

# Fossil wood of *Cynometra* from the Neogene of Tripura, India

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IN Tripura, the northeastern State of India, the Tipam sandstone representing the Neogene sediments are rich in petrified dicotyledonous woods (Menon, 1975). The woods are generally found in the Upper Tipam (Champanagar) Formation which consists of coarse, poorly sorted, massive, friable, sub-arkosic sandstone with occasional laminae of sandy shale unconformably overlain by Dupitila and are Upper Miocene in age (Karunakaran, 1974).

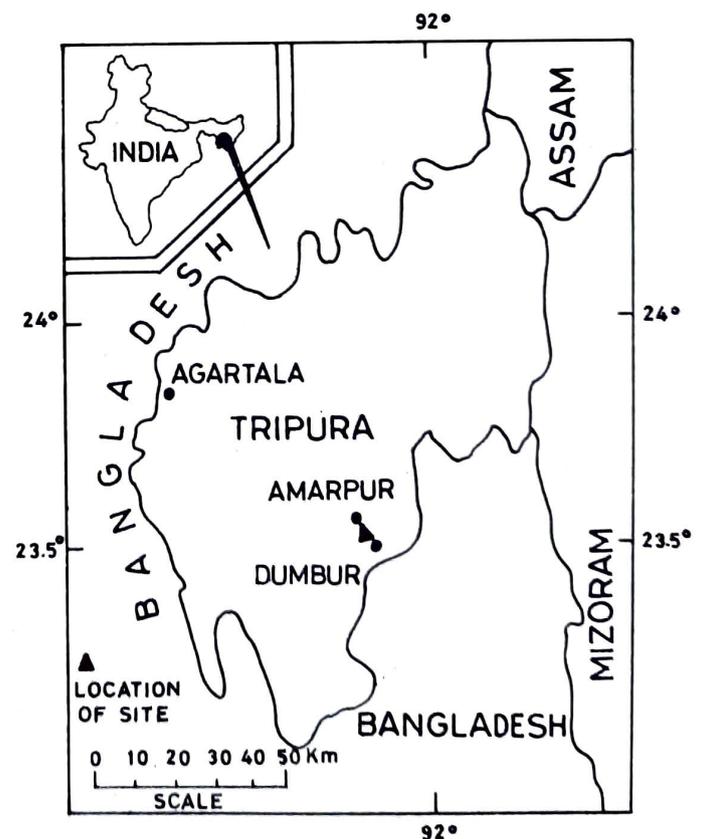
So far only a few fossil woods have been studied and identified from Tripura. They are *Glutoxylon burmense* (Holden) Chowdhury of Anacardiaceae (Ghosh & Taneja, 1961), *Pahudioxylon sahnii* (Ghosh & Kazmi, 1961), *Millettioxylon bengalensis* and *Cassinium tripuranum* of Fabaceae (Acharya & Roy, 1986).

The fossil wood being described here was collected by one of us (A.B.) from the Tipam Sandstone near Dumbur water falls in Amarpur sub-division (Text-fig.1). This fossiliferous locality exposed along road cutting on Amarpur-Dumbur road is about 127 km southeast of Agartala.

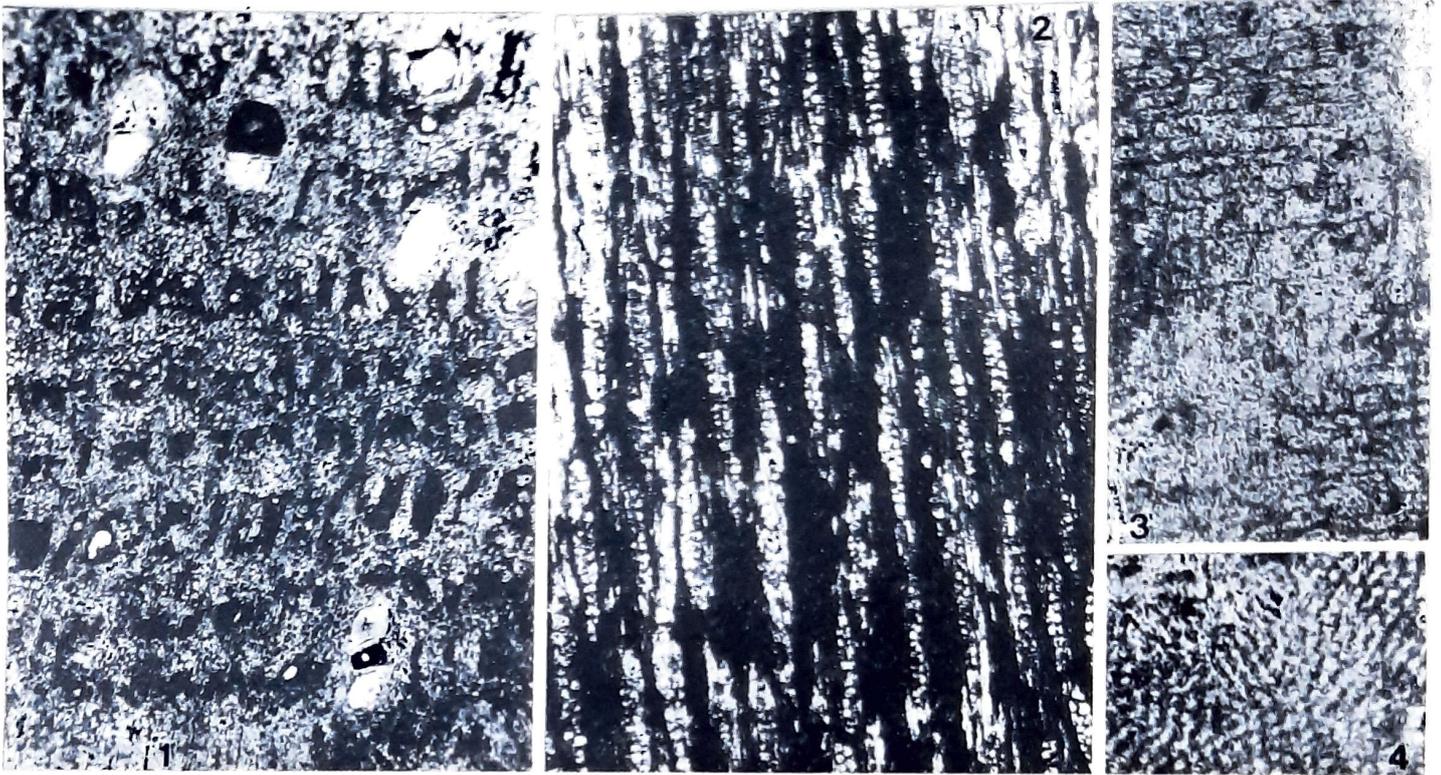
Examination of thin ground sections of the wood revealed the following anatomical features.

Wood diffuse-porous (Pl. 1, fig. 1). Growth rings not observed. Vessels small to large, t.d. 68-208  $\mu\text{m}$ , r.d. 50-292  $\mu\text{m}$ , round to oval, solitary and in radial multiples of 2-4, rarely in tangential pairs, evenly distributed, 3-9 per sq mm (Pl. 1, fig. 1), sometimes filled with dark contents; perforations simple; vessel-members 140-440  $\mu\text{m}$  long with oblique to horizontal ends; intervessel pits bordered, alternate, minute, less than 4  $\mu\text{m}$  in diameter, vested, circular to oval in shape with linear-lenticular apertures (Pl. 1, fig. 4). Parenchyma abundant, in regular concentric bands, each 3-8 cells wide, alternating with

those of fibres of more or less same width (Pl. 1, fig. 1); parenchyma cells 12-32  $\mu\text{m}$  in diameter and 28-120  $\mu\text{m}$  in length. Xylem rays 1-3 (rarely 4) seriate, 9-12 per mm; ray tissue heterogeneous; uniseriate rays consisting of both procumbent and upright cells, 12-24  $\mu\text{m}$  in width and 3-10 cells or 60-260  $\mu\text{m}$  in height; multiseriate rays consisting of procumbent cells in the central portion and 1-4 rows of upright or square cells at one or both the ends; 24-60  $\mu\text{m}$  in width and 5-23 cells or 128-680  $\mu\text{m}$



Text-figure-1. Map of Tripura showing fossil locality.



### Plate 1

*Cynometroxylon holdenii* (Gupta) Prakash & Bande

1. Cross section showing parenchyma pattern and shape, size and distribution of the vessels, x 45; Slide no. BSIP 36644-I.
2. Tangential longitudinal section showing structure of the xylem rays, x 60; Slide no. BSIP 36644-II

3. Radial longitudinal section showing heterogeneous ray tissue, x 125; Slide no. BSIP 36644-III.
4. Intervessel pits, x525; Slide no. BSIP 36644-II.

in height (Pl.1, fig.2); sometimes ray to ray fusion observed; procumbent cells 40-72  $\mu\text{m}$  in radial length and 16-28  $\mu\text{m}$  in tangential height, upright or square cells 24-60  $\mu\text{m}$  in tangential height and 16-28  $\mu\text{m}$  in radial length (Pl.1, fig.3). *Fibres* thickwalled, angular in cross section, 8-12  $\mu\text{m}$  in diameter and 280-520  $\mu\text{m}$  in length, nonseptate (Pl.1, figs 1,2).

*Figured specimen* - BSIP no. 36644.

The above features collectively indicate that the fossil wood belongs to the genus *Cynometra* of Fabaceae. From a detailed comparison with the thin sections of the woods of a number of species of *Cynometra* it was found that the fossil wood shows close similarity with *Cynometra polyandra* (Pearson & Brown, 1932; Ramesh Rao *et al.*, 1972).

Fossil woods resembling *Cynometra* are generally assigned to *Cynometroxylon* Chowdhury & Ghosh (1946). So far, five species of this genus are known from different parts of the world. These are *Cynometroxylon*

*parinaequifolium* Prakash (1979) from the Tertiary of Thailand, *C. holdenii* (Gupta) Prakash & Bande (1980) (*Cynometroxylon indicum* Chowdhury & Ghosh, 1946) from various Neogene localities of India (Guleria, 1984), *Cynometra alexandri* C.H. Wright, *C. sessiliflora* Harms. and *C. zairensis* from the Cenozoic of Zaire, Africa (Bande *et al.*, 1987). Of these, *Cynometroxylon holdenii* possesses all the characters as exhibited by the present fossil wood. Therefore, the fossil wood is assigned to *Cynometroxylon holdenii*.

Occurrence of *Cynometra* in the Upper Tertiary sediments in Tripura further suggests that this genus was most widely distributed throughout India in the tropical evergreen forests during Neogene. *Cynometra polyandra*, the modern counterpart of the fossil, occurs in Cachar, Garo, Lushai and Khasi Hills, northeast India and Sylhet and Chittagong in Bangla Desh (Ramesh Rao *et al.*, 1972).

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