

3. FOSSIL GYMNOSPERM WOOD FROM ASWAN AREA

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Abstract

Fossil woods were collected from two localities of Late Cretaceous Age to the west of Lake Nasser (Aswan area). In this contribution the anatomy of two samples are described. The preservation is not so well but the remnants are without doubt of gymnospermous origin. Based on some wood anatomical data earlier characteristics are observed, similar to the recent Podocarpaceae taxa.

Key words: Xylotomy, fossil, gymnosperm, Upper Cretaceous, Egypt.

Introduction

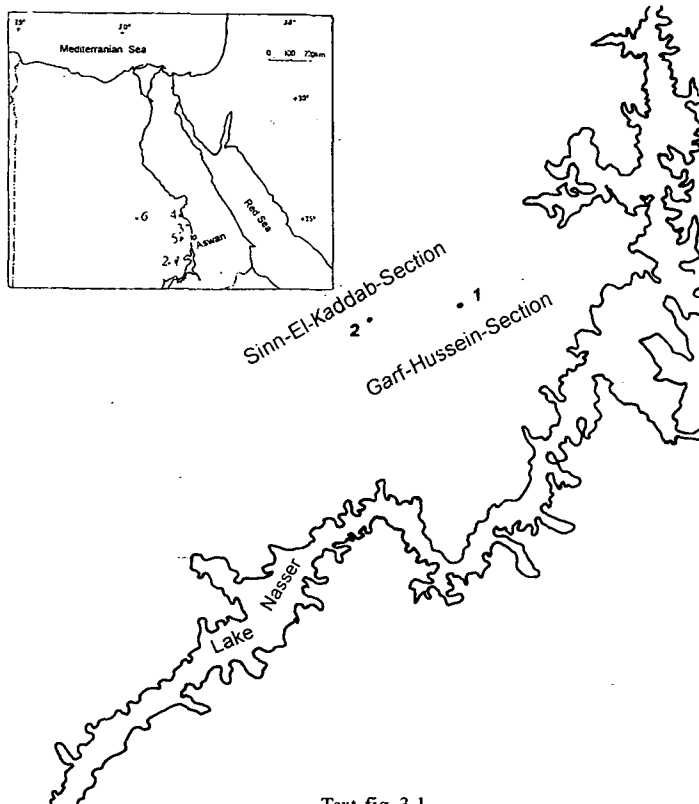
The present work deals with the study of fossil woods collected from two localities of Late Cretaceous Age to the west of Lake Nasser within Aswan area. These localities are Sinn-El-Kaddab and Garf Hussein (Text-fig. 3.1.). Fossil woods of gymnosperms had been reported earlier (e.g.: UNGER, 1858, 1859, KRÄUSEL, 1939, YOUSSEF et al., 2000) from localities not far away from the present study area, namely from the road between Esna and Wadi Halfa, Gebel Garra and Kharga Oasis (Text-fig. 3.1.).

The Study Area

The study area lies 120 km to the southwest of Aswan city on the western side of Lake Nasser. The area is covered by strata which belong to Nubia Sandstone Formation (Late Cretaceous, OSMAN, 1992). The area includes two fossiliferous localities, south of Gebel Sinn-El-Kaddab and Garf Hussein (Text-fig. 3.1.). In these two localities numerous fragmented tree trunks occur scattered on the surface (Plate 3.1., fig. 1), most of them are 1.5–3 m long and 20–30 cm in diameter. Many of these trunks or wood logs are highly silicified and variously colored.

Materials and Methods

One specimen was collected from each locality. The specimen of Sinn-El-Kaddab locality belongs to the lower part of the section (Text-fig. 3.2.,A). This part is composed of white to yellowish white, hard, ill-sorted sandstone beds. The specimen of Garf Hussein locality also belongs to the lower part of the section (Text-fig. 3.2.,B). This part is composed of conglomeratic sandstone and kaolinitic clay beds. It is a pity that after the preparation of cross thin ground section (LACEY, 1963) from the specimen of Sinn-El-Kaddab, R.L.S, T.L.S., and Garf Hussein two specimens were accidentally lost, however, the 3 slides were rescued.



Text-fig. 3.1.

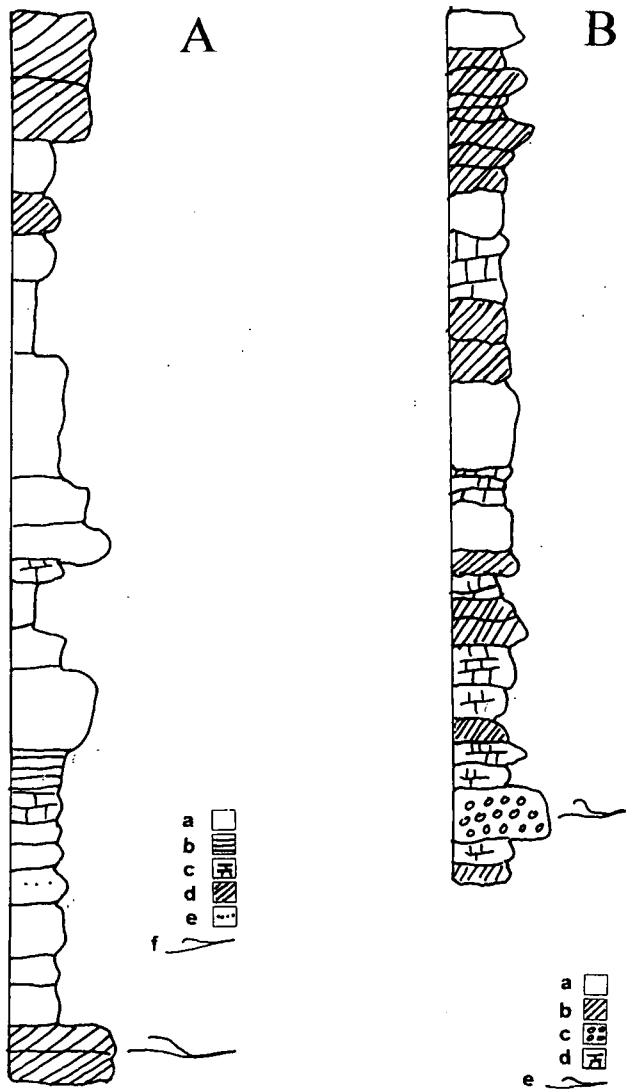
Map showing the situation of the two fossiliferous localities Sinn-EI-Kaddab (1) and Garf Hussein (2) and other nearby localities namely: Road between Esna and Wadi Halfa (3,4), Gebel Garra (5) and Kharga Oasis (6).

Results

Careful study of the three sections prepared from the two specimens (Plate 3.2., figs. 1-4) proved that they belong to only one species of gymnosperms which is described as follows:

A coniferous wood made of tracheids, axial parenchyma, ray parenchyma and sometimes traumatic tissues. Annual rings distinct, quite narrow, 5-6 mm. Transition from early to late wood is abrupt. The late wood is very narrow with one to three cells in width.

Tracheids in the early wood quadrate to rectangular in cross section: 15-18 μm in tangential and radial diameters respectively, thin walled, 2-3 μm . Late wood tracheids, smaller than early wood tracheids, 12-16 μm x 11-16 μm in tangential and radial diameters respectively, thick walled, 3-5 μm . Bordered pits, in uniseriate rows, circular-quadrate 5-10 μm in diameter and with rounded apertures. Cross field pits, one large window like per a field, 10-15 μm in diameter.



Text-fig. 3.2.

A. - Sinn-El-Kaddab Section. Supplied by Dr. Rifaat Osman, Geology Department, Faculty of Science, Benha Branch of Zagazig University. 1 cm = 4 m. a. - structureless, b. - laminated, c. - calcareous, d. - cross bedding, e. - clay, f. - trunks.

B. - Garf Hussein Section. Supplied by Dr. Rifaat Osman, Geology Department, Faculty of Science, Benha Branch of Zagazig University. 1 cm = 4 m. a. - structureless, b. - cross bedding, c. - conglomerate, d. - calcareous, e. - trunks.

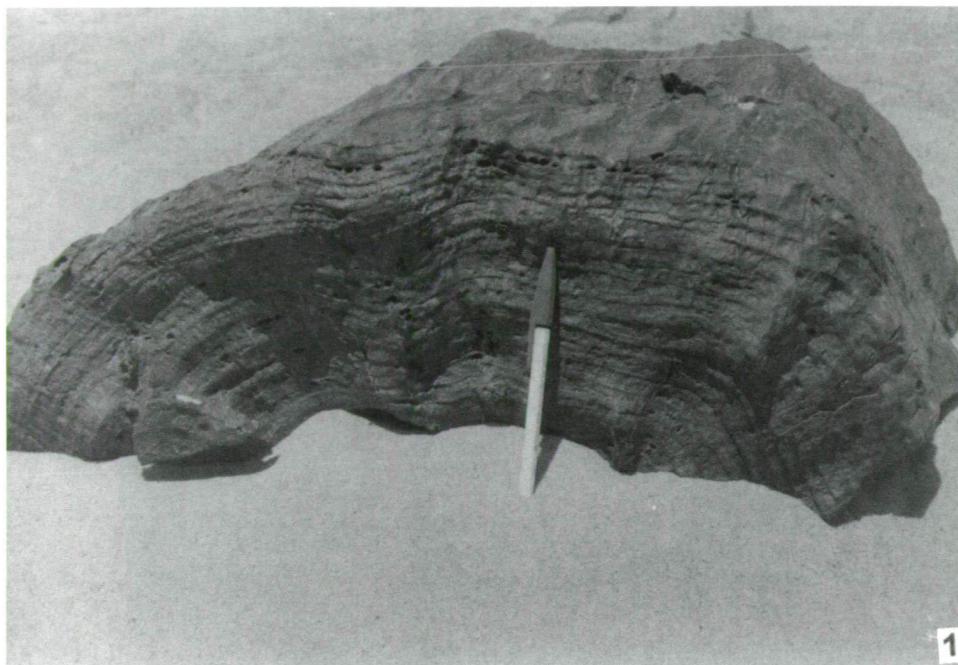


Plate 3.1.

1. One of the two specimens of Aswan Area. Photograph taken at the site of collection.

Axial parenchyma in strands and abundant single cells diffused within the annual rings: $5 \times 10 \mu\text{m}$ in size. Horizontal walls of the axial parenchyma are thick and smooth, $3\text{-}4 \mu\text{m}$.

Rays uniseriate and constituted from parenchymatous cells, 1-5 cells high, rectangular in radial section.

Discussion and Conclusions

The narrow annual rings indicate moderate alterations in the yearly clima. A relatively short drier period may be supposed. The observed wood anatomical characteristic features in comparison to other Senonian data refer to a tropical gymnosperm taxon. The cross field pits in the radial section are observed by GREGUSS (1949) from Senonian fusit collected from the brown coal basin of Ajka, Hungary. In the monograph of the fossil

Plate 3.2.

Cf. *Podocarpoxyton* sp.

1. Part of cross-section showing a row of late tracheids (arrows), 55x.
2. Part of the same section at a higher magnification showing a traumatic resin canal (arrow), 120x.
3. Part of a tangential section showing resinous xylem parenchyma (arrows) and uniseriate rays (R), 130x.
4. Part of a tangential section magnified to show one row of pits on tracheids (arrow), 750x.

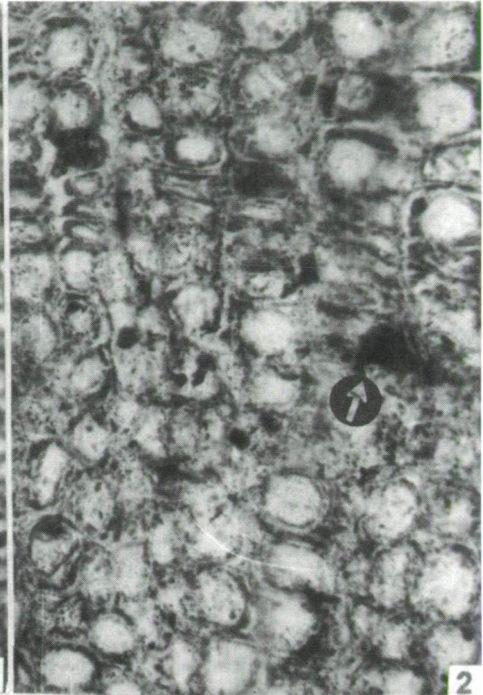
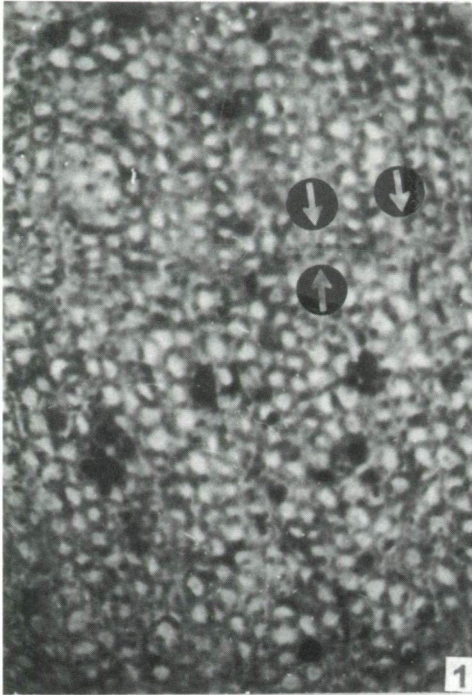


Plate 3.2.

gymnosperm woods of Hungary GREGUSS (1967) published the wood anatomy of several tropical taxa (*Araucarioxylon*, *Agathoxylon*, *Podocarpoxyton*). The recently described remains may not be identical with the *Podocarpoxyton ajkaense* GREGUSS 1949, because of the much shorter rays, but in all probability may be related to the family of Podocarpaceae.

In resumé because of the not so well preservation of the fossil wood it is the best to remain to the description and for designation cf. *Podocarpoxyton* sp. seems the most reasonable in this moment. In this context it may be worth to mention that a species of *Podocarpoxyton* (*P. wekitii* LEMOIGNE and BEAUCHAMP) is known to exist in Ethiopia which lies not far from the southeast of Egypt (cf. DUPÉRON-LAUDOUENEIX and DUPÉRON, 1995). Podocarpaceous fossil wood was published by BAMFORD et al. (2002) from the Mesozoic of Southern Sahara (Mali).

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