Natufian Foragers in the Levant

Terminal Pleistocene Social Changes in Western Asia

edited by

Ofer Bar-Yosef
&
François R. Valla

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Preliminary Results from Analyses of Charred Plant Remains from a Burnt Natufian Building at Dederiyeh Cave in Northwest Syria

Ken-ichi Tanno, George Willcox, Sultan Muhesen, Yoshihiro Nishiaki, Yousef Kanjo and Takeru Akazawa

Introduction

Dederiyeh is a cave site situated 13 km south of Afrin, and about 65 km from the present-day Mediterranean coast in northwest Syria (Fig. 1). It has been excavated by a joint Japanese and Syrian team led by Takeru Akazawa and Yousef Kanjo. The cave deposits consist of Lower and Middle Palaeolithic layers, above which part of a Natufian layer survives (Akazawa and Muhesen 2002; Akazawa *et al.* 2009; Nishiaki *et al.* 2011). It is one of the most northern Natufian sites in the Near East (Nishiaki *et al.* in press) lying in Mediterranean vegetation zone where the average annual rainfall is approximately 600 mm per year. Today's vegetation in the area of Dederiyeh is a degraded Mediterranean forest with sparse evergreen oak (*Quercus calliprinos*), rarely deciduous oaks and wild cereals such as emmer and barely.

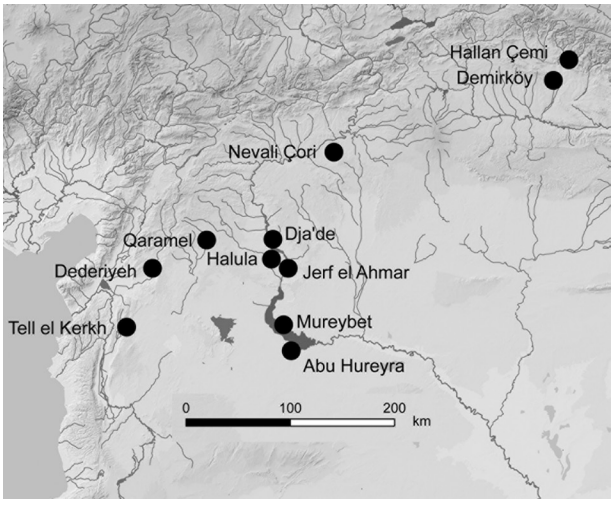

Fig. 1. Location of principal sites mentioned.

The site is still under excavation. At least five Natufian structures were found in the entrance to the cave. Building 1 had burnt destruction levels caused by a fire that partially destroyed the building (Nishiaki *et al.* in press). The fire probably took place while the building was still in use with many of its contents in place, which explains the exceptionally rich charred plant remains. Several ^{14}C dates from the burnt levels indicate that the fire took place between 12,950 and 13,180 calBP (Yoneda *et al.* 2006). This building measures approximately 2.5 x 5 m making a half circled with a stone wall towards the rear. Postholes were located along the wall and at the front of the building. Charred timbers were scattered across the floor.

Sampling of building 1 was carried out in 2005 and 2007. In 2005 sediment from the fill of the building was sampled. Then in 2007 sediment corresponding to the floor levels was systematically sampled from forty 50 x 50 cm squares, which allowed a spatial analysis of the charred finds within the building to be carried out. Sediment samples were subjected to flotation using 1.0 mm and 0.5 mm mesh sieves during the 2005 season and in 2007 a 0.34 mm mesh sieve was added. The position of charred beams representing construction material from the building was recorded. Large fragments of charcoal were picked out by hand.

Results

The study of the charred remains is ongoing; this short report presents only preliminary results (Table 1). In 2007 a total of 11.5 liters of charred plant remains were recovered from 623 liters of sediment. 57 charred beams fragments were sampled. Similar volumes were collected in 2005. This quantity of charred remains is exceptional for Natufian

Table 1. Results of preliminary analyses giving absolute counts of taxa identified. Note the small volume of charred remains analyzed compared to the total recovered

Year of excavation	**2005 (fill)**	**2007 (floor)**
Volume of sediment sampled (l)	297.5	623
Volume of charred remains recovered (l)		11.5
Volume of charred remains analysed (ml)	89	360
Cereals		
Triticum boeoticum / dicoccoides (Einkorn/Emmer)	53	120
Triticum spikelet base	0	2
*Hordeum spontaneum (*Wild barley)	2	8
Grasses		
Hordeum sp.	3	0
Stipa sp. (Fearther grass)	128	152
Gramineae (Grasses)	18	12
Pulses		
Lens sp. (Lentil)	8	11
Pisum sp. (Pea)	2	3 (1cf.)
Vicia ervilia (Bitter vetch)	1	1
Vicia sp. (Vetch)	2	2
Lathyrus sp. (Grass pea)	1	2 (2cf.)
Fruits		
Pistacia sp. (Oriental terebinth)	4268	5426
Amygdalus sp. (Almond)	203	1177
Celtis sp. (Hackberry)	30	72
Crataegus sp. (Hawthorn)	0	2 (1cf.)
Ficus sp. (Fig)	0	1cf.
Wild/weed taxa		
Adonis sp. (Pheasants eye)	0	1
Apiaceae (Umbliferous)	0	11
Brassica sp. (Cabbage family)	1	1
Bupleurum sp.	1	4 (2cf.)
Caryophyllaceae/Malvaceae	0	1
Centaurea sp.	0	1
Chenopodiaceae	0	2
Compositae	0	2
Hyoscyamus sp.	0	1cf.
Labiatae	0	8
Leguminosae	7	16
Onobrychis type	16	13 (4cf.)
Onopordum sp.	1	2
Papaveraceae	13	6
Silene sp.	0	1
Trigonella / Trifoliae	0	2
Ziziphora sp.	164	327
indet. Large Pulse	0	3
indet	26	34
Charred rodent faecies	4	212

sites. Over 12,000 items of carbonized seeds were identified from only 450 ml charred remains out of a total, which exceeds 12 liters. This shows that the final analysis will probably include more than 100,000 items.

Founder taxa

Charred grains of wild cereals were common. The most frequent was hulled wheat. Many specimens were morphologically close to wild single-grained einkorn with a convex ventral face. However two- grained einkorn was also present. These grains had a flat ventral face. Other grains were much wider and may represent small emmer grains some of which could have come from spikelets with one grain. The wild wheats are not easy to identify and future work will clarify these preliminary identifications. Wild barley was present but only ten grains were recorded. Pulses lentils, pea and bitter vetch were found at Dederiyeh. They occur at frequencies similar to those found on PPNA sites but less frequent compared to finds at early PPNB sites such as Nevali Çori, Dja'de and Tell el-Kerkh (Willcox *et al.* 2009) when they are almost as frequent as cereals.

Fruit taxa

The most common charred remains are represented by nutshells of *Pistacia atlantica / palaestina* with 9694 fragments, which were scattered throughout the building. In Syria these taxa are represented by two species (oriental terebinth and/or turpentine tree), which are difficult to separate when only fragments of endocarp are present.

Finds of these endocarp fragments are common on late Pleistocene/early Holocene sites in the Near East that have been sampled by flotation. The fruits have many different uses and they are still gathered today in many areas indicating continuity in the use of these fruits. Almond shells were also very common with 1380 fragments identified. At present it is not known which species was present. These taxa were also very common in Khiamian levels at the site of Tell Qaramel (Willcox *et al.* 2008). Another fruit that was identified at Dederiyeh was hackberry (*Celtis* sp.). The whole endocarps were quite common as indeed they were at Tell Qaramel. Two hawthorn endocarps were recovered and a possible fig seed. The later needs to be confirmed by future analyses.

Other common taxa that may have been used

Ziziphora sp. A member of the mint family was frequent at Dederiyeh. This taxa has been found at other late Pleistocene/early Holocene sites for example Tell Qaramel, Halan Çemi (Savard *et al.* 2006) and Demirköy. Seeds of *Ziziphora* sp. from Dederiyeh were concentrated near a hearth. The quantities suggest a specific use. The plant contains essential oils and is aromatic.

Wild grasses were also used, the most common being feather grass (*Stipa* sp.) with 280 fragments recorded. This taxa has been found at other pre-farming sites such as Abu Hureyra and Tell Qaramel. It was also found on later sites such as Dja'de, Nevali Cori, Jerf el-Ahmar and Tell el-Kerkh.

Charcoal analyses

Charcoal analysis of samples taken from the beams and the postholes revealed that deciduous *Quercus* (oak) and *Ulmus* (elm) were the most common species used. *Pistacia*, *Acer* (maple), *Amygdalus* (almond) and *Fraxinus* (ash) were also present. Elm and ash may have grown along the nearby river; the other species would have been part of the local vegetation growing on the surrounding hills. The presence of deciduous oak at this time is in concordance with data from other areas of the Mediterranean where evergreen oak was rare having retreated into refugia during the Last Glacial Maximum and did not expand until the beginning of the Holocene well after the Natufian occupation at Dederiyeh.

Discussion and conclusion

The plant economy during the Natufian period is poorly documented with the exception of information provided by analyses at Abu Hureyra (Hillman 2000). This period is considered as the prelude to the shift from foraging to cultivation. The archaeobotanical results obtained from the building partly destroyed by fire found in Dederiyeh cave in northwest Syria offer an exceptional opportunity to get a better understanding of this crucial period. It allows us for the first time to compare the plant economy from two contemporary Natufian sites from different geographical areas. The plant remains from Dederiyeh are remarkably well pre-

served thanks to the cave environment and offer the possibility of examining the plant economy at a new Natufian site, which corresponds in date to the early levels from Abu Hureyra 1 and coincides with the beginning of the Younger Dryas.

Hillman posited the possibility of cultivation (Hillman 2000) for Natufian Abu Hureyra situated on the Euphrates where he also reports on a few plump "domestic" type rye grains (Hillman *et al.* 2001). However the reliability of these interpretations based on plant material from Abu Hureyra has been questioned and should be treated with caution (Colledge and Conoly 2010). In Table 2 we compare the number of identifications of a selection of food plants found at Dederiyeh and Abu Hureyra. Most striking is the high levels of *Rumex/Polygonum* at Abu Hureyra and their absence at Dederiyeh. Of the cereals barley is absent at Abu Hureyra where rye played an important role; whereas at Dederiyeh hulled wheats dominate. The marked difference between the two sites, and indeed the finds from Mureybet (Willcox 2008), is due to the different climatic conditions which gives rise to a very different vegetation and hence the available plants (Willcox 2005). Indeed the assemblage from Dederiyeh is similar to that of early Holocene Tell Qaramel (Willcox *et al.* 2008) situated about 40 km to the east in essentially the same vegetation zone. Abu Hureyra and Mureybet are situated about 150 km to the east in a much more arid zone consisting of steppe vegetation. Founder crops are rare at Abu Huereyra whereas at Dederiyeh they dominate the assemblage if we discount *Pistacia*.

The results from Dederiyeh suggest that at this site cereals were an important part of the diet. This is not the case for other sites dated the Younger Dryas or even the start of the Holocene (Weiss *et al.* 2004). The plant economy at Dederiyeh is a precursor of what was to be seen a millennium later (*ca.* 12,000 years ago) at Tell Qaramel situated in a climatically similar region. By about 11,500 years ago it is generally accepted that pre-domestic cultivation was widely practiced during the PPNA (Weiss *et al.* 2006; Willcox *et al.* 2008). As for morphological domestication this was not fully established in the area of northern Syria until about 10,000 years ago having been identified at Middle PPNB Halula and Abu Hureyra 2.

Table 2. Comparison of a selection of food plants from Dederiyeh and Abu Hureyra giving absolute counts from each site (* predominantly rye)

	Abu Hureyra	**Dederiyeh**
*Triticum/Secale** grain	888	0
Triticum spikelet base	0	2
H.spontaneum	0	10
Emmer/Einkorn	0	173
Lens sp	48	17
Pisum/Vicia/Lathyrus	48	11
Vicia ervilia	3	3
Stipa	1573	280
Panicoid grasses	342	0
Rumex/Polygonum	4848	0
Ficus carica	0	1
Amygdalus spp	0	1380
Pistacia sp frags	357	9694
Charred rodent faecies	0	216
Volume of sediment (liters)	7925	11.5

References Cited

Akazawa, T., Kanjo, Y., Nishiaki, Y. Nakata, H., Yoneda, M., Kondo, O., Tanno, K. and S. Muhesen
2009 The 2007-2008 seasons' excavations at Dederiyeh Cave, Afrin, Northwest Syria. *Chronique Archéologique en Syrie* 4:31-38.

Akazawa, T. and S. Muhesen (editors)
2002 *The Neanderthal Burials: Excavations of the Dederiyeh Cave, Afrin, Syria.* International Research Center for Japanese Studies, Kyoto.

Colledge, S. and J. Conolly
2010 Reassessing the evidence for the cultivation of wild crops during the Younger Dryas at Tell Abu Hureyra, Syria. *Environmental Archaeology* 15:124–13.

Hillman, G.
2000 Plant food economy of Abu Hureyra. In *Village on the Euphrates, from Foraging to Farming at Abu Hureyra*, by A. Moore, G. Hillman and T. Legge, pp. 372–392. Oxford University Press, Oxford.

Hillman, G. C., Hedges, R., Moore, A., Colledge, S. and P. Pettitt
2001 New evidence of late glacial cereal cultivation at Abu Hureyra on the Euphrates. *The Holocene* 11(4):383-393.

Nishiaki, Y., Kanjo, Y., Muhesen, S. and T. Akazawa
in press Recent progress in Lower and Middle Palaeolithic research at Dederiyeh Cave, Northwest Syria. In *The Lower and Middle Palaeolithic in the Middle East and Neighbouring Regions*, edited by J.-M. Le Tensorer, R. Jagher and M. Otte. ERAUL. Université de Liège, Liège.

Nishiaki, Y., Muhesen, S. and T. Akazawa
2011 Newly discovered Late Epipalaeolithic assemblages from Dederiyeh Cave, the northern Levant. In *Studies in Technology, Environment, Production, and Society*, edited by E. Healey, S. Campbell and O. Maeda. The Proceedings of the 6th International Conference on PPN Chipped and Ground Stone Industries of the Fertile Crescent (Manchester). ex oriente, Berlin.

Savard M., Nesbitt, M. and M. K. Jones
2006 The role of wild grasses in subsistence and sedentism: new evidence from the northern Fertile Crescent. *World Archaeology* 38(2):179-196.

Tanno, K. and G. Willcox
2006 How fast was wild wheat domesticated? *Science* 311:1886.

Weiss, E., Kislev, M. and A. Hartmann
2006 Autonomous cultivation before domestication. *Science* 312:1608-1610.

Weiss, E., Wetterstrom, W., Nadel, D. and O. Bar-Yosef
2004 The broad spectrum revisited: Evidence from plant remains. *Proceedings of the National Academy of Sciences* 101/26:9551-9555.

Willcox, G.
2005 The distribution, natural habitats and availability of wild cereals in relation to their domestication in the Near East: multiple events, multiple centres. *Vegetation History and Archaeobotany* 14(4):534-541.
2008 Nouvelles données archéobotaniques de Mureybet et la néolithisation du moyen Euphrate. In *Le site néolithique de Tell Mureybet (Syrie du Nord), en hommage à Jacques Cauvin*, edited by J. Ibañez, pp. 103-114. BAR International Series 1843 (1). Oxford.

Willcox, G., Buxo, R. and L. Herveux
2009 Late Pleistocene and early Holocene climate and the beginnings of cultivation in northern Syria. *Holocene* 19:151–158.

Willcox, G., Fornite, S. and L. Herveux
2008 Early Holocene cultivation before domestication in northern Syria. *Vegetation History and Archaeobotany* 17(3):313-325.

Yoneda, M., Nakata, H., Aoki, M., Kondo, O., Nishiaki, Y. and T. Akazawa
2006 Age determinations at the Dederiyeh Cave, Syrian Arab Republic. *Anthropological Science* 114(3):251.