

**MYRISTICOXYLON RANIKOTENSE SP. NOV., A SILICIFIED DICOT.  
WOOD FROM RANIKOT FORT AREA OF SIND, PAKISTAN**

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**Abstract**

A fossil wood *Myristicoxylon ranikotense* sp. nov. belonging to family Myristicaceae is described from Ranikot Fort area of Sind, Pakistan.

**Introduction**

During a study of the fossil flora, a new species of fossil dicotyledonous wood belonging to the family Myristicaceae was collected from the tertiary rocks of Manchhar formation exposed at Ranikot Fort area, in Dadu district, Sind, Pakistan. The material consisted of one piece of silicified wood with grey-brown appearance, ca. 15 cm. long and 6 cm. in diameter (Fig. 1A). The sections were prepared following the standard technique for microscopic studies.

From Ranikot Fort area, so far only a few dicot. woods have been reported (Khan & Rehmatullah, 1971; Rajput & Khan, 1975, 1982). Rajput & Khan (1984) has also reported a gymnospermous wood *Araucarioxylon ranikotensis* from this area. The species described here is reported for the first time from Pakistan.

**ANATOMICAL DESCRIPTION**

*Transverse section:* Growth rings absent. Vessels medium to large irregularly distributed (Fig. 1, B & C), solitary as well as in radial groups of 2-3 (Fig. 1, B & C), rarely in radial groups of 4. Vessels thin walled, oval to elliptical radial diameter 158-269 x 158-205  $\mu\text{m}$ . Radial diameter of a three membered multiple is ca. 395  $\mu\text{m}$  (158 + 158 + 79  $\mu\text{m}$ ); intervessel pits poorly preserved.

Wood parenchyma diffuse, irregularly scattered (Fig. 1, C), among the fibres and rays. The cell of wood parenchyma oval to polygonal in shape, size of the cell 19-32  $\mu\text{m}$  in diameter. Fibre cell more or less polygonal in shape, forming the ground mass of the wood.

*Radial section:* Vessel elongated tube-like structures (Fig. 2 A and Fig. 4 A). Length of the vessel member 253-869  $\mu\text{m}$  with breadth 158 to 190  $\mu\text{m}$ . Nearly all the

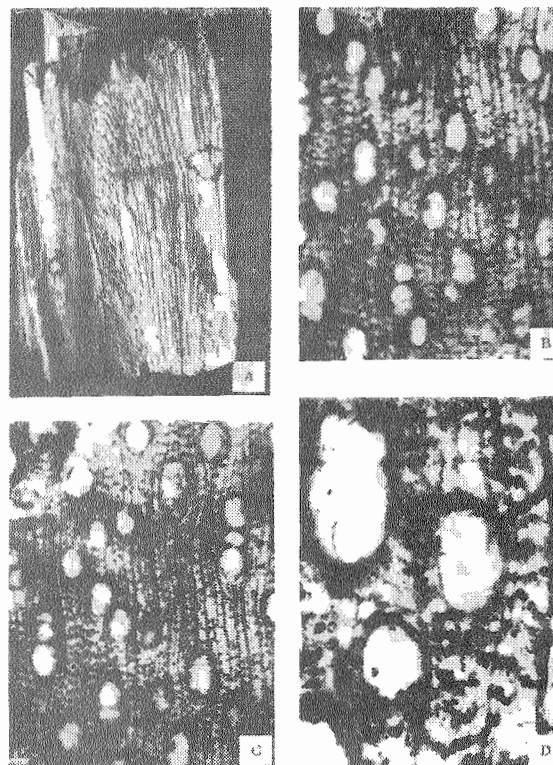


Fig. 1. A. *Myristicoxylon ranikorensis*, sliced stem wood.  
 B. T.S. showing the distribution of vessels and parenchyma.  
 C. T.S. showing radial grouping of vessels, wood parenchyma and xylem rays.  
 D. Enlarged portion of cross-section, showing scattered parenchyma and pits in the wall of the vessels.

vessels contain tyloses (Fig. 2. C), which bulges inside the lumen of the vessel. Circular bordered and simple pits are present in longitudinal wall of the vessels. Fibres thick walled,  $190\text{--}344 \times 9\text{--}13 \mu\text{m}$ .

*Tangential section:* Xylem rays numerous and uniformly distributed (Fig. 2. B), mostly biseriate (Fig. 3 A & B), uniseriate occasionally 3 to 4 celled wide. Uniseriate rays mostly homogenous whereas multiseriate rays are homogenous as well as heterogenous; uniseriate rays are 10-13 and rarely 24 cells high; biseriate rays are 8-13 cell high. The ray cells are partially filled with brownish deposits of unknown nature. Ray cells are thin walled, oval to square shaped (Fig. 3 B; Fig. 4 A & B), total length of the rays range from  $158\text{--}474 \mu\text{m}$  with  $14\text{--}24 \mu\text{m}$  in diameter. Fibres found among the rays; simple pits are present in the wall of the fibres, which are arranged in longitudinal rows.

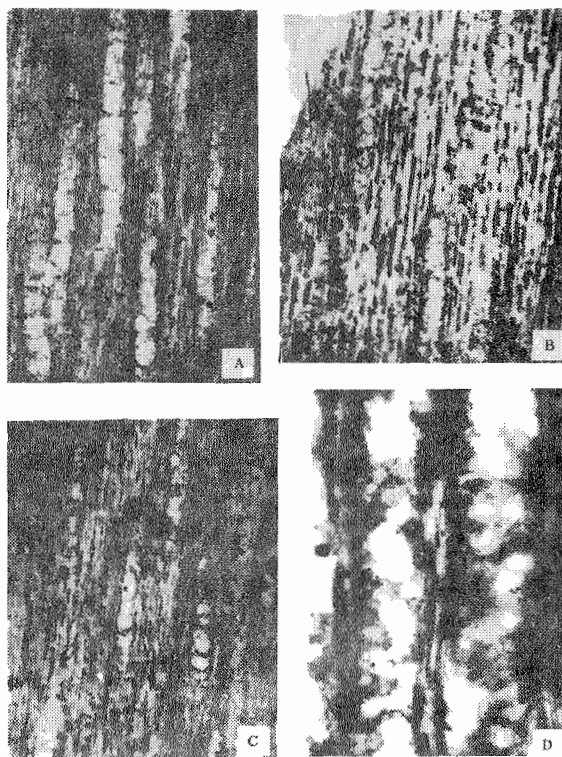


Fig. 2 A. Radial section, showing the vessel and vessel segments.  
 B. Enlarged portion of radial section, showing vessels having tyloses.  
 C. T.S. showing the distribution of vessels and xylem rays.  
 D. Radial-tangential section, showing vessels having tyloses and nature of the xylem rays.

### Comparison and Discussion

The important xylotomical characters, as described in cross, radial longitudinal and tangential longitudinal sections show resemblances with some members of the following dicotyledonous families e.g., Euphorbiaceae, Depterocarpaceae and Myristicaceae. Family Euphorbiaceae is characterized by ducts (Metcalf & Chalk, 1950) which are mostly filled by white granular substance, as the ducts are absent in the fossil under investigation, therefore this family has no comparison.

Among the members of the family Depterocarpaceae it shows affinities with the wood of *Shoreoxylon* in having tyloses and irregularly scattered diffused parenchyma (Greguss, 1969). The fossil specimen under investigation differs from *Shoreoxylon* since rays are 1-2 cell layers wide, 8-13 cell high; vessels 158-190  $\mu\text{m}$  wide, whereas

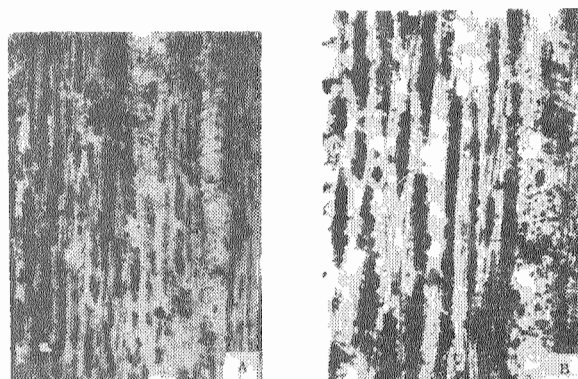


Fig. 3. A Tangential section showing uniseriate and biseriate xylem rays.  
 B Radial-tangential section showing uniseriate and biseriate homogenous xylem rays and pits on the surface of the wall of the vessels.

rays in *Shoreoxylon* are 4-5 or even 6 cell layers wide, 20-25 cells high, and vessels 280-300  $\mu\text{m}$  wide. The fossil under investigation therefore does not belong to the genus *Shoreoxylon* of family Depterocarpeaceae

The anatomical features of the fossil wood agrees with the characteristic features of wood of the family Myristicaceae (Melcalf & Chalk, 1950). The petrified fossil wood is therefore assigned to genus *Myristicoxylon* of the family Myristicaceae. *Myristicoxylon hungaricum* Greguss and *Myristicoxylon bajnaense* Greguss have been described from Hungary and Bajna. Our specimen differs from cited species of *Myristicoxylon* in the nature and height of xylem rays and arrangement of parenchyma (Table 1). As differences are marked at species level, it is therefore named *Myristicoxylon ranikotense* sp. nov. The specific epithet refers to the locality from where the specimen was collected.

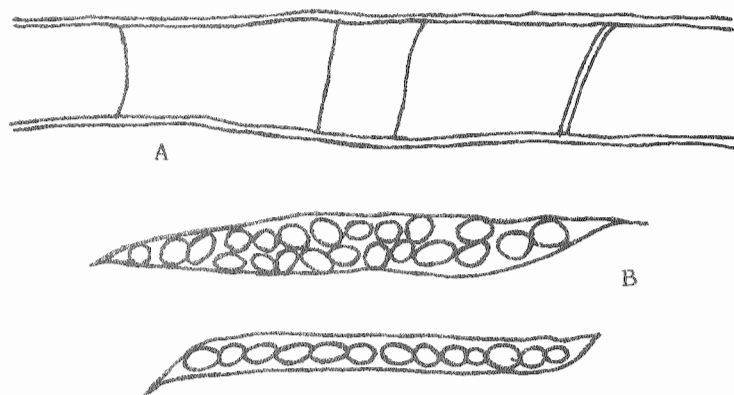


Fig. 4. A. Uniseriate and biseriate nature of the rays. B. Vessels and vessel segments.

Table I. Comparison of the fossil under investigation with the known species of *Myristicoxylon* (Based on Greguss, 1969)

S.No.	Name of the species	Vessels	Rays	Parenchyma	Tyloses
1.	<i>Myristicoxylon hungaricum</i> Greguss	Solitary or in radial groups of 2, medium sized diameter ranges from 150-180 $\mu\text{m}$ , perforation with numerous bordered pits.	Mostly 1-cell layer wide or sometimes 2-3 cell layers wide, 6-8-15 or occasionally 20 cell high heterogenous.	Present, diffuse and terminal	Present
2.	<i>M. bajnaense</i> Greguss	Solitary as well as in radial groups of 2, small to medium sized, diameter ranges from 60-120 $\mu\text{m}$ ; circular bordered pits present in longitudinal walls.	1-2 cell layer wide 8-15 cell high.	Absent	Absent
3.	<i>M. ranikotense</i> sp. nov. Rajput, Tahir and Khan	Sometimes solitary mostly in radial groups of 2, and rarely in 4, medium to large sized, diameter ranges from 158-269 $\mu\text{m}$ ; longitudinal wall perforated with numerous bordered pits.	Mostly 2-3 or 1-2 cell layer wide or rarely 4 cell layer wide, 10-13-24 cell high, homogenous as well as heterogenous.	Present, diffused, scattered in the ground mass.	Present

*Diagnosis:* Growth rings absent. Medium to large sized vessels, mostly in radial groups of 2, radial diameter 158-269  $\mu\text{m}$ , width varies from 158-205  $\mu\text{m}$ . Tyloses present. Xylem rays numerous, homogenous and heterogenous, mostly biseriate, 8-13 cell high, diameter of ray cell 14-24  $\mu\text{m}$ . Fibres thin walled. Parenchyma diffused.

Horizon: Manchhar Formation.

Age: Tertiary.

Holotype: Ranikot Fort Area, District Dadu, Sind, Pakistan, M.T.M. Rajput and K.M. Khan, R.K. 13, (1974). Paleobotanical Museum, Department of Botany, University of Sind, Jamshoro, Sind, Pakistan.

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