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Exhuming Saint-Hilaire: revision of the *Drosera villosa* complex (Droseraceae) supports 200 year-old neglected species concepts

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Abstract

The *Drosera villosa* complex is here reviewed and includes six species endemic to Brazil: *D. villosa*, here identified for the first time as a narrow endemic species native to the neighboring highlands of the Serra Negra and Serra do Ibitipoca, in southern Minas Gerais state; *D. ascendens*, rediscovered nearly 200 years after its description, narrowly endemic to the Diamantina Plateau, central Minas Gerais; *D. graomogolensis*, endemic to northern Minas Gerais, but here found to be more widespread than previously reported; *D. latifolia*, a highly polymorphic and widespread taxon, previously placed in synonymy of *D. villosa* and heretofore misidentified as *D. ascendens*, is here elevated to species rank; and two new species here described, *D. riparia* and *D. chimaera*. Furthermore, two new natural hybrids are reported: *D. villosa* × *D. tomentosa* var. *glabrata* and *D. latifolia* × *D. tomentosa*. The morphological characters distinguishing these taxa from each other and from similar species are discussed, together with habitat and ecological information, detailed illustrations and photographs, distribution maps, and a key to the species of the *D. villosa* complex is provided.

Key words: Brazil, carnivorous plants, Chapada Diamantina, Espinhaço Range, new species

Resumo

O complexo *Drosera villosa* é aqui revisado e é composto por seis espécies endêmicas do Brasil: *D. villosa*, aqui identificada pela primeira vez como uma espécie endêmica das vizinhas Serra Negra e Serra do Ibitipoca, no sul de Minas Gerais; *D. ascendens*, redescoberta após quase 200 anos, micro-endêmica no Planalto de Diamantina, no centro de Minas Gerais; *D. graomogolensis*, endêmica do norte de Minas Gerais, porém aqui considerada mais amplamente distribuída do que reportado anteriormente; *D. latifolia*, um táxon altamente polimórfico e amplamente distribuído, anteriormente colocado em sinonímia de *D. villosa* e até então erroneamente identificado como *D. ascendens*, é aqui elevado ao status de espécie; e duas novas espécies que são aqui descritas, *D. riparia* e *D. chimaera*. Dois novos híbridos naturais são reportados: *D. villosa* × *D. tomentosa* var. *glabrata* e *D. latifolia* × *D. tomentosa*. As características morfológicas que distinguem esses táxons uns dos outros e de espécies similares são discutidos, juntamente com informações sobre habitat e ecologia, ilustrações detalhadas e fotografias, mapas de distribuição e uma chave para as espécies do complexo *D. villosa* é apresentada.

Palavras-chave: Brasil, Cadeia do Espinhaço, Chapada Diamantina, espécies novas, plantas carnívoras.

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Conclusions

Detailed analysis of herbarium specimens, together with field surveys throughout the range of the *D. villosa* complex, uncovered a much higher diversity than presented in previous works. Each of the six species accepted here as members of this complex can be recognized by a unique combination of morphological characters, of which the most relevant are: leaf shape and indumentum, scape indumentum, petal and style length, seed shape, as well as geographical distribution (Table 1).

The variable and widespread *D. latifolia* is essential to the understanding of speciation within this complex. Studies focusing on the phylogeography of this species are necessary to better comprehend its variability and whether the morphotypes deserve sub-specific classification. Also, further studies are necessary to uncover the phylogenetic relationships within the *D. villosa* complex and between this group and the closely related *D. grantsaui* and the *D. montana* complex, the latter being the current focus of a revisional study (Rivadavia et al, in prep.).

Based on the morphological data presented here, hypotheses can be drawn to explain the relationships between the species of the *D. villosa* complex. *Drosera ascendens* and *D. graomogolensis* are deemed close, based on the large flowers with long styles, low self-fertility, as well as the glandular trichomes densely distributed along the whole scape, and the smaller slightly oblong-ovoid seeds. The remaining species of this complex share with *D. tomentosa* the small flowers and style morphology, as well as the absence of glandular trichomes on the basal third of the scape. *Drosera latifolia*, *D. villosa* and *D. riparia* have in common the long and somewhat fusiform seeds. Finally, while leaf morphology supports that *D. chimaera* is allied to the species of the *D. villosa* complex, seed shape and scape indumentum place it closer to *D. tomentosa*, suggesting a basal position for *D. chimaera*, a hypothesis to be corroborated by future molecular studies.

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