

# Use of wood in the ancient cult of fire temple at Mele Hairam (south-western Turkmenistan), based on preliminary charcoal analysis

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**Summary:** The analysis of charcoals from an ancient temple dedicated to the cult of fire, discovered in the south-western Turkmenistan (the Mele Hairam site), was conducted. The following taxa of trees and shrubs were identified: *Fagus orientalis*, *Populus* sp., *Tamarix* sp., *Ulmus* sp., *Chenopodiaceae* type I and type II, *Pomoideae* cf. *Crataegus/Cydonia* type, as well as cf. *Pistacia* sp., cf. *Punica granatum*, cf. *Tamarix* sp. and undeterminate anatomical type III. *Tamarix* sp. was the most numerous and frequent taxon at the site, followed by taxa from the *Chenopodiaceae* family and *Populus* sp. These are common trees and shrubs growing also nowadays in Turkmenistan. The wood used in the fireplaces at the Mele Hairam site was probably not imported, but originated from the nearest surroundings of the temple.

**Key words:** charcoal analysis, wood anatomy, Zoroastrian temple, archaeological Mele Hairam site, south-western Turkmenistan

## INTRODUCTION

The archeological Mele Hairam site is situated in the area of the Serakhs Oasis, in south-western Turkmenistan. At this site the Zoroastrian temple dedicated to the cult of fire was discovered. The temple was occupied during the Sasanian times, ca. 2nd – 7th century AD. (Kaim, 2002; Website: The Polish Archaeological Mission in Iran and Central Asia, online: 2011). The Mele Hairam site is located on the Turanian Lowland, on borderland of two kinds of deserts: sandy and clayey ones. Near the Mele Hairam site there are two permanent rivers, Tadzen and Murghab. On the Turanian Lowland occur saline soils, swamps and halophytes connected with them. Also saline ground-waters are found there. Steppe and desert plants cover the Turanian Lowland with the predominance of grasses and some shrubs.

The taxonomic identification of charcoals from the Mele Hairam site aimed at answering the question about what kinds of woods were used to keep up a fire in the temple as well as from where they originated (from the nearest surrounding area, or imported especially for this purpose).

## DATA AND RESULTS

Sixteen soil samples coming from different chambers of the temple and from the altar were analyzed. Charred wood material was found in twelve samples only.

Among the charcoal fragments the following taxa were distinguished, *Fagus orientalis*, *Populus* sp., *Tamarix* sp., *Ulmus* sp., *Chenopodiaceae* type I and type II, *Pomoideae* cf. *Crataegus/Cydonia* type. Approximately determined were cf. *Pistacia* sp., cf. *Punica granatum*, cf. *Tamarix* as well as indeterminate anatomical type III. In the sample originating from the altar four taxa were determined, *Tamarix* sp.,

*Chenopodiaceae* type II, *Pomoideae* cf. *Crataegus/Cydonia* type and *Ulmus* sp.

At the site, *Tamarix* sp. shows the greatest abundance of fragments (36.8% of the total sum of fragments) (Fig. 1). The less numerous taxa are: *Populus* sp. (23.6%), anatomical type III (14.8%), *Chenopodiaceae* type I (8.3%), cf. *Tamarix* sp. (4.8%), *Pomoideae* cf. *Crataegus/Cydonia* type (2.6%), and cf. *Punica granatum* (0.9%). The other taxa constitute together 1.5% of all fragments. 6.7% of the total sum of charcoal fragments remained undetermined because of excessive charring (undeterminable). *Tamarix* sp. is also the most frequent taxon at the site. In comparison with the other taxa also *Populus* sp., *Chenopodiaceae* type I and *Pomoideae* cf. *Crataegus/Cydonia* type appear quite often.

## DISCUSSION

In the present-day Turkmenistan the most common plants are those growing in extreme types of habitats, such as xerophytes and halophytes. The most popular are species of *Calligonum* from the Polygonaceae, *Haloxyton ammodendron*, *H. persicum* and different species of *Salsola*, *Aellenia*, *Anabasis*, *Arthrocnemum*, *Halogeton* from the *Chenopodiaceae* family, *Artemisia* from the Asteraceae family as well as *Tamarix* from Tamaricaceae (Ovezliev *et al.*, 1997).

Plants from the *Chenopodiaceae* family are particularly common on the Turanian Lowland (Ovezliev *et al.*, 1997). Wood of different species of *Chenopodiaceae* is quite similar in broad outline. The determination was limited therefore only to family level and two anatomical types. The distinguished categories of *Chenopodiaceae* type I and type II wood might represent two different genera.

The determination of *Fagus orientalis* is an interesting phenomenon. Beech is not a characteristic

genus for the oasis vegetation, and presently is unknown from Turkmenistan. *Fagus orientalis* is the only beech species occurring nowadays in that part of Asia, but is known from Asia Minor, Caucasus, Northern Iran (Krüssmann, 1977; Russell *et al.*, 2004) and Pakistan (Safdari *et al.*, 2008).

The determination cf. *Punica granatum* was based on the similarity to pomegranate wood. However in the analyzed material the absence of crystals typical for that taxon was noted. The charcoal fragments determined as cf. *Pistacia* sp. show wood structure similar to this genus. In the determined material only homogenous rays were observed, which is not a typical feature of *Pistacia* wood (Fahn *et al.*, 1986).

The group of charcoals with wood anatomy similar to *Tamarix* sp. was determined as cf. *Tamarix* sp. This taxon has homogenous rays as well as numerous tyloses in vessels, which are not described in tamarisk wood (Fahn *et al.*, op. cit.; Neumann *et al.*, 2001).

Among the investigated charcoals a group of undetermined fragments with similar anatomical features was recognized. They could not be determined on the basis of the available reference materials and were described as anatomical type III.

## CONCLUSIONS

The majority of the taxa recognized at the archaeological Mele Hairam site are characteristic for the present-day vegetation of the Turanian Lowland. The most numerous and frequent taxa were *Tamarix* sp., *Populus* sp. as well as taxa from the Chenopodiaceae family. These plants belong to the common trees and shrubs nowadays found in the area of Turkmenistan. To keep up fire in fireplaces in the temple, during the Sasanian times, trees and shrubs potentially easily accessible, originating from the nearest surrounding area of the site, were used.

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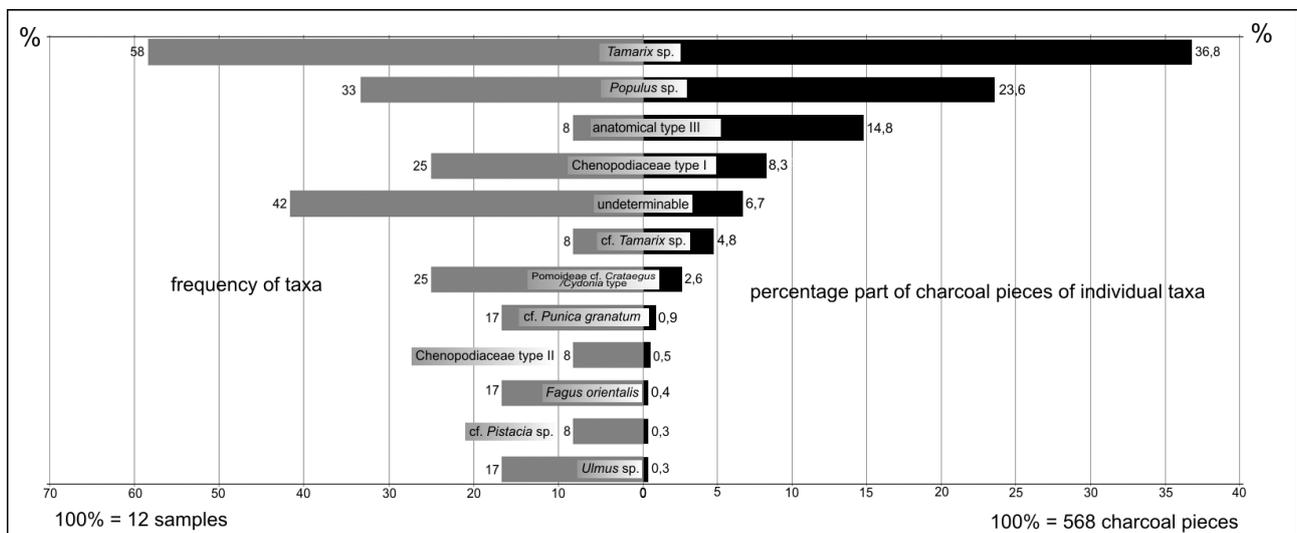


FIGURE 1. Frequency and percentage part of charcoal fragments of individual taxa from Mele Hairam.