

SYSTEMATIC NOTES ON THE ALSEUOSMIACEAE

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Study of living and herbarium material of the small dicotyledon family *Alseuosmiaceae* (Gardner, 1976) has suggested some emendation of Airy Shaw's diagnosis (1965: 249) of this group. Also, Hutchinson's generic key (1967: 83) is unsatisfactory.

Alseuosmiaceae Airy Shaw *em.* R. O. Gardner.

Flores hermaphroditi (vel polygami?), actinomorphi (androecio interdum zygomorpho?). *Calyx* tetramerus vel pentamerus, sepalis liberis valvatis. *Corolla* gamopetala, infundibularis vel campanulata vel urceolata, lobis 4 vel 5(—7?) valvatis intus interdum ± tuberculatis vel verruculosus, marginibus interdum ± dentatis vel fimbriatis. *Stamina* 4 vel 5 (—7?), alternipetala, corollae tubo inserta vel libera (duo interdum majora?), antheris introrsis. *Ovarium* inferum vel semi-superum, biloculare, disco tumido vel plano coronatum, ovulis in quoque loculo 2—6 vel pluri axilibus; stylo simplici gracili vel robusto; stigmatate capitato ± bilobo. *Fructus* baccatus, bilocularis, 1 — pluri-spermi; semina albuminosa. *Frutices*, plerumque glabri praeter pilos ferrugineos fasciculatos ad axillas limitatos. *Folia* alterna, simplicia, sinuato-dentata vel integra, exstipulata; petioli basi dilatata. *Inflorescentiae* axillares, fasciculares, interdum 1-florae; flores interdum fragrantes.

Genus typicum: *Alseuosmia* A. Cunn.

KEY TO THE GENERA

- 1a. Corolla funnellform, lacking a transverse caruncle inside the lobes; stamens epipetalous; leaves usually serrate-dentate **Alseuosmia**
- b. Corolla campanulate-urceolate, with a transverse caruncle inside the lobes; stamens free, or fused to corolla at their fleshy bases only: leaves entire. 2
- 2a. Hypanthium present, formed by calyx, corolla, and fleshy bases of stamens; disc weakly developed; ovary inferior **Memecylanthus**
- b. Hypanthium absent; disc prominent; ovary inferior to semisuperior **Periomphale**

Alseuosmia A. Cunn.

Alseuosmia A. Cunn., Ann. Nat. Hist. 2 (1839) 209.

New Zealand. Four species (Gardner, 1976, and in preparation).

Memecylanthus Gilg et Schltr.

Memecylanthus Gilg et Schltr., Bot. Jahrb. 39 (1906) 269.

New Caledonia. Monotypic. (*M. neo-caledonicus* Gilg et Schltr).

I have seen only one specimen (*Deplanche* 413, K; seven duplicates at P). The holotype, *Schlechter* 15677, January 1903, has been lost from Berlin. No duplicates have been traced.

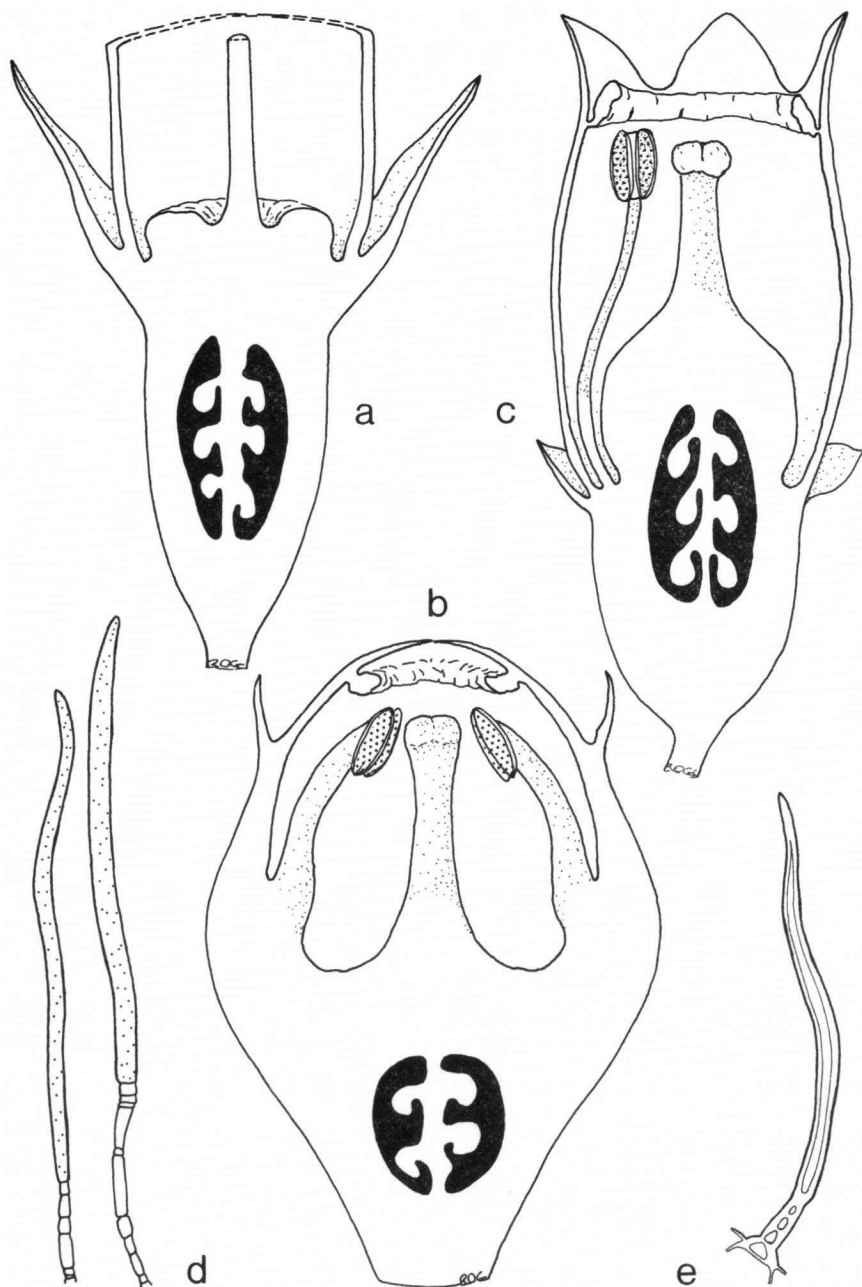


Fig. 1. a—c. Flowers of *Alseuosmiaceae*, partly dissected. a. *Alseuosmia* A. Cunn., $\times 10$; b. *Memecylanthus* Gilg et Schltr., $\times 15$; c. *Periomphale* Baill., $\times 20$. — d, e. Multicellular uniseriate hairs. d. *Alseuosmiaceae*. Terminal cell thick-walled and with tannin deposits, $\times 60$; e. *Pittosporaceae*. Terminal cell very thick-walled, $\times 110$.

Periomphale Baill.

Periomphale Baill., Bull. Soc. Linn. Paris 1 (1888) 731.

Pachydiscus Gilg et Schltr., loc. cit. 270. New Caledonia.

Two species have been described: *P. balansae* Baill. and *P. pancheri* Baill. (= *Pachydiscus gautherioides* Gilg et Schltr.). The types differ only in leaf size and shape. Material with leaves of intermediate size and shape form the bulk of the collections seen (E, K, L); consequently I believe this genus may be monotypic. Airy Shaw (1965: 250) has selected *P. balansae* Baill. as lectotype.

No specimen seen by me would support Baillon's description of the genus as polygamous, neither were the stamens ever more than five in number, or ever didynamous. Such sex differentiation has been maintained provisionally, however, in the family diagnosis above, pending examination of abundant living material.

The placentation of the genus is axile, with several ovules per locule (Plate 1B), *contra* Baillon (1888: 731) and Gilg and Schlechter (1906: 270).

The flowers of the three genera are illustrated in Fig. 1a—c.

Two anatomical features of the *Alseuosmiaceae* are notable. Firstly, all genera have a stem endodermis with well-developed Casparian banding (Plate 1C). In *Alseuosmia* at least, the endodermis passes through the secondary and quaternary stages (lignification-suberization of walls; accumulation of phenolic compounds) typical of a root endodermis. Secondly, there is a contrast between the raylessness of the wood of all *Alseuosmia* species (Barghoorn, 1941: 319; Paliwal and Srivastava, 1969; Gardner, 1976) and the extremely tall (at least several millimeters) rays of the New Caledonian genera (Plate 1D, E).

Airy Shaw removed the above three genera from the *Caprifoliaceae*, noting their characters which were anomalous in the latter family: alternate leaves, valvate corolla lobes, southern hemisphere distribution, and pollen morphology (*vide* Erdtman, 1952: 98; see also Bortenschlager et al., 1966: 166). Also, *Alseuosmia* contains ellagitannin (Gardner, 1976); this substance is not known from any member of *Caprifoliaceae s.s.* (Bate-Smith, 1962).

Like Airy Shaw (1965) and Cronquist (1968: 231), I believe the *Alseuosmiaceae* is best placed near the woody rosalean groups e.g. *Escalloniaceae sensu* Hutchinson (1967) (but including *Argophyllum* Forst. and *Corokia* A. Cunn.). The *Alseuosmiaceae* is more advanced in floral and associated features (unitegmic-tenuinucellate ovule, trinucleate pollen; Philipson, 1974: 96; Gardner, 1976) than most escalloniads, but only the epipetalous stamens of *Alseuosmia* are completely unknown in the latter group. The level of wood specialisation in each group is also comparable, the *Alseuosmiaceae* having vessels which are disposed singly or sometimes in radial multiples of 2—4, and which have scalariform 16—37-barred plates and weak spiral (tertiary) thickening (Gardner, 1976).

Because of their similar facies and their southern hemisphere distribution, the *Pittosporaceae* have also been envisaged as possible allies (Airy Shaw, 1965, but see 1973; Cronquist, 1968; Philipson, 1974). The considerable morphological, anatomical, and chemical differences (Cronquist, 1968; Hegnauer, 1969) would seem to make such a relationship rather improbable. It is curious, however, that the multicellular uniseriate hairs of the *Alseuosmiaceae* are known elsewhere in the rosalean and allied groups only from the *Pittosporaceae* (Fig. 1 d, e), in *Hymenosporum* and *Pittosporum* (own observations) and in *Billardiera*, *Marianthus*, *Pronaya*, and *Sollya* (Metcalfe and Chalk, 1950: 128). In the *Alseuosmiaceae* these hairs are restricted to axillary positions, but are found in the *Pitto-*

sporaceae on the leaves, branchlets, pedicel, calyx, and ovary. In their structure and development the pittosporaceous multicellular uniseriate hairs appear to be homologous with the T-hairs common in the family (Gardner, 1976). This brings to mind the presence of multicellular T-hairs in *Argophyllum* and *Corokia* (Metcalf and Chalk, 1950: 565, 736; Eyde, 1966). Also, unicellular T-hairs (i.e. of derived status?) are found in at least one escalloniad (*Ixerba*; own observations) and in some advanced allied groups (*Philadelphaceae*, *Cornaceae*, *Araliaceae*, *Sapindaceae*; Metcalfe and Chalk, 1950; Bense and Palser, 1975: 684). Then the sharing of the multicellular uniseriate hairs by the above two families can be supposed to reflect the ancient affinity of two lineages, the rosalean (*Cunoniaceae-Escalloniaceae-Cornaceae et al.*) and sapindalean (*Sapindaceae-Rutaceae-Pittosporaceae-Araliaceae et al.*) superorders (Cronquist, 1968; Eyde and Tseng, 1971; Philipson, 1974).

ACKNOWLEDGEMENTS

I would like to thank the Directors of the following herbaria for their generous loans of material: Royal Botanic Gardens, Edinburgh; Royal Botanic Gardens, Kew; Rijksherbarium, Leiden; Museum National d'Histoire Naturelle, Paris.

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