

## A Fossil Wood of Meliaceae From the Deccan Intertrappean Beds of Madhya Pradesh

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A fossil wood resembling the extant genus *Heynea trijuga* Roxb. of the family Meliaceae, isolated from the Deccan Intertrappean exposure of Parapani Village of Mandla district, M.P. is described.

**Key Words**—Band Fossil *Heynea* Tangential Wood

The communication deals with the anatomical description and affinities of a fossil wood collected from Deccan Intertrappean beds of Mandla (22°S, 80°N) near the village Parapani, M.P.

Leaf impressions of Meliaceae have been reported by Verma (1968) from Hardwar (Shiwalik formations) U.P. Bande and Prakash (1980) have instituted a new form genus of Meliaceae i.e. *Heyneoxyton* comparable to the wood of *Heynea*, Roxb. One more fossil wood of Meliaceae, *Aglaioxyton mandlaense* gen. et. sp. nov.

(Trivedi & Srivastava, 1982) has been reported from Deccan Intertrappean beds of Mandla district.

**SYSTEMATIC DESCRIPTION** Family Meliaceae  
Genus - *Heyneoxyton* Bande & Prakash (1980) *Heyneoxyton intertrappeum* sp. nov

The fossil is a corticated wood measuring 10 cm in length and 4 cm in diameter before sectioning. It is reddish brown in colour with quite satisfactory preservation.

**TOPOGRAPHY** Wood diffuse porous, *Grown rings* demarcated by terminal parenchyma, *Vessels* small to medium sized, radial and oval in shape, solitary as well as in radial groups of 3-5, thick walled, pores filled with gummy infiltrations, vasicentric tracheids present, pores arranged in diagonal or oblique pattern. *Parenchyma* paratracheal, forming 3-6 seriate continuous tangential bands (may be interrupted at few places), terminal parenchyma distinctly demarcated. *Rays* uni to 4 seriate (mostly biseriate, but 3 to 4 cells wide at median places), heterogeneous, homocellular tending towards heterocellular i.e. ray tissue composed of mostly procumbent cells, only 2 or 3 upright cells present at the tapering ends or on margins of rays; *Fibres* semilibriform to libriform, aper-

ture very small, cells hexagonal, nonseptate but rarely septate.

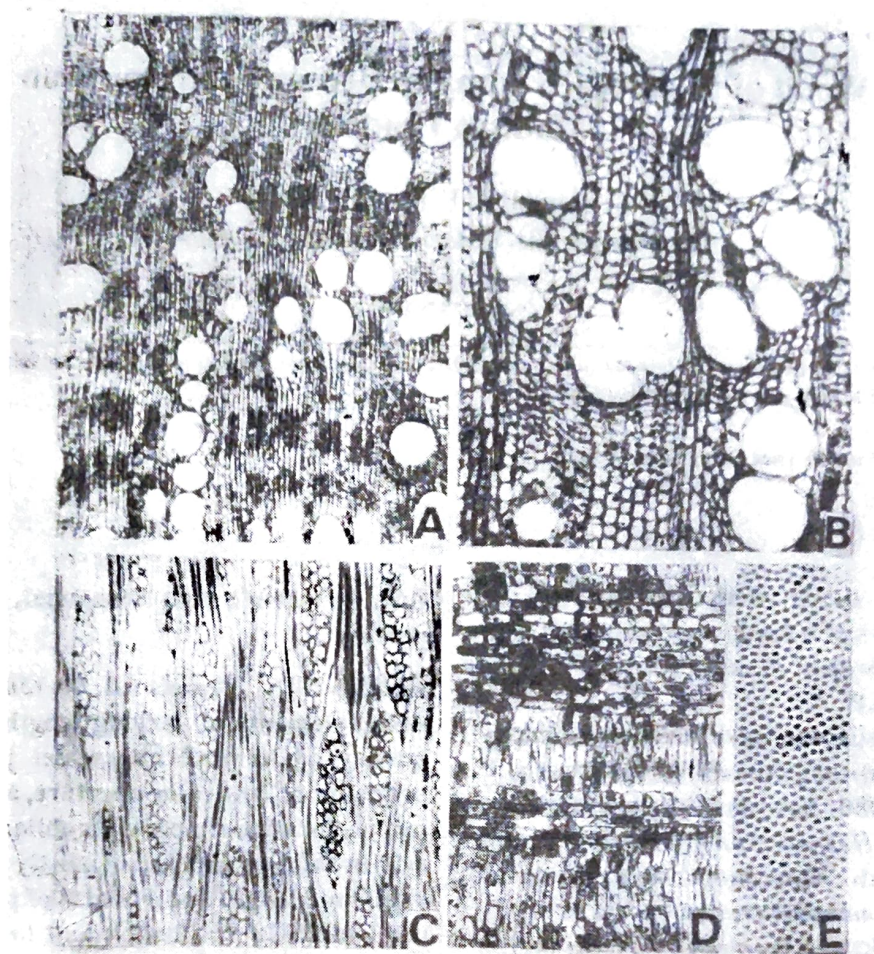
**ELEMENTS** *Vessels* r.d. 60-150  $\mu$ m, t.d. 45 - 135  $\mu$ m vessel elements of varying length i.e. 225-600  $\mu$ m, frequency 14-30/mm<sup>2</sup> intervessel pitting alternate with orbicular or lenticular aperture, about 2-3  $\mu$ m in diameter, perforation simple with oblique endwalls. *Rays* 4-38 cells in height composed of mostly procumbent cells, 8-14 rays/mm<sup>2</sup> length and breadth of procumbent cells 20-30  $\mu$ m and 15-20  $\mu$ m, length and breadth of upright cells measured as 25-35  $\mu$ m and 10-17  $\mu$ m respectively, *Fibres* semilibriform, cells 10-15  $\mu$ m in diameter.

**DISCUSSION** The outstanding diagnostic features of this wood are the occurrence of tangential bands of paratracheal parenchyma, presence of vasicentric tracheids, diagonal arrangement of vessels filled with gummy infiltrations and fibres - nonseptate. The survey of dicotyledonous woods (Metcalf & Chalk 1950) shows that these diagnostic features are found in one or more genera of the family Celastraceae, Sapindaceae and Meliaceae.

Amongst Celastraceae, the fossil wood approaches the genus *Celastrus peduncularis* in arrangement of vessels, tangential bands of parenchyma, simple perforation, however, the fossil differs in structure and height of xylem rays, uniseriate rays only 1 or 2 cells high are common in *Celastrus* (Metcalf & Chalk 1950), the fossil also differs in the size and frequency of vessels as well as in possession of septate fibres in living taxon.

The fossil wood shows superficial resemblance with a few





*Heyneoxylon intertrappeum* Sp. Nov.

- A. Cross section of fossil wood showing arrangement of vessels and parenchyma x 40.
- B. A magnified portion of cross section of fossil wood x 100.
- C. Tangential longitudinal section of fossil wood x 40
- D. Radial longitudinal section of fossil wood showing structure of xylem rays x 40
- E. A portion of vessel showing inter vessel pits x 100

genera of the family Sapindaceae in its possession of vessels in radial groups of cells, perforation simple, intervessel pitting alternate and small, banded paratracheal parenchyma, xylem rays long, uni to triseriate, however, it differs in structure of rays and distribution of vessels.

The present fossil wood is having distinguishing characters such as 3-6 cells wide continuous tangential parenchymatous bands, uni to 4 seriate heterogeneous xylem rays as also in distribution, size and frequency of xylem show close similarity with the modern wood of *Heynea trijuga* Roxb. belonging to the family Meliaceae (Ghosh et al. 1963, Metcalfe & Chalk 1950). After a detailed comparative study with illustrations and photographs it has been

found that combination of above important anatomical features of the fossil wood closely resembles the wood of the extant member, however, it differs in minor characters such as size and frequency of vessels and thickness of xylem rays which is somewhat greater in fossil wood.

**Comparison with fossil species:** Bande & Prakash (1980) instituted a form genus *Heyneoxylon* in the fossil state, resembling the wood of modern taxon *Heynea* of Meliaceae from Shahpura, Mandla district (M.P.). One more fossil wood of Meliaceae i.e. *Aglaioxylon mandlaense* gen. et sp. nov. (Trivedi & Srivastava 1982) has been reported from Deccan Intertrappean beds of Mandla district. The petrified wood described herewith, has been thoroughly compared with the two already



described fossil woods representing *Heynea* and *Aglaia* from Deccan Intertrappean beds. The present fossil wood shares its generic features with *Heyneoxydon* (Bande & Prakash 1980) but it can be differentiated from the present record of Meliaceae in having smaller vessels, difference in frequency of vessels, tangential bands of parenchyma are thicker and continuous as well as rays are thinner in comparison to *H. tertiarum*. As the present fossil wood is quite different from the above mentioned species, a new specific name *Heyneoxydon intertrappeum* sp. nov. is proposed for it

**SPECIFIC DIAGNOSIS** *Heyneoxydon intertrappeum* sp. nov.

**Vessels** in radial multiples of 3-5, r.d. 60-150  $\mu$ m t.d. 45-135  $\mu$ m, thick walled, filled with gummy infiltrations, vasicentric tracheids present, pores arranged in diagonal or oblique pattern, 14-30/mm<sup>2</sup>, intervessel pitting alternate with orbicular to lenticular aperture, perforation simple with vessel elements of maximum length 225-600  $\mu$ m. **Parenchyma** paratracheal forming 3-6 seriate continuous tangential bands (at few places may be interrupted), terminal parenchyma also present. **Rays** 1-4 seriate, heterogenous, homocellular but tending towards heterocellular i.e. ray tissue consists of mostly procumbent cells, only 2 or 3 upright cells present on the tapering ends or margins of rays, rays 4-38 cells high, frequency 8-14 rays/mm<sup>2</sup>. **Fibres** semilibriform to nonlibriform aligned in radial rows.

**DISTRIBUTION** The genus *Heynea* Roxb. consists of four species *H. trijuga* Roxb (*H. affinis* A. Juss) or *H. connaroides* Wight, *H. fruticosa*, Telism and Binn, and *H. quinqueijua* Roxb (Willis, 1982) *Heynea* occurs in sub Himalayan tract, from Kumaon eastwards ascending in Sikkim to 4,000 ft. in Khasi Hills, Manipur, Singhapur, Godawary Western Ghats from Poona to Southward

Nilgiris, In Burma on the hills between Shillong and Salween (Hooker, 1970)

The present day distribution of *Heynea* sp. indicates a tropical and subtropical forest type. The record of Meliaceae wood from fossil state of Deccan Intertrappean beds of Madhya Pradesh demarcates that tropical and sub-tropical climate might be prevailing in India during Tertiary times.

Holotype	B.S. Trivedi, Collection NO. M-50 Botany Department, Lucknow University, Lucknow.
Locality	Parapani, Mandla District (M.P.)
Age	Tertiary (Early Eocene).

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