WOOD ANATOMY OF XANTHOPHYLLUM ROXB.

by

Susannah Bridgewater and Pieter Baas
Rijksheerbarium, P.O. Box 9514, 2300 RA Leiden, The Netherlands

Summary
The wood anatomy of Xanthophyllum (Polygalaceae) is described, based on 56 specimens representing 23 (out of a total of 95) species. Solitary, wide vessels with simple perforations, a ground tissue of fibre-tracheids, parenchyma both vascentric and in fine bands, and narrow rays are constant for the genus. Ray composition, the precise distribution of axial parenchyma and occurrence of chambered crystals show a diversity which is discussed in connection with Van der Meijden’s recent classification of Xanthophyllum. The close mutual affinities of subgenera Brunophyllum and Exsertum are confirmed. Xanthophyllum fragrans from North Queensland has the longest vessel members and fibres of the genus, which may support the allegedly allopolyploid origin of this species.

The wider affinities of Xanthophyllum as based on wood anatomical similarity appear to be with other Polygalaceae as well as with the Trigoniacae.

Introduction
Xanthophyllum is a genus of shrubs and trees (1.5–)3–50 m high, mostly confined to the lowland tropical rain forest (few species occur at higher altitudes) of SE. Asia and Malesia, extending to S. India and Ceylon in the west, and to N. Queensland and the Solomon Islands in the east (Van der Meijden, 1982). Earlier accounts of the wood anatomy of Xanthophyl­hum, always based on few species, have not revealed much infrageneric variation (Moll & Jansonius, 1906; Lecomte, 1925; Den Berger, 1926; Reyes, 1938; Heimsch, 1942; Metcalfe & Chalk, 1950; Desch, 1954; Chowdhury & Ghosh, 1958; Hayashi et al., 1973). The timber of some species is of restricted applicability (Den Berger, 1926; Reyes, 1938; Desch, 1954) but on the whole the genus is commercially insignificant, due also to the very low frequencies of individual Xanthophyllum trees in the rain forest.

This wood anatomical study was undertaken as a complement to a taxonomic revision of Xanthophyllum (Polygalaceae) by Van der Meij­den (1982) and a previous leaf anatomical sur­vey by Dickson (1973). Although our research material was limited by the fact that samples could only be obtained of 23 out of the total of 95 species, it was hoped that this study could positively contribute to the discussion of infragen­eric classification and wider affinities of Xanthophyllum.

Materials and Methods
Sections and macerations were prepared ac­cording to standard techniques. Quantitative data are usually based on 25 measurements per sample. Because of the low vessel frequency, vessel members were often very scarce in macer­ation slides, and vessel member length was therefore measured in longitudinal sections, thus ignoring tails (never long) when present. Data on vessel and ray frequency are based on at least 10 counts in areas of a square millimeter or tangential distances of one millimeter respectively. In the description the range of mean values is given between the range of extremes.

The wood samples were obtained from a number of institutional wood collections (abbreviated according to Stern, 1978a). Where herbarium vouchers and collecting data allowed, identifications have been checked and in numerous instances corrected by Dr. R. van der Meijden; the nomenclature also follows Van der Meijden’s recent revision (1982), which im­plies that many of the names in the following list deviate from the original labels on the wood samples. In the list of material studied numbers in brackets indicate xylarium accession numbers; other numbers refer to herbarium vouchers. If a specimen is represented by branch material the diameter is indicated between brackets.

X. adenotus Miq.: Borneo, Jacobs 5450 (Lw) – X. affine Korth. ex Miq.: Sumatra, De Wilde & De Wilde-Duyfjes 12948 (Lw, diam. 3 cm); Rahmat si Boeoa 6506 (USw 28848, diam. 2 cm) and 7032 (USw 28903, diam. 1.9 cm); Borneo, Jacobs 5435 (Lw) – X. amoenum Chodat: Malaysia, KEP 92425 (WT 7951 ex KEPl); cf. amoenum, Borneo, SAN 15077 (SJRw 51982) – X. arnotianum Wight: India, Ridsdale 74 (Lw) – X. ecarinatum Chodat: Borneo, Jacobs 5384 (Lw) – X. eurhynchum
Fig. 1–6. *Xanthophyllum*, transverse sections, all x 20. — 1: *X. fragrans*, parenchyma abundant in closely spaced bands or diffuse-in-aggregates. — 2: *X. lanceatum*, parenchyma as in *X. fragrans*. — 3: *X. flavescens*, parenchyma bands on average 3 fibres apart. — 4: *X. novoguinense*, parenchyma bands on average 4 fibres apart but band distance highly variable. — 5: *X. philippinense*, parenchyma bands on average 5 cells apart. — 6: *X. obscurum*, parenchyma bands on average 6–8 cells apart; aliform parenchyma mixed with fibre-tracheids well developed.