

Prof. T. Pullaiah,

Professor of Botany,

Sri Krishnadevaraya University,

Anantapur 515003, A.P.

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MESEMBRIOXYLON TIRUMANGALENSE, A NEW SPECIES FROM THE SRIPERMATUR GROUP NEAR MADRAS

BY K. SURYANARAYANA

Birbal Sahni Institute of Palaeobotany, Lucknow

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INTRODUCTION

THE present paper deals with a new species of *Mesembrioxylon* from the Sripermatur group, named after the town, Sripermatur, which lies 25 miles W.S.W. of Madras. The specimen was collected by me (April, 1952) from Tirumangalam, near Sripermatur. The exact locality where it occurs *in situ* is not known.

The various geological formations in India from where the genus *Mesembrioxylon* has been reported are the 'Tiki beds' of the Maleri stage in South Rewah, the Gollapili group in Godavari District, the Sripermatur group and lastly the Tertiary beds at Tiruvakkarai near Pondicherry. All these beds belong to the upper Gondwanas except the Tiruvakkarai grits. Three fossil woods were reported by Bruce Foote (1873) from the vicinity of Sripermatur. Describing a fossil wood from Vellum, he says (p. 104): "This fossil wood which is firmly imbedded in the grits is beautifully silicified, every pore of the close grained woody structure having been perfectly preserved and the exogenous character being extremely distinct." From the same locality a very handsome piece of silicified wood was reported to have been found long ago on the bottom of an irrigation channel. Sahni (1931) described two species of *Mesembrioxylon* from the Sripermatur area.

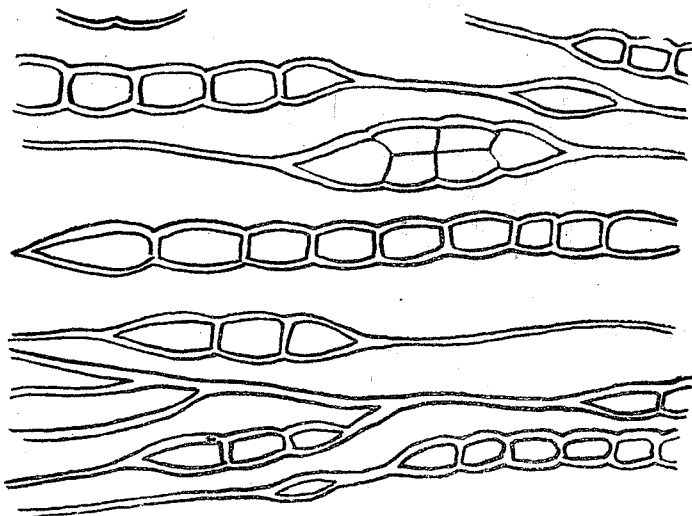
The geology of the area is quite simple, the chief formations being buff, variegated shales and clays resting on gritty sandstones. But the southern part of the area is occupied by a series of grits, sandstones and sandy clays whose exact relation to the shales is not quite clear. These shales contain both marine animal and plant remains of Rajmahal age. Among the invertebrate fossils found here, *Leda* and *Pecten* are common. Two or three ammonites have been recorded from here by Foote (1873). As a whole these fossiliferous shales are covered by the recent lateritic and alluvial formations. These shale beds have been referred to the 'Kota stage' among the upper Gondwana

subdivision (Lower Jurassic) and thought to be the equivalents of the Vaemavaram and Raghavapuram shales along the coastal region.

DESCRIPTION

The solitary specimen is a block of ferruginous rock with very fine-grained texture. It consists of only secondary wood and measures about 7 cm. in length and 5 cm. in width. The growth rings are narrow and can be seen even with the naked eye. The curvature of these rings shows that this portion of the wood is not far from the pith. The cells of the spring wood are larger than the cells of the summer wood and are roughly rectangular in shape. The summer wood contains cells with thicker walls (Pl. VII, Fig. 2). The width of the tracheidal cells, measured tangentially, ranges from 120 to 160 μ . Xylem parenchyma is absent.

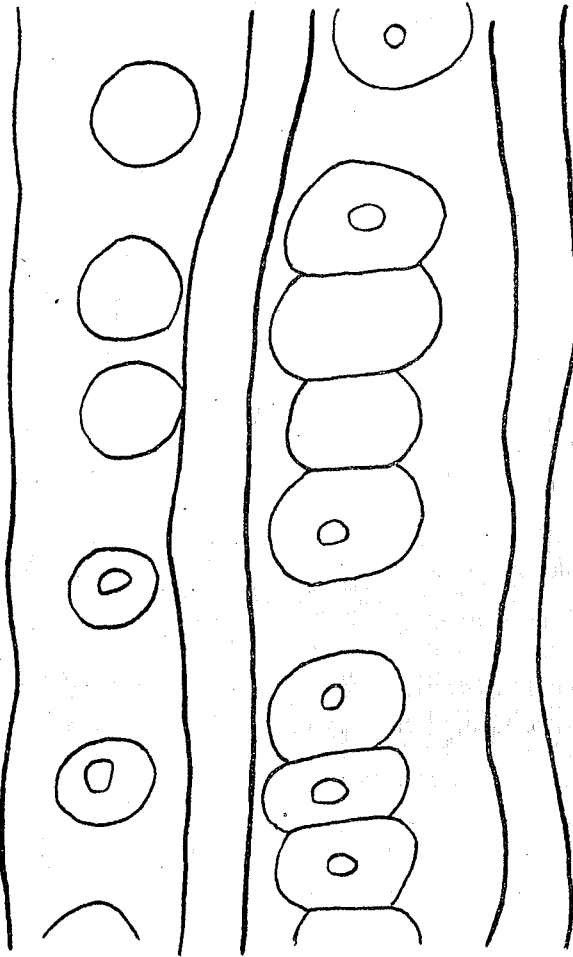
In tangential section of the medullary rays, the cells are either isodiametric or slightly higher than broad (Pl. VII, Fig. 3; Text-Fig. 1).



TEXT-FIG. 1. A portion of the tangential section showing the distribution of medullary rays, $\times 160$.

The diameter of these cells varies from 26 to 50 μ . The medullary rays are mostly uniseriate but biseriate ones are also very common. The height of these rays is from 1 to 15 cells and rarely reaches 23, the average being 4. The medullary rays do not show any pitting on the tangential walls.

The radial section shows the bordered pits in the tracheids which are usually circular and uniseriate. When in contact they are slightly flattened above and below. Both contiguous as well as separate pits are found (Pl. VII, Fig. 4; Text-Fig. 2). All of them are almost of the

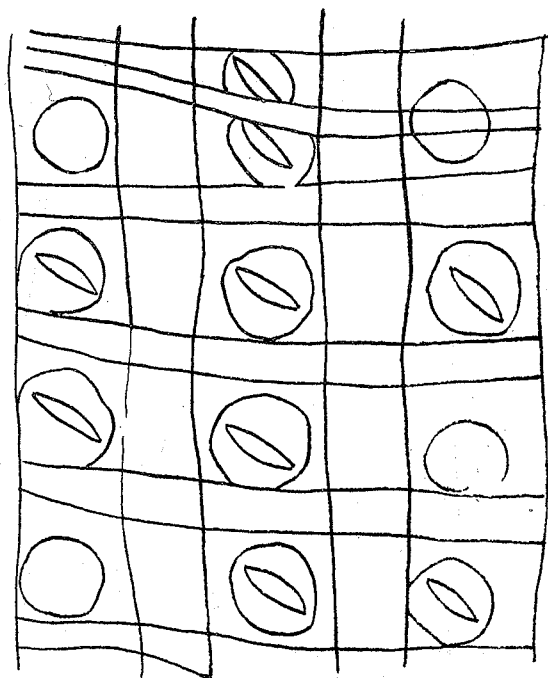


TEXT-FIG. 2. Radial section showing the bordered pits, $\times 650$.

same size, the diameter being from 13μ to 16μ . Sometimes the bordered pits are not well preserved, and then they appear like a simple pit.

The pits in the field are well preserved (Pl. VII, Fig. 5). They are round or oval in shape and usually 1 to 3 in number, very rarely 4. In most cases a single large pit is seen occupying the field completely (Eiporen) (Pl. VII, Fig. 6; Text-Fig. 3). The pores of the pits are narrow, elongated and placed slightly oblique to the vertical.

As will be shown below, this species will have to be regarded as a new one and I therefore give the diagnosis as follows:



TEXT-FIG. 3. Radial section showing the pores of the field pits, $\times 650$.

Diagnosis.—Growth rings well marked, narrow; xylem parenchyma absent; medullary rays mostly uniseriate, cells isodiametric or slightly higher than broad, horizontal and tangential walls smooth. Radial pits of tracheids bordered and circular, uniseriate rarely biseriate, when biseriate sub-opposite to alternate, contiguous or separate. Pits in the field mostly one, fairly large and bordered, sometimes 2 to 3 small bordered pits with a narrow, oblique pore.

DISCUSSION

The absence of xylem parenchyma, the uniseriate and sub-oppositely arranged biseriate pitting, the uni- and bi-seriate medullary rays and the smaller number of pits in the field, in particular the presence of eiporen with narrow, oblique pores indicate that the wood may belong to the genus *Mesembrioxylon*. At the same time it may also be confused with *Cupressinoxylon*, which also shows somewhat similar characters. There is always the difficulty of distinguishing the *Mesembrioxylon* wood from the *Cupressinoxylon* type and as Sahni (1931, p. 53) says, "Among the numerous species assigned to the latter genus there are not a few that might with equal justice be described under *Podocarpoxylon* or *Mesembrioxylon* (e.g., *Cupressinoxylon Hortu Stopes*)." According to Gothan the only distinctive character of any value is the medullary ray pitting in the spring wood, the pore being narrow and more or less vertical in *Mesembrioxylon* (podocarpoid

pitting) but wider and more nearly horizontal in *Cupressinoxylon* (cupressoid pitting). Since the present wood, as has been described before, shows a narrow elongated and almost vertically placed pore in the medullary ray pit, it can be safely put under the genus *Mesembrioxylon*.

Mesembrioxylon Parthasarathyi described by Sahni (1931) from the Sripermatur group shows more affinities to our present wood than any other species, the resemblances being in the bordered pits which are separate or contiguous and circular, in the height of the medullary rays which ranges from 1 to 18 in number, in the isodiametric nature of the medullary ray cells, in the field pits which are round and bordered with a narrow oblique pore. However the new species differs in the occurrence of biseriate bordered pitting, often with elliptic pits; further in having a great percentage of biseriate medullary rays; in the low height of medullary rays (average 4 as compared with 8 in *M. Parthasarathyi*), and finally in having only one to 3 pits in the field instead of 2 to 6.

There is another specimen from the Sripermatur group which was also described by Sahni (1931). In this the structural features were not clear owing to bad preservation and so he gave it no other name than *Mesembrioxylon* sp. It resembles our wood in the presence of well marked narrow growth rings, circular bordered pits, either in single or in double rows and the number of field pits, but differs in having opposite bordered pits, uniseriate medullary rays and lastly by the height of the rays which is from 5 to 45, average being 20.

M. schmiedianum from Tiruvakkarai, described by Sahni (1931) agrees with the present species in the manner of bordered pitting with circular or elliptical pits, field pitting with an oblique pore in each pit and in the absence of resin canals. On the other hand it is distinguished by the height of medullary rays which is from 2 or 3 to over 100 (average 36), by the number of pits in the field and by the presence of xylem parenchyma.

Likewise, *M. godaverianum* from Bogalpalmila, in the Godavari area, described by Sahni (1931) resembles the new species in the height of medullary rays and their uniseriate nature and in the bordered pitting. The Godavari species is characterised by the absence of growth rings, the large number of pits in the field and the presence of xylem parenchyma full of resin and also by its uniseriate medullary rays.

Lastly there is another species from the Maleri stage, Tiki in Rewah, namely *M. malerianum* (Sahni, 1931). This differs from the present wood by its greater number of pits in the field and in the presence of uniseriate arrangement of medullary rays.

Almost all foreign species differ from the one under consideration in having a very low height of the medullary rays, in the presence of xylem parenchyma, either in abundance or in scattered condition and in the uniseriate bordered pitting.

M. woburnense, described by Stopes (1915) from Bedfordshire, agrees to some extent in the height of the medullary rays and in the

bordered pitting, but differs in the presence of xylem parenchyma all through the wood, the presence of rims of Sanio and the single oval pit in the field.

Kubart (1915) described *M. Schwendæ* from upper Austria which shows greater affinities to the present species, but is distinguished by its xylem parenchyma and the uniseriate medullary rays.

Finally mention may be made of the Tasmanian species, *M. Hookeri*, described by Arber (1904). It differs in the uniseriate medullary rays, the presence of rims of Sanio and a large simple, single pit in the field.

From the above it will be seen that the present wood cannot be identified with any of the species of *Mesembrioxylon* so far recorded and it is described here as *M. tirumangalense* sp. nov.

ACKNOWLEDGEMENTS

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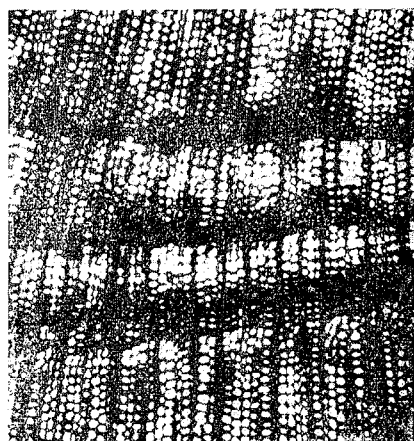
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EXPLANATION OF PLATE

PLATE VII

- FIG. 1. Transverse section under low power showing the growth rings (*g.r.*), $\times 50$.
- FIG. 2. Transverse section showing the spring and summer woods, $\times 90$.
- FIG. 3. Tangential section showing the distribution of medullary rays (*m.r.*), $\times 90$.
- FIG. 4. Radial section showing the nature of the bordered pits (*b.p.*), $\times 360$.
- FIG. 5. Radial section showing the number of pits (*f.p.*) in the field, $\times 350$.
- FIG. 6. Another radial section illustrating eiporen (*e.p.*) with oblique pores, $\times 350$.



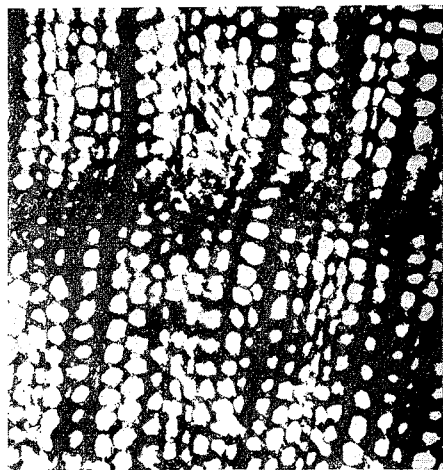
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} *g. r.*

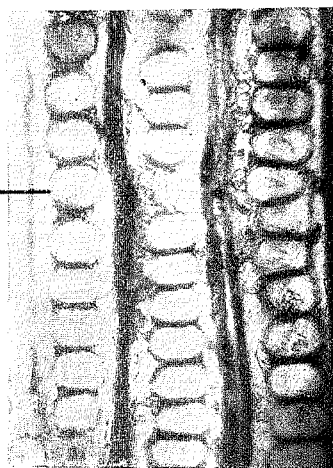


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m. r. —

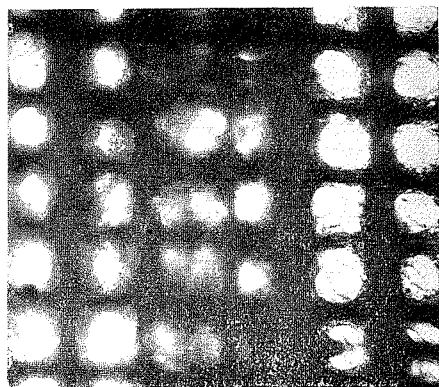


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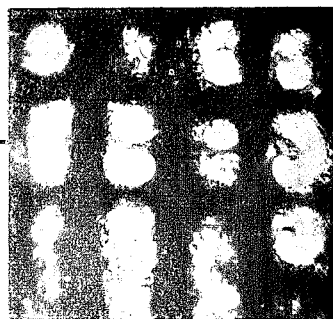
b. p. —



6

f. p. —

e. p. —



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