

# A carbonised wood resembling *Parinari* from the Neyveli Lignite deposits, India

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## ABSTRACT

Awasthi, Nilamber & Agarwal, Anil (1986). A carbonised wood resembling *Parinari* from the Neyveli Lignite deposits, India. *Palaeobotanist* 35(1) : 57-60.

A carbonised wood showing close resemblance with that of *Parinari* (*Parinarium*) belonging to the sub-family Chrysobalanoideae of Rosaceae has been described from the Neyveli Lignite deposits. It is named as *Parinarioxylon neyveliense* sp. nov. The occurrence of *Parinari* is also indicative of tropical humid conditions in this area at the time of its deposition.

**Key-words**—Xylotomy, Carbonised wood, Rosaceae, *Parinarioxylon*, Neyveli Lignite, Miocene (India).

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## सारांश

भारत के निवेली लघुडांगार निक्षेपों से पैरीनारी सदृश एक कार्बनी काष्ठ

नीलाम्बर अवस्थी एवं अनिल अग्रवाल

भारत के निवेली लघुडांगार निक्षेपों से एकत्रित रोजेसी कुल के क्राइसोबैलोनॉयडी नामक उपकुल की पैरीनारी (पैरीनारियम) से घनिष्ठ समानता प्रदर्शित करने वाली एक कार्बनी काष्ठ का वर्णन किया गया है तथा इसे पैरीनारिऑक्सीलॉन निवेलीयेन्सिस नव जाति से नामांकित किया गया है। पैरीनारी की उपस्थिति से इस क्षेत्र में इसके निक्षेपण के समय उष्णकटिबन्धीय आर्द्र परिस्थितियाँ व्यक्त होती हैं।

## INTRODUCTION

SYSTEMATIC studies on the carbonised woods from the Neyveli lignite deposits have been initiated recently by one of us (Awasthi, 1984) who described the dicotyledonous woods resembling those of *Hopea*, *Carallia*, *Gluta*, *Diospyros* and *Cordia*. Further investigations of more carbonised woods carried out by the present authors from the same mine also revealed the presence of several new forms; one of them being described here shows close similarity with that of *Parinari* of the family Rosaceae.

The carbonised wood measures about 5.00 × 2.00 cm in length and width having central core which obviously represents a twig small branch of the tree. The material was embedded in paraffin wax and sectioned on a sliding microtome.

## DESCRIPTION

Family—Rosaceae

Sub-family—Chrysobalanoideae

**Genus**—*Parinarioxylon* Pfeiffer & Van Heurn, 1928

*Parinarioxylon neyveliense* sp. nov.

Pl. 1, figs 1-5

Wood diffuse-porous (Pl. 1, fig. 1). *Growth rings* not seen. *Vessels* small to medium, round to oval, t.d. about 30-140 μm, r.d. 30-160 μm, exclusively solitary, unevenly distributed, tending to arrange in oblique radial lines or echelon (Pl. 1, figs 1, 2), about 10-25 per sq mm; perforations simple, vessel-members truncate or with slightly inclined ends; pits leading to contiguous fibres

or fibre-tracheids small to medium (Pl. 1, fig. 5), about 6-8  $\mu\text{m}$ , in diameter, alternate, with seemingly linear apertures; tyloses occasionally present. *Parenchyma* apotracheal, in numerous fine lines, 1-2 (mostly 1) seriate, almost continuous to sometimes broken, wavy (Pl. 1, figs 1,2), about 12-18 per mm; sometimes more towards centre; cells about 12-24  $\mu\text{m}$  in diameter. *Rays* fine, uniseriate (Pl. 1, fig. 3), rarely with paired cells, about 25-30 per mm in cross-section, about 4-30 cells in height, heterocellular, consisting of procumbent cells and 1-2 marginal rows of upright cells (Pl. 1, fig. 4). *Fibres* about 12-16  $\mu\text{m}$  in diameter, thick-walled (Pl. 1, fig. 2), walls 4-6  $\mu\text{m}$ , in thickness, with narrow lumen, nonseptate; pits on tangential walls occasionally seen, uniseriate, small, about 3-4  $\mu\text{m}$ , in diameter with small slit-like apertures.

### COMPARISON WITH MODERN SPECIES

In important and characteristic features, such as: exclusively solitary vessels, apotracheal parenchyma in fine, 1-2 (mostly 1) seriate lines with long strands; uniseriate, heterocellular rays and the thick-walled fibres with bordered pits the carbonised wood resembles those of *Acioa*, *Angelesia*, *Chrysobalanus*, *Couepia*, *Grangeria*, *Hirtella*, *Licania*, *Parastemon* and *Parinari* (Metcalfe & Chalk, 1950) of sub-family Chrysobalanoideae (Rosaceae). After examining thin sections as well as available literature on a number of species of these genera (Desch, 1954, p. 474, pl. 95, fig. 2; pl. 96, fig. 2; pl. 97, fig. 1; Henderson, 1953, p. 62, fig. 322; Kribs, 1959, p. 135, figs 450, 451; Metcalfe & Chalk, 1950, p. 552, fig. 121; Miles, 1978, p. 160; Normand, 1950, p. 92, pls. 21-23; Purkayastha & Sahi in Ramesh Rao & Purkayastha, 1972, p. 151, pl. 86, fig. 514) a close agreement in all anatomical features is observed between the Neyveli carbonised wood and those of *Acioa*, *Angelesia*, *Chrysobalanus*, *Licania*, *Parastemon* and *Parinari*. These genera are so similar in their xylotomy that they cannot be easily differentiated from one another though Metcalfe and Chalk (1950) have pointed out a few minor

differences between them. Since *Parinari* (*P. indicum* and *P. travancoricum*) is the only genus that also occurs on the Indian mainland, it is assumed that the carbonised wood belongs to the genus *Parinari*. The fossil being a piece of small branch/twig, possesses relatively smaller vessels.

### COMPARISON WITH FOSSIL SPECIES

So far three species of fossil woods resembling *Parinari* Aubl. (*Parinarium* Juss.) are known. These are *Parinarioxylon itersonii* from the Tertiary of Java (Pfeiffer & Van Heurn, 1928) and Omo Basin, Ethiopia (Lemoigne, 1978), *P. cuddaloreense* from the Cuddalore Sandstones near Pondicherry (Awasthi, 1969) from and *P. splendidum* from the Lower Siwalik beds of Kalagarh (Trivedi & Ahuja, 1979). The affinities of *P. splendidum* with that of *Parinari* are doubtful as bordered pits are absent on the tangential wall of the fibres. Even the gross xylotomical characters as revealed by the photographs do not tally with those of *Parinari*. It instead, appears somewhat similar to *Ebenoxylon miocenicum* from the same locality (Prakash, 1978).

The Neyveli wood differs from both the other species in one or two characters which may justifiably be considered as specific differences. In *P. itersonii* the vessels are comparatively very large and less frequent while in *P. cuddaloreense* the vessels are relatively smaller and more frequent and the parenchyma bands are 1-3 seriate and less closely placed, i.e. 6-10 per mm as against 12-18 in the present fossil wood.

Of the two species of *Parinari* occurring in India, *P. indicum* is distributed in the evergreen forest of Western Ghats, while *P. travancoricum* is confined to the evergreen forest of Travancore Hills (Gamble, 1972). Thus the occurrence of *Parinari* in the Neyveli lignites also suggests the prevalence of tropical humid condition in this region of South India during its deposition.

*Holotype*—B.S.I.P. Museum Specimen no. 35734; Neyveli Lignite Mine I; Cuddalore Series; Miocene.

### PLATE 1

*Parinarioxylon neyveliense* sp. nov.

1. Cross section showing nature and distribution of vessels, parenchyma and rays.  $\times 45$  (BSIP slide no. 35734-1).
2. Cross section magnified showing details of vessels and parenchyma.  $\times 105$  (BSIP slide no. 35734-1).
3. Tangential longitudinal section showing heterocellular rays.  $\times 155$

- (BSIP slide no. 35734-2).
4. Radial longitudinal section showing heterocellular rays.  $\times 155$  (BSIP slide no. 35734-3).
5. Tangential longitudinal section showing vascular pittings.  $\times 750$  (BSIP slide no. 35734-2).

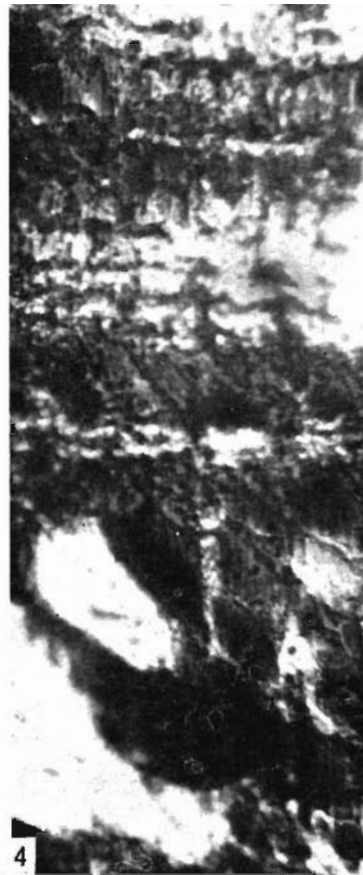
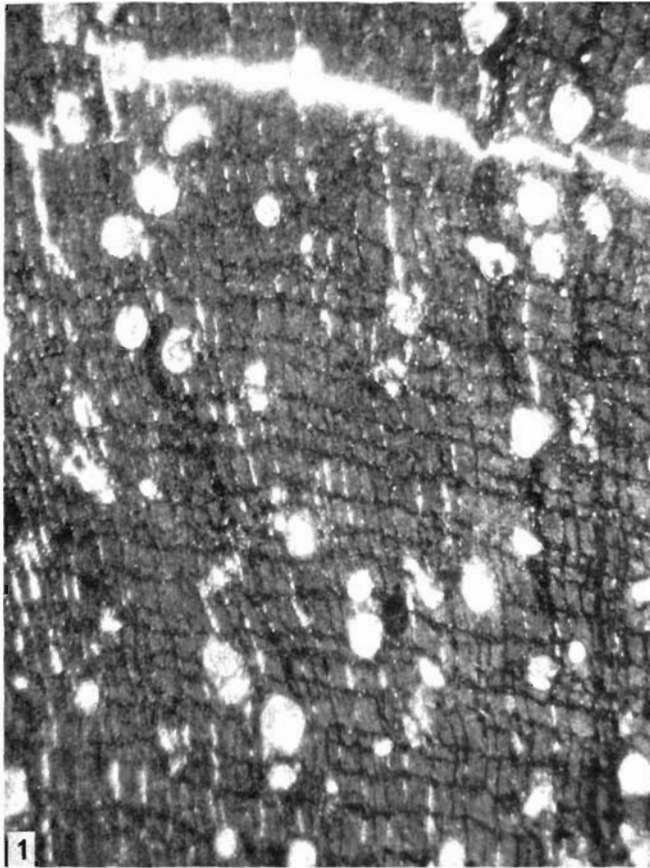


PLATE 1

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