



## VALIDATION OF FOUR NEW PLANT FOSSIL NAMES FROM TURKEY

ÜNAL AKKEMİK

Istanbul University-Cerrahpasa, Faculty of Forestry, Department of Forest Botany, 34473, Bahçeköy-Sarıyer, Istanbul, Turkey; e-mail: uakkemik@istanbul.edu.tr.

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**Abstract:** Fossil-wood descriptions from Turkey have been increasing in recent years. The aim of the present paper is to re-define four new fossil species according to the protologue for new plant fossil names. As result, these four new fossil species are verified: *Cupressinoxylon pliocenica* AKKEMİK sp. nov., *Cercioxylon zeynepae* AKKEMİK sp. nov., *Zelkovoxyton yesimae* AKKEMİK et I.POOLE sp. nov. and *Pistacioxyton ufukii* AKKEMİK et I.POOLE sp. nov.

**Key words:** validation, fossil wood, description, new species

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### Introduction

Recently, eight new plant fossil-species from Turkey were published by Akkemik et al. (2018), Akkemik (2019) and Akkemik et al. (2019). These new fossil-species are *Pistacioxyton ufukii* Ü.AKKEMİK et I.POOLE and *Zelkovoxyton yesimae* Ü.AKKEMİK et I.POOLE (Akkemik et al. 2018), and *Cupressinoxylon pliocenica* Ü.AKKEMİK and *Cercioxylon zeynepae* Ü.AKKEMİK (Akkemik 2019), and *Mimosoxyton ceratonioides* AKKEMİK, *Pterocaryoxyton tuncayi* AKKEMİK, *Laurinoxylon thomasi* AKKEMİK, *Prunoidoxyton aytugii* AKKEMİK (Akkemik et al. 2019). Due to missing information in the protologue for new plant fossil names, the new fossil species described by Akkemik et al. (2018) and Akkemik (2019) were considered invalid by the administrators of Plant Fossil Names Registry Database. The purpose of the present paper is to provide the missing information to validate these four new plant fossil names.

### Systematic palaeobotany

#### Genus *Cupressinoxylon* GÖPP., 1850

#### *Cupressinoxylon pliocenica* AKKEMİK sp. nov.

Text-fig. 1a

**Holotype.** YIP01 (Text-fig. 1a, and pls I–II in Akkemik 2019). It is stored at the Department of Forest Botany, Faculty of Forestry, Istanbul University, Istanbul, Turkey.

Plant Fossil Names Registry Number. PFN000547 (for new species).

**Etymology.** The epithet *pliocenica* originates from the geological time, Pliocene, of the sample.

**Type locality.** Close to Yıprak Village of the city of Çerkeş, the province of Çankırı, Turkey.

**Type horizon.** Örencik Formation (Yörük Member), Pliocene.

**Diagnosis.** Growth ring border in the wood is distinct, transition from earlywood to latewood gradual. Resin canal absent, axial parenchyma common mostly in latewood zone, tracheids mostly circular, intercellular spaces present. Small tracheidal pitting common in tangential section, tracheidal pitting uniseriate in radial section. Rays uniseriate, ray height 3–15 (1–34) cells. Cross-field pits cupressoid and 1–2 pits per cross-field. End walls of axial parenchyma cells both smooth and nodular (Akkemik 2019).

**Remarks.** For detailed description and discussion see Akkemik (2019).

#### Genus *Cercioxylon* AKKEMİK gen. nov.

**Type.** *Cercioxylon zeynepae* AKKEMİK sp. nov.

Plant Fossil Names Registry Numbers. PFN000565 (for new genus).

**Etymology.** The epithet *Cercioxylon* originates from the modern genus *Cercis* L. Because the fossil wood has very similar features to the wood of *Cercis*, I prefer to use this name for the new genus.

**Diagnosis.** Wood semi-ring to ring porous. Vessels are in radial multiples and clusters, common or sometimes diffuse.



**Text-fig. 1.** The petrified woods validated as new fossil-species. YIP01 and YIP02 from Akkemik (2019), and HAY02 and HAY05 from Akkemik et al. (2018). a) *Cupressinoxylon pliocenica* AKKEMİK sp. nov. No. YIP01 (holotype); b) *Cercioxylon zeynepae* AKKEMİK sp. nov. No. YIP02 (holotype); c) *Zelkovoxyton yesimae* AKKEMİK et I.POOLE sp. nov. No. HAY02 (holotype); d) *Pistacioxyton ufukii* AKKEMİK et I.POOLE sp. nov. No. HAY05 (holotype).

Perforation plates simple. All rays procumbent in general, and body rays procumbent with one to four upright cells. Axial parenchyma paratracheal to vasicentric and in confluent type, banded, and in dendritic to net-like groups with vessels, and axial parenchyma storied, 2–4 cells per parenchyma strands. Ray width up to 5 seriate (2–4 in general), and uniseriate rays 5–15 cells. Vestured ray pits present (Akkemik 2019).

**Remarks.** For discussion to the genus see Akkemik (2019).

***Cercioxylon zeynepae* AKKEMİK sp. nov.**

Text-fig. 1b

**Holotype.** YIP02 (Text-fig. 1b, and pls V–VI in Akkemik 2019). It is stored at the Department of Forest Botany, Faculty of Forestry, Istanbul University, Istanbul, Turkey.

**Plant Fossil Names Registry Number.** PFN000548 (for new species).

**Etymology.** The epithet *zeynepae* originates from the name Zeynep. I have used it to honor my wife, as she has been a most patient partner throughout my hard scientific life.

**Type locality.** Close to Yıprak Village of the city of Çerkeş, the province of Çankırı, Turkey.

**Type horizon.** Örencik Formation (Yörük Member), Pliocene.

**Diagnosis.** Wood semi-ring to ring porous. Vessels in short radial pattern up to 6 cells, and clusters common. Mean tangential and radial diameters of earlywood vessel lumina 84 (52–132)  $\mu\text{m}$  and 82 (32–135)  $\mu\text{m}$ , respectively, and their shapes almost circular, they are 30 (11–47)  $\mu\text{m}$  and 32 (12–48)  $\mu\text{m}$  in the latewood, respectively. Vessel frequency 40–100 per  $\text{mm}^2$ . Perforation plate simple. Fibers thin- to thick-walled. Axial parenchyma paratracheal to vasicentric and in confluent type, banded, and in dendritic to net-like groups with vessels, axial parenchyma storied, and 2–4 cells per parenchyma strands. Rays 1–5 (2–4) seriate, multiseriate ray height generally 18–27 (max. 56) cells, and uniseriate rays 5–15 cells. 6–12 rays per  $\text{mm}$ . All rays procumbent or body ray cells procumbent with one to four square marginal cells, vestured ray pits common (Akkemik 2019).

**Remarks:** For more detailed description and discussion see Akkemik (2019).

**Genus *Zelkovoxyton* GREGUSS, 1969**

***Zelkovoxyton yesimae* AKKEMİK et I.POOLE sp. nov.**

Text-fig. 1c

**Holotype.** HAY02 (Text-fig. 1c, and pls IV–V in Akkemik et al. 2018). It is stored at the Department of Forest Botany, Faculty of Forestry, Istanbul University, Istanbul, Turkey.

**Plant Fossil Names Registry Number:** PFN000362 (for new species).

**Etymology.** The epithet *yesimae* originates from the name Yeşim. It is used in honor of Yeşim Akkemik, as she has been one of the most patient persons in my very hard scientific life.

**Type locality.** Near the village of Çayraz in the Haymana Basin (Ankara) at 32°33'49" E and 39°28'46" N.

**Type horizon.** Canımına ignimbrite member of the Yenice volcanics, with age of  $24.7 \pm 1.9$  Ma, i.e. latest Oligocene-early Miocene (Atıcı et al. 2014).

**Diagnosis.** Wood of the new species is ring porous; earlywood vessels wider and in 2–3 rows; solitary or up to 4 vessels in radial multiples; latewood pores are narrow, generally in clusters and diagonal bands. Rays are heterocellular, body ray cells procumbent with one or two rows of upright cells, and ray width 1–2 seriate. Prismatic crystals common in the axial parenchyma cells (Akkemik et al. 2018).

**Remarks.** For detailed description and discussion see Akkemik et al. (2018).

## Genus *Pistacioxylon* J.DUPÉRON, 1973

*Pistacioxylon ufukii* AKKEMİK et I.POOLE sp. nov.  
Text-fig. 1d

**Holotype.** HAY05 (Text-fig. 1d, and pls II–III in Akkemik et al. 2018). It is stored at the Department of Forest Botany, Faculty of Forestry, Istanbul University, Istanbul, Turkey.

**Plant Fossil Names Registry Number.** PFN000361 (for new species).

**Etymology.** The epithet *ufukii* originates from the name Ufuk. It is used in honor of Ufuk Akkemik, as he has been one of the most patient persons in my very hard scientific life.

**Type locality.** Near the village of Çayraz in the Haymana Basin (Ankara) at 32°33'49" E and 39°28'46" N.

**Type horizon.** Canmana Ignimbrite Member of the Yenice volcanics, with age of  $24.7 \pm 1.9$  Ma, i.e. latest Oligocene-early Miocene (Atıcı et al. 2014).

**Diagnosis.** Growth ring boundaries distinct and wood ring-porous. Earlywood vessels 1(–2) seriate and transition from earlywood to latewood is abrupt. Tyloses common in wider vessels. Latewood vessels occur in narrow dendritic pattern and clusters. Perforation plate simple. Rays 1–5 seriate and 6–12 per mm. Radial canals are common in rays and their number 1–3 per ray. Ray width generally 1–2 seriate (to 5 seriate around the radial canals). Ray height 5–20 cells. Rays heterocellular and body ray cells procumbent with mostly 1–4 rows of upright and/or square marginal cells (Akkemik et al. 2018).

**Remarks.** For detailed description and discussion see Akkemik et al. (2018).

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