

New combinations for two species of *Galium* (Rubiaceae) from southern Brazil

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Abstract

In order to update accurately the list of *Galium* species in the Brazilian Flora Checklist, it is necessary to propose some new combinations. For these species, the geographic distribution is noted, along with comments on morphological features, and discussion on their relationship with other taxa.

Key words: Brazilian Flora Checklist, *Relbunium*, Rubieae, taxonomy

Introduction

Rubiaceae is the four largest families of angiosperms, with approximately 13,526 species and 615 genera (Govaerts 2010). According to Barbosa *et al.* (2014), approximately 1,400 species and 125 genera are present in Brazil. Within the Rubiaceae, the tribe Rubieae shown to be monophyletic (Manen *et al.* 1994, Bremer 1996, Natali *et al.* 1996, Andersson & Rova 1999, Bremer & Manen 2000, Bremer & Eriksson 2009), with several morphological and molecular synapomorphies. In addition, its herbaceous habit, preferential occurrence in temperate regions, whorled leaves, rudimentary calyx, and bilocular ovary with one ovule per locule differentiate this tribe from other Rubiaceae (Soza & Olmstead 2010). However, classification and identification within Rubieae is difficult, especially for *Galium* Linnaeus (1753:105). This genus is particularly problematic as its taxa are polymorphic, and with a few morphological characters correlated with geographical distribution that can be used to distinguish them (Schischkin 2000). Similarly, the generic delimitation of *Relbunium* (Endlicher 1839:523), Bentham & Hooker f. (1873:149), as described by Endlicher (1839), is equally problematic in that some taxonomists recognized it as a section of *Galium* (e.g., Dempster 1978, 1981, 1982, 1990), whereas others treated it as a separate genus (Ehrendorfer 1955, Natali *et al.* 1996).

The studies by Dempster, support the proposals by Endlicher (1839), treating *Relbunium* as a section of *Galium*. According to Barbosa *et al.* (2014), 24 species of *Galium* occur in Brazil, which are present in all regions, except for the northern one, and the genus displays the highest species diversity in the southern region, with approximately 21 species.

Despite Dempster's detailed studies (1978, 1981, 1982, 1990), some species originally described in *Relbunium* were not transferred to *Galium*, including *Relbunium humilioides* M.L. Porto & Ehrendorfer (1977:179) and *R. longipedunculatum* Mariath & Ehrendorfer (1977:184). Therefore, this study proposes two new species combinations, in order to update the Brazilian Flora Checklist (Barbosa *et al.* 2014).

Material & Methods

For the analysis of *Galium* species, we referred to the studies by Dempster (1978, 1981, 1982, and 1990), and we used the botanical material deposited in the following herbaria: A, B, F, GH, ICN, K, MA, NY, RB, S, SI, and U. Herbaria acronyms followed Thiers (2013).