# A NEW SPECIES OF *ZALESSKIOXYLON* FROM THE GLOSSOPTERIS BEARING BEDS OF ZAMBESI BASIN, MOZAMBIQUE

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ABSTRACT

*Zalesskioxylon zambesiensis*—a new species, is recorded from the Permian of Zambesi. The wood is characterised by the presence of pitting, both on the radial and tangential walls of tracheids and several small, simple pits in the cross-field area.

## INTRODUCTION

Fossil plants from the Permian of Zambesi Basin, Mozambique was earlier described by TEIXEIRA (1947). He identified *Glossopteris browniana, G. brancai, G. indica, Asterotheca* sp., *Sphenophyllum thonii, S. oblongifolium, S. speciosum, Schizoneura* sp., and *Sigillaria* sp. from ferruginous brown shales in the vicinity of Tete. HØEG AND BOSE (1960) recorded *Schizoneura gondwanensis, Samaropsis zambesicus, Vertebraria indica* and? *Cordaicarpus* sp. REAL (1966) reported *Glossopteris brancai, G. browniana* and *G. indica* from the outcrops above dark shales in the banks of two tributaries of the Sanangoe, near the road to Tete. OLIVERIA (in ROCHA-CAMPOS, 1972) recorded the following forms in addition to the previously known forms, viz. *Glossopteris communis, G.* cf. *G. longicaulis, G.* cf. *G. occidentalis, G. retifera, G. stricta, G. angustifolia, G.* cf. *G. ampla, Gangamopteris obovata, Paracalamites, Umbellophyllites,* and scale leaves.

In comparison to this, the petrified woods are poorly known from Mozambique. The fossil woods—*Dadoxylon nicoli* and *Australoxylon teixeirae* (MARGUERIER, 1971) only are on record from the Lower Permian. The present paper deals with a new fossil wood, so far not known, from Zambesi Basin. The fossil woods were collected as detailed below from the Tete Coalfield.

| *Specimen number* | *Locality* |
|---|---|
| RG 17039 | From Coal in bed Chipanga V |
| RG 17040 | From bed Chipanga III |

## DESCRIPTION

**Zalesskioxylon** Lepekhina & Yatsenko-Khmelevsky, 1966

**Zalesskioxylon zambesiensis** sp. nov.

Pl. 1, Figs. 1-7; Text-fig. 1.

Two fossil woods—No. RG 17039 and RG 17040, show similar anatomical characters, and are referable to one species. In both specimens only secondary xylem is preserved, primary wood and cortex is not seen.

*Diagnosis*—Pycnoxylic secondary wood, growth zones doubtful, pits bordered, pitting on radial wall of tracheids 1-4 seriate (commonly bi- to triseriate) or in groups of 2,3 or

Table 1—Wood Piece No. 17039; Height of medullary rays

| Serial no. of counts | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | Number of Medulllary rays counted |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I | 1 | 4 | 4 | 9 | 12 (2) | 7 (1) | 9 (2) | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 48 (5) |
| II | .. | 4 | 5 | 12 | 12 (2) | 11 | 2 | 3 (1) | 2 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 52 (3) |
| III | 1 | 9 | 11 | 10 (1) | 16 | 3 | 5 (1) | 9 | 3 (1) | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 69 (3) |
| IV | 2 | 11 | 6 | 12 (1) | 10 | 11 (1) | 8 (1) | 4 (2) | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 67 (5) |
| V | .. | 15 | 13 | 10 | 5 | 11 | 9 | 2 | 3 (1) | 1 | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | 72 (1) |
| Total of counts | 4 | 43 | 39 | 53 (2) | 55 (4) | 43 (2) | 33 (4) | 18 (3) | 13 (2) | 2 | 1 | 1 | .. | 1 | 1 | .. | .. | .. | 1 | 308 (17) |

Table 2—Wood Piece No. 17040; Height of medullary rays.

| Serial no. of counts | 1 | 2 | 3 | 4 | 5 | 6 | **7** | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | Number of Medullary rays counted |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I | 2 | 6 | 4 | 5 | 4 | 8 (1) | **2** | 4 | 3 | 2 | .. | 2 | | .. | .. | 1 | .. | 1 | .. | 44 (1) |
| II | 2 | 7 | 7 | 8 | 10 | 3 | 7 | **2** | 2 | 3 | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | 53 |
| III | .. | 9 | 6 | 7 | 7 | 7 | 3 | **2** | 4 | 1 | 2 | 2 (1) | .. | 2 | .. | 1 | .. | .. | .. | 53 (1) |
| IV | 1 | 3 | 5 | 8 | 5 | 7 | **2** | 5 | 2 | 3 (1) | 2 | 1 | .. | .. | 1 | 1 | .. | .. | .. | 46 (1) |
| V | .. | 1 | 4 | 8 | 8 (I) | 7 | 2 | 6 | 3 | 6 (1) | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | 48 (2) |
| Total of counts | 5 | 26 | 26 | 36 | 34 (1) | 32 (1) | 16 | 19 | 14 | 15 (**2**) | 6 | 7 (1) | | 2 | 1 | 3 | 1 | 1 | .. | 244 (5) |

more; arranged alternate, sub-opposite to opposite; contiguous or separate (mixed type), pit circular when free and flattened or hexagonal when contiguous; pit-pore circular; tangential wall pitting 1-2 seriate or in groups of 2 or 3 pits, pits bordered and circular or circular-oval in shape; pits in the cross-field area 2-14 (commonly 5-6), simple, circular-oval to circular; xylem-rays uniseriate or biseriate, 1-24 cells high (5-6 cells common).

*Holotype*—RG 17039, Musée Royal du Congo, Belge.

*Locality*—From coal in bed Chipanga, V. Zambesi Basin.

*Age*—Permian.

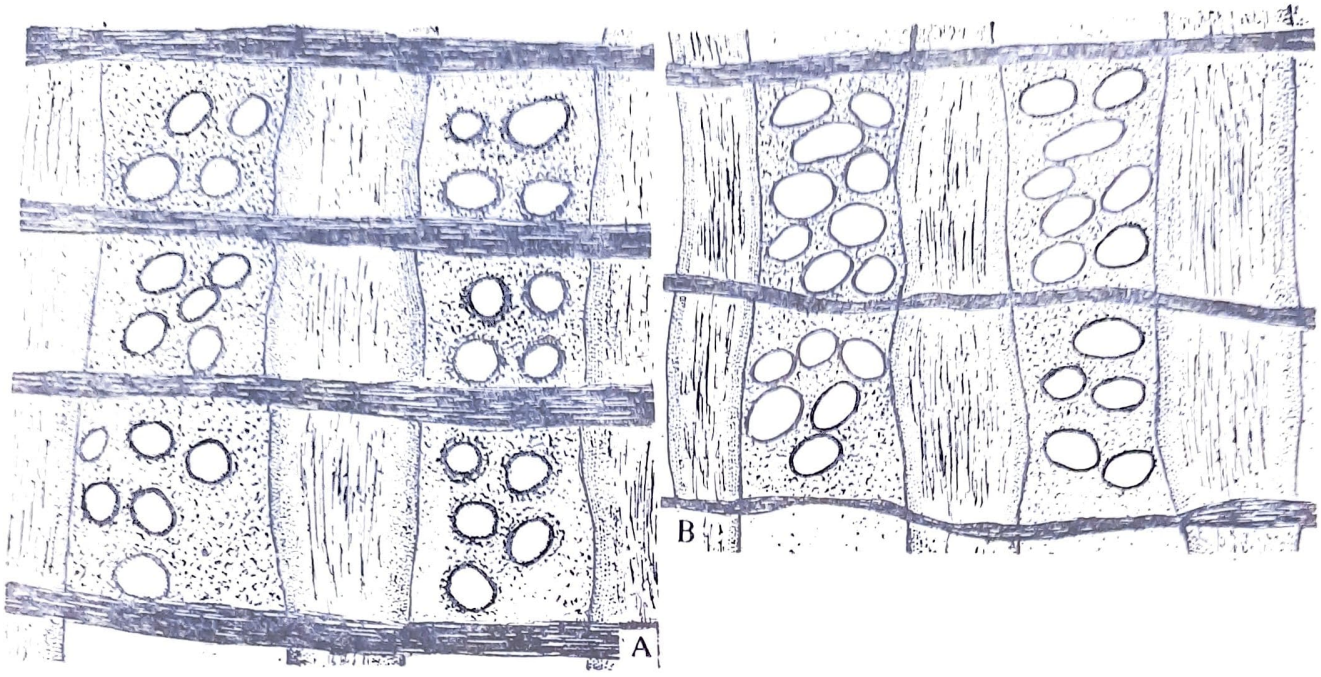
*Transverse section*—The secondary wood is pycnoxylic composed of tracheids and xylem rays only. Growth zones are not visible to unaided eye, but at places blackish-brown streaks give the appearance of growth rings. The growth zones are also not well marked (Pl. 1, Fig. 1). The late wood is represented by a single row of tracheids which is extremely narrow in comparison to early wood. The shape of late wood cells is narrow and elongate. Width of the late wood is $\pm$ 6 $\mu$. The early wood zone is 24-40 cells deep, thick-walled, square to rectangular in shape and their size varies from 24-60 $\mu$. The intermediate wall between the tracheids is 8-10 $\mu$ thick. The xylem rays are placed at an interval of 4-14 tracheids.

*Pitting*—Both radial and tangential walls of the tracheids are pitted. However, the pitting on the tangential wall of the tracheids is not common. The radial wall of the tracheids show uniseriate to tetraseriate pitting. Biseriate and triseriate pitting are more common. The uniseriate (Pl. 1, Fig. 2) pits are either arranged in a straight row or irregular. When biseriate, triseriate and tetraseriate, the pits are arranged alternate, sub-opposite or opposite (Pl. 1, Figs. 3, 4). They are either contiguous or separate (i.e. arranged in distinct rows). In several tracheids the pits are arranged in groups of either 2, 3, or 5-6 pits (Pl. 1, Fig. 3). When pits are in pair, they are placed opposite to each other and the third one occupying the central position between the two, either below or above. Groups of 5 or 6 pits show stellate arrangement. Pits are bordered, circular to circular-oval when separate and hexagonal to flattened when contiguous. Rims of Sanio are absent. The diamensions of circular pits are 10.5-14 $\mu \times$ 10.5-12 $\mu$ (average 12 $\times$ 10.5 $\mu$) and that of flattened pits 8-12 $\times$ 8-10 $\mu$. The pit-pores in most of cases are well preserved. It is circular in outline and placed at the centre of pits. Diamension of pore is 3.5-5 $\mu$ (Text-fig. 1).

Pitting on the tangential walls of the tracheids is comparatively rare than on the radial walls (Pl. 1, Fig. 5) Pits are either arranged scattered, in uniseriate or even biseriate rows; they may be contiguous or separate, and are arranged opposite or alternate. Pits are bordered, circular or circular-oval in outline and comparatively smaller than the radial pits (6-8 $\mu$ in size). Pit-pores are circular to oval in outline and 2.5-3 $\mu$ in size.

*Comparison*—Due to presence of several simple pits in the cross-field area and araucaroid pitting, the wood is referable to *Zalesskioxylon* Lepekhina & Yatsenko-Khmelevsky. *Z. sahnii* (Singh) Lepekhina (1972) differs in the absence of pits on the tangential wall of tracheids and few pits in the cross-field area. *Zalesskioxylon barakarense* (Surange & Saxena) Lepekhina (1972) differs in the presence of xylem parenchyma in secondary woods. *Araucarioxylon kharkhariense* (Maithy) Maheshwari (1972) resembles in the presence of pits on the tangential wall of tracheids but differs in the presence of bordered pits in the cross-field areas. *Araucarioxylon manieroi* (Krsl. & Dolli.) Maheshwari (1972) from Brazil shows intercellular spaces in the secondary xylem, and the pit-pores of the bordered pits are boat shaped, whereas in the present wood, the intercellular spaces are absent and the pit-pore

is broadly oval. *Protophyllocladoxylon derbyi* (Oliveira) Maheshwari (1972) is characterised by the presence of uniseriate pits, and 1 or 2 big, simple pits in the cross-field.




Text-fig. 1. A & B. Simple pits in the cross-field area. ×500.

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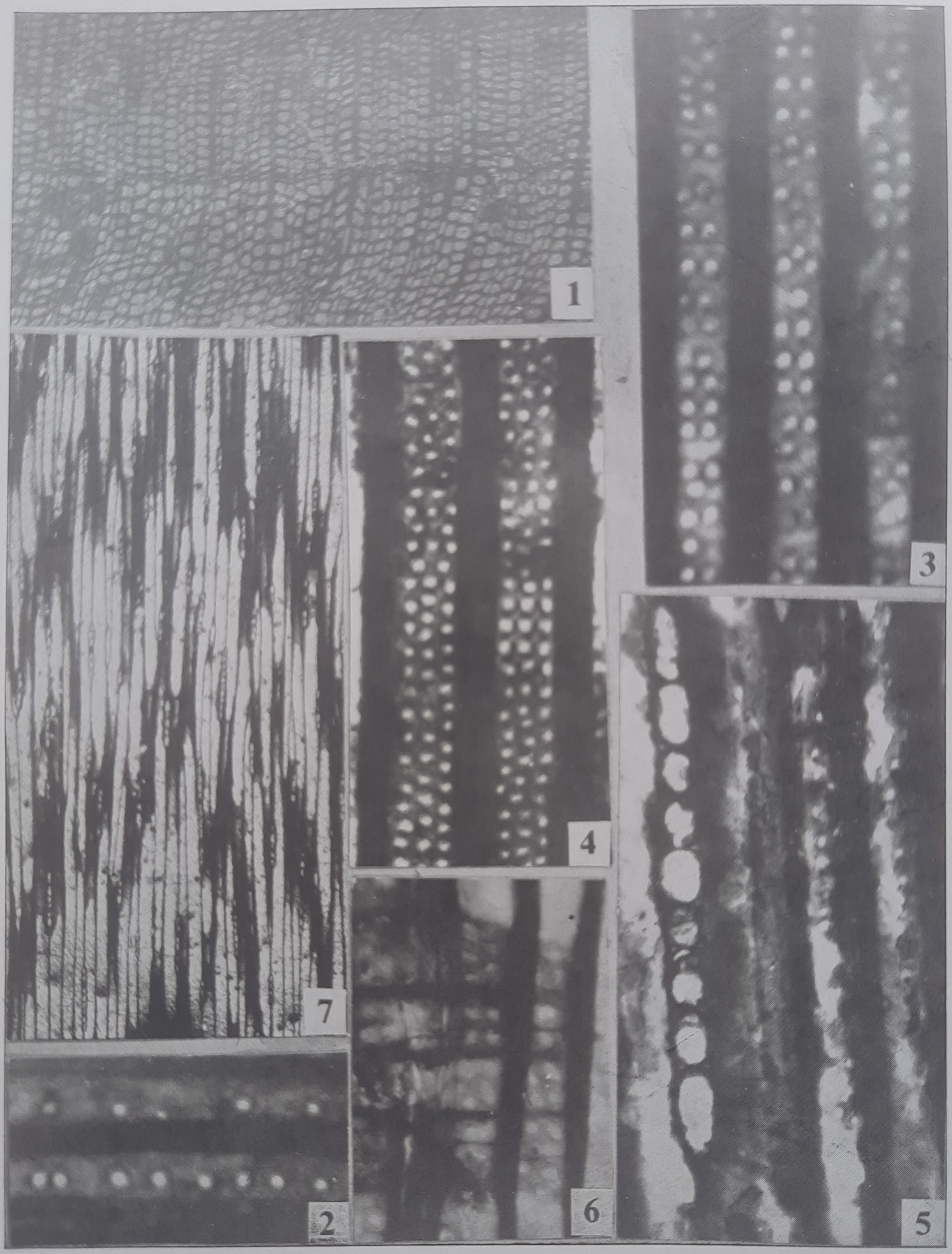
## EXPLANATION OF PLATE

PLATE 1

*Zalesskioxylon zambesiensis* sp. nov.

1. Transverse section. ×40.
2. Uniseriate radial pitting. ×400.
3. Biseriate radial pitting. ×400.
4. Triseriate radial pitting. ×400.
5. A medullary ray and uniserate ptting on the tangential wall of tracheids. ×400.
6. Simple pits in the cross-field area. ×400.
7. Tangential section of wood showing uniseriate or partly biseriate medullay rays. ×100.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