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Floral morphology and anatomy of *Ophiocaryon*, a paedomorphic genus of Sabiaceae

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Annals of Botany, Volume 120, Issue 5, 10 November 2017, Pages 819–832,
<https://doi.org/10.1093/aob/mcx115>

Published: 25 October 2017 **Article history** ▼

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Abstract

Background and Aims

Ophiocaryon is a lesser known genus in *Sabiaceae*. This study examines flowers of six *Ophiocaryon* species in comparison with *Meliosma alba*, to identify taxonomically informative characters for understanding relationships within the family *Sabiaceae*, to imply previously unknown pollination mechanisms of *Ophiocaryon*, and to contribute to the placement of *Sabiaceae* within the early-diverging eudicots.

Methods

Floral morphology and anatomy of six *Ophiocaryon* species and *M. alba* were studied and described using scanning electron microscopy, clearing techniques and resin sectioning.

Key Results

Novel characters of *Ophiocaryon* were identified, e.g. conical cells on petals, different kinds of orbicules in anthers, stomata on nectary appendage tips and ovary, two distinct surface patterns on stamens and ovary, tanniferous cell layers in the ovary wall, and acorn-shaped unitegmic ovules with very short integuments. Comparison of floral characters between *Ophiocaryon* and *Meliosma* found that the calyx, corolla, androecium and gynoecium of *Ophiocaryon* resemble an undeveloped state of the latter taxon, reflecting a paedomorphic regression of the flower of *Ophiocaryon*. The flower morphology and anatomy of *Ophiocaryon* was compared with its putative sister species *M. alba*, but no clear shared derived characters could be detected. Moreover, the findings of scent, presence of conical cells on petals and a nectary suggest flowers are pollinated by small insects with a secondary pollen presentation on the cupula of fertile stamens.

Conclusions

We found that *Ophiocaryon* may be derived from ancestors that were similar to extant *Meliosma* in their flower structure and pollination mechanism. However, the lack of shared derived characters between *Ophiocaryon* and its phylogenetic sister group *M. alba* is puzzling and requires further investigations on the diversity of the latter species.

Keywords: Basal eudicots, floral anatomy, *Meliosma alba*, nectary, *Ophiocaryon*, paedomorphosis, *Sabiaceae*, secondary pollen presentation

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