



# REVIEW OF RESEARCH

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## A NEW SPECIES *AUSTRALOXYLON VAGYANIENSIS* FROM LOWER GONDWANA OF CHANDRAPUR DISTRICT, MAHARASHTRA

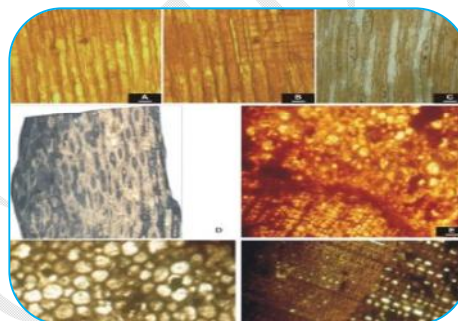
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### ABSTRACT:

Several petrified woods were collected from Panwadala in Chandrapur District of Maharashtra. A promising specimen numbering PNW/07/2015 is anatomically studied and agrees with the genus *Australoxylon* Margurier. Hence it is identified with it. On account of their unique anatomical characters it was found that it is a new species of the genus. Hence It is described as *A. vagyaniensis* sp. nov. The locality belongs to Kamthi Formation of Maharashtra-Lower Triassic age. It is a new addition to the fossil flora of Kamthi Formation.



**KEYWORDS:** *Australoxylon*, Petrified woods, Anatomical features, Kamthi Formation, - Lower Triassic.

### INTRODUCTION :

Fossil flora of the Kamthi Formation of Chandrapur District in Maharashtra was described by following workers Sahani (1932), Agashe (1977), Agashe and Shashi Kumar (1996, 1997, 2002), Chitale (1949), Biradar and Bonde (1981, 1984), Chandra and Prasad (1979, 1981), Mahabale and Vagyan (1980), Prasad (1982, 1986), Prasad and Chandra (1978a, b, 1981), Vagyan and Chougule (2001), Vagyan and Jamane (1986), Vagyan and Raju (1981) Jadhav (2014, 2019).

### MATERIAL AND METHODS:

The specimen is silicified

decorticated wood measuring 12 cm. long and 3.6 cm. broad. The present specimen is a piece of secondary wood without pith and primary xylem. The slides showing T.S., T.L.S. and R.L.S. were prepared by thin ground section method. Following anatomical characters were observed in it.

### DESCRIPTION:

**T.S.:** The present wood is a piece of secondary xylem without pith and primary xylem. The secondary xylem is differentiated into spring wood and autumn wood. It shows three distinct growth rings within a distance of 1.5 cm. Spring wood is 55 cells thick. The tracheids are squarish

in outline and radially arranged. They measure  $228.6 \mu\text{m} \times 27.52 \mu\text{m}$ . Autumn wood is 2 cells thick. The tracheids are horizontally stretched and measure  $0.6 \mu\text{m} \times 23.64 \mu\text{m}$ .

(Pl. I, Fig.1)

**T.L.S.:** Xylem rays are uniseriate to biseriate in nature. Mostly uniseriate. The height of rays varies 2 to 17 cells. Average height found is 6 cells in 10 counts. The Ray cells are oval in shape measure  $31.75 \mu\text{m} \times 22.58 \mu\text{m}$ . A distinct feature observed here is presence of xylem parenchyma. It is marked by horizontal septa. At places annular rings are observed.

(Pl. I, Fig. 2 - 4)

**R.L.S.:** Radial pits show the following patterns.

- 1) Uniseriate pits are circular flattened, separate and measure 28.58  $\mu\text{m}$  X 26.91  $\mu\text{m}$ . The pit pore is round and 13.93  $\mu\text{m}$ .  
(Pl. I, Fig.5)
- 2) Biseriate pits are circular, alternate and measure 33.87  $\mu\text{m}$  X 32.1  $\mu\text{m}$ .  
(Pl. I, Fig.6)
- 3) Pits are observed in groups of 2,3 and 4  
(Pl. I, Fig.7)
- 4) Multiseriate pits are circular and alternate. They measure 26.46  $\mu\text{m}$  X 26.81  $\mu\text{m}$ .  
(Pl. I, Fig.8)

#### **CROSS-FIELD PITS:**

Cross field pits are simple, circular to oval in shape. Their number varies from 3-4. They measure 4.45  $\mu\text{m}$  X 3.46  $\mu\text{m}$ .

(Pl. I, Fig.9)

#### **IDENTIFICATION AND COMPARISON:**

The wood shows 1-3 seriate radial pits. The pits in groups represent a combination of *Australoxylon* and *Abietinean* features. These characters are agrees with generic characters of *Australoxylon*. The genus was instituted by Margurier (1971) from Lower Gondwana of South Africa. Hence the wood is generically identified with it. Prasad and Chandra (1981) reported two species of *Australoxylon* from Kamthi Formation of Chandrapur District in Maharashtra.

It is compared with *A. natalense* Margurier (1973) in having 1-2 seriate xylem rays, 1-3 seriate mixed type of radial pitting and absence of tangential pitting. But present wood differs from *A. natalense* in having xylem parenchyma, annual rings, 3-5 field pits and bars of sanio. In *A. natalense* annual rings and xylem parenchyma are absent. *A. natalense* comes from Lower Gondwana of Ecca Formation of South Africa, while present wood belongs to Kamthi Formation of India.

It is also compared with *A. barakarensis* Margurier (1973) in having 1-3 seriate mixed type of radial pitting and 2-5 field pits. But present wood differs from *A. barakarensis* in having 1-3 xylem rays and annual rings. In *A. barakarensis* xylem rays are uniseriate, annual rings are absent and tangential pitting is present. *A. barakarensis* comes from Barakar Stage of Bihar. While present wood belongs to Kamthi Formation of Maharashtra.

It is also comparable with *A. Kanhargaoense* Prasad and Chandra (1978) in having 1-2 seriate xylem rays and 1-3 seriate mixed type of pitting and pits in groups of 2,3 and 4. But present wood differs from *A. Kanhargaoense* in having presence of annual rings and xylem parenchyma. and 2-4 field pits. In *A. Kanhargaoense* xylem parenchyma and annual rings are absent and number of field pits is 1-7 (mostly 4). *A. Kanhargaoense* and present wood comes from Kamthi Formation of Maharashtra.

Further it is also comparable with *A. Kharkariense* Margurier (1973) in having 1-2 seriate xylem rays, 1-3 seriate mixed type of pitting, pits in groups of 2 and 3 and 2-5 field pits. But present wood differs from *A. Kharkariense* in having xylem parenchyma and annual rings. *A. Kharkariense* comes from Barakar Stage of Bihar, while present wood belongs to Kamthi Formation of Maharashtra.

From the above comparison it is found that present wood differs from all the Known species of *Australoxylon* Margurier. Hence the present wood is reported as a new species namely *Australoxylon vagyaniensis* sp. nov. The particular name is after the eminent palaeobotanist Department of Botany, Shivaji University, Kolhapur.

#### **Diagnosis:**

Secondary petrified wood showing spring wood and autumn wood. Growth rings distinct. Spring wood 228.6  $\mu\text{m}$  X 27.52  $\mu\text{m}$ . cells thick. Tracheids squarish in shape. Autumn wood 2 cells thick. Tracheids horizontally stretched. Xylem rays uniseriate, height varies from 2- 13 cells. Average height 6

cells. Xylem parenchyma and annual rings present. Radial pits 1 – 3 seriate. Uniseriate pits circular and separate. Biseriate pits circular alternate or opposite. Multiseriate pits circular and alternate, pits in group of 2, 3 and 4. Hexagonal pits are biseriate and alternate. Cross field pits 3 – 4 simple circular to oval

**Type:** - PNW/07/2015

**Locality:** -Panwadala, District. Chandrapur, Maharashtra.

**Horizon:** - Kamthi Formation.

**Geological age:** -Lower Triassic.

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**Plate: 1 - 9: *Australoxylon vagyaniensis* sp. nov.**

1. T. S. Showing secondary xylem differentiated into spring wood SP and autumn wood AU
2. T. L. S. Showing uniseriate and biseriate xylem ray
3. T. L. S. Showing xylem parenchyma XP
4. T. L. S. Showing annual rings AR
5. R. L. S. Showing Uniseriate pits are circular flattened, separate and measure  $28.58 \mu\text{m} \times 26.91 \mu\text{m}$ . The pit pore is round and  $13.93 \mu\text{m}$ .
6. R. L. S. Showing biseriate pits are circular, alternate and measure  $33.87 \mu\text{m} \times 32.1 \mu\text{m}$  R. L. S. Showing multiseriate pits are hexagonal compact and measure  $24.72 \mu\text{m} \times 60.02 \mu\text{m}$ .
7. R. L. S. Showing Pits are observed in groups of 2,3 and 4
8. R. L. S. Showing Multiseriate pits are circular and alternate. They measure  $26.46 \mu\text{m} \times 26.81 \mu\text{m}$ .
9. R. L. S. Showing 3 - 4 simple, circular to oval cupressoid cross-field pits CFP  $4.45 \mu\text{m} \times 3.46 \mu\text{m}$ .



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