



Paraphyly and polyphyly in *Polyscias* sensu lato: molecular evidence and the case for recircumscribing the “pinnate genera” of Araliaceae

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With 5 figures and 1 table

Abstract

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Seven Paleotropical genera of Araliaceae have imparipinnate leaves and belong to the single large “*Polyscias* sensu lato” clade. Current generic circumscriptions, however, fail to reflect the evolutionary history of the group. Building on earlier results, the present study employs an enhanced set of samples and a third molecular marker (nuclear ETS, in addition to nuclear ITS and the plastid *trnL-trnF*) to examine phylogenetic relationships in *Polyscias* sensu lato. Results confirm that *Polyscias* is paraphyletic with regard to the remaining six genera, three of which (*Gastonia*, *Cuphocarpus*, and *Reynoldsia*) are themselves polyphyletic. Of the three remaining genera, *Tetraplasandra* and *Munroidendron* are most closely related to *Reynoldsia* and thence to a set of Malesian species currently assigned to *Polyscias* and *Gastonia*, while *Arthrophyllum* belongs to a distinct clade of *Polyscias* species from Malesia, Australia, and the SW Pacific. Several formally recognized infra-generic groups within *Polyscias* are also non-monophyletic, including sections *Eupteron* and *Kissodendron*, while the single species of section *Gelibia* is best placed in the informally recognized section *Tieghemopanax*. The small type section (sect. *Polyscias*, with 13 species) is monophyletic, but restricting the generic concept to this clade presents a series of taxonomic and pragmatic difficulties.

Keywords: Araliaceae, *Polyscias* sensu lato, phylogeny, *Gastonia*, *Reynoldsia*, *Tetraplasandra*, *Munroidendron*, *Cuphocarpus*, *Arthrophyllum*.

Introduction

Generic circumscriptions in Araliaceae have been unstable for many decades. This is reflected, in part, by the total number of genera recognized in the family, which has fluctuated from c. 40 (e.g., 38 genera in Bentham 1867; 41 in Plunkett et al. 2004b) to roughly double that number (e.g., 77 genera in Tseng & Hoo 1982, and 85 Hutchinson

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