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THE ANATOMY OF ALZATEA RUIZ & PAV. (MYRTALES)

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SUMMARY

The mature xylem of *Alzatea* is described for the first time, based on material from its new locality in Costa Rica. The wood anatomy pleads against inclusion of *Alzatea* in Crypteroniaceae but can be cited in favour of Lythraceous affinities of the genus.

1. INTRODUCTION

The vegetative anatomy and taxonomic history of *Alzatea* have been elaborately described and reviewed by VAN VLIET (1975) and VAN VLIET & BAAS (1975) following its debatable inclusion in Crypteroniaceae (VAN BEUSEKOM-OSINGA & VAN BEUSEKOM 1975). At that time, *Alzatea* material was only available from herbarium collections from Peru, belonging to the single species *A. verticillata* Ruiz & Pav. Consequently our wood anatomical knowledge of the genus was exclusively based on juvenile xylem from twigs, up to 6 mm in diameter. Recently the genus *Alzatea* has been rediscovered far outside its previously known distribution area in Peru, viz. in Costa Rica. Through the cooperation of Mrs. and Mr. Kathy and John Utley an excellent mature wood specimen of this, possibly new, species of *Alzatea* as well as leaf and twig material has become available for anatomical study. This note gives a descriptive anatomical account and a taxonomic discussion based on this material in relation to the wood anatomical survey of Lythraceae published in this issue (BAAS & ZWEYPFENNING 1979).

2. RESULTS AND DISCUSSION

Leaf and twig anatomy of the *Alzatea* collection from Costa Rica (UTLEY & UTLEY 4337) are strikingly similar to that of *Alzatea verticillata* from Peru described previously (see VAN VLIET & BAAS 1975); the material from Costa Rica only differs in the more pronounced differentiation of an adaxial hypodermis throughout the lamina (in *A. verticillata* the hypodermis is only differentiated in the vicinity of the midrib).

The bark of *Alzatea* spec. from Costa Rica is characterized by parenchyma strands containing druses, 1–3-seriate heterogeneous rays, and infrequent, strongly sclerified elongate cells. The mature secondary xylem is described below, based on a stem sample ca. 8 cm in diameter (see also *plate I*).

Growth rings faint. *Vessels* diffuse, 36/mm^2, solitary and in radial multiples of 2–4, 30% solitary, round to oval or angular, tangential diameter (40–)75(–105) μm, radial diameter up to 130 μm, walls

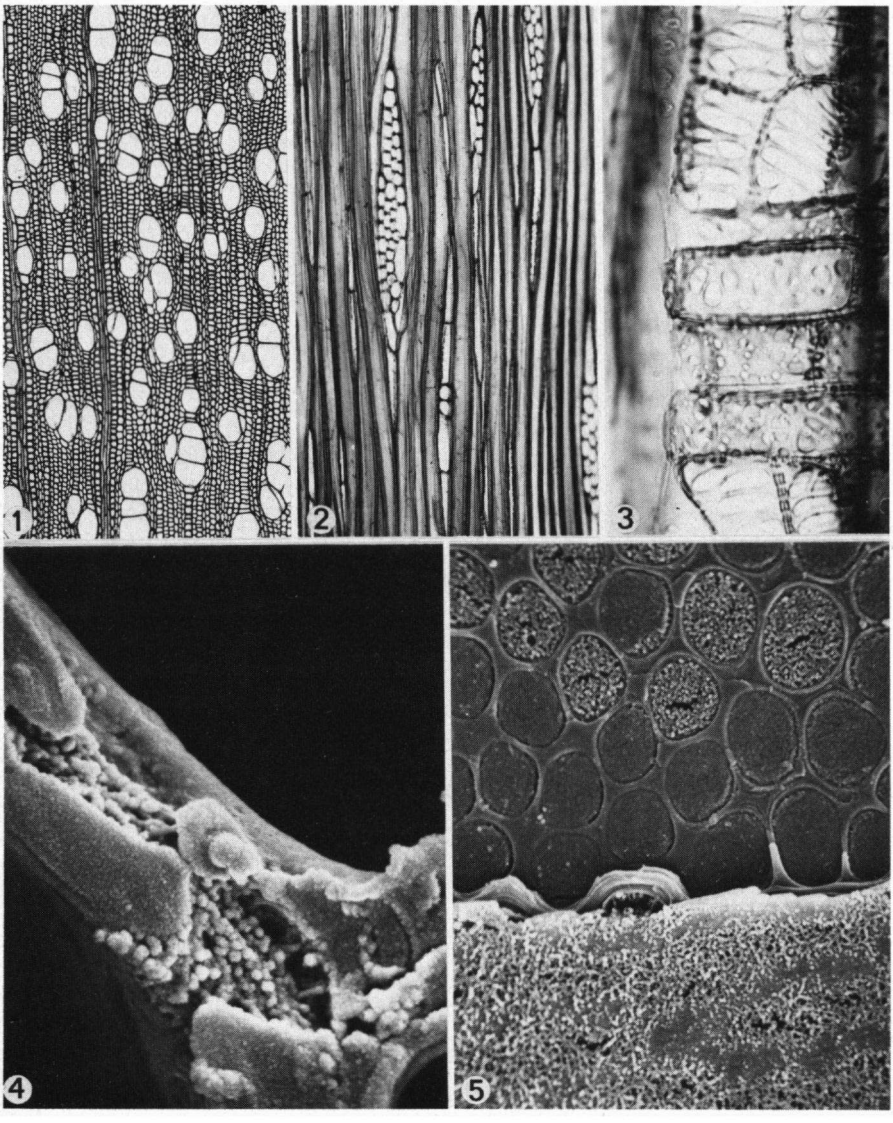

Plate I. *Alzatea* spec. (Utley & Utley 4337), wood structure. – 1. Transverse section, × 35. – 2. Tangential section, × 88. – 3. Radial section showing coarse, simple vessel–ray pits, × 350. – 4. SEM picture of transected vestured inter-vessel pit pair with type A vesturing, × 4200. – 5. Surface view of vessel wall showing vestures on apertures (bottom), 'clean' pit floors (centre), and bead-like endings of vesturing from adjacent pit chambers (top), × 1500.

2–3 μm thick. Vessel members (470–)730(–1100) μm long, mostly with long tails. Perforations simple in oblique end walls. Inter-vessel pits crowded, alternate, vestured, polygonal, 6–8 μm, apertures sometimes coalescent. vestures of type A (cf. VAN VLIET 1978). Vessel–ray pits large and simple, often elongate and in a reticulate to scalariform pattern. Vessel–parenchyma pits rarely observed, with

reduced borders and widely spaced (infrequent) in the vessel–parenchyma cell wall. Warts present and intergrading with abundant vesturing on the pit apertures. Thin-walled tyloses abundant. *Fibres* (540–)960(–1240) μm long, walls thin, partly with gelatinous layers, with minutely bordered to simple pits (2–3 μm) mainly confined to the radial walls, septate. *Parenchyma* very scanty paratracheal to almost absent. Strands of 4 cells. *Rays* heterogeneous I–II, 14/mm, 1–3-seriate; uniseriate rays composed of erect cells only; multiseriate rays with central portions of strongly procumbent cells, occasionally with sheath cells. *Crystals* absent. Dark amorphous contents present in ray cells and some of the fibres.

Except for some quantitative details the wood of *Alzatea* spec. from Costa Rica again resembles the immature xylem of *A. verticillata* from Peru very closely.

The arguments from vegetative anatomy against close affinities of *Alzatea* with *Crypteronia* and other putative members of the Crypteroniaceae (*Axinandra* and *Dactylocladus*) are thus reinforced. A comparison with Lythraceae (BAAS & ZWEYPFENNING 1979, in this issue) yields much closer similarities. *Alzatea* would remain abnormal within Lythraceae on account of its trilacunar nodes, very coarse and simple vessel–ray pits, comparatively long vessel members, and vestures which belong distinctly to type A in VAN VLIET's classification (1978). In Lythraceae the vesturing is usually of type B, and if tending to type A there are still signs of being intermediate between types A and B. In other respects the wood of *Alzatea* is remarkably similar to the unspecialized type of Lythraceae wood with scanty paratracheal parenchyma, heterogeneous rays and septate fibres with minutely bordered to simple pits. It is therefore feasible to picture *Alzatea* as an early off-shoot from the protolythraceous stock, which possibly also gave rise to Melastomataceae (the vesturing and vessel–ray pitting of *Alzatea* are reminiscent of the situation in some members of the latter family).

The above view on the phylogenetic relationships of *Alzatea* is not necessarily incompatible with inclusion of *Alzatea* in Lythraceae as advocated by several authors in the past. On the other hand, using similar arguments from wood anatomy, taxa like Sonneratiaceae and Oliniaceae should also be merged with Lythraceae. Characters from reproductive parts must obviously also be considered in the formal assignation of *Alzatea* and these other Myrtalean taxa to their proper taxonomic status.

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REFERENCES

BAAS, P. & R. C. V. J. ZWEYPFENNING (1979): Wood anatomy of the Lythraceae. *Acta Bot. Neerl.* **28**: 117–155 (this issue).

BEUSEKOM-OSINGA, R. J. VAN & C. F. VAN BEUSEKOM (1975): Delimitation and subdivision of the Crypteroniaceae (Myrtales). *Blumea* **22**: 255–266.

VLIET, G. J. C. M. VAN (1975): Wood anatomy of Crypteroniaceae sensu lato. *J. Microscopy* **104**: 65–82.

— (1978): The vestured pits of the Combretaceae. *Acta Bot. Neerl.* **27** (5/6): 273–285.

— & P. BAAS (1975): Comparative anatomy of the Crypteroniaceae sensu lato. *Blumea* **22**: 173–195.