

A NEW FOSSIL WOOD OF EUPHORBIACEAE FROM THE DECCAN INTERTRAPPEAN BEDS OF MADHYA PRADESH

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ABSTRACT

A new fossil dicotyledonous wood belonging to Euphorbiaceae has been described from the fossiliferous locality of Keria (21°59'40"N; 79°10'15"E), District Chhindwara in Madhya Pradesh. It has been referred to *Paraphyllanthoxylon* Bailey (1924), and described as *Paraphyllanthoxylon kerienne* sp. nov.

INTRODUCTION

SO far a number of fossil woods referred to different genera of the Euphorbiaceae have been described from various localities of Indian Tertiaries. These are *Bridelioxylon krauselii* (Prakash) Mädel (1962) and *Mallotoxylon kerienne* Lakhanpal & Dayal (1964) from the Deccan Intertrappean beds of Keria; *Paraphyllanthoxylon sahnii* (Prakash) Mädel (*l.c.*) from the Deccan Intertrappean beds of Mahurzari; *Euphorbioxylon sagarensis* Mahabalé & Deshpande (1963) from the Deccan Intertrappean beds of Sagar; *Bridelioxylon cuddalorensis* Ramanujam (1956), *Putranjivoxylon puratanum* Ramanujam (*l.c.*), *Paraphyllanthoxylon tertiarium* (Ramanujam) Mädel (*l.c.*), *Bridelioxylon miocenicum* (Ramanujam) Mädel (*l.c.*) and *Paraphyllanthoxylon bangalamodense* (Navale) Lakhanpal & Dayal (*l.c.*) from the Cuddalore Series of South India. In the present paper is described a new species of fossil woods from Keria (21°59'40"N; 79°10'15"E), a fossiliferous locality of the Deccan Intertrappean beds. It shows a near resemblance to the genus *Bischofia* of the Euphorbiaceae.

DESCRIPTION

The species described here is represented by a piece of petrified secondary wood measuring about 8 cm. in length and 4 cm. in diameter. The preservation of the fossil specimen is fairly satisfactory. It shows the following anatomical details:

TOPOGRAPHY — Wood diffuse-porous (PL. 1, FIG. 1). Growth rings absent. Vessels

appearing as pin points to the naked eye, moderately small to medium-sized (mostly medium-sized), solitary and in radial multiples of 2-3 or more, 8-12 per sq. mm., profusely tylosed (PL. 1, FIGS. 1 & 6), distributed without any pattern, with contiguous rays usually on one side. Xylem parenchyma absent (PL. 1, FIGS. 1 & 6). Xylem rays visible to the naked eye in the cross-section, 1-4 (mostly 2-3) seriate and up to 75 μ broad (PL. 1, FIGS. 2 & 5), 6-24 cells and 150-720 μ occasionally up to 1050 μ high, 8-10 rays per mm.; consisting of procumbent cells in the thickened part, with 1-2 sometimes more marginal rows of upright cells (PL. 1, FIGS. 2 & 5); ray tissue heterogeneous; end to ray fusion rare. Fibres aligned in radial rows between the two consecutive xylem rays (PL. 1, FIG. 6).

ELEMENTS — Vessels thick-walled, the walls about 6-8 μ thick, circular to oval (PL. 1, FIGS. 1 & 6), t.d. 30-165 μ , r.d. 30-180 μ ; vessel-members short to medium in length, 225-600 μ long, with truncate ends; perforations simple; intervascular pitting bordered, pits alternate, large, 10 μ in diameter, with lenticular horizontal apertures (PL. 1, FIG. 3); vessel-ray and vessel parenchyma pits not preserved. Ray cells thin to moderately thick-walled, procumbent cells circular or angular in tangential longitudinal sections, filled with infiltration (PL. 1, FIG. 2), their vertical height 8-20 μ , radial length 30-120 μ ; upright cells radial length 24-36 μ , vertical height 30-88 μ . Fibres thick-walled (PL. 1, FIG. 6), the wall about 6 μ thick, septate (PL. 1, FIG. 2), circular to oval in cross section; interfibre pits not observed.

DISCUSSION

The important anatomical features exhibited by the present Intertrappean fossil wood are: (1) small to medium-sized (mostly medium-sized) and profusely tylosed vessels; (2) simple perforations; (3) large and alternate intervascular pitting; (4) absence of

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any parenchyma; (5) 1-4 seriate xylem rays with heterogeneous ray tissue; and (6) thick-walled, septate fibres. Considering all these features collectively the present fossil wood shows striking resemblance with the woods of *Glochidion* group of the Phyllanthoideae (Euphorbiaceae). The *Glochidion* group includes the genera *Antidesma* Linn., *Aporosella* Chodat., *Bischofia* Bl., *Glochidion* Forst., *Phyllanthus* Linn., *Securinega* Comm. ex Juss., *Bridelia* Willd. and *Cleistanthus* Hook. f. ex Planch (METCALFE & CHALK, 1950: 1220-1222).

Of these, *Bridelia* and *Cleistanthus* can be easily distinguished by the presence of vested intervacular pitting (BAILEY, 1933). In *Securinega* the perforation plates are scalariform.

A detailed comparison of the Intertrappean wood with woods of the various genera of *Glochidion* group reveals that it resembles broadly the wood structure of the living genus *Bischofia*. The resembling features between the two are, the shape, size and distribution of the vessels, presence of tyloses intervacular pitting which is large, bordered and alternate and the thick-walled, septate fibres. However, in *Bischofia* few cells of parenchyma are present about the vessels and the xylem rays are higher.

Name of the fossil wood — Since no absolute generic identity is warranted with the living genus *Bischofia*, the assignment of the present fossil wood to *Bischofioxylon* Ramanujam (1960) would be very committal. Moreover, the genus *Bischofioxylon* with the only species *B. miocenicum* has been shown to belong to *Bridelioxylon* Ramanujam (1956) and changed to *Bridelioxylon miocenicum* (Ramanujam) by Mädel (1962). Considering the structural features of the present fossil wood, it can appropriately be referred to the genus *Paraphyllanthoxylon* Bailey (1924). The other two genera, viz., *Phyllanthinum* Ogura (1932) and *Glochidioxylon* Ramanujam (1956) having the same definition and circumscription as the present fossil wood have been shown to be synonyms of *Paraphyllanthoxylon* Bailey (*l.c.*) by Mädel (*l.c.*). Therefore, the genus *Paraphyllanthoxylon* has been adopted for the present fossil wood.

Comparison with the Fossil Species — So far a number of fossil woods belonging to the Euphorbiaceae have been described from many parts of the world (see in LAKHANPAL & DAYAL, 1964). Of these, only 7

species have been referred to the genus *Paraphyllanthoxylon* Bailey (1924).

Paraphyllanthoxylon arizonense Bailey (1924) differs from the present fossil wood in having parenchyma and in the xylem rays which are up to 7 cells wide.

P. tertiarum (Ramanujam) Mädel (1962), *P. sahnii* (Prakash) Mädel (1962) and *P. bangalamodense* (Navale) Lakhanpal & Dayal (1964), possess diffuse parenchyma and *P. pseudo-hobashiraishi* (Ogura) Mädel (1962) has crystalliferous parenchyma, a character by which alone they are distinguished from the Intertrappean wood.

P. capense Mädel (1962) differs from the present fossil wood in having vessels which are mostly in radial multiples of 2-5 (-6) cells and 24-60 per sq. mm. whereas, in the Intertrappean wood the vessels are solitary and in radial multiples of 2-3 and 8-12 per sq. mm.

Since the present fossil wood is quite different from the known species of *Paraphyllanthoxylon*, it has been assigned to a new species, viz., *Paraphyllanthoxylon heriense*. The specific epithet is after the village Keria from where it was collected.

DIAGNOSIS

Wood—diffuse-porous. *Growth rings* not observed. *Vessels* small to medium-sized (mostly medium-sized), t.d. 30-165 μ , r.d. 30-180 μ , solitary and in radial multiples of 2-3 cells, 8-12 per sq. mm.; vessel-members short to medium-sized; perforations simple; intervacular pitting bordered, alternate, pits large, 10 μ in diameter, with oval border and horizontal, lenticular aperture. *Parenchyma* absent. *Xylem rays* 1-4 (mostly 2-3) seriate, 8-10 per mm., consisting of procumbent cells in the thickened part, with 1-3 rows of marginal upright cells; ray tissue heterogeneous. *Fibres* septate, thickwalled.

Holotype — B.S.I.P. Museum No. 32808.

Locality — Keria, district Chhindwara, Madhya Pradesh.

Horizon — Deccan Intertrappean Series.

Age — Probably Early Eocene.

ACKNOWLEDGEMENT

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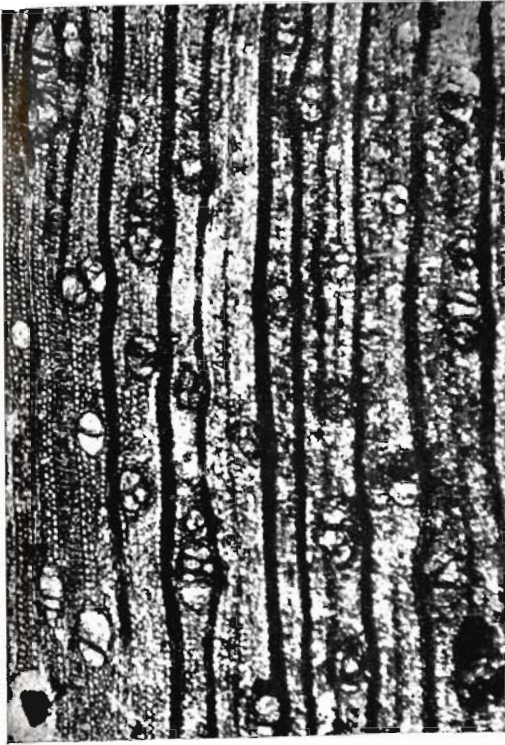
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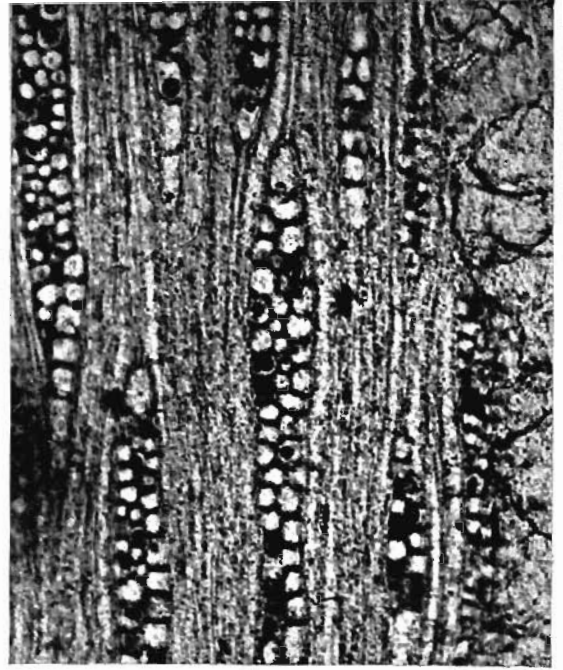
EXPLANATION OF PLATE 1

Paraphyllanthoxylon kerienne sp. nov.

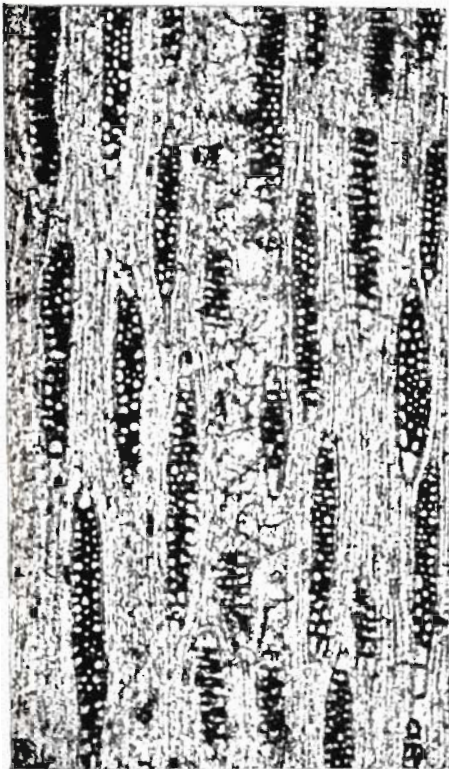
1. Cross-section at low magnification showing the shape, size and distribution of the vessels and the tyloses. $\times 40$.
2. Tangential longitudinal section magnified to show the nature of the xylem rays and the separate fibres. Note the marginal row of upright cells. $\times 160$.
3. Intervessel pit-pairs. $\times 550$.
4. Radial longitudinal section showing the heterogeneous ray tissue. $\times 160$.
5. Tangential longitudinal section showing the distribution of the xylem rays. $\times 70$.
6. Cross-section magnified showing the shape and size of the vessels, tyloses and the nature of the fibres. $\times 120$.



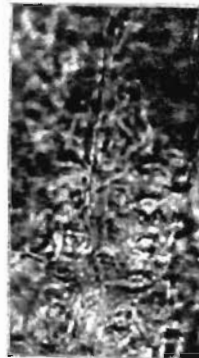
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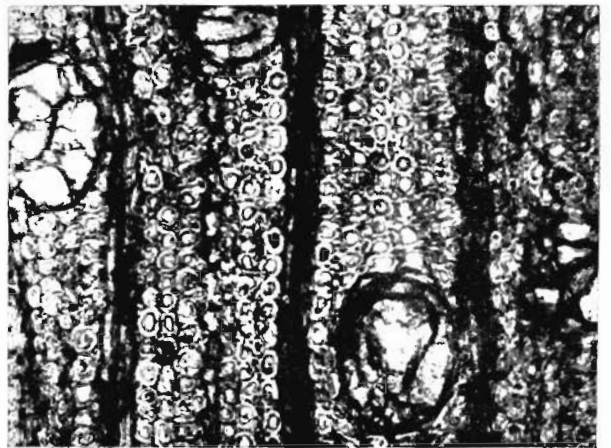
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