 0.9-1.7 mm.

The spikelets are cylindrical with a smooth round disarticulation scar on the bottom (Figure 6b). The width and thickness of the spikelets at the thickest part of the basal swelling: 2.9-3.7 x 2.4-3.2 mm. The glumes have heavy narrow veining.

Galium L. (bedstraw): Almost spherical fruits with a deep cavity (Figure 6c). Measurements: 1.3-2.8 mm.

Lolium L. (rye grass): The ventral side of the grains are strongly convex, the dorsal side is flat or slightly concave (Figure 6d). Measurements: 2.4-4.9 x 1.1-1.9 x 0.8-1.3 mm.

Other wild and weedy taxa identified are *Adonis* L. (pheasant's-eye), *Ajuga* L. (bugle), Asteraceae (daisy family), *Astragalus* L. (milk-vetch), *Avena byzantina* C. Koch-type (wild oat), *Bromus* L. (brome grass), *Centaurea* L., *Cephalaria* Schrader ex Romer & Schultes., *Chenopodium* L. (goosefoot), *Filipendula ulmaria* (L.) Maxim. (meadow-sweet), *Fumaria* L. (fumitory), *Malva* L. (mallow), *Medicago radiata* L. (calvary clover), *Neslia* Desv., Poaceae (grass family), *Polygonum* L. (knotweed), *Potentilla* L. (cinquefoil), *Rumex* L. (dock), *Salvia syriaca* L. (sage) and *Triticum boeoticum* Boiss. Emend. Schiem./*T. dicoccoides* (Körn.) Aarons. (wild einkorn/emmer wheat). Five different types could not be determined and they are grouped under unspecified taxa.

Discussion and Conclusions

The majority of the Mezraa Höyük and Gre Virike archaeobotanical samples were poor in seeds. For the former site, the scarcity of plant remains could be related to the context types which yielded plant material. Most are either floor deposits or refuse deposits in pits. For EBA Gre Virike this could be related partly to the use of the mound as a sanctuary. At this site most material comes from pits. Despite the low density of plant remains, archaeobotanical analyses of the samples from the sites give some information about agricultural practices and plant use in ancient times, namely the EBA, MBA and Medieval period. Thus, it is possible at least to build up an outline picture of the plant-based agriculture of these periods in the study area.

The sites under study are indeed located in the Fertile Crescent of the Near East, where it is widely believed that the earliest plant husbandry and animal breeding originated and developed. Rivera-Núñez et al. (1999) think that in view of the evidence for early settlement and its wealth of wild ancestors of crop plants, it is most likely that Turkey and Syria played a crucial role in the origins of agriculture. Sites of earlier periods, such as Nevali Çori (Hilvan-Şanlıurfa) (Pasternak, 1995) and Çayönü (Diyarbakır) (van Zeist & de Roller, 1991/1992) in south-eastern Turkey, and Tell Abu Hureyra (Moore et al., 2000) and Tell Aswad and Tell Ramad (van Zeist & Bakker-Heeres, 1985) in northern Syria, yielded remains of domestic plants including primarily einkorn and emmer wheats, barley and various legumes.

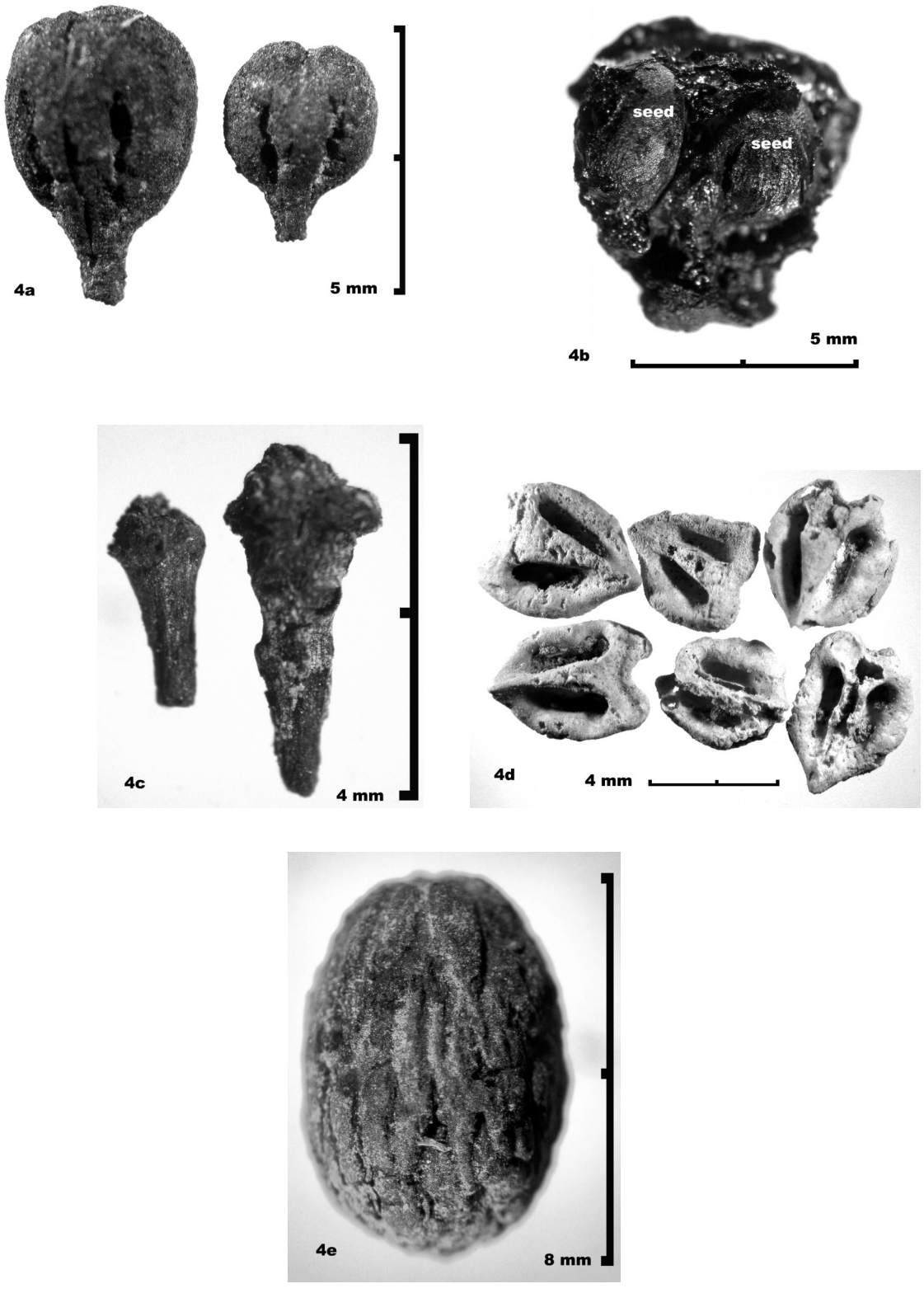

Figure 4. Remains of fruits: a. seeds of grape (Gre Virike - EBA), b. fruit fragment of grape (Mezraa Höyük - Medieval), c. peduncles of grape (Gre Virike - EBA), d. mineralised seeds of grape (Mezraa Höyük - MBA), e. stone of olive (Gre Virike - EBA).

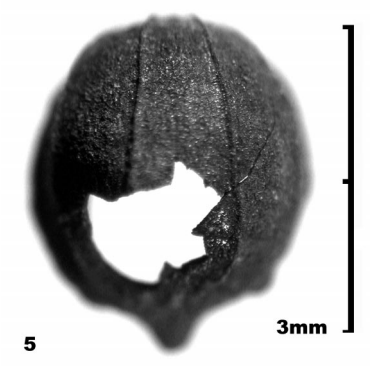

Figure 5. Fruit fragment of coriander (Mezraa Höyük - Medieval).

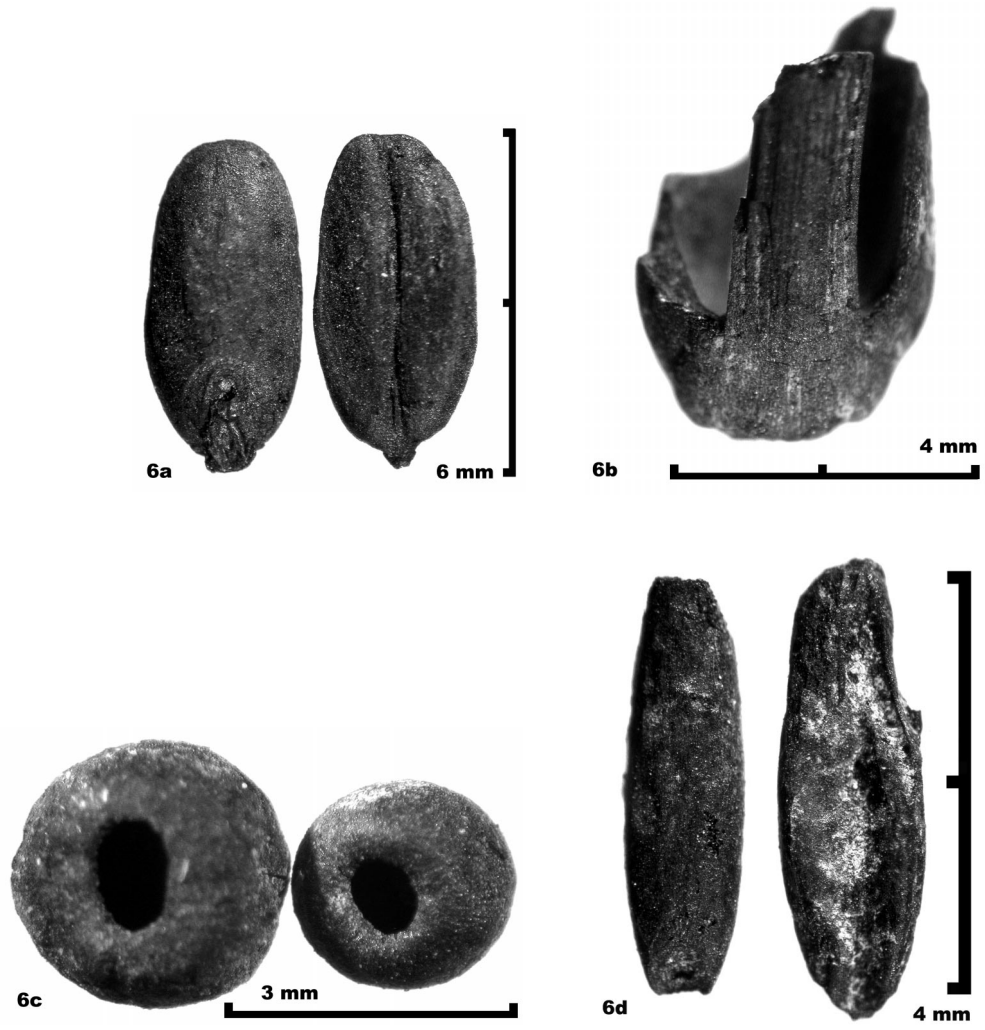

Figure 6. Remains of weeds: a. grains of goat grass (Mezraa Höyük - EBA), b. spikelet base of goat grass (Mezraa Höyük - EBA), c. fruits of bedstraw (Gre Virike - EBA), d. grains of rye grass (Gre Virike - EBA).

Reports of recent studies in the settlements of earlier periods situated in the vicinity of Mezraa Höyük and Gre Virike on the Euphrates, such as Akarçay Tepe (Balkan-Atlı et al., 2002) and Fıstıklı Höyük (Pollock et al., 2001) also point to the presence of domestic plant remains, belonging mainly to cereals and legumes. It is clear that the earlier farmers who settled in the Karkamış area were already cultivating these crop plants.

Early Bronze Age (the third millennium BC) (3000-2000 BC)

Evidence from biological and archaeological studies indicates that by the third millennium BC (EBA) agriculture was already firmly established and in the EBA urban civilisations were developed in Mesopotamia and peripheral regions (Miller, 1991). Algaze (1999) claims that an increase in settlement density and initial urbanisation in the north of Karkamış occurred in the EBA. As mentioned previously, archaeological surveys of the study sites, Mezraa Höyük and Gre Virike, indicate that the former became a larger settlement while the latter was used as a sanctuary of the surrounding settlements in EBA Karkamış. Plant remains recovered from the EBA levels of the study sites are mostly represented by cultivated plants of cereals and legumes. In addition to archaeobotanical findings, several grinding stones found in EBA Mezraa Höyük (Yalçıklı and Tekinalp, 2004) and Gre Virike (Ökse, 2004b) provide evidence for agricultural activities and food preparation on the mounds.

The botanical remains from the simultaneous layers of the neighbouring sites in the Karkamış area are still under study. Therefore, a comparison between the study sites and neighbouring sites from an archaeobotanical point of view cannot be given here. However, the EBA plant assemblages reported from some of the other sites in the Upper Euphrates basin could be considered.

As deduced from the results of archaeobotanical analyses of the EBA samples from the sites, hulled barley appears to be the most common crop. Similarly, barley, although naked (*H. vulgare* L.), is found to be the main constituent of the crop assemblage recorded from the contemporary levels of Yarım Höyük situated on the west bank of the Upper Euphrates, near Birecik, by Miller (1998a). In EBA Titriş Höyük, located some 40 km north of Şanlıurfa, hulled barley has been recorded as the predominant crop plant (Schlee, 1995). A group of EBA sites in the north Syrian Euphrates basin, such as Selenkahiye, Tell Es-Sweyhat (van Zeist & Bakker-Heeres, 1985), Tell al-Raqa and Tell Bderi (van Zeist, 1999/2000) and Tell Hazna I, a religious and administrative centre (Lebedeva, 2004), also yielded hulled barley remains in high quantities. Coming further down to some other EBA sites in the south, in Tell Taya (Iraq) (Waines, 1973) located in Mesopotamia and Malyan in highland Iran (Miller, 1991), barley, again, seems to be the chief crop of plant husbandry. All this evidence obtained from the sites mentioned above, however, contrasts with that from Kurban Höyük (Miller, 1986) situated to the north in Şanlıurfa province, suggesting the predominance of wheat. The wheats are, in general, less abundantly represented in the EBA contexts of the study sites, Mezraa Höyük and Gre Virike. Miller (1998b) suggests that in archaeobotanical assemblages from EBA sites along the Euphrates, the importance of barley relative to wheat tends to follow rainfall: in the drier south barley was more important, whereas in the north heavier reliance was placed on wheat having a higher moisture requirement. However, geomorphological and pedological data from the Şanlıurfa plain (Rosen, 1997) and northern Syria (Courty, 1994) suggest that drier environmental conditions set in during much of the third millennium BC. Therefore, it is still curious why the people in the north had chosen wheat, whereas the people in the south had chosen barley. Archaeological findings dating to the EBA from Mezraa Höyük and Gre Virike indicate close contacts between the occupants and the north Syrian cultures (Ökse & Bucak, 2003; Yalçıklı & Tekinalp, 2003). Considering cultural connections, one could assume that the dominance of barley in the crop spectra of the study sites and north Syrian sites may reflect similar preferences of the EBA farmers for barley in the south-eastern Turkish-northern Syrian region.

At a closer examination of the wheat remains of the archaebotanical assemblages from the study sites, bread/macaroni wheat grains occur occasionally. A single rachis internode found at Mezraa Höyük suggests that bread wheat would have been involved in crop production. Apart from the naked wheat, the remains of the hulled wheats, emmer and einkorn, are scarcely represented at Mezraa Höyük. The quantity of the grains of the former is, however, higher and the latter is not present at Gre Virike. The rare occurrence or absence of

einkorn wheat is consistent with the contention of Zohary and Hopf (1994) that the importance of einkorn wheat, one of the founder crops of Neolithic agriculture, seems to have declined in Bronze Age times. The significant presence of emmer wheat at Gre Virike, on the other hand, suggests that this hulled wheat, another founder crop of the earliest agriculture, maintained its importance in food production of the EBA in the study area as in the other contemporary settlements, such as Selenkahiye, Tell al-Raqa and Tell Bderi in northern Syria.

Spikelet forks and glume bases of the hulled wheats were found in several samples at the study sites. At Mezraa Höyük, chaff remains would represent the waste of crop-processing. It is, however, difficult to give a definite answer for those found at Gre Virike in view of the EBA use of the site. Such chaff remains may be related to fodder and they may have entered the mound in animal dung.

The amount of domesticated legumes is quite low relative to crop cereals on the mounds under study. Lentil, the most common pulse in some samples, was probably grown locally. Grass pea and garden pea occur in such small numbers that their importance in the agricultural system appears to be minor. The single specimen of bitter vetch at Mezraa Höyük is no firm evidence of the cultivation of this species because it also occurs as a field weed. It, however, appears, although not commonly, on the north Syrian Euphrates (van Zeist & Bakker-Heeres, 1985).

Grape is present in low quantities at the study sites. According to Zohary and Hopf (1994), there are definite signs of grape cultivation in the Levant from the EBA. At Kurban Höyük, located in the Şanlıurfa district, grape remains increase from the Early EBA onwards (Miller, 1991). Miller documents the finding of one Mid-Late EBA deposit filled with numerous charred seeds, peduncles and fruits. She interprets the sample as refuse, probably from wine production, and representing a cultivated type. Viticulture may have developed in the Şanlıurfa district in EBA times. Furthermore, the Mezraa Höyük and Gre Virike material represent cultivated grape, although it is small in number. In addition to grape remains, small numbers of intact olive fruit stones and parts were found at Gre Virike. Admittedly, the Karkamış area is outside the present distribution of olive trees (Zohary & Spiegel-Roy, 1973). It is likely that olives were imported from the Mediterranean coastal region. Olive remains are also recorded from the EBA sites on the north Syrian Euphrates (van Zeist & Bakker-Heeres, 1985), which is also outside the present distribution of olive. All the evidence suggests that olive served as an article of commerce in EBA Levant. Both grape and olive may have played a part in the diet of the people of the Mezraa Höyük-Gre Virike area.

Small-seeded legumes, including clover (*Trifolium*), constitute a substantial portion of the wild seed remains at Mezraa Höyük and Gre Virike. Most form an important part of the vegetation of grazing land and had probably been eaten by herbivores. With regard to such animals of fauna, domestic species including sheep (*Ovis aries* L.), goats (*Capra hircus* L.), pigs (*Sus domesticus* L.) and cattle (*Bos taurus* L.) would be considered since archaeozoological investigations conducted in the neighbouring settlements, such as Zeytinlibahçe Höyük (Frangipane et al., 2002) and Yarım Höyük (Weber, 1998), indicate that these species were important elements of the EBA animal husbandry in the region. According to preliminary analyses of the faunal remains from EBA Mezraa Höyük by Albayrak (pers. comm.) sheep and goats were present on the mound. Here, one would ask that how these seed types were brought to the study sites. Miller and Smart (1984) suggest that seeds of plants consumed by dung-producing animals can be brought to a site incorporated in animal dung and charred when that dung is burned as fuel, especially in areas where wood for fuel might have been scarce. Carbonised small-seeded legumes recorded on the mounds under study may have originated in dung, although no burnt dung remains were found. There is, however, no strong evidence signalling a scarcity of wood in the study area in EBA times. As mentioned previously, most samples from the study sites are rich in wood charcoal. Abundant wood remains have been also found at Fıstıklı Höyük in the Karkamış area (Bernbeck et al., 2002). A preliminary examination of the Gre Virike wood material by Akkemik (pers. comm.) indicates the presence of open woodland elements, such as juniper (*Juniperus* L.) and pearl (*Pyrus* L.), as well as riverine taxa, e.g., willow (*Salix* L.), possibly thriving near the Euphrates River.

The common weedy taxa, goat grass (*Aegilops*), bedstraw (*Galium*) and rye grass (*Lolium*), identified from the study sites may have arrived on the sites as weeds of cultivated fields. The weeds with other items, such as glume chaff remains, may have been then separated from

the crop by various processing methods. These weeds are also known from other archaeological sites, such as Jerablus-Tahtani (Murray, 1995) and Tell Bderi (van Zeist, 1999/2000) in the Euphrates basin. Other various weedy/wild taxa attested could represent weeds of crop fields and species from pastural land and other different habitats.

In summary, the archaeobotanical evidence from Mezraa Höyük and Gre Virike suggests that hulled barley was the principal crop of the EBA people in the area. The domesticated wheats and legumes appear to have been less important in the plant-based agriculture. Gre Virike, defined as a cult place, is of special interest here. It seems that plant-related activities, probably also including food preparation, were also performed on the mound by visitors. The evidence points to use of plants in ceremonies as inferred from the presence of the grains in sacrificial pits (Samples 5 and 6), which were found to be covered with perforated fumigation lids, and in a water channel (Sample 3), all of which have been related to ritual activities by Ökse (2004b).

Middle Bronze Age (the second millennium BC) (2000-1500 BC)

According to Algaze et al. (1994), during the MBA there were fewer settlements in the north of Karkamış, probably reflecting the recession of urbanisation. Geoarchaeological investigations at Kazane Höyük on the upper Şanlıurfa plain by Rosen (1997) point to drier environmental conditions in this period. With respect to the issue of the responses of human socities to environmental change, Rosen assumes that abandonments of a number of sites in the region at the end of the EBA were related either directly or indirectly to decreased agricultural yields in a drying environment. At Mezraa Höyük, however, occupation continued into the MBA and this period is represented only by few structures and remains on the mound (Yalçıklı & Tekinalp, 2002). Based on the archaeobotanical material, although small, it appears that hulled barley is again an important element of the crop spectrum of Mezraa Höyük. It is accompanied by some domesticated legumes, lentil, grass pea and garden pea. Barley is also reported to be the main crop of MBA Hadidi, located on the north Syrian Euphrates (van Zeist & Bakker-Heeres, 1985).

Some mineralised grape seeds were found inside a grave vessel at Mezraa Höyük. Grape would be apparently a kind of funerary offering. It may have become more important and common in use in MBA times at the study area.

Medieval (11th-13th centuries AD)

The archaeological record by Mergen and Deveci (2001) shows that during the Medieval period there were Christian communities in the study area. Wilkinson (1990) considers the fact that this was a fairly cosmopolitan period as is well illustrated by the range of Frankish, Byzantine and Muslim coins from the Gritille excavations in south-eastern Turkey.

According to Yalçıklı and Tekinalp (2003), Mezraa Höyük was one of the villages located along the Upper Euphrates River in the Medieval period. Based on the findings of building remains and silos in considerable numbers, the authors point to dense settlement on the mound and extensive/intensive cultivation of crop plants within lowlands. A storage complex recovered at Medieval Gre Virike by Ökse and Bucak (2003) also provides evidence of agricultural activities. Taken together, it may be inferred that increases in population resulted in increases in demand for food in the study area.

The Medieval storage pits and grain storage buildings of Mezraa Höyük and Gre Virike, respectively, recorded by the excavators unfortunately did not yield any identifiable plant material. Some other types of contexts of this period, however, produced plant remains in some quantities. In addition, there are, again, no comparable results from the neighbouring sites of Medieval Karkamış.

The archaeobotanical record indicates that barley (probably 2-rowed) maintained its importance at Medieval Mezraa Höyük and Gre Virike. However, the significant occurrence of naked wheat (bread/macaroni wheat) in some of the Mezraa Höyük samples suggests that it was appreciated in the area. Pit D in the profile of Mezraa Höyük contained many grains of this wheat and it may have been used for grain storage. The pit is, in fact, very similar to the subterranean silos, in shape and size, found in the excavated Medieval levels of the site (Yalçıklı, pers. comm.). Emmer wheat occurs in smaller quantities whereas einkorn wheat is never recorded at either site. This would indicate the replacement of the glume wheats by the naked type. Naked wheat was found to be the main crop at Medieval Gritille on the Euphrates, some 40 km upstream, in Adıyaman province (Miller, 1998b).

Domesticated legumes and grape are recorded as other economic plants of the Mezraa Höyük-Gre Virike area in Medieval times. Legumes, namely lentil, grass pea and garden pea, seem to assume less importance, as is the case in the Bronze Age archaeobotanical spectra of the study area. A single seed of chickpea (*Cicer*) retrieved from Mezraa Höyük corresponds in size to the cultivated type (*C. arietinum*). This is, in fact, expected because archaeobotanical records from the Near East arc point to early cultivation of this legume in prehistoric times, very probably from Neolithic (Zohary and Hopf, 1994). Grape, again, occurs in small quantities. However, based on archaeobotanical evidence and historical documentation indicating common use and cultivation of grape in the Levant from the EBA (Zohary & Hopf, 1994), one can assume that this fruit plant would have been cultivated in the study area.

A single half-fruit of coriander (*Coriandrum sativum*) found at Mezraa Höyük is of special interest here because remains of condiments have been discovered rarely in archaeological contexts in the Near East. It may have been used for its aromatic fruits in the study area. Archaeobotanical evidence and linguistic sources, in fact, indicate that its use started much earlier (Zohary & Hopf, 1994). For example, coriander remains were discovered in the second millennium BC Tell ed-Dēr (Syria) by van Zeist & Vynckier (1984).

The weedy/wild seed assemblage represents plants of crop fields, pastural land and other kinds of habitats. The weeds of cultivated fields may have been brought to the settlements unintentionally, while the plants of grazing lands may have originated in dung since most came from refuse pits, especially at Mezraa Höyük.

In relation to the use of wood, it seems that it was still used in the study area, possibly as fuel and building material, as inferred from the frequency of the charcoal material recorded. However, it should be emphasised here that there is evidence of the gradual removal of woodland due to human activities and climatic desiccation from prehistorical times to historical times in south-eastern Turkey (Wilkinson 1990, 1999).

In conclusion, the archaeobotanical assemblage of different periods provides a general picture of agricultural and other plant-related activities in the area of Mezraa Höyük and Gre Virike.

The data indicate that in the EBA (the third millennium BC) hulled barley (*Hordeum*) was the most used crop plant and continued to be so in the MBA (the second millennium BC). During the Medieval period (11^{th}-13^{th} centuries AD), it still assumed importance in the area.

The Bronze Age cereal crops also included emmer wheat (*Triticum dicoccum*), einkorn wheat (*T. monococcum*) and naked wheat (bread/macaroni wheat) (*T. aestivum/durum*). Naked wheat became important and replaced the hulled wheats in Medieval times. However, Ertuğ (2004) reports that today, the Anatolian people, at least in the central Black Sea area, especially in villages at high altitudes, are still producing einkorn and emmer wheats for food and sometimes also for fodder.

Of the domesticated legumes, lentil (*Lens culinaris*), grass pea (*Lathyrus sativus/cicera*), garden pea (*Pisum sativum*), bitter vetch (*Vicia ervilia*) and chickpea (*Cicer arietinum*) are represented, but their small numbers in the assemblage suggest that they played a minor role in plant-related activities of the Bronze Age and Medieval period.

Grape (*Vitis*) and olive (*Olea europaea*) remains recovered in the study area indicate that they were part of the diet of the people. Moreover, the former may have been cultivated in the Upper Euphrates basin from prehistory as suggested by the archaeobotanical data from the region.

Small-seeded legumes and other plants of pastural lands formed a part of the vegetation of grazing terrains, probably located in the uplands. They may have been brought to the sites incorporated in animal dung.

Based on the archaeozoological evidence of the Karkamış area and the presence of the plants of grazing land at Mezraa Höyük and Gre Virike, there is no doubt that animal husbandry also played a role in the agricultural economy of the area.

The common weedy taxa represented by goat grass (*Aegilops*), bedstraw (*Galium*) and rye grass (*Lolium*) appear to have infested the crop fields in all the periods under study.

The results of this archaeobotanical study show similarities with those from some of the simultaneous sites situated in the Upper Euphrates basin. This may be attributed in part to similar natural conditions and in part to cultural preferences.

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