

# HYPOPTERYGIACEAE

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**Hypopterygiaceae** Mitt., *J. Proc. Linn. Soc., Bot.*, Suppl. 1: 147 (1859).

Type: *Hypopterygium* Brid.

Dioicous or monoicous, unisexual or partly bisexual. Plants forming loose to dense groups of dendroids or fans, occasionally forming mats, pleurocarpous. Rhizome creeping, sympodially branched, tomentose. Stems horizontal (rarely creeping), ascending or erect, simple or branched and differentiated into stipe and rachis; branches usually lateral, rarely ventral, distant or closely set. Foliation complanate and anisophyllous or partly non-complanate and isophyllous. Leaves in 3, 8 or 11 (rarely more) ranks, but arranged in 2 lateral rows of asymmetrical leaves and a ventral row of smaller symmetrical leaves (amphigastria) in the distal part of the stem or frond, distant or closely set, symmetrical or asymmetrical; apex usually acuminate. Gemmae absent or filiform.

Gametoecia usually lateral, occasionally dorsal or ventral. Calyptra cucullate or mitrate. Capsules subglobose to ovoid-oblong; operculum rostrate. Peristome diplolepidous; exostome teeth 16 (absent from *Catharomnion*); endostome with 16 processes, ciliate or not. Spores subglobose to broadly ellipsoidal, scabrous.

The family consists of seven genera and 21 species with a predominantly Gondwanan distribution. It occurs mainly in humid forests of warm-temperate to tropical areas of the world, and it is most diverse in Indo-Malaysia. Three genera and six species are known with certainty from Australia.

The Hypopterygiaceae have been regarded as comprising two subfamilies: Hypopterygioideae (*Canalohypopterygium*, *Catharomnion*, *Dendrocypthophorum*, *Dendrohypopterygium*, *Hypopterygium* and *Lopidium*) and Cyathophoroideae (Kindb.) Broth. (*Cyathophorum* and *Cyathophorella*). The former is characterised by gametophytes with branched stems differentiated into a stipe and rachis and by horizontal, ascending or vertical sporophytes. Cyathophoroideae have simple or weakly branched stems and horizontal to descending sporophytes. Some authors treated the Cyathophoroideae as a separate family; others proposed a different classification, and placed genera of the Hypopterygiaceae in the Daltoniaceae or Hookeriaceae. However, according to Kruijer (2002), the Hypopterygiaceae constitute a monophyletic group that is best retained as a separate family nested in the Hookeriales-Leucodontales-Hypnales clade. Thus, there is no need to distinguish subfamilies. In this treatment, the classification and circumscription of the family, its genera and species follow Kruijer (2002).

The name of the family Lophidiaceae Brid. ex Rodway (Rodway, 1914), based on *Lopidium*, is illegitimate because it includes *Hypopterygium*.

Species are very variable in size and habit, and distantly foliate plants often appear rather different to closely foliate individuals of the same species. Branched plants with a loose or distant ramification have a different appearance to those that are branched with numerous and closely set branches; both types of ramification often occur within the same species. Branches and leaves are oriented roughly at right angles to the direction of most intense incident light.

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## Key to Genera

- 1 Stems usually simple, occasionally with a few innovations or a few distant branches, not differentiated into stipe and rachis, terete or quadrangular; sporophytes projecting beneath plane of gametophore ..... **CYATHOPHORUM**
- 1: Stems branched, differentiated into stipe and rachis, terete; sporophytes projecting above plane of gametophore ..... 2
- 2 Plants pinnate to bipinnate; laminal leaf cells collenchymatous; walls incrassate; costa of lateral frond leaves percurrent or nearly so; setae mammillose; calyptra glabrous or with long paraphyses several cells wide (*l.*) ..... **LOPIDIUM**
- 2: Plants usually palmate or umbellate, less often pinnate or flabellate; laminal leaf cells not collenchymatous; walls thin; costa of lateral frond leaves reaching 80% of leaf length at most; setae smooth; calyptra glabrous ..... **HYPOPTERYGIUM**