

There and back again: molecular phylogenetics of the Brazilian endemic *Psyllocarpus* (Rubiaceae: Spermaceae) supports a circumscription of the genus based on its original concept

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The *Spermaceae* clade (tribe Spermaceae) is one of the most taxonomically complex groups in Rubiaceae due to the unclear delimitation of *Borreria* and *Spermaceae*, in which several smaller genera are phylogenetically intermingled. One of these genera is the Brazilian endemic *Psyllocarpus*, whose circumscription was broadened, thereby including two sections. *Psyllocarpus* sect. *Psyllocarpus*, being based on the original genus delineation, includes nine species, distributed in the Cerrado and campo rupestre of eastern Brazil, whereas *P.* sect. *Amazonica* comprises three species, occurring in the Amazonian campinas. Furthermore, *P. intermedius* was not classified in any of these sections when it was later described. In order to test the monophyly of *Psyllocarpus* and assess its relationships to other genera, we conducted phylogenetic analyses, sampling across the whole *Spermaceae* clade, including nearly all *Psyllocarpus* species. A combined nuclear ribosomal (ETS and ITS) and plastid (*rps16* and *trnL-trnF*) dataset was generated, representing 124 species (ca 25% of the species in the clade) in 15 genera (ca 65%). Various methodologies were applied to investigate the degree of incongruence among markers and address the lack of resolution and low support values for some branches. Our results revealed that *Psyllocarpus* is not monophyletic. *Psyllocarpus campinorum* (from *P.* sect. *Amazonica*) and *P. intermedius* are situated as distinct lineages in the *Spermaceae* clade, yet do not belong to *Psyllocarpus*. Members of section *Psyllocarpus* form a strongly supported clade sister to *Staelia* and was recovered with high to maximum support across different datasets and inference methods. Therefore, *Psyllocarpus* has to be circumscribed based on its original concept, excluding *P.* sect. *Amazonica* and *P. intermedius*. This establishes the genus as a monophyletic and easily diagnosable taxon, characterized by terete leaves, homostylous flowers, a bilobate calyx, included stamens and style, and compressed, septifragally dehiscent capsules with a persistent septum.