Studies in fossil gymnospermous woods-part VIII. A new species of *Araucarioxylon — A. wejgaoense* from Lower Gondwana of Chandrapur District, Maharashtra

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Recent palaeobotanical field work carried out in Lower Gondwana exposures of Chandrapur District has brought to light several petrified woods with good preservation. Most of them were found in nalas. Amongst them, a new species of *Araucarioxylon* has been described in this paper.

Key-words—Fossil wood, Anatomy, *Araucarioxylon*, Gymnosperm, Lower Gondwana, India.

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सारांश

अनावृतबीजी अश्मित काष्ठों का अध्ययन-भाग 8. महाराष्ट्र में चन्द्रपुर जनपद के अधरि गोंडवाना से *अराकेरिऑक्सीलॉन* की एक नई जाति - *अ. वेजगाँवयेन्से*

श्रीपद एन. अगाशे एवं एम.एस. शशीकुमार

महाराष्ट्र में चन्द्रपुर जनपद में अधरि गोंडवाना अनावरणों से कई सुपरिरक्षित अश्मीभूत काष्ठ प्राप्त हुई हैं। इनमें से अधिकतर नालों से एकत्र की गई हैं। इस शोध-पत्र में *अराकेरिऑक्सीलॉन* की एक नई जाति का वर्णन किया गया है।

EXTENSIVE palaeobotanical investigation has been made from the Lower Gondwana strata occurring in Bihar, Bengal, Assam, Madhya Pradesh and Maharashtra. The main contributions to our knowledge of Lower Gondwana petrified woods from India inlcude those of Agashe (1969, 1977), Agashe and Chitnis (1971), Agashe and Gowda (1978, 1981), Agashe *et al.* (1981a, 1981b), Agashe and Prasad (1984, 1989), Biradar and Bonde (1981, 1984), Chandra and Prasad (1979, 1980, 1981), Chitaley (1949), Jacob (1950), Krausel *et al.* (1962), Kulkarni (1971), Kulkarni *et al.* (1971), Lakhanpal (1977), Mahabale and Vagyani (1980), Meheshwari (1964, 1965, 1967), Maithy (1965, 1968, 1974, 1977), Prakash *et al.* (1962), Prasad (1982), Prasad and Chandra (1978a, 1978b, 1980, 1981), Ramanujam (1953, 1978), Surange and Maithy (1962, 1963), Surange and Sah (1957), Surange and Saksena (1959), Vagyani and Mahabale (1974), Vagyani and Raju (1981), and Varadpande (1978).

The present work involved collection and investigation of a large number of well preserved petrified woods from various Lower Gondwana localities of Chandrapur District. The Present paper incorporates the anatomical studies of a petrified wood.

MATERIAL AND METHOD

Petrified wood described here was collected during field trips to Chandrapur District, Maharashtra.

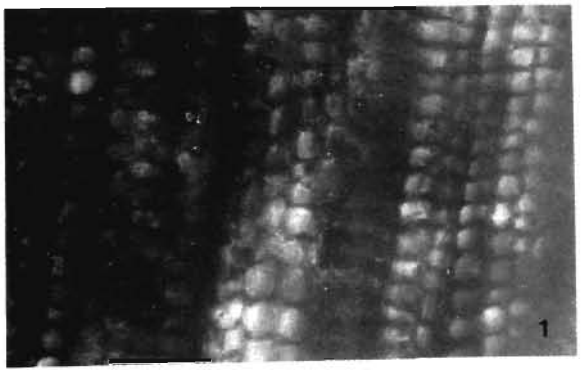
Table 1—Showing comparative anatomical characters of species of *Araucarioxylon*

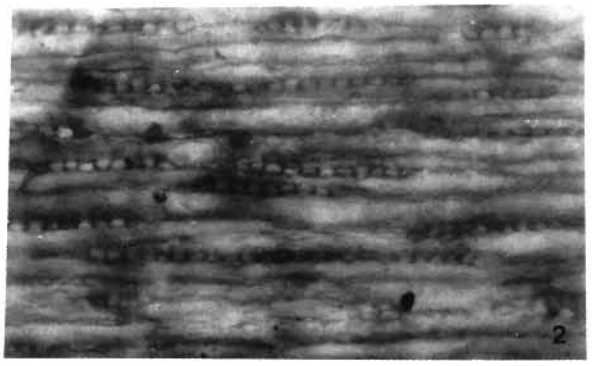
Species	Age	Growth ring	Medullary ray	Tangential pitting	Border pitting on radial walls	Cross field pits	Locality
A. arberi (Seward 1919) comb. nov. Maheshwari 1972	Upper Carboniferous	Distinct	1-21 cells usually 6-12 cells high	Absent	1-4 seriate circular	1-10 oblique	Australia
A. manieroi (Krausel & Dolianiti 1958) comb. nov. Maheshwari 1972)	Upper Carboniferous	Distinct	1-47 cells high average of 9-10 cells high	Absent	1-4 seriate pore elliptical	1-9 some times in groups	Brazil
A. mohgaoensis Lakhanpal *et al.* 1977	Early Tertiary	Distinct	Uniseriate 2-30 cells high mostly 8-15 cells	Absent	1-3 seriate mostly 2 seriate contiguous alternate Hexagonal	1-2 bordered cupressoid circular-oval in shape	Mohgaon Kalan Chindwara District M.P.
A. gondwanense (Maithy 1964) comb. nov. Maheshwari 1972	Lower Permian	Distinct	13% rays Biseriate 1-43 cells high average of 9-10 cells high	Absent	1-5 seriate alternate/sub-opposite	2-8 contiguous or seperate circular-oval in shape	Jharia Coalfield, Bihar
A. parbeliense (Rao 1935) comb. nov. Maheshwari 1972	Permian	Distinct	1-24 cells mostly 2-3 cells high	Absent	1-5 seriate pore circular-oval	8-9 bordered pores oblique slit like	Parbelia Colliery, Bengal
A. lobarense Agashe & Gowda 1978	Permian	Distinct	1-2 seriate 2-27 cells high average of 11 cells high	Present	1-4 seriate round-hexagonal with distinct border	2-9 most commonly 2,4,6	Chandrapur, Maharashtra
A. surangeii Agashe, Prasad & Suresh 1981	Permian	Distinct	1-2 seriate Commonly uniseriate 1-35 cells average of 4 cells high	Present	1-4 seriate alternate, separate contiguous hexagonal	1-11 cupressoid commonly 2-4 round-oval	Lathi, Chandrapur, Maharashtra
A. lathiense Agashe, Prasad & Suresh 1981	Permian	Distinct	Uniseriate 1-27 cells high average of 5 cells high	Absent	1-4 seriate alternate, separate contiguous	1-10 cupressoid circular-oval with thin border	Lathi, Chandrapur, Maharashtra
A. nandori Vagyani & Raju 1981	Upper Permian	Distinct	1-2 seriate mostly uniseriate 2-30 cells high		1-multiseriate free/contiguous hexagonal	2-6 cupressoid	Nandori, Chandrapur, Maharashtra
A. Kothariensis Agashe & Prasad 1984	Permian	Distinct	1-3 seriate 1-44 cells high with an average of 8 cells	Present	1-4 seriate araucaroid free/contiguous radial pits in groups of 2,3,4,6,8 occur.	1-12 cupressoid with thin border commonly 4-8 field pits occur	Wejgaon, Chandrapur, Maharashtra
A. bhivkundense Agashe & Prasad 1984	Permian	Distinct	1-2 seriate free 1-33 cells high with an average height of 8 cells	Present	1-2 seriate free/contiguous some times in groups of 2,3,4	1-8 cupressoid commonly 1-2 field pits per field occur	Bhivkund, Chandrapur, Maharashtra
A. wejgaoense sp. nov.	Permian	Distinct	1-2 seriate mostly uniseriate 2-34 cells high on an average of 8-12 cells high.	Present	1-2 seriate mostly biseriate contiguous altornate/ sub-opposite may be in groups of 2 also.	1-6 cupressoid commonly 2-4 field pits occur	Wejgaon, Chandrapur, Maharashtra

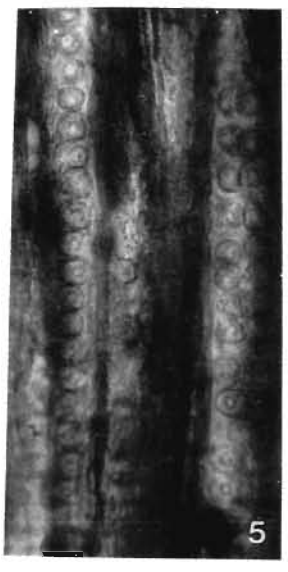
PLATE 1

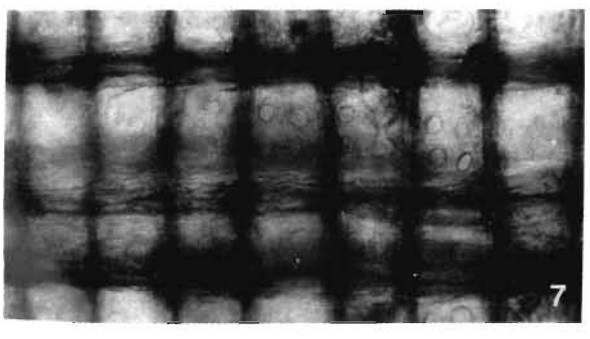
Araucarioxylon wejgaoense sp. nov.

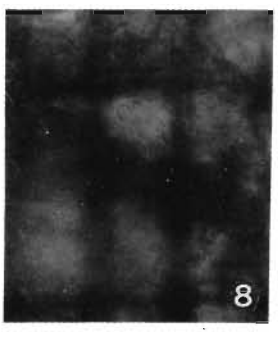
1. T.S. of the spring wood x 250.
2. Uniseriate and biseriate medullary ray in T.L.S.X 100.
3. R.L.S. showing uniseriate contiguous bordered pits x 400.
4. R.L.S. with biseriate contiguous or free bordered pits x 400.
5. Uniseriate and biseriate bordered pits, biseriate pits in groups of two x 400.
6. R.L.S. showing biseriate alternate bordered pits x 1000.
7. Cross field having two, three, four field pits x 400.
8. Cross field showing maximum of six field pits x 400.
9. Cross field having four field pits x 1000.











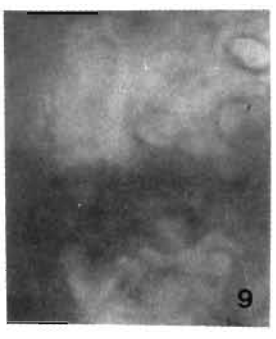


PLATE 1

One of the petrified woods numbered as B.U.P.W. No. 2074 was silcified and collected from Wejgaon, a small village, situated at a distance of about 60 km southeast of Chandrapur. This wood was collected from an open field. Several thin sections in different planes were made using standard methods of sectioning. Though these specimens were rich in silica lot of organic matter was also well preserved with them.

DESCRIPTION

***Araucarioxylon* Kraus 1870 emend. Maheshwari 1972**

Araucarioxylon wejgaoense *sp. nov.*

Diagnosis—Decorticated secondary wood with distinct growth rings, 1-2 seriate, mostly uniseriate, 2-34 cells high medullary ray, 2 seriate rays being rare. Tangential pits present, radial pits 1-3 seriate. Araucaroid field pits, cross field pits 1-6 cupressoid type.

Holotype—B.U.P.W. no. 2074 along with slides deposited in Palaeobotany and Palynology Laboratory, Department of Botany, Bangalore University, Bangalore.

Locality—Wejgaon Village, Chandarpur District, Maharashtra, India.

Horizon—Lower Gondwana (Permian).

The anatomical characters of the present wood compare with the generic diagnostic characters of *Araucarioxylon.* Further comparison with known species of *Araucarioxylon* made us to describe a new species for this wood.

Observations—The material consists of decorticated secondary wood measuring 11.3 cm in length and 6.6 x 5 cm in thickness. Secondary wood shows distinct growth rings. Spring wood tracheids are 120-140 cells thick and appear mostly rectangular in shape measuring 180 x 60 µm (Pl. 1, fig. 1). Autumn wood tracheids are comparatively narrow with 2-4 cells thick measuring 60 x 30 µm. Medullary rays are 1-2 seriate, commonly uniseriate, rarely biseriate rays occur 2-34 cells high, average height of ray is 8-12 cells, tangential pits distinct. Uniseriate rays constitute 98 per cent whereas biseriate rays are represented by 2 per cent of the total rays. Radial pits range from 1-2 seriate. Araucaroid bordered pits circular oval in shape with distinct border. Radial pits arranged in various manner. Uniseriate radial pits are contiguous (Pl. 1, fig. 3). Biseriate radial pits contiguous/free alternate sub-opposite, arranged in group of 2, 4. Hexagonal biseriate radial pits are also seen (Pl. 1, figs 4, 5, 6.) Maximum diameter of radial pit 25 µm, that of lumen is 10 µm. Cross field pits 1-6 cupressoid spherical oval in shape, commonly 2, 4 pits occur in a field. Average diameter of field pit is 15 µm (Pl. 1, figs 7, 8, 9).

DISCUSSION AND COMPARISON

The petrified wood described in this paper shows the typical characters of *Araucarioxylon* Kraus emend. Maheshwari 1972 in the presence of cupressoid round pits in cross field areas and Araucaroid pitting on radial walls. In having maximum number of six cross field pits the present species comes closer to *A. nandori*, but differs in radial pitting and ray characters. However, this new species does not have any resemblance with *A. bhivkundense* in cross field pits and in medullary rays. The only similarity is in the arrangement of radial pits. In both *A. wejgaoense* and *A. bhivkundense* the radial pits are arranged in groups of 2, 4. *A. wejgaoense* sp. nov. differs from *A. mohgaoensis* in radial and cross field pit characters. In both the species, the medullary ray characters are similar being mostly uniseriate, although average ray height show slight variations. The other araucarian wood, *A. loharense,* described from the same horizon, differs from new wood in medullary ray and radial pitting. The only resemblance between the two is in cross field pits arrangement where 2, 4 pits/field occur commonly. It also somewhat resembles *A. surangeii* in cross field pits arrangement, but differs from *A. surangeii* in medullary ray and radial pitting characters.

The comparison of the new species with all the known and described species of *Araucarioxylon* has been shown in the Table 1.

Since it differs from all the known species, it has been described as a new species– *A. wejgaoense.* The specific epithet is after the village Wejgaon from where the wood was collected.

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