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Desmodium album (Fabaceae, Papilionoideae): a new record for Rio Grande do Sul and the Pampa biome

Desmodium album (Fabaceae, Papilionoideae): um novo registro para o Rio Grande do Sul e bioma Pampa

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ABSTRACT

Desmodium album (Fabaceae, Papilionoideae): a new record for Rio Grande do Sul and the Pampa biome. This work enhances knowledge of Fabaceae species in Rio Grande do Sul (RS), providing a historical review of *Desmodium album* records in Brazil and documenting the species' first occurrence in RS and the Pampa biome. The specimens were photographed *in situ*, collected, and deposited in the SMDB herbarium.

Palavras-chave: Brazilian flora; Legume; Taxonomy

RESUMO

Desmodium album (Fabaceae, Papilionoideae): um novo registro para o Rio Grande do Sul e o bioma Pampa. Este trabalho amplia o conhecimento das espécies de Fabaceae no Rio Grande do Sul (RS), fornecendo uma revisão histórica dos registros de *Desmodium album* no Brasil e documentando a primeira ocorrência da espécie no RS e no bioma Pampa. O material foi fotografado *in situ*, coletado e tombado no herbário SMDB.

Palavras-chave: Flora brasileira; Leguminosae; Taxonomia

1 INTRODUCTION

The Fabaceae Lindl. or Leguminosae Juss. family comprises about 770 genera and approximately 19,500 species, making it the third-largest family among flowering plants (LPWG, 2017). The Legume family currently comprises six subfamilies: Duparquetioideae LPWG (one genus and one species), Cercidoideae LPWG (12 genera and ~335 species), Detarioideae Burmeist. (84 genera and ~760 species), Dialioideae (17 genera and ~85 species), Caesalpinioideae DC. (148 genera and ~4,400 species), and Papilionoideae DC. (503 genera and ~14,000 species) (Miotto et al., 2022).

In Brazilian flora, Fabaceae stands out as the richest family, with 261 genera, approximately 3,091 species, 58 subspecies, and 608 varieties (Flora e Funga do Brasil 2025; Lima, 2024). In Rio Grande do Sul (RS) State, 105 genera and 407 species are recorded, including native (77 genera and ~350 species), cultivated, and naturalized species (Miotto et al., 2022). With cosmopolitan distribution, Fabaceae occurs in a wide diversity of habitats and exhibits many life forms. Such ecological and morphological success is related to its ability to occupy almost all terrestrial environments, from coastal areas and tropical forests to mountaintops and even deserts (Schrire et al., 2005).

Legumes are economically important mostly in human and animal nutrition, as well as in agriculture. Present in our daily life, various species of beans (*Phaseolus* L.), peas (*Pisum sativum* L.), lentils *(Lens culinaris* Medik.), and soybeans (*Glycine max* (L.) Merr. are almost essential in the human diet (Graham& Vance, 2003; Burkart, 1987). In agriculture, Fabaceae species are used as forage, fiber and protein source, and energy for meat and dairy production, while also improving the soil by increasing organic matter levels and nitrogen fixation (Burkart, 1987). Fabaceae are also relevant in other contexts, such as some popular ornamental species (e.g., cork oaks, calliandras, and flamboyant trees), honey plants (clovers and alfalfa), green manure (lupins and crotalarias), leather tanning (black acacia), and medicinal plants (e.g., pata-de-vaca, sene, and erva-de-touro) (Miotto et al., 2022).

The subfamily Papilionoideae occurs in nearly all regions of the planet and is represented by 28 tribes (Lewis et al., 2005). Of these, 14 have native taxa in RS. Phaseoleae is the tribe with the highest number of genera in the State, comprising 23 genera and 56 species, followed by Dalbergieae, with 11 genera and 56 species. On the other hand, there are tribes represented by only one genus in RS: Brongniartieae, Crotalarieae, Desmodieae, Indigofereae, Sesbanieae, Loteae, and Trifolieae (Miotto et al., 2022). Desmodieae is represented by the genus *Desmodium*, which has the highest species diversity of the subfamily Papilionoideae, with 17 species in RS (Lima, 2024; Oliveira, 2022).

Here we increase the number of *Desmodium* species for RS, presenting the first record of Desmodium album (Schindl.) J.F.Macbr. in the Pampa biome.

2 MATERIAL AND METHODS

Collections were made mostly in urbanized areas in Santa Maria, RS State. Situated in the ecotone zone between Pampa and Atlantic Forest biomes, Santa Maria is located between the parallels 29°43’57” and 29°55’30” S and the meridians 50°42’13” and 53°48’13” W.

Specimens of *Desmodium album* were photographed *in situ*, collected, and deposited in the Herbarium of the Department of Biology (SMDB) at the Federal University of Santa Maria, under catalog numbers SMDB 22761, SMDB 23304, and SMDB 24350.

Species identification followed classical botanical techniques, such as comparison with images, herbarium specimens, and the use of botanical keys and descriptions available in the specialized scientific literature (Freitas, 2012; Lima et al., 2014; Tozzi, 2016; Oliveira, 2022; Lima, 2024). The occurrence history of *D. album* was verified through digital platforms that provide data on herbarium collections and information on the location and distribution of biodiversity (Lima, 2024; Gbif, 2024, SpeciesLink, 2024; Flora e Funga do Brasil, 2025). From this, a timeline was created to

present the first records of *D. album* in the Brazilian states. The basionym *Meibomia alba* Schindl. was also used to find possible records with outdated names.

3 RESULTS

3.1 Occurrence of *Desmodium album*

The first herbarium record of the species dates back to 1898 (GH 00053803), a collection that, following the species description in 1934, was identified with the basionym *Meibomia alba* Schindl. (Repert. Spec. Nov. Regni Veg. 20: 150. 1924) until 2010, when it was analyzed and identified as *Desmodium album* by Lima, L.C.P., a taxonomist of this genus.

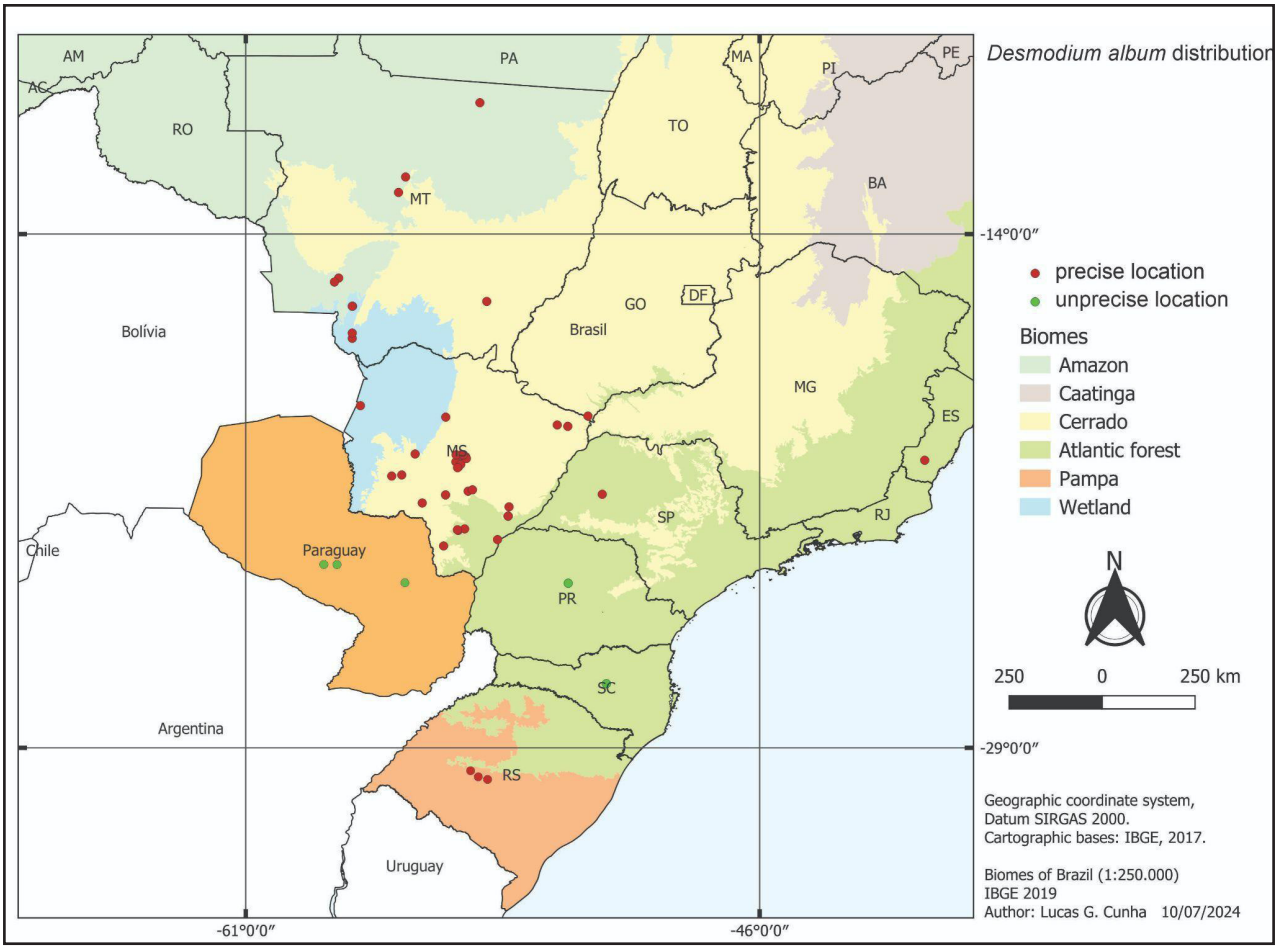
The first documented record of *D. album* in Brazil is from 1997, in Mato Grosso State, municipality of Tapurah (ESA 043466 photo!). However, the species was correctly identified only in 2012 (Lima, 2011). For this reason, until 2012, collections of *D. album* were generally misidentified as *D. uncinatum* (Jacq.) DC.

A similar situation occurred with a collection from 2002 in Mato Grosso do Sul State, a specimen misidentified as *D. distortum* (Aubl.) Macbr. until 2019, when it was corrected to *D. album* by the same expert taxonomist (EVB 002263 photo!). In 2004, a new collection of *D. album* was made in Goiás State (CGMS 14222 photo!). However, this record was correctly identified by Laura C. Lima only in 2011; until then, the species had been identified as *D. distortum*. In Espírito Santo State, a collection of *D. album* was made in 2019 (MBM 422569 photo!).

Although the REFLORA platform (Flora e Funga do Brasil, 2025) lists the occurrence of *D. album* in Santa Catarina (SC) and Paraná (PR) States, no scientific literature or virtual data from herbaria was found confirming that. In SC, a synopsis of the genus *Desmodium* shows no record of *D. album* for this state, and the authors suggest that more field expeditions are necessary (Freitas, 2012). In a recent study involving the Papilionoideae subfamily in RS (Miotto et al., 2022), 17 *Desmodium* species

are presented, but *D. album* is not mentioned (Oliveira, 2022). It is worth mentioning that it was only in 2020 that the first determination of *D. album* was made by a non-specialist researcher (CGMS 66121 photo!).

Figure 1 – Updated distribution of *Desmodium album*



Souce: Authors (2024)

Collections with accurate locations (red points) were plotted using *SpeciesLink* (2024) data, and those with imprecise locations (green points) were represented by PR and SC centroids. Figure 1 illustrates that our new *Desmodium album* collections represent the first record of this species for RS and in the Pampa biome.

3.2 *Desmodium album* (Schindl.) J.F. Macbr., *Candollea* 6: 10. 1934

Shrub, erect, branched, up to 2 meters tall, without a xylopodium. Stem cylindrical, striated, densely puberulent-hooked, sometimes becoming glabrous at

maturity, rarely tomentose. Stipules 10-14 x 4-5 mm, ovate, non-auriculate, semi-amplexicaul, inserted perpendicularly at the base of the leaf petiole, free from each other, apex caudate, margin ciliate, glabrescent, striate on the outer surface. Leaves pinnate-trifoliolate, petiole 21-42 mm long, canaliculate, cylindrical, uncinate, rarely tomentose; rachis 12-20 mm long. Stipels 8-12 mm long, lanceolate, margin straight, glabrescent on the outer surface, persistent or caducous. Leaflets discolorous, membranaceous or chartaceous, venation eucamptodromous, primary and secondary veins prominent, indumentum densely villose or tomentose on the primary, secondary and tertiary veins on the abaxial surface, adaxial surface puberulous and sparsely tomentose, uncinate hairs covering adaxial surface; terminal leaflet 8,2-11 x 5-9,1 cm, elliptic, lanceolate, ovate or rhombic, base oblique, obtuse, subcordate or truncate, apex acuminate, obtuse or retuse; lateral leaflets 5,6-7 x 2,8-4,5 cm, the same shape as the terminal leaflet. Inflorescence a terminal panicle; 27,2-45,5 cm long, hispid and uncinate, 2-4 flowers per node; primary bract 6-7 mm long, ovate-lanceolate, margin straight, glabrescent, caducous, veins conspicuous on the outer surface; secondary bract 1-1,5 mm long, subulate, margin ciliate hispid and puberulous-uncinate on the outer surface, caducous, veins inconspicuous on the outer surface; pedicel 6-9 mm long, densely hispid and puberulous-uncinate. Flowers 6-9,5 mm long; calyx bilabiate, tube campanulate, 1-1,5 mm long, hirsute and puberulous-uncinate on the outer surface; upper lip bifid, the second teeth joined for ca. ¾ of their length; lower lip trifid, lateral tooth triangular, 1-1,5 mm long, central tooth triangular, 2-2,5 mm long; corolla white, lilac when young, 7-8 x 7-8 mm, broadly obovate, apex obcordate, maculate at the base, claw ca. 0,5 mm long; wing petals 7,5-9,5 x 3-4 mm, oblong, apex obtuse, claw 0,5-1 mm long; keel petals 8-9,5 x 2,5-3 mm, narrowly obovate, apex subacute, with callosities, claw 2,5-3 mm long; androecium monadelphous, 6-9,5 mm long, vexillary stamen partially fused with the others from the base 2-3 mm long; ovary 3,5-4 mm long, tomentose, stipe ca. 1 mm long. Loment 1,5-2,4 cm long, stipe 2-3 mm long, hirsute, margins sinuate, indehiscent, membranaceous or subcoriaceous, veins conspicuous

even when fresh, densely hirsute and sparsely puberulous-uncinate. Seed 2-2,5 x 1-1,2 mm, oblong with hilum subcentral. Species' description, including terminology and morphological variations, follows the approach adopted by Lima et al. (2014).

Materials examined: BRAZIL. Rio Grande do Sul: Santa Maria, Boca do Monte District, FEPAGRO, altitude 549 m, *Vogel Ely, C. 552*; *Silva Filho P.J.S.*, 2023 (SMDB 22761); Camobi, between the ERS-509 lanes, *Vogel Ely, C. 611* (SMDB 23304); Camobi, Botanical Garden of the Federal University of Santa Maria, *Silva Filho, P.J.S., 2-655* (SMDB 24350).

Figure 2 – *Desmodium album* (Schindl.) J.F. Macbr. a. Habit. b. Branches with leaves/ leaflets. c-d. Flowers. e-f. Immature gynoecium. g-h. Fruits. i. Stipules. (Authors: A, B, H e I Vogel Ely, C.; C e D Silva Filho, P.J.S.; E-G Cunha, L.G.)

Source: Authors (2024)

Etymology: *albus*, from Latin, meaning white, in reference to the corolla, usually white in maturity.

Table 1 – Morphological differences between similar *Desmodium* species that co-occur in Rio Grande do Sul State

Characters	*D. album*	*D. cuneatum*	*D. hassleri*	*D. tortuosum*
Height (meters)	2-5	2	2	1,5
Corolla colour	white or greenish-cream, rarely lilac	lilac	lilac	lilac or purple
Gynoecium indumentum	tomentose	tomentose	tomentose	glabrous
Stipules	broadly triangular and semi-amplexicaul	narrowly triangular and not amplexicaul	broadly triangular and semi-amplexicaul	broadly triangular and semi-amplexicaul
Stipule ornament	with striations on the outer face and conspicuous veins	with striations on the outer face and inconspicuous veins	without striations or conspicuous veins	with striations on the outer face and conspicuous veins
Pedicel (millimeters)	> 6	< 4	4 - 11	7 - 11
Veins in fruit	conspicuous	inconspicuous	conspicuous	inconspicuous

Notes: *Desmodium album* is a native species in Brazil (Lima, 2024). In RS State, however, it occurs mostly in anthropized environments, which might characterize the species as ruderal.
Source: Authors (2024)

4 CONCLUSION

Here we present the new record of *Desmodium album* for RS State and Pampa biome, increasing the number of *Desmodium* species in RS to 18 and expanding the known distribution of *D. album* to the south (RS State). Our new data emphasizes the importance of fieldwork, especially for those with taxonomic bias, since no record of *D. album* was found in the herbaria of RS State by specialists.

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