SOME FURTHER OBSERVATIONS AND REMARKS ON *ARAUCARIOXYLON DAINTREEII* CHAPMAN

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ABSTRACT

Some further observations on the anatomical structure of *Araucarioxylon daintreeii* are made and on basis of the study it is suggested to retain *A. daintreeii* a distinct species.

INTRODUCTION

SAHNI and Singh (1926) described a fossil wood recorded from the Permian of New South Wales of Australia under the name *Dadoxylon arberi* Seward. While describing the above fossil wood Sahni and Singh (*l.c.*) also examined the sections of the type specimen of *Araucarioxylon daintreeii* Chapman (1904) recorded from the Permo-Carboniferous beds in the Bowen river Coalfields, Queensland (Baron river, a southern tributary of the Burdekin River) and came to the conclusion that the wood shows a close comparison to *D. arberi* Seward both in radial pitting and the structure of the cross-field pits, hence the wood was considered synonymous to *D. arberi* Seward. Kräusel (1928) remarked that due to the presence of a very small pith (1·7 mm.) it will not be advisable to merge it under *D. arberi*. The slides of *Araucarioxylon daintreeii* preserved at the Birbal Sahni Institute of Palaeobotany were reexamined. The examination revealed the record of some new structures which leads to the conclusion that a distinct name should be retained for this fossil wood.

DESCRIPTION

Dadoxylon Endlicher

Dadoxylon daintreeii Chapman

Pl. 1, Figs. 1-4; Text-figs. 1A-D

Synonymy:
1904 — *Araucarioxylon daintreeii* Chapman
1926 — *Dadoxylon arberi* Sahni & Singh

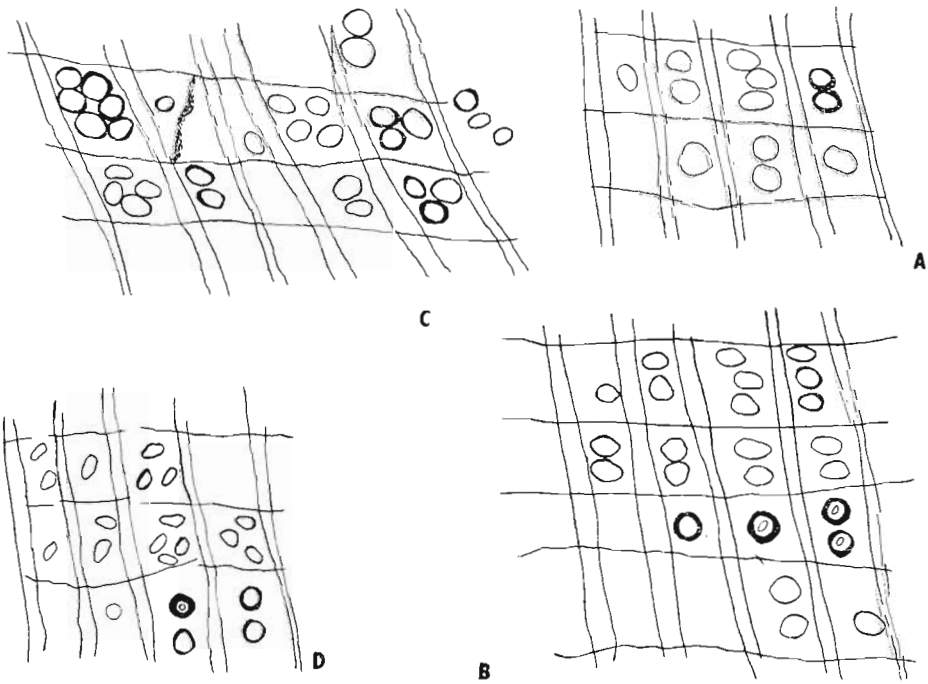
Only one transverse section and three longitudinal radial sections of the fossil wood are preserved at the Sahni Institute Museum. The pith is small (1·7 mm.), composed of parenchymatous cells, closely packed. The cells in transverse sections are rectangular, hexagonal or polygonal in shape (Pl. 1, Fig. 4). The primary xylem encircles the pith in form of a continuous ring and the secondary xylem abuts over the primary xylem. No transfusion tissue or separating layer is present in between the pith and the primary xylem. The primary xylem is endarch.

Secondary xylem is composed of tracheids and medullary rays. Tracheids are only radially pitted, commonly uniseriate and occasionally biseriate. Commonly pits are contiguous and rarely separate. Pits ± circular, 10-14 μ in diameter. Pore ± circular in outline, sometimes oblique or verticillate.

The most diagnostic feature of this wood is the pits in the cross-field area. Sahni and Singh, (1926: 110) remarked that the pits in the field agree with those of *D. arberi*. However, the present examination shows that the arrangement is very variable. Pits in the cross-field area are either commonly simple, or sometimes they are bordered. The number of pits in the cross-field area is also very variable. The pits are either 1 or 2, simple big circular or oval pits in cross-field (Podocarpoid or Dacrydoid) (Pl. 1, Figs. 2 & 3; Text-fig. 1A, B), or 4-6 simple elleptical with oblique apertures (Cupressoid pits) (Pl. 1, Fig. 4; Text-fig. 1D), 4-9 bordered circular or oval alternate or and contiguous pits (Araucarioid pits) (Pl. 1, Fig. 4; Text-fig. 1C).

COMPARISON AND DISCUSSION

In recent years the studies of the fossil woods from the Permian of the Southern hemisphere have shown that the secondary wood characters are homogeneous, though, their primary xylem and pith characters are variable. On basis of the pith and primary xylem character (which are now regarded important features for identification) several new genera have been proposed (Kräusel,



TEXT-FIGS. 1A-D — 1A-B. Radial longitudinal section of the stem showing 1, 2 or 3 simple pits and 1 or 2 bordered pits in the Cross-field area. × 400. 1C. Radial longitudinal section of the stem showing Araucaroid pitting in Cross-field area. × 400. 1D. Radial longitudinal section showing oblique pits in the Cross-field area and uniseriate bordered pits on the radial walls of the tracheids. × 400.

1956; KRÄUSEL & RANGE, 1928; KRÄUSEL & DOLIANITI, 1958). It is well known from the studies of the Palaeozoic fossil woods of the Southern hemisphere that they resemble considerably in secondary wood characters, though, differ remarkably in their primary xylem and pith characters (KRÄUSEL, 1928; KRÄUSEL & DOLLIANITI, 1958). Therefore, it will be more justfiable to separate the fossil wood of Chapman from *D. nicolii* Sew., which is based only on the secondary wood characters. Beside this in *D. nicolii* only 2-6 simple pits are present in the cross-field areas, whereas in Chapman's specimen both simple and bordered types of pits are present. With the woods of *D. nicolii* type Walton (1925) had also suggested " when any wood with well preserved primary structure and possessing the *Dadoxylon arberi* — type of secondary wood is found, it must be given a distinct name ". Later Kräusel (1928) supported this view. In view of this it is hereby proposed to keep *Araucarioxylon daintreeii* Chapman separate from *D. nicolii* Seward. However, the older name *Dadoxylon* Endlicher will be used in place of *Araucarioxylon*.

Dadoxylon daintreeii Chapman is comparable due to the homogenous parenchymatous pith with *Dadoxylon porosum* Kräusel & Range (1928), *Dadoxylon rangeii* Kräusel & Range (1928), *Dadoxylon krauseli* Sahni (1933), *Dadoxylon parenchymosum* Surange & Maithy (1963) and *Dadoxylon jamuriense* Maheshwari (1965), but *D. daintreeii* Chapman differs from all of them in the presence of mixed type of pitting in the cross-field areas, i.e. 1 or 2 big simple pits or 4-9 bordered or circular pits or 3-6 oblique pits.

In the wood *Dadoxylon daintreeii* the arrangement of the cross-field pits is variable. The range of variation in the arrangement, shape and number of cross-field pits raises question on the generic status of some fossil woods for which this character has been applied as diagnostic features. Kräusel (1956) instituted the genus *Megaporoxylon* and Maheshwari (1966) *Damudoxylon* for the fossil woods with secretory cells in the

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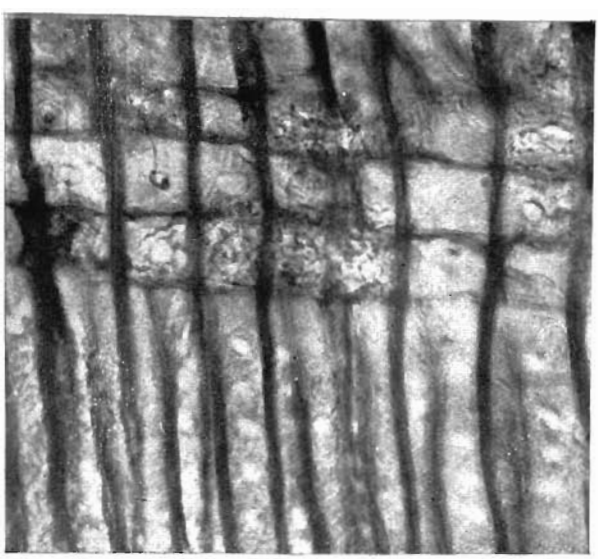

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pith. The former is characterized by 1 or 2 or 3 big simple pits in the cross-field areas, while the latter differs from the former in having 1 to 9 bordered small pits in the cross-field area. The record of 1 or 2 big simple field pits or 4-9 small simple and bordered pits and 4-6 oblique simple pits in the cross-field area in *Dadoxylon daintreeii* raises doubt on the importance of this character for generic determination. From this study one feels it will not be justifiable to institute two different genera alone on the basis of this character. If so then the genus *Damudoxylon* will stand synonymy to *Megaporoxylon*, because the latter name has been applied earlier. It will not be out of place to remark upon another fossil wood *Trigonomyelon* Walton (1925; Synonymy: *Lobatoxylon* Kräusel, 1956). This wood has general araucarioid pitting and secretory cells in the pith. In these characters it compares with *Megaporoxylon* Kräusel (as proposed here), except that in *Trigonomyelon* the pith is prominently lobed. It is difficult to say that how much emphasis can be laid on the lobing feature of the pith. Because in many of the Palaeozoic woods of southern hemisphere one notes certain amount of lobing (*Barakaroxylon* Surange & Maithy, *Solenopitys* Kräusel & Dolianiti, 1958). Further, Zeiller (1895) pointed that lobing character of pith has a relationship with the departure of leaf traces. Therefore, it is felt that it will be more appropriate if this character is applied only for specific delimitation. Future anatomical works on these fossil woods will throw more light on the importance of different characters for generic determination.

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EXPLANATION OF PLATE

PLATE 1

1. Transverse section of a portion of a fossil wood showing pith, primary xylem and secondary xylem. × 100. (Slide No. 2706, Birbal Sahni Institute of Palaeobotany Museum).

2. Radial longitudinal section of the secondary xylem showing uniseriate separate pits on the trachiedal walls and eipore type of pitting (Podocarpoid) in the Crossfield area. × 400. (Slide No. 2707, Birbal Sahni Institute of Palaeobotany Museum).

3. Radial longitudinal section of the secondary xylem showing 2 or 3 separate pits (Dacrydoid) or 5 or 6 contiguous (Araucaroid) type of pitting in the Crossfield area. × 400. (Slide No. 2707, Birbal Sahni Institute of Palaeobotany Museum).

4. Radial longitudinal section of the secondary xylem showing uniseriate pitting and 2 or 3 oblique pits in the Cross-field area. (Slide No. 2707, Birbal Sahni Institute of Palaeobotany Museum).