Tell Qaramel 1999-2007

Protoneolithic and Early Pre-Pottery Neolithic Settlement in Northern Syria
Preliminary results of Syrian–Polish archaeological excavations 1999–2007

Un Village Protonéolithique et Précéramique en Syrie du Nord
Résultats des fouilles syriennes et polonaises 1999–2007

Editors / Éditeurs
Ryszard F. Mazurowski, Youssef Kanjou

Polish Centre of Mediterranean Archaeology
University of Warsaw

PCMA EXCAVATION SERIES 2

Series managing editor:
Iwona Zych

Volume editor: Iwona Zych

Text translation and revisions:
Katarzyna Bartkiewicz (French), Iwona Zych (English)
and Edyta Ciosek (French – plates), Ryszard F. Mazurowski (English – Introduction),
George Wilcox (French – chapter nine)

Photographs: Ryszard F. Mazurowski
Drawings: Marcin Białowarczuk, Katarzyna Januszek, Joanna Gawrońska, Ewa Hander,
Piotr Karczmarek, Renata Maskowicz, Katarzyna Odya

Illustration processing and digitizing:
Ewa Czyżewska, Szymon Maślak

Book and cover design: MOYO Teresa Witkowska
Typesetting: MOYO Teresa Witkowska

Cover: General view of Tower I in Tell Qaramel (Photo R.F. Mazurowski)

ISBN 978-83-903796-3-0

Polish Centre of Mediterranean Archaeology
University of Warsaw
Ul. Krakowskie Przedmieście 26/28
00-497 Warszawa, Poland
www.pcma.uw.edu.pl
pcma@uw.edu.pl; pam.pcma@uw.edu.pl

Printed in Poland

George Willcox, Linda Herveux

LATE PLEISTOCENE/EARLY HOLOCENE CHARRED PLANT REMAINS: PRELIMINARY REPORT

The site of Tell Qaramel has provided a rich archaeobotanical assemblage of charred plant remains. These remains give an understanding of the plant economy at a date when societies in the Near East were first starting to bring wild plants under cultivation, thus helping to gain an overall picture of the origins of agriculture in the Near East. Until now most archaeobotanical information from northern Syria has come from sites situated on the Euphrates. Tell Qaramel provides the first opportunity to examine a site situated away from this major river.

The overall results from Tell Qaramel indicate a very different plant assemblage compared to that found on the Euphrates sites. As to be expected the major groups of plants which include cereals, pulses and nuts and wild/weed species are the same, however the species within these groups are different. This dissimilarity is largely due to the fact that Tell Qaramel is situated in a different climatic zone and the original vegetation was different from that in the Euphrates valley.

Tell Qaramel is situated in an area which receives an annual average rainfall of 350 mm. The site lies in the valley of the Quoeiq river, which has deep rich soils on the gently sloping sides that are intensely dry farmed today. The area is heavily degraded. Soil erosion on the upper steeper slopes has exposed bare rock. The vegetation is highly overgrazed and degraded, but potentially the region could have had open forest vegetation.

Tell Qaramel was occupied at the Pleistocene/Holocene boundary. The climate in the region would have been different from that of today. Horizons H1 and H2 at Tell Qaramel coincide with the end of cold dry Younger Dryas and the beginning of a period of climatic improvement at the start of the Holocene.

Methods

Flotation was carried at the dig house situated near the site. Layers which were rich in charcoal and showed *in situ* burning were sampled. The preservation of the remains was excellent, probably because of the thick overlying archaeological layers. At Tell Qaramel 108 samples were taken for flotation, representing 1772 liters of sediment. These samples provided 5934 mls of charred remains consisting of seeds and charcoal. From the seed remains a total of 12,247 items were identified. The majority of the samples came from horizon H2 representing layers dated to between 10,300 and 10,000 BP non cal.

Results

Total numbers of identifications for each taxa identified and ubiquity (% of samples where a taxon is present) are given in *Table 9-1*. Following is a description of groups of taxa with a column for each period.

Cereals

Cereal grains were abundant at Tell Qaramel and the most common species was einkorn (*Triticum boeoticum*) [*Table 9-2*]. A high proportion of the grains had a convex ventral side indicating that these grains came from single-grained einkorn. Others grains had a flat ventral surface, which could be two-grained einkorn or possibly rye. All spikelet bases were from wild einkorn. This demonstrates that the major cereal used at the site was wild einkorn consisting of a mixture of single and two grained forms. Mixtures of these two types are common in wild populations. No positive identification of rye was made.

Table 9-1. Total number of identifications and ubiquity values / Nombre total d'identifications et valeur des ubiquités

Taxon	Total	Ubiquity
Adonis	7	7
Aegilops grain	1	1
Amygdalus fragment	2214	52
Androsace maxima	2	1
Apiaceae	5	4
Apiaceae type 1	46	5
Astragalus	7	5
Bellevalia	30	16
Bromus	2	2
Bupleurum	91	14
Celtis	400	38
Chenopodiaceae	2	2
Compositae	27	8
Coprolite rodent / Excréments de souris	49	27
Coronilla	4	4
Crucianella	3	2
Cruciferae	18	7
Cyperaceae	242	48
Echinaria	1	1
Fabaceae type 1	3	2
Ficus	4	4
Fruit fragment / Fragment de fruit	5	2
Galium	2	2
Glaucium	8	4
Heliotropium	7	6
H. murinum grain	63	17
H. spontaneum grain	217	39
Hyoscyamus	19	7
Indeterminate / Indeterminée	520	49
Insect / Insecte	12	4
Labiatae	53	8
Lathyrus	8	7
Lens	1113	84
Lolium	3	3
Malva	4	4
Medicago	1	1

Taxon	Total	Ubiquity
Medicago pod / Gousse	1	1
Medicago radiata	4	4
Nigella	1	1
Ornithogalum	2	1
Panicoid	1	1
Papaver	2	1
Floral part / Partie florale	17	10
Phalaris	1	1
Pistacia whole fruit / Fruit complet	64	13
Pistacia fragment	1705	63
Pisum	1	1
Pisum/Vicia/Lathyrus	682	68
Poa bulbosum	36	1
Poaceae	267	42
Polygonum/Rumex	11	4
Quercus acorn	3	2
Charred food / Aliments	43	21
Rhizome / Tubercule	1	1
Seed cake / Amas de graines	9	1
Silene/Gypsophila	13	9
Stipa	526	12
Taeniatherum grain	5	3
Thymelaea	1	1
Trifoliae	75	21
Trigonella	3	3
Trigonella astroite	5	3
Triticum spikelet base / Base d'épillet	303	11
T. boeticum 1 grain	1108	74
Triticum *dicoccoides* grain	4	2
Triticum 2 grains/Secale	1170	50
Vaccaria	2	1
Valerianella	5	4
Verbascum	5	2
Vicia	19	9
Vicia ervilia	11	-
Ziziphora	959	57

Emmer was not found in significant quantities, only four grains were identified. Barley grains were ten times less common than einkorn. This cereal assemblage is different from the PPNA sites on Euphrates which are dominated by rye and barley; einkorn is a minor component (Willcox 2005).

Nuts and fruits

Tell Qaramel has unusually high frequencies of edible fruits such as almonds, *Oriental turpentine tree* to use the local Arabic name (=*Pistacia atlantica*), and hackberry [*Table 9-2*]. *Oriental turpentine tree* occurs on all late Pleistocene/

early Holocene sites in the Near East. The tree must have been much more common in the past. The fruits have played an important role in the plant economy in the region for millennia. They could have been stored and they had many uses for example as food, as a source of oil and for making a beverage.

Almond shell fragments like the *oriental turpentine tree* fragments have high counts and high ubiquity values at Tell Qaramel. The almond shells from Tell Qaramel are identical to the wild progenitor of the domestic almond *Amygdalus communis* (Browicz, Zohary 1996) [*Fig. 9-1*]. Similar finds came from Khamian levels at a site in the Bal'as region to the south (Abbès 2008). The two sites are found within the boundary of where the wild ancestor is found today (Browicz, Zohary 1996). These archaeological finds confirm that the wild ancestor was part of the natural vegetation and that present day wild almonds are truly wild and not escapees. At sites on the Euphrates two xeric species of almond were identified, *A. webbii* and *A. orientalis*. At Öküzini, an Epipalaeolithic site in southern Turkey a large number of fragments of similar species were recovered (Martinoli, Jacomet 2004). Wild almonds are toxic to different extents, but this does not mean they cannot be consumed because they can be easily detoxified.

Two cotyledons from acorns were identified. While oak charcoal has been identified at a large number of sites in the Near East, including the Euphrates sites (Willcox 2002), this is first time that acorns have been found in northern Syria. The finds suggest that oak trees were growing not far from the site.

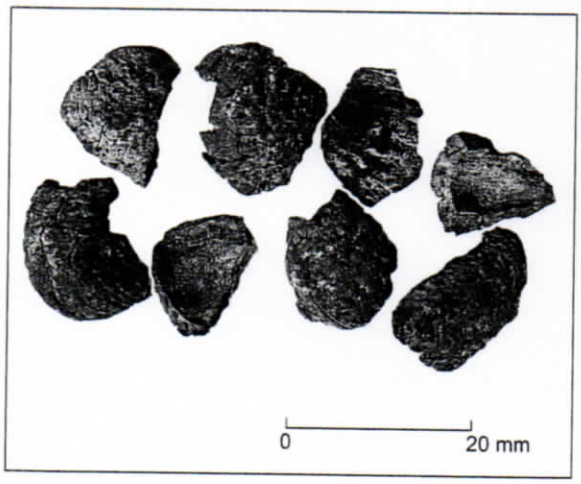

Fig. 9-1. Almond shells (sample QRM 62) closely resembling wild ancestors / Coquilles d'amande (échantillon QRM 62) ressemblant à l'ancêtre sauvage de l'amande domestique

Table 9-2. Common edible plants from the different periods / Total des plantes comestibles communes des différentes périodes

Cereals / Céréales	H1	H2	H3
Hordeum spontaneum grain	-	187	30
Triticum boeticum spikelet base / Base d'épillets	-	302	-
Triticum boeticum grain	18	1050	40
Triticum dicoccum grain	-	4	-
Triticum/Secale grain	71	1081	18
Edible pulses / Légumineuses comestibles	H1	H2	H3
Lathyrus	-	8	-
Lens	-	1086	27
Pisum	-	1	-
Pisum/Vicia/Lathyrus	-	653	29
Vicia	-	18	1
Vicia ervilia	-	11	-
Edible fruits / Fruits comestibles	H1	H2	H3
Quercus fruit	-	3	-
Pistacia whole / complet	-	63	1
Pistacia fragment	1	1691	13
Ficus	-	4	-
Fruit / fruit	-	4	1
Celtis fragment	-	46	-
Celtis	-	350	4
Amygdalus fragment	-	2206	8

Table 9-3. Small seeded grasses from the different periods/ Petites graminées sauvages des différentes périodes

Small seeded grasses	H1	H2	H3
Stipa	-	524	2
Taeniatherum grain	-	5	-
Poaceae	-	257	10
Phalaris	-	1	-
Panicoid	-	1	-
Lolium	-	3	-
Bromus	-	2	-
Echinaria	-	1	-
Poa bulbosum	-	36	-
Hordeum murinum/ bulbosum grain	-	59	4
Aegilops grain	-	1	-

Table 9-4. Wild/weed taxa from the different periods / Plantes adventices potentielles des différentes périodes

Wild/Weed	H1	H2	H3
Adonis	–	7	–
Alkanna	–	1	–
Androsace maxima	–	2	–
Apiaceae	–	5	–
Apiaceae type 1	–	28	18
Astragalus	–	7	–
Bellevalia	–	29	1
Boraginaceae	–	25	–
Bupleurum	–	84	7
Chara/Nitella oogonia	–	1	–
Chenopodiaceae	–	2	–
Compositae	–	27	–
Coronilla	–	2	2
Crucianella	–	3	–
Cruciferae	–	18	–
Cyperaceae	1	231	10
Fabaceae type 1	–	3	–
Galium	–	2	–
Glaucium	–	7	1
Heliotropium	–	6	1
Hyoscyamus	–	17	2
Indeterminae	4	514	2
Labiatae	2	46	5
Liliaceae	–	1	–
Malva	–	4	–
Medicago	–	1	–
Medicago pod / Gousse	–	1	–
Medicago radiata	–	4	–
Nigella	–	1	–
Ornithogalum	–	1	1
Papaver	–	2	–
Capitulim	–	17	–
Polygonaceae	–	7	–
Polygonum/Rumex	–	4	–
Silene/Gypsophila	–	12	1
Thymelaea	–	1	–
Trifoliae	5	61	9
Trigonella	–	3	–
Trigonella astroite	–	3	2
Vaccaria	–	2	–
Valerianella	–	5	–
Verbascum	–	5	–
Ziziphora	–	942	17

Table 9-5. Other charred remains from the different periods / Autres restes carbonisés des différentes périodes

Other remains / Autres restes	H1	H2	H3
Rodent coprolite / Excréments de souris	–	48	1
Prepared food remains / Réstes d'aliments	1	40	2
Rhizome / Tubercule	–	1	
Seed cake / Amas de graine	–	9	–
Insect / Insecte	–	12	–
Slag silica / Scorie de silice	–	3	–

ces taxons comme adventices est une hypothèse controversée en l'absence de taxons morphologiquement domestiques.

En comparant ce groupe de taxon entre Tell Qaramel et les sites de l'Euphrate, on note qu'un bon nombre sont absents de l'assemblage de Qaramel. Ainsi, Ajuga/Teucrium, Atriplex, Capparis, Centaurea, les endospermes de Chenopodiaceae spiralés, Asteraceae type I, Cruciferae type I, Cruciferae type Brassica, Cucurbitaceae type Bryonia, Eremopyron, Erodium, Erodium (arêtes en hélice), Onobrychis, Papaveraceae, Plantago, Solanaceae, Tragopogon, Tribulus terrestris sont absents de l'assemblage de Tell Qaramel. Ces taxons représentent certainement des espèces arides qui ne poussent pas dans la région de Tell Qaramel mais qui sont présentent dans la végétation naturelle de la région de l'Euphrate.

Autres restes carbonisées

Il faut noter la découverte de crottes de souris carbonisées au nombre de 49 et avec une ubiquité de 27% au sein de l'assemblage [*Tables 9-5*]. Cette découverte semble indiquer que le site fournissait un habitat pour les rongeurs ce qui implique par conséquent la présence de stockage de céréales ou autres graines offrant ainsi durant toute l'année l'alimentation pour ces espèces commensales. Ce type de restes n'a pas été identifié sur beaucoup de sites certainement parce qu'il n'a pas été déterminé comme tel. La souris domestique a été identifiée

Hackberry was quite common at Tell Qaramel. 354 whole stones were found and 46 fragments. This tree requires a minimum annual rainfall of approximately 450 mm. Figs were poorly represented; only four nutlets were identified.

Edible pulses

Pulses were widely used at Tell Qaramel. Indeed lentils have the highest ubiquity scores of all the plants identified [*Table 9-2*]. The group *Pisum/Vicia/Lathyrus* probably represents, in the majority of cases, the wild ancestor of the common pea (*Pisum elatius*). This taxon is frequent, so it is probable that peas were commonly consumed.

Small seeded gasses

These plants were not well represented compared to cereals (i.e., large wild grasses) [*Table 9-3*]. If we take into account the volume of the small grasses compared to the volume of the cereals, then the former represent less than a tenth of the volume of the later. This strongly suggests that these plants were not an important part of the economy. Indeed, it is probable that they were simply harvested accidentally with the cereals. Numerically *Stipa* was one of the more frequent grasses but this taxon has a low ubiquity because the finds were concentrated in one sample. In conclusion it appears that the small seeded wild grasses were not widely used.

Wild/weed plants

Most taxa in this group include plants which do not have any obvious use [*Table 9-4*]. There is one exception and that is *Ziziphora* which was frequent and therefore may have been used, perhaps as flavouring. *Ziziphora* was also very common on PPNA sites in south east Turkey (Savard *et alii* 2006) Many of the other taxa could be interpreted as representing ruderals and/or weeds of cultivation. However, to interpret these taxa as weed remains is controversial in the absence of morphological domestication. Comparing the taxa from Qaramel with those from the Euphrates sites there a significant number which are absent at Tell Qaramel, these include the following: *Ajuga/Teucrium, Atriplex, Capparis, Centaurea,* Chenopodiaceae spiral endosperm, Compositae type 1, Cruciferae type 1, Cruciferae type *Brassica,* Cucurbitaceae type *Bryonia, Eremopyron, Erodium, Erodium* spirale beak, *Onobrychis,* Papaveraceae, *Plantago,* Solanaceae, *Tragopogon, Tribulus terrestris.* These taxa probably represent xeric species, which were common further east in region of the Euphrates.

Other charred remains

Finds of charred rodent droppings totaled 49 with 27% ubiquity [*Table 9-5*]. This indicates that the site provided a habitat for rodents and implies frequent use of grain and other seeds including storage to provide year round food for these animals. Charred rodent droppings have not been identified at many sites, possibly because they were simply not recognized during sorting and identification. Domestic mice have been identified at sites of earlier date in the Near East (Cucchi *et alii* 2005).

Amorphous charred remains were quite common. These remains could represent fragments of charred food. Others may be coprolites. At present no detailed study has been made of the finds. Preliminary microscopic observation suggests the presence of charred flesh, seed cake, and possible dough containing fragments of cereal grains.

Discussion

The plant assemblage from Tell Qaramel indicates that fruits, cereals and pulses were commonly consumed at the site. The plants that provided these resources were probably available in the local vegetation, not far from the site.

Gathering or cultivation?

In a recent article we argued that there are several lines of evidence which point to cultivation being practiced at the PPNA sites of Jerf el-Ahmar and Tell 'Abr and the early PPNB site of Dja'de el-Mughara (Willcox *et alii* 2008). These sites are situated on the Euphrates and are outside the range of wild wheat and rye, which were found on the sites. During the sequence of these sites, rye diminished and barley increased as emmer appeared. These changes have been interpreted as resulting from the adoption of cultivation. Other arguments include the presence of pulses and a weed assemblage. We argue that cultivation was supplemented by gathering particularly when stocks became low during periods of drought or disease. Compared to the Euphrates, at Tell Qaramel cereals could have been growing locally, so there would have been less incentive to cultivate. It can be assumed that the majority of the plant resources were gathered rather than cultivated. However, we should not exclude the possibility that some cultivation was taking place. First, there is the potential weed assemblage at Tell Qaramel, even if it less abundant than at Jerf el-Ahmar

and at Dja'de el-Mughara. These plants were less common at Abu Hureyra and almost absent at late Pleistocene Ohalo II where cultivation is highly improbable. Second, pulses are very common at Tell Qaramel, and yet these plants are never very common in the wild. Wild stands are small and restricted in their distribution, so in order to provide a year round supply of pulses cultivation and storage may have been necessary.

Climate during the occupation of Tell Qaramel

What evidence do we have of the climate during the occupation of Tell Qaramel? We know from palaeo-climatic data from ice cores that at this time the planet was emerging from a cool spell known as the younger Dryas, which had affected many parts of the world. The number and density of sites during the younger Dryas in the Near East diminishes. But with the climate amelioration of the Holocene the number of sites increased and not long after the first farming villages emerged. The earliest occupation at Tell Qaramel corresponded to the cool younger Dryas climatic period. Unfortunately, there are few samples from this period. The second period corresponds with end of the younger Dryas and the beginning of the Holocene. The plant remains do not provide precise information on climate. However the tree species and the cereals could not have grown if climatic conditions were drier than those found in the area today. Indeed the presence of *Celtis* and Oak might be interpreted as indicative of slightly more moist conditions.

Plant assemblage compared to other sites in the northern Levant

Near Eastern PPNA cereal assemblages exhibit regional differences that correlate with present-day wild habitat distributions (Willcox 2005). The Tell Qaramel cereal assemblage is dominated by single-grained einkorn. This species was found at the sites of Nevali Çori and Tell Ain el Kerkh which are located in areas with similar annual rainfall. Rye is absent at Qaramel but was frequent at contemporary or earlier sites on the Euphrates. Rye was probably introduced into the Euphrates valley from cooler regions upstream because there were no suitable cereals growing naturally farther south in the area of the sites. As we have seen the assemblage at Tell Qaramel indicates a more moderate climate compared to the Euphrates sites. Steppe plants are less frequent and the cereal and tree species indicate a moister climate at Tell Qaramel compared to the Euphrates sites.

Conclusion

Tell Qaramel was situated in a favorable environment with abundant local plant resources. This abundance was probably one of the reasons why the inhabitants were able settle on a permanent basis. Fruits are particularly well represented at Tell Qaramel compared with other sites of the same period. The question of whether or not the inhabitants practiced cultivation is difficult to resolve. The availability of wild locally growing cereals provided little incentive to cultivate them. This may not have been the case for the pulses which were widely used at Tell Qaramel and may have been cultivated on a small scale.