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TILMEN HÖYÜK: IDENTIFICATION OF WOOD SPECIES FROM AREAS E AND G

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The Laboratory of Wood Anatomy of CNR-IVALSA in Sesto Fiorentino (Florence) received samples of charcoal material from the Tilmen Höyük excavations, in order to proceed to the identification of the timber.[1] Samples come from Areas E and G. The sample from Area E comes from Building E, likely a MB II temple, while those from Area G come from MB II (F.938 and F.1279) house contexts (Marchetti 2008; 2010). Analyzed samples are listed below (Table 1).

SAMPLE NUMBER	AREA	LOCUS	CONTEXT DATE	CHARCOAL TYPE
TH.05.G.265*40	G	F.938/L.940	MB II	Juniperus sp.
TH.05.G.269*58	G	F.938/L.940	MB II	Pinus sp.
TH.06.G.76*59	G west	F.1279	MB II	Cupressus sp. (Cupressus sempervirens)
TH.06.G.76*61	G west	F.1279	MB II	Cupressus sp. (Cupressus sempervirens)
TH.07.E.274*104	E	F.1985	MB II	Abies sp.

Table 1 Sample numbers, findspots and typologies of each analyzed sample (in the sample number, the number before the * refers to the bucket number, that after the * is the actual sample absolute number of that year)

1. MATERIALS AND METHODS

The identification of charcoal material follows the same path as for wood identification. The transformation of wood into charcoal doesn't modify significantly the anatomical aspect of the material, acting just on the alteration of the composition of the cell walls and on a small shrinkage of the dimensions of the anatomical elements. What is significantly altered is the mechanical aspect, so we cannot easily make thin sections of the samples along the three anatomical directions of the material (transversal, longitudinal radial and longitudinal tangential), because the material is extremely fragile.

The best way to observe the anatomical constitution of charcoal is through electronic microscopy (Scanning Electronic Microscope – SEM), after simply fracturing by hand the samples. On such a fragile material the use of blades frequently produces

[1] We would like to thank the scientific staff of Gaziantep Museum and of the General Directorate for Cultural Heritage and Museums in Ankara for the possibility of analyzing in our laboratory the samples discussed here.

crumbling on the surfaces, preventing a good observation; on the contrary, hand fracturing follows the natural fracture planes along the longitudinal directions and, partially, along the transverse direction. Resulting surfaces have a very good quality. From charcoal samples some specimens were then fractured and mounted on a stub for the SEM observation on a Philips XL 20 instrument, through gold coating. The anatomical observation was made along the three principal anatomical directions in order to reach the proper identification.

2. RESULTS

The anatomical characteristics of the species are visible on the photographs. Pl. I: 1 shows two images of the transverse section. Anatomical features are characteristic of an omoxyl wood, i.e. a softwood (also called conifer). On the left image two annual ring limits are visible, showing a gradual boundary between early and latewood. Resin ducts are present, but they are clearly traumatic, being on a tangential line, along the boundary early-latewood. The cross-field in Pl. I: 2 shows a parenchymatic ray wood without ray tracheids. Real resin ducts are not visible even in the tangential pictures (Pl. I: 3). The same picture has on the right a tangential section showing several biseriate parenchymatic rays, which are not characteristic of conifer wood anatomy. They must be associated to the presence of traumatic tissue, as for the traumatic resin ducts visible in Pl. I: 1.

Traumatic resin ducts are the response of the wooden tissue to the presence of small injury suffered by the stem. They can be found even on softwood characterised by the absence of resin ducts. The described anatomical characteristics lead to the identification of the *Abies* genus, belonging to the family of *Pinaceae*. This genus collects the group of conifers generally called in English as "Fir". In the Mediterranean basin this genus is present between the 35th (North Africa and Lebanon) and the 50th (North of the Alps) parallel, with 11 typical mountain species. They cannot be clearly distinguished by their anatomical aspect. The *Abies* species of the eastern part of Mediterranean are *A. equi-trojani* Aschers. Et Sint, *A. bornmulleriana* Mattf., *A. nordmanniana* Spach. and *A. cilicica* Carr. Among them, the most widespread is *Abies nordmanniana* that grows from Caucasus to Armenia between 800 and 2000 m a.s.l. in pure stands or mixed with *Picea orientalis* (eastern spruce) and *Fagus sylvatica* (common beech). It is a big tree that in natural stands can reach 50 m of height and 5 m of circumference, and the stems of which were traditionally utilised for structural purposes.

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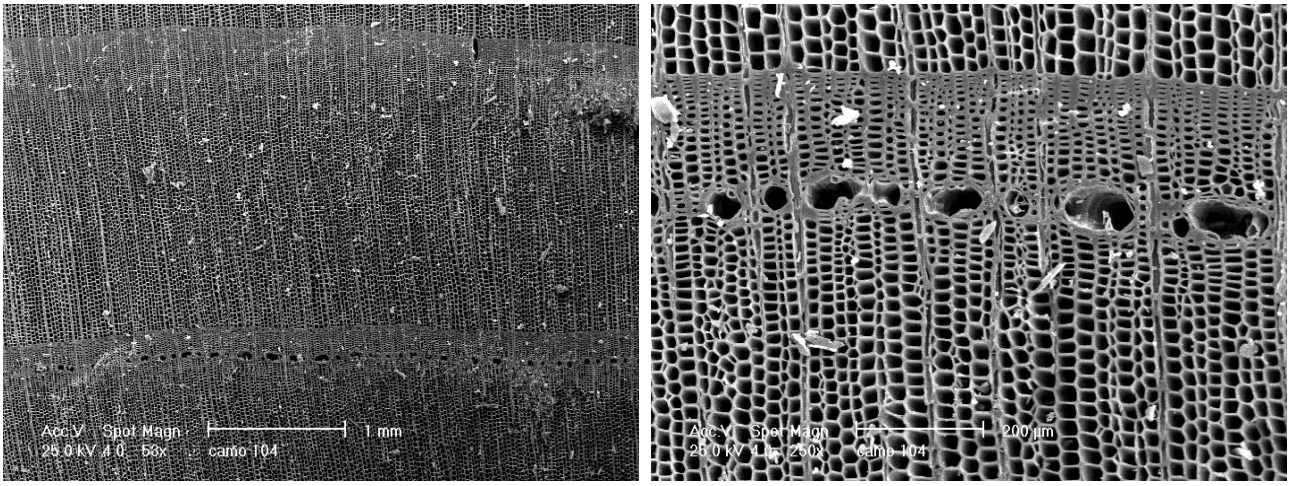
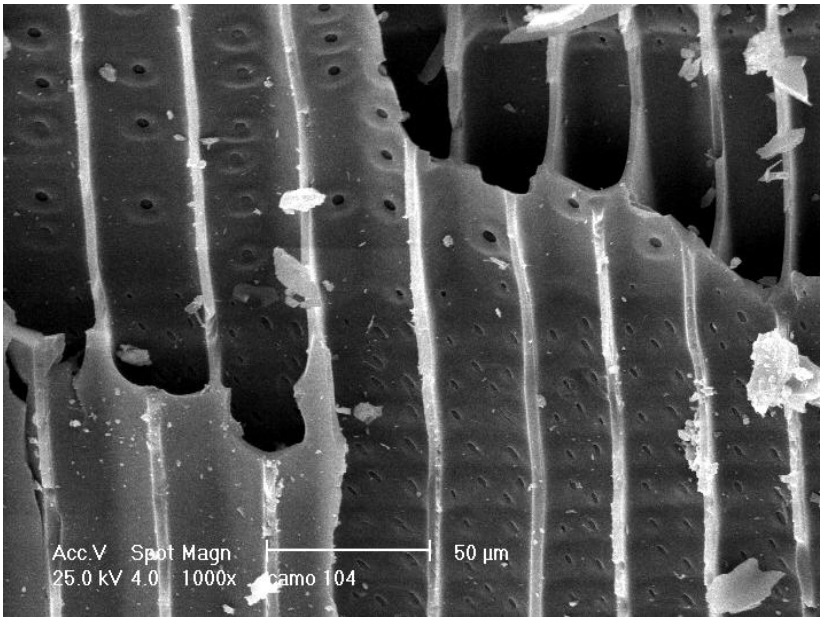
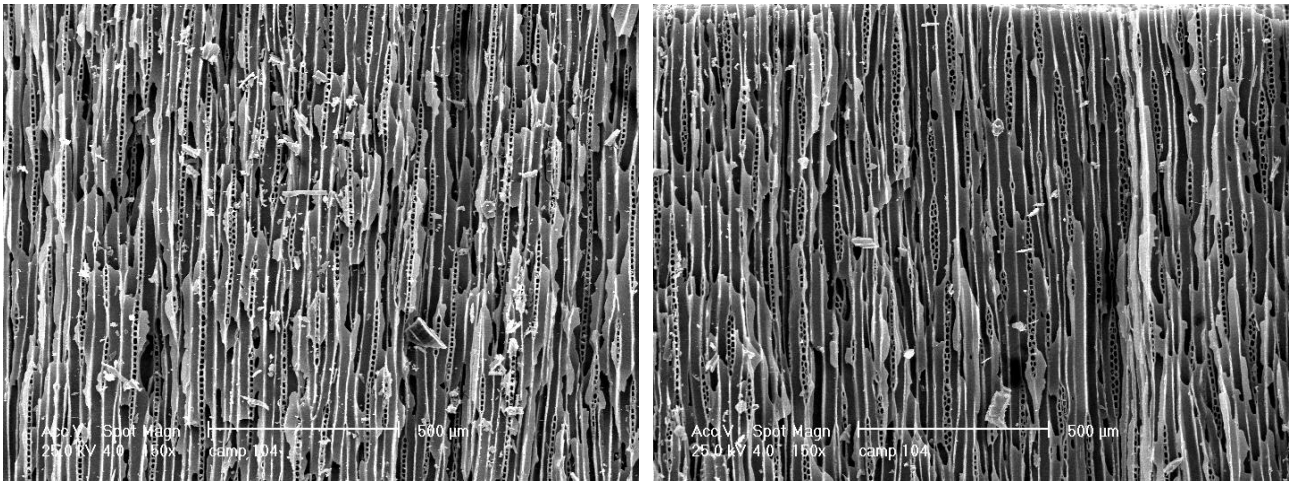


1 Sample TH.07.E.274*104: transverse sections. On the right are showed at a higher magnification the traumatic resin ducts visible on the lower part of the left image.



2 Sample TH.07.E.274*104. Longitudinal radial section: a cross-field.



3 Sample TH.07.E.274*104. Longitudinal tangential sections.