

PROTOTAXOXYLON MAHESHWARII SP. NOV. - A FOSSIL GYMNOSPERMOUS WOOD FROM UTTATUR, TAMIL NADU.

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ABSTRACT:

Several pieces of petrified gymnospermous wood were collected from Uttatur, District of Tiruchirapalli, Tamil Nadu. A preserved piece of petrified wood was collected for the present work. It is found that it differs from other known species of *Prototaxoxylon* in one or other characters. Hence, it is identified and described as species *Prototaxoxylon maheshwarii sp. nov.*

Key words: Fossil, gymnospermous wood, Uttatur formation, petrification

Introduction:

Several pieces of petrified gymnospermous wood were collected from Uttatur in district of Tiruchirapalli of Tamil Nadu. A preserved piece of petrified wood was selected for present study work. It was a piece of decorticated secondary wood without pith and primary xylem. The specimen was yellowish brown in colour and measured 4.5 cm in length and 3.2 cm in breadth. Present communication adds new information of this wood.

Materials and methods:

Techniques used for petrification:

The specimen of decorticated piece of secondary wood was brought to the laboratory, thoroughly washed under tap water and, thin ground section method (Biradar and Bonde, 1974) was employed. The T. S., T. L. S. and R. L. S. were taken and slides were made (Fig. 1 and 2) The anatomical characters are represented below.

The T. S. Showed six distinct growth rings within a width of 3 cm. The secondary xylem was distinguishable into spring wood and autumn wood. The spring wood was 55 cells in height. The tracheids were squarish in outline, thick walled and with broad lumen.

They measured 26 X 22 μm . The autumn wood was 2-3 cells thick. The tracheids were horizontally stretched and their lumen was narrow. They measured 20 X 15 μm .

The T. L.S. of sample specimen showed uniseriate xylem rays. Height of rays varied from 3-4 cells. Average height being 10 cells in count. The ray cells were barrel shaped, measuring 16 X 22 μm . Xylem parenchyma and tangential pitting were absent.

In the R. L.S. pits on the radial walls of tracheids were uniseriate, circular, contiguous or separate. They measured 6-8 μm . Biseriate pits were circular in outline, measuring 5-6 μm . Circular pits were uniseriate showing occasionally biseriate condition. They measured 6 X 5 μm . Biseriate pits were hexagonal, alternate and compact. They measure 5 X 6 μm . Spiral thickening was present. Single spiral thickening was associated with uniseriate, circular pits. The double spiral thickening was present while the pits were absent. The spiral thickening was clock-wise and anti-clock-wise. The pits were simple, circular in shape and their number was 1-2. The pits measured 5 X 6 μm .

Identification and comparison:

The woods showing spiral thickening described are found in Paleozoic, Mesozoic

and Cenozoic rocks. The presence of spiral thickening is a diagnostic character family Taxaceae. Woods with circular pit and spiral thickening are found in Mesozoic and Cenozoic rocks. The Paleozoic wood shows spiral wood and hexagonal pitting. This indicates evolution of Taxaceae and Araucariaceae. One such genus is *Prototaxoxylon* (Krausel and Dolanthy 1958). The genus evolved in the Paleozoic and continued in the Mesozoic and became extinct in Cenozoic period. During present study hexagonal pitting showed Araucarian affinities, while spiral thickening indicated Taxaceae characters. Hence it is in agreement with generic character of *Prototaxoxylon*.

The wood is comparable with *P. brasilianum* (Krausel and Dolanthy 1958) in having uniseriate xylem rays, 1-2 seriate, circular, contiguous or alternate radial pitting and spiral thickening. But it differed from *P. brasilianum* in having 1-2 field pits and distinct growth rings. Further-more *P. Brasilianum* belongs to lower Permian of Brazil, while the wood under investigation belongs to Uttatur formation in Tamil Nadu from early Cretaceous age. It is comparable with *Prototaxoxylon mahabalei* (Biradar and Bonde, 1974) in having distinct growth rings, 1-2 seriate, circular, contiguous or alternate pits, biseriate, hexagonal, alternate pits and spiral thickening. But present wood differs from *P. mahabalei* in having uniseriate xylem rays and 1-2 pit fields. Further *P. mahabalei* belongs to Upper Permian of Chandrapur district in Maharashtra while the present wood comes from early Cretaceous of Tamil Nadu.

It is also compared with *P. africanum* (Walton) (Krausel and Dolanthy, 1958) in having distinct growth rings, 1-2 seriate, circular, contiguous or alternate pits and vertically compressed, xylem rays and spiral thickening. But present wood differs from *P. africanum* in having 1-2 field pits and occasionally 1-2 biseriate pitting. In addition, *P. africanum* belongs to late Mesozoic era of

Africa, while present wood belongs to early Cretaceous as Tamil Nadu.

From the above comparison, it was assumed that the present wood differs from other known species of *Prototaxoxylon* in one or other characters. Hence, it is identified and described as species namely *Prototaxoxylon maheshwarii* sp. nov. The scientific name is after the eminent Paleobotanist Dr. H. K. Maheshwari of Birbal Sahani Institute of Paleobotany, Lucknow.

Diagnosis-

Decorticated, secondary wood growth rings distinct. Secondary xylem differentiated into spring wood and autumn wood. Spring wood 55 cells in height. Tracheids are squarish in outline. Autumn wood is 3 cells thick. Tracheids horizontally elongated. Xylem rays uniseriate. Height of rays 3 - 14 celled. Average height is 9 cells in 10 counts radial pits, uniseriate, circular, contiguous or separate. Biseriate pits, circular and alternate uniseriate, circular pits becoming occasionally biseriate. Hexagonal pits are biseriate and alternate. Spiral thickening single and double, covering circular pits. Cross-field pits 1-2, oval.

UTR - UTR22/98

Locality - Uttatur, Dist-Tirchirpalli, Tamil-Nadu.

Horizon - Early Cretaceous, Uttatur Formation.

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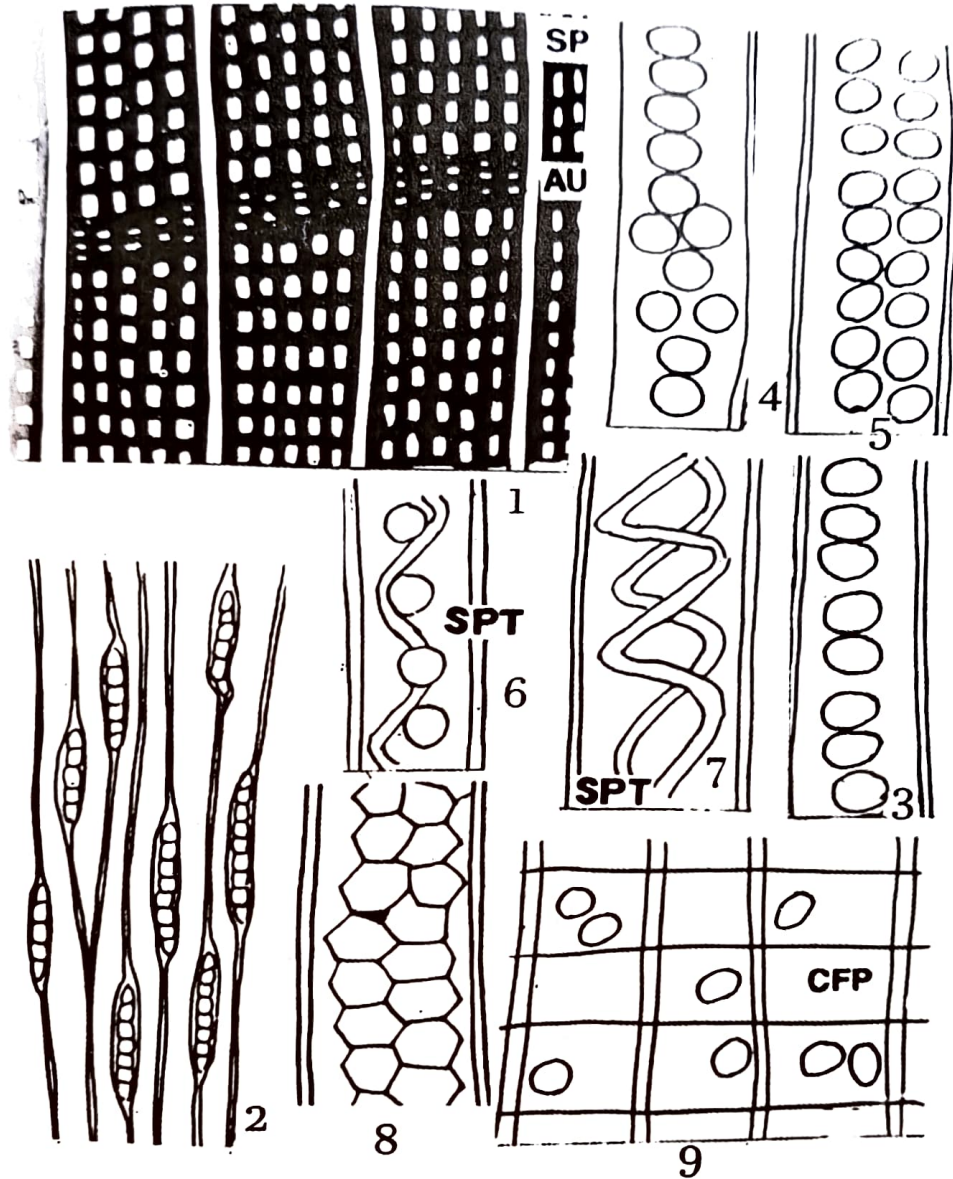


Fig. 1. T.S. showing secondary xylem differentiated into spring wood SP and autumn wood AU X 200. 2. T.L.S showing uniseriate xylem rays X 200. 3. R.L.S. showing uniseriate, circular and separate pits X 595. 4. R.L.S. showing uniseriate, circular pits occasionally biseriate X 595. 5. R.L.S. showing biseriate, circular alternate pits X 595. 6. R.L.S. showing uniseriate, circular separate pits with spiral thickening SPT X 595. 7. R.L.S. showing double spiral thickening SPT X 595. 8. R.L.S. showing biseriate, hexagonal alternate, compact pits X 595. 9. R.L.S. showing 1-2 simple, circular cross field pits CFP X 595

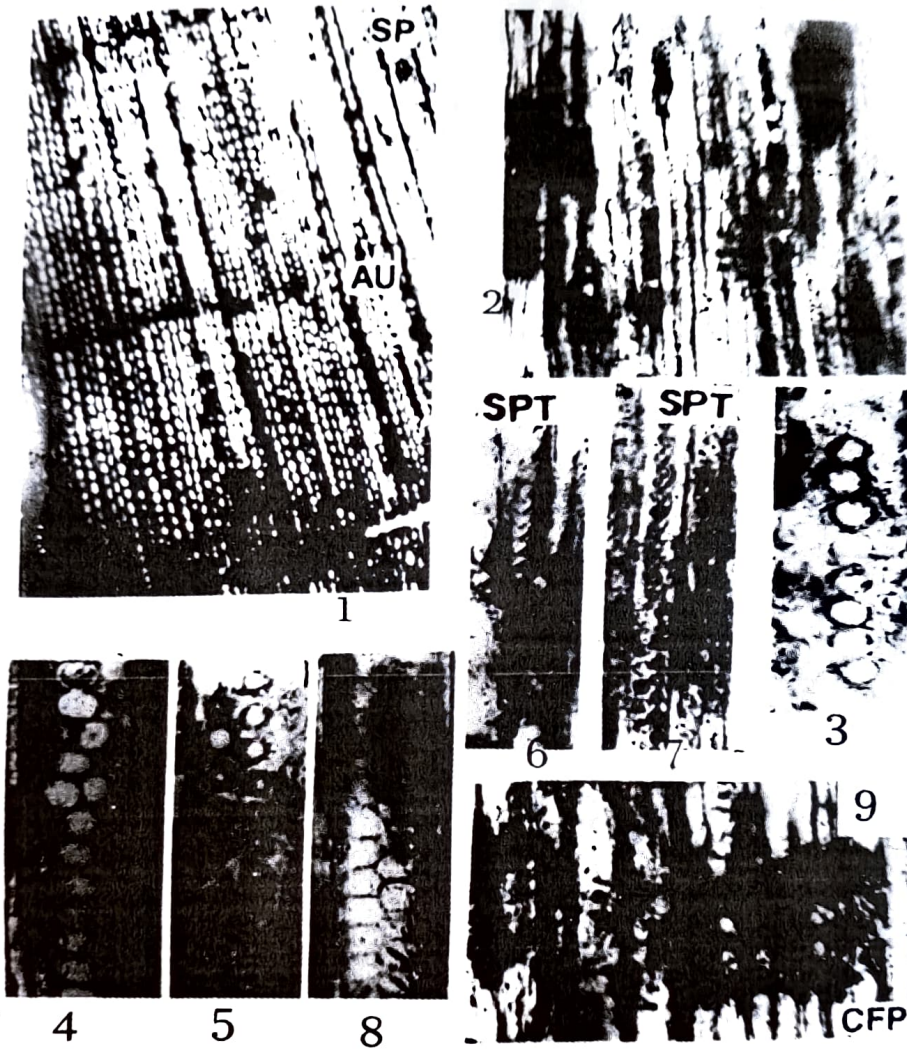


Fig. 2 T.S. showing secondary xylem differentiated into spring wood SP and autumn wood AU X 200. 2. T.L.S showing uniseriate xylem rays X 200. 3. R.L.S. showing uniseriate, circular and separate pits X 595. 4. R.L.S. showing uniseriate, circular pits occasionally biseriate X 595. 5. R.L.S. showing biseriate, circular alternate pits X 595. 6. R.L.S. showing uniseriate, circular separate pits with spiral thickening SPT X 595. 7. R.L.S. showing double spiral thickening SPT X 595. 8. R.L.S. showing biseriate, hexagonal alternate, compact pits X 595. 9. R.L.S. showing 1-2 simple, circular cross field pits CFP X 595