Fossil woods from Middle Miocene sediments of Karimganj, Assam, India

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Key-words—Fossil woods, Tipam Sandstone Formation, Middle Miocene, Karimganj.

KARIMGANJ is located at the southern tip of Assam. Two new fossiliferous sites, namely, Maishassar and Kamalpur have been found to contain two types of fossil woods. The former is located in the west of Karimganj on India-Bangladesh border, while the latter is situated in the south of the town.

SYSTEMATIC DESCRIPTION

Family—Fabaceae

Genus—*Cynometroxylon* Chowdhury & Ghosh, 1946

Cynometroxylon holdenii (Gupta) Prakash & Bande, 1980

Pl. 1, Figs 1-3

The description is based on a single piece of fossil wood.

Description—Wood diffuse-porous. *Growth rings* not observed. *Vessels* small to medium, t.d. 70-120 μm, r.d. 70-170 μm, solitary and in radial multiples of 2-3, round to oval when solitary, with flat contact walls when in multiples, evenly distributed, 8-12 per sq mm, tyloses absent (Pl. 1, fig. 1); vessel members 300-500 μm long with horizontal to oblique ends; perforations simple; intervessel pit pairs ill preserved, appearing vestured, small and alternate. *Parenchyma* abundant, in the form of regular concentric bands alternating with the bands of fibres of more or less equal width (Pl. 1, fig. 1), bands 3-6 celled thick. *Xylem rays* 10-14 per mm, 1-3 seriate, made up of procumbent cells (Pl. 1, fig. 2), rarely having upright cells at the margins, 30-45 μm in width and 100-400 μm in height; ray tissue weakly heterogeneous, procumbent cells 24-36 μm in radial length and 15-30 μm in tangential height (Pl. 1, fig. 3); upright cells 10-25 μm in radial length and 15-30 μm in tangential height. *Fibres* thick-walled, nonseptate, angular in cross section, about 12-16 μm in diameter.

Specimen—BSIP No. 38930.

Horizon and Locality—Tipam Sandstone Formation; Kamalpur, Karimganj District, Assam.

Age—Middle Miocene.

Affinities—The diagnostic characters of the fossil, viz., banded parenchyma alternating with the bands of fibres of more or less equal width, simple perforation plates, 2-3 seriate xylem rays, weakly heterogeneous ray tissue and open vessels indicate close resemblance with *Cynometra* (Gupta) Prakash & Bande (1980).

Genus-*Hopeoxylon* Navale emend. Awasthi, 1977

Hopeoxylon indicum (Navale) Awasthi, 1977

Pl. 1, Figs 4-6

The description is based on a single piece of fossil wood.

Description—Wood diffuse-porous. *Growth rings* indistinct, probably delimited by apotracheal bands of parenchyma enclosing the gum canals (Pl. 1, fig. 4). *Vessels* medium to large, t.d. 100-170 μm, r.d. 60-230 μm, solitary and in radial multiples of 2-3, round to oval when solitary, with flat contact walls when in multiples, but usually deformed due to compression,

evenly distributed, 4-7 per sq mm (Pl. 1, fig. 4), tyloses not seen; vessel members 400-700 μm long with horizontal to oblique ends; perforations simple; intervessel pit pairs ill preserved, appearing vestured. *Parenchyma* both paratracheal and apotracheal; paratracheal vasicentric to aliform, apotracheal in the form of tangential bands enclosing the gum canals, bands 2-3 celled thick (Pl. 1, fig. 4). *Xylem rays* 9-16 per mm, 1-4 (mostly 2-3) seriate (Pl. 1, fig. 5); uniseriate rays made up of procumbent cells only, 8-16 μm in width and 7-10 cells or 120-170 μm in height, multiseriate rays made up of procumbent cells, rarely having upright cells at the margins, 20-32 μm in width and 15-31 cells or 250-550 μm in height; ray tissue weakly heterogeneous, procumbent cells 50-80 μm in radial length and 6-12 μm in tangential height (Pl. 1, fig. 6); upright cells about 20 μm in radial length and about 32 μm in tangential height. *Fibres* thick-walled, nonseptate, angular in cross section, about 16 μm in diameter. *Gum canals* normal, vertical, arranged in concentric rings, usually smaller than the vessels, t.d. 35-80 μm, r.d. 55-80 μm (Pl. 1, fig. 4).

Specimen—BSIP No. 38931.

Horizon and Locality—Tipam Sandstone Formation; Maishassar, Karimganj District, Assam.

Age—Middle Miocene.

Affinities—The characteristic features of the fossil wood, such as, concentric rings of gum canals enclosed by bands of parenchyma, vasicentric to aliform parenchyma, simple perforation plates, 1-4 seriate xylem rays, weakly heterogeneous ray tissue and non-septate fibres indicate affinity with the xylotomically similar genera, viz., *Sindora* Miq., *Detarium* Jussieu and *Copaifera* Linn. of the family Fabaceae. Fossil woods resembling *Sindora* and allied forms are generally placed under the fossil genus *Hopeoxylon* Navale emend. Awashti (1977). The present fossil shows close resemblance with *Hopeoxylon indicum* (Navale) Awasthi (1977) described from the Cuddalore Series near Pondicherry. However, ray tissue is heterogeneous in Pondicherry specimens while it is weakly heterogeneous in the present specimen.

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REFERENCES

Awasthi, N 1977. Revision of *Hopeoxylon indicum* Navale and *Shoreoxylon speciosum* Navale from the Cuddalore Series near Pondicherry. *Palaeobotanist* **24:** 102-107.

Chowdhury, K.A. & Ghosh, S.S. 1946. On the anatomy of *Cynometroxylon indicum* gen. et sp. nov. - a fossil dicotyledondus wood from Nailebung, Assam. *Proc. natn. Inst. Sci. India* **12** (8) : 435-447.

Prakash, U & Bande, MB 1980. Some more fossil woods from the Tertiary of Burma. *Palaeobotanist* **26:** 261-278.

PLATE 1 →

1-3. *Cynometroxylon holdenii* (Gupta) Chowdhury & Ghosh

1. Cross section of the fossil wood showing continuous and alternating bands of parenchyma and fibres. x40; Slide No. BSIP 38930-I.
2. Tangential longitudinal section of the fossil showing the structure of xylem rays. x100; Slide No. BSIP 38930-II.
3. Radial longitudinal section of the fossil showing the nature of xylem ray tissue. x100; Slide No. BSIP 38930-III.

4-6. *Hopeoxylon indicum* (Navale) Awasthi

4. Cross section of the fossil wood showing a distinct ring of gum canals. x40; Slide No. BSIP 38931-I.
2. Tangential longitudinal section of the fossil showing the structure of xylem rays. x100; Slide No. BSIP 38931-II.
3. Radial longitudinal section of the fossil showing the nature of ray tissue. x100; Slide No.BSIP 38931-III.

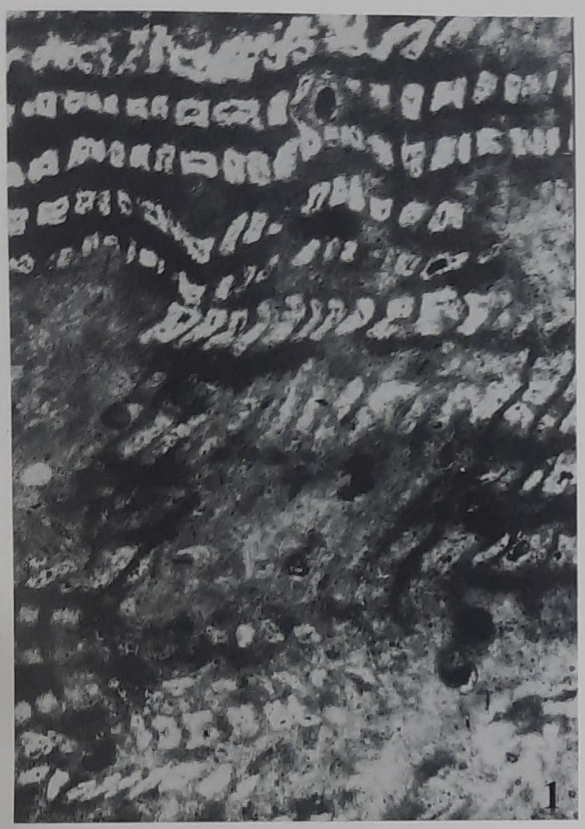

PLATE 1