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Dioscorea sphaeroidea (Dioscoreaceae), a threatened new species from the high-altitude grasslands of southeastern Brazil with wingless seeds

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Abstract

Dioscorea sphaeroidea is endemic to the high-altitude grasslands of the Serra dos Órgãos National Park located in southeastern Brazil. Based on the spheroid shape of its fruit and seed, i.e., not flattened or winged, this new species is morphologically unusual in the *Dioscorea* genus. Moreover, its unique morphology leaves this new species with no clear position in the infrageneric taxonomy of *Dioscorea*. Herein we present the morphological description of this species, including a discussion of its ecology and habitat, distribution, and preliminary risk of extinction assessment.

Key words: Atlantic rainforest, critically endangered species, Dioscoreales, endemism, neotropics

Introduction

Dioscoreaceae is comprised of four genera and about 650 species distributed worldwide, but particularly in tropical regions (Govaerts *et al.* 2007; WCSP 2014). With over 600 species, *Dioscorea* Linnaeus (1753: 1032) is the genus with largest number of species, and it is the most widely distributed genus in the family (Govaerts *et al.* 2007). The genus is richest in the neotropics, with over 50% of known species. The Brazilian flora has the largest number of species, with 131 *Dioscorea* species, 96 of which are endemic (Kirizawa *et al.* 2013).

The phylogenies for the family have shown that *Dioscorea* is a monophyletic genus (Caddick *et al.* 2002a, 2002b), but with a rather complex and paraphyletic infrageneric classification (Wilkin *et al.* 2005). The infrageneric classification of *Dioscorea* was initially based on the characteristics of the seed wing. Thus, the species of the subgenus *Dioscorea* (*Eudioscorea*) are circumscribed by a circular wing surrounding the seed, and the species of the subgenus *Helmia* (Kunth 1850: 414) R. Knuth (1924: 50) are characterized by an elongated wing toward the base of the seed (Knuth 1924). Each subgenus is also subdivided into sections, 17 for *Helmia* and 39 for *Dioscorea*, mostly based on characteristics of inflorescence morphology, but with poorly defined boundaries. This fact prevents most of the known species of *Dioscorea* from inclusion in any of the subgenera or sections, with the current morphological delimitations provided by Grisebach (1842), Uline (1897) and Knuth (1924). Moreover, Wilkin *et al.* (2005) renders the previous infrageneric classifications redundant.

Based on the spheroid shape of its fruit and seed, i.e., not flattened or winged, *Dioscorea sphaeroidea* is morphologically unusual in the *Dioscorea* genus. It was discovered during a field investigation in southeastern Brazil, more specifically in the high-altitude grasslands of Serra dos Órgãos National Park (Fig. 1).

Material and Methods

Dioscorea sphaeroidea was described and illustrated by composite line-drawings from dried material. The new species was carefully compared with *Dioscorea* specimens from BR, C, CAY, CESJ, COAH, COL, CR,

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