Anthracological analysis of an Early PPNB roof from Tell Qarassa North (southern Syria)

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Summary: *This work presents the results of the analysis of wood charcoal remains from a roof found in Tell Qarassa North (Early PPNB), southern Syria. The analysis was carried out in 50 burnt beams found* in situ*, as well as in 3 flotation samples from the same structure and in a flotation sample retrieved from a post hole. The taxa selected to build up the roof were* Pistacia terebinthus/palaestina*, Salicaceae and to a lesser extent* Amygdalus *sp. The structure was composed at least of a post of* Pistacia *wood which supported a structure made of branches and medium size trunks orthogonally disposed. The wood structure was covered with non-woody plant parts and adobe layers. Abundant xylophagous galleries and fungi remains identified in the charcoal remains point to a deterioration of the wooden structure previous to its burning.*

Key words: *charcoal, Near East, roof, building technology, PPNB.*

INTRODUCTION

During the Early PPNB significant changes in the building techniques were developed, among others the transformation from round to square shape houses or the stabilization of large-scale villages (e.g. Goring and Belfer, 2008, and references therein). In our study we will analyze an *in situ* burnt roof found in an Early PPNB context from the site of Tell Qarassa North and we will briefly characterize some of the building elements employed in its construction.

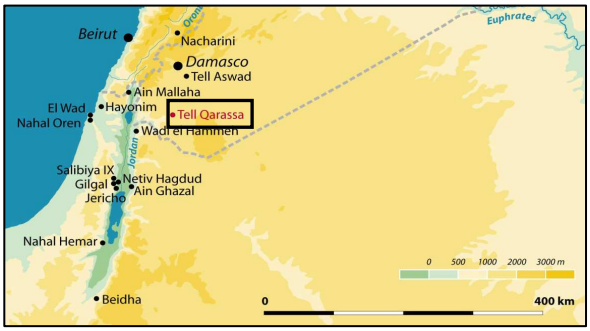

FIGURE 1. Location map of Tell Qarassa North.

Tell Qarassa North is located in the Leja basaltic plain, to the west of the Jebel el Arab mountain range, 20 km from the city of Sweida, southern Syria (Fig. 1), (Ibáñez *et al*., 2009, Ibáñez *et al*., 2010). Nowadays the climate in this region is arid to semi-arid, and the annual precipitation ranges from 250 mm in the north and southeast, to 530 mm in the central and upper parts. Tell Qarassa North is situated in a Mediterranean forest zone or Mediterranean island composed of a forest-like community of *Pistacia atlantica-Amygdalus korschinskii* and *Quercus calliprinos-Crataegus azarolus*. The site is formed by different spaces -up to 8- built up of basaltic stones, which can be considered as an aggregated habitat. So far, spaces 1 and 2 have been excavated. The roof here presented was found in space 1 (Fig. 2). The context has been dated to 8740-8470 cal BC, (Beta-290929, *T. monococcum* sp. charred seed).

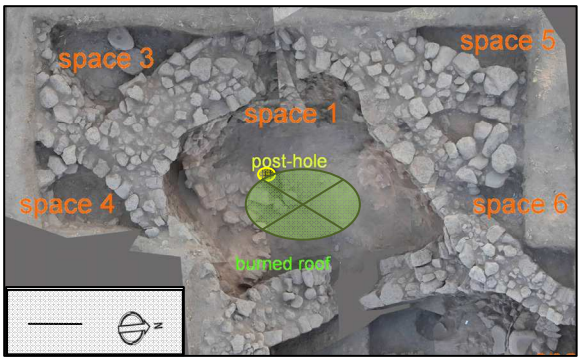

FIGURE 2. Excavation area of phase 2 of this zone, scale 1 m.

DATA AND RESULTS

The roof was sampled after identifying archaeologically each trunk or branch, taking the corresponding diameters and measuring their plunge and trend when possible. Apart from this, 3 flotation samples were taken from the burnt roof in order to assess whether other wood species had also been used. A post-hole was also sampled and processed through flotation. The wood was identified using an incident light microscope, several atlases (among others Fahn *et al*., 1986; Schweingruber, 1990) and our own reference collection.

The identifications of the 50 beams indicate that the roof is mainly composed of *Pistacia* sp. (33 beams out of 50) which probably corresponds to *Pistacia terebinthus/palaestina* rather than *P. lentiscus* or *P.*

atlantica due to the pore distribution, growth rings and ray width and height. The second taxon best represented is Salicaceae which is present in 14 out of 50 samples. The wood probably corresponds to *Salix* sp. (willow) due to the presence of heterogeneous rays in many beams. Finally, the presence of *Amygdalus* sp. is also attested but only in 3 beams. The analyses of the 3 flotation samples retrieved from this roof suggest that no other taxa were used to build up the roof.

With respect to the size of the trunks used in the roof, different groups are clearly distinguishable: 1) small size branches (20-50 mm width), which are more than half of the elements, 27 in total; 2) medium size trunks (13 elements) which are 60-75 mm wide and; 3) few big beams of 100-140 mm width (7 in total). At least 4 branches preserve the outer bark. It is located immediately after the earlywood so spring cutting is suggested. Unfortunately this does not allow us to say when the roof was built because the wood could have been stored before it was employed in the construction of the structure. Apart from this it is interesting to point out that at least 33 beams present fungi and/or xylophagous galleries. Most of the trunks have markedly deformed and thinned cell patterns and mycelia filaments. However more work must be carried out to find out what type of alteration has been developed in each trunk and the probable reasons for it.

With regard to the post-hole sample, 100 charcoal fragments have been analyzed. 98 of them correspond to *Pistacia terebinthus/palaestina* and 2 to *Amygdalus* sp. so most probably the post was made of the former taxon. All the rings of the wood fragments present little curvature and very different ring width, but it has not been possible to assess whether they correspond to a single trunk or not in absence of more systematic ring measurements which are underway.

Concerning the adobe layer, it was found on the top of the roof structure. It includes phytoliths and abundant impressions of straw fragments which were probably intentionally cut for this purpose. It has not been possible yet to assess the cereal species to which this tempering material belonged. Apart from this, the adobe fragments also contain fungi carbonate filaments, micro faunal bones and small rounded rock fragments.

DISCUSSION

Considering the taxa identified in these analyses we suggest a selection of *Pistacia* sp. and Salicaceae to build up the roof. We find no straightforward relation between the taxa and the diameter sizes of the trunk and branches. In other words, it can be said that different size trunks were collected regardless the 3 species to which they belonged (Arranz, 2010 in press). The use of these taxa as building material is well documented ethnographically and archaeologically in different regions (Arranz, 2010 in press).

The presence of fungi and xylophagous galleries indicate an advanced state of deterioration which in fact could have led to an accidental burning of the house. However, the presence of some trunk fragments with an optimal preservation suggests that not all the structure was affected or that partial replacements might have taken place during use as it is common with thatching structures.

CONCLUSIONS

The analysis of the wood charcoal preserved in the burnt roof of the Early PPNB house Space 1 from Tell Qarassa North (Syria) gives us significant data on building techniques during this period and on the selection of plant raw materials for this purpose. In Tell Qarassa North the roof was supported at least by a post of *Pistacia terebinthus/palaestina* wood. The roof itself was composed of beams and small branches *of Pistacia terebinthus/palaestina*, Salicaceae and *Amygdalus* sp. disposed orthogonally and it was covered by straw and adobe layers. The high state of deterioration in most of the woody elements as well as in the adobe layers could have led to an intentional burning of the structure maybe within a practical cycle of renovation, rebuilding and structural repair of the dwelling.

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