

AN UNUSUAL TYPE OF PERFORATION PLATE IN *CANTHIUM BARBATUM* SEEM.
(RUBIACEAE)

by

P. J. Rudall

Jodrell Laboratory, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3DS, England

Summary

An unusual type of perforation plate, with a ring of pits surrounding a simple or irregularly reticulate perforation, is recorded in *Canthium barbatum* Seem. (Rubiaceae). Other irregular perforations also occur, although most are simple. Irregular and unusual perforations are usually associated with perforated ray cells.

Perforation plates in secondary xylem of Rubiaceae are mainly simple (Metcalfe & Chalk, 1950) although both Solereder (1885) and Koek-Noorman (1969) report the occurrence of some scalariform perforations near the primary wood in a few genera. Chalk and Chattaway (1933) record that in certain woods (including several genera of the Rubiaceae, and *Canthium ventosum*), whose rays have uniseriate margins, vessels sometimes pass obliquely through the uniseriate part of a ray. The intervening ray cell, which connects two vessel elements, itself resembles (and presumably functions as) a very short vessel element, as it has perforation plates in its radial walls, connecting with corresponding perforation plates in the neighbouring vessel elements.

During a routine examination of reference slides with a light microscope, for identification of an unnamed wood sample, I observed unusual perforation plates in wood of *Canthium barbatum*, of a type which does not appear to have been recorded in secondary xylem of Dicotyledons (for example, see Ohtani & Ishida, 1978; Meylan & Butterfield, 1975). This type consists of a perforation either partly or wholly surrounded by a ring of pits (Figs. 1–3). In some cases the ring of pits is complete, or it may be incomplete (Figs. 5, 6; this type resembles the perforation pictured by Meylan and Butterfield, 1975, for *Carmichaelia angustata*, a member of the Papilionaceae) sometimes consisting of very few pits, or there may be two or more concentric rings (complete or incomplete). Usually the central perforation is simple, but it may be irregularly reticulate (Fig. 4). The majority of perforations in this wood are normal simple ones, although reticulate or scalariform perforation plates also occur (Fig. 8 shows a combination simple/scalariform plate), and there are also occasional very irregular reticulate perforation plates (Fig. 7). In Fig. 7 there

are unusual disc-like structures with pitting in the centre and vesturing round the edge, which appear to be related to the perforation plate. Vesturing is a common feature of the perforation rim in *Canthium* (Figs. 3–8).

The unusual type of perforation plate in Figs. 1–3 resembles types occurring in primary xylem elements of various genera recorded by Bierhorst and Zamora (1965), such as *Cyperus alternifolius* (Cyperaceae).

All the different types of perforation plate seen here are most easily visible on the radial section. It is often difficult to establish whether they link up with another vessel element or a perforated ray cell, as described above (Chalk & Chattaway, 1933). However, close examination of both tangential and radial sections suggests that most of the simple perforations directly link two vessel elements, and most of the irregular types described here occur where a vessel passes through a ray.

The wood sample examined is from the Wood Museum, Royal Botanic Gardens, Kew (No. 10, 1929, from Raratonga).

References

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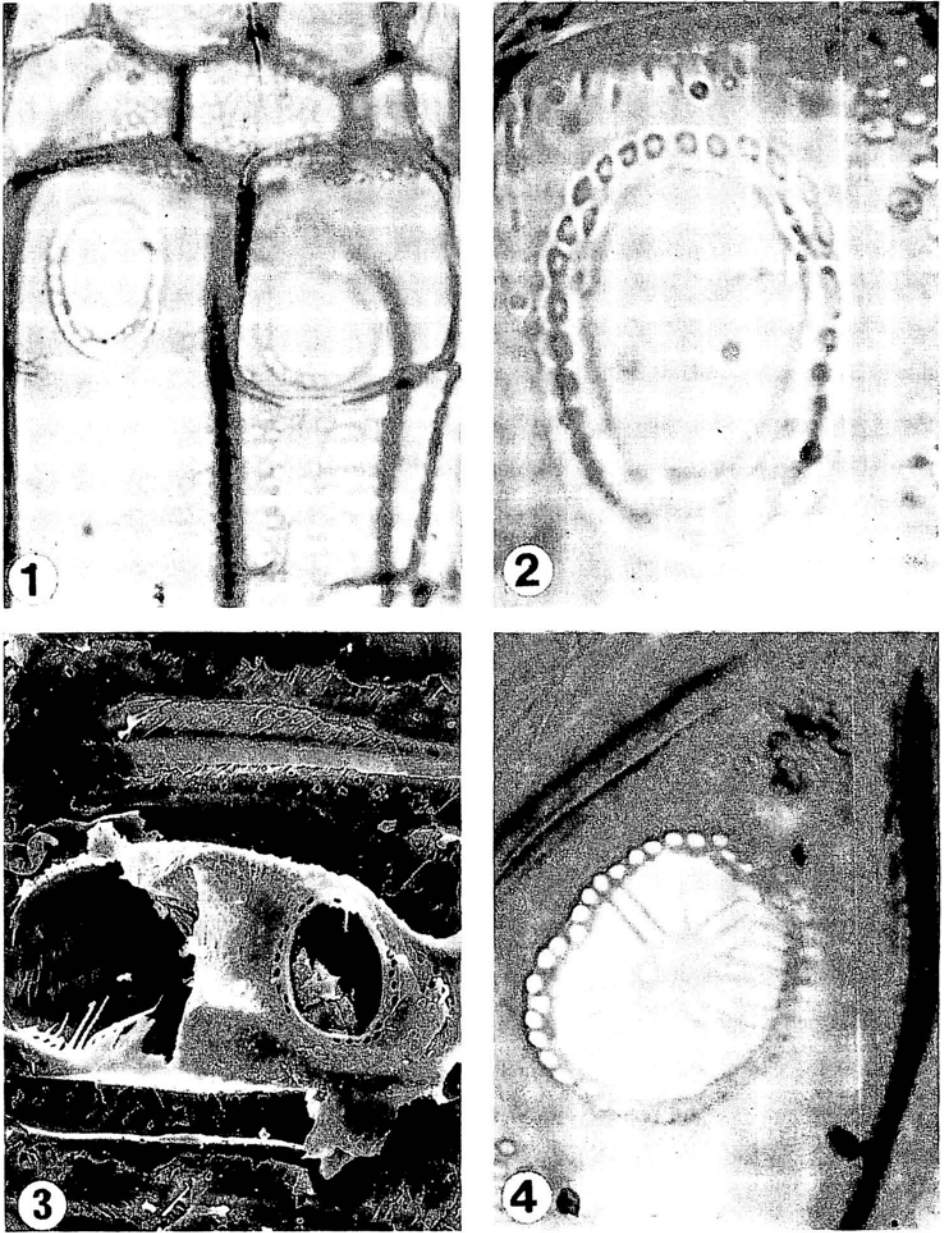


Fig. 1-4. Perforation plates in *Canthium barbatum*. — 1: Linking two vessel members with adjacent perforated ray cells, LM x 400. — 2: Close up, LM x 1000. — 3: Left hand perforation with remains of reticulate structure, SEM, x 400. — 4: Unusual form of reticulate perforation, LM x 1000.

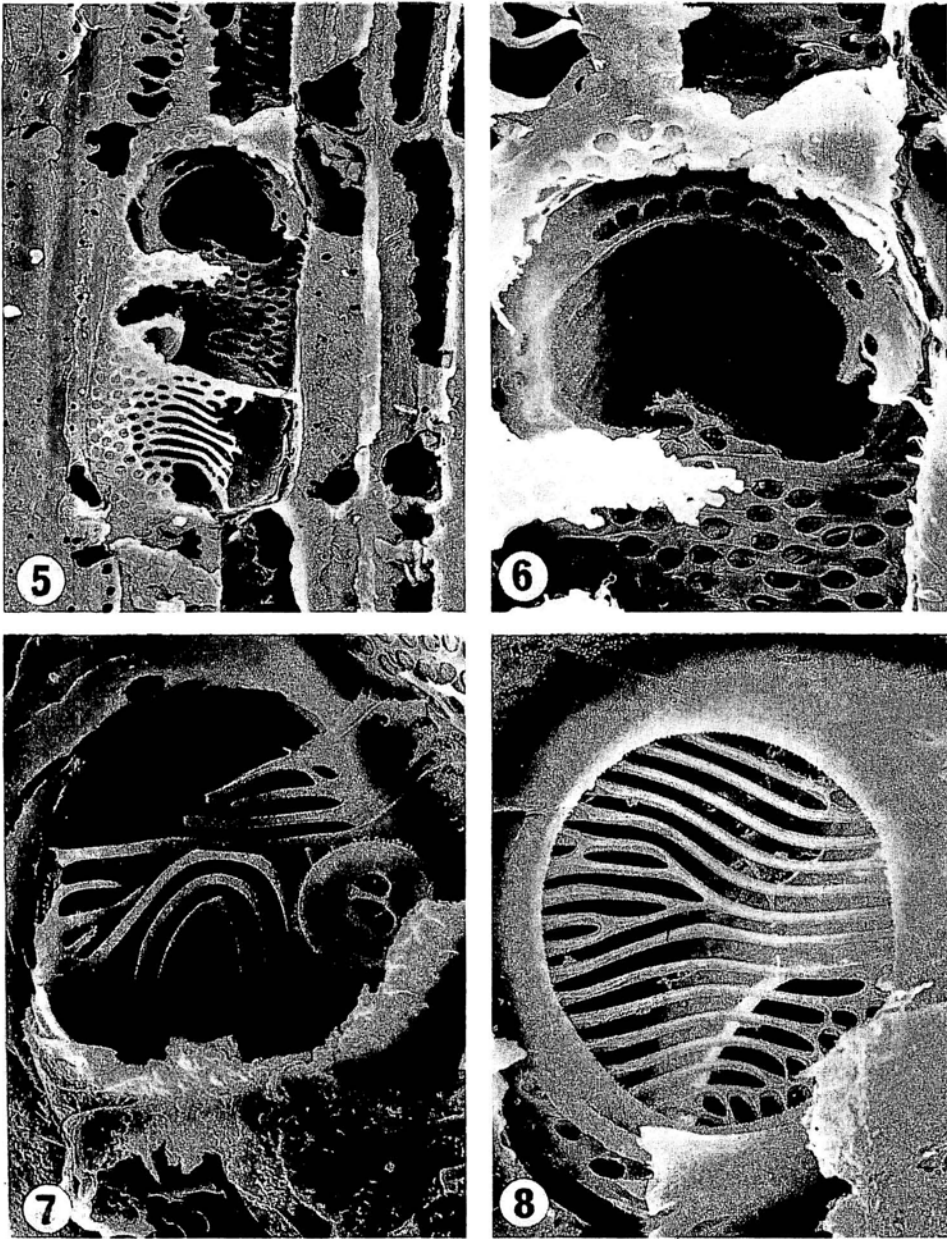


Fig. 5-8. Perforation plates in *Canthium barbatum*, all SEM. — 5: Two perforation plates presumably in upright, perforated ray cell, x 480. — 6: Close up, x 1200. — 7: Irregular perforation with disc-like structure. — 8: Combination simple/scalariform plate, x 1200.