

**TAXONOMIC NOVELTIES IN SOUTHERN BRAZILIAN
AMARYLLIDACEAE – III: *HIPPEASTRUM MULTIFLORUM*, A NEW SPECIES
FROM RIO GRANDE DO SUL¹**

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ABSTRACT

Hippeastrum multiflorum is an endemic saxicolous new species from Rio Grande do Sul, southern Brazil. It is described, illustrated, and data about its geographic distribution and ecology are provided. The new species has morphological affinity with *H. sanctaecatharinae* and *H. ramboi*.

Keywords: Taxonomy, Monocot, Amaryllidoideae, Hippeastreae, Hippeastrinae

RESUMO

[Novidades taxonômicas em Amaryllidaceae sul-brasileiras – III: *Hippeastrum multiflorum*, uma nova espécie para o Rio Grande do Sul].

Hippeastrum multiflorum é uma nova espécie saxícola endêmica do Rio Grande do Sul, sul do Brasil. Ela é aqui descrita e ilustrada, sendo fornecidos dados sobre sua distribuição geográfica e ecologia. A nova espécie é morfologicamente relacionada com *H. sanctaecatharinae* e *H. ramboi*.

Palavras-chave: Taxonomia, Monocotiledônea, Amaryllidoideae, Hippeastreae, Hippeastrinae

INTRODUCTION

Among the 14 accepted genera of Amaryllidaceae Saint-Hilaire (1805: 134) occurring naturally in Brazil, five are endemic (e.g. *Cearanthes* Ravenna (2000: 11), *Eithea* Ravenna (2002: 2), *Griffinia* Ker Gawler (1820: t. 444), *Tocantinia* Ravenna (2000: 9) and *Worsleya* (Watson ex Traub) Traub (1944: 89)). Among the 145 species cited for this country, 67 are endemic. The high number of species is associated with each of the most diverse Brazilian phytogeographic units. If we apply the

biomes delimitations to understand the species distribution, for example, 32 spp. occur in the Cerrado, 8 spp. occur in the Amazon, 19 spp. occur in the Caatinga, 3 spp. occur in the Pantanal, 78 spp. occur in the Atlantic Rain Forest and 33 spp. occur in the Pampa (Flora do Brasil 2020 under construction; Büneker et al., 2016; Büneker & Bastian, 2016; 2017; 2018).

A significant variety of vegetation physiognomies occurs in the Rio Grande do Sul state, from forest to field. The Pampa Biome is characterized mainly by fields formations which, in Brazil, can only be found in this state. The Amaryllidaceae diversity in the Pampa biome is one of the richest, especially if we look at the number of species by territorial area. Therefore, is not surprising that Rio Grande do Sul is the Brazilian state with the largest number of Amaryllidaceae species: 46, corresponding to 31.7% of the country's species. In this state, there are eight Amaryllidoideae Burnett (1835: 446) genera (e.g. *Crinum* Linnaeus (1753: 291), with 1 spp.; *Habranthus* Herbert (1824: t 2464), with 7 spp.; *Haylockia* Herbert (1830: 1371), with 1 sp.; *Hippeastrum* Herbert (1821: 31), with 9 spp.; *Rhodophiala* Presl (1845: 545), with

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1 sp. and *Zephyranthes* Herbert (1821: 36), with 8 spp.) and three Alliioideae Herbert (1837: 48) genera (e.g. *Beauverdia* Herter (1943: 507), with 2 spp.; *Ipheion* Rafinesque (1836: 12) with 2 spp. and *Nothoscordum* Kunth (1843: 457), with 13 spp.) (Flora of Brazil 2020 under construction; Büneker et al., 2016, Büneker & Bastian, 2016, 2017, 2018, Hurrell et al., 2009; Hurrell & Delucchi, 2009).

Despite the great importance of the Brazilian Amaryllidaceae in the horticultural, agronomical and ethnobotanical aspects, the taxonomic knowledge about this botanical family is still incipient in this country. If we focus on southern Brazil in the last decade, for example, the only studies about the taxonomy and nomenclature of this botanical family were Büneker & Bastian, 2016; 2017; 2018. Further extending the list of taxonomic novelties for the southern Brazilian Amaryllidaceae (Büneker & Bastian, 2017; 2018), we hereby present a new species, *Hippeastrum multiflorum*, which remained obscure to science so far, despite its conspicuous habit, relative abundance and wide occurrence in the Rio Grande do Sul state.

MATERIAL AND METHODS

Specimens were collected for laboratory study, cultivation and herborization. The living specimens were included in the living collection of botanical garden of Colégio Politécnico da Universidade Federal de Santa Maria (Santa Maria, Rio Grande do Sul, Brazil). The morphological variation of this new species was observed in habitat, in cultivation and herbaria. The terminology used in the description follows Büneker et al. (2016) with adaptations. The data on related species was obtained in the original descriptions and herbaria collections of HAS, HDCF, ICN, MBM, PACA, RB, SMDB; and digital collections of B, K, MO, NY, P, UEC, US; with acronyms according to Thiers (2013). The photographs were taken from plants in natural habitat and in cultivation and the drawings were based on living material. The points on the map represent populations and were obtained

through expeditions and photographic reports from other researchers. For the elaboration of the map we used the UTM projection system and Datum SIRGAS 2000.

TAXONOMY

Hippeastrum multiflorum Büneker, K. Soares & L.C. Assis, *sp. nov.*, (Figs. 1 A–C, 2 A–G).

Species morphologicice proxima Hippeastro ramboi et Hippeastro sanctaecatharinae. A prima differt foliis dilatatis in florazione (vs. absentes), nervaturis inconspicuis (vs. conspicuae), colore rubescenti vel aeriiginoso et fortiter pruinosis (vs. galbina, glabra vel sparse pruinosa), inflorescentia usque ad 13 flores (vs. usque ad 8 flores), floribus cum pedicellis usque ad 11.5 cm longis (vs. usque ad 8 cm longis), tepalis rubro-aurantiaceis (vs. rubicunda), et maculis carmineis absentibus vel parum salientibus (vs. maculae coloris carminei semper evidentes), paraperigonio fimbriis conicis, regulariter dispositis, base connatis (vs. fimbriae forma dispositioneque irregulari, in glomeris intermissis) et lobis stigmaticis usque ad 10 mm longis (vs. usque ad 4 mm longi). A H. sanctaecatharinae differt pseudocolis usque ad 7 cm longis (vs. usque ad 10 cm longi), colore rubescenti vel aeriiginoso foliorum, fortiter pruinoso (vs. viridula, glabra vel sparse pruinosa), floribus pedicellis usque ad 11.5 cm longis (vs. usque ad 4.5 cm longis), tepalis minus rosatis, rubro-aurantiacei (vs. rubicunda) et paraperigonio multis fimbriis usque ad 3 mm longis (vs. paucae fimbriae usque ad 1.5 mm longae).

Type: BRAZIL. Rio Grande do Sul: São Martinho da Serra, em escarpa rochosa às margens do rio Guassupi, próximo ao Salto do Guassupi, 23 May 2015, fl. cult. 4 March 2016, H.M. Büneker 489, R.C. Pontes & L. Witeck (holotype HDCF!).

Herb geophyte, saxicolous, forming large agglomerations, 28–73 cm tall when flowering. *Bulb* globose, 6–9.5 cm diam., brown; *pseudocolo* 1–7 cm long, brown. *Leaves* 5–9, annual, present during flowering, linear, 20–72



FIGURE 1 – *Hippeastrum multiflorum* Büneker, K. Soares & L.C. Assis (*H.M. Büneker 489 et al.*). A – Habit fertile. B – Inflorescence. C – Longitudinal cut of the flower.



FIGURE 2 – *Hippeastrum multiflorum* Büneker, K. Soares & L.C. Assis (A and G - *K.P. Soares s.n.*; B and C - *L. Witeck s.n. et al.*; D-F - *H.M. Büneker 489 et al.*). A – Habitat. B-C – Habit in habitat. D – Detail of bulb. E – Detail of the leaves when flowering. F – Inflorescence bracts detail. G – Inflorescence seen from above.

× 2.3–6.1 cm, keeled, ribbed with ca. 41 inconspicuous nerves, reddish to dark green or verdigris color, heavily pruinose, margins reddish, apex obtuse-rounded. *Inflorescence* 6–11(–13) flowered; *scape* subcylindrical, hollow, 25–68 × 1.2–2.8 cm, compressed and reddish at the base, reddish-green in the apical portion, pruinose; *bracts* 2, free, strongly reflexed during anthesis, narrow-elliptic, 2–3.1 × 5–6.5 cm, becoming papiraceous, apex cucullate; *bracteoles* present, narrow-triangular to linear, 2–4.2 × 0.2–0.3 cm, becoming papiraceous. *Flower* suberect to patent, pedicellate; *pedicel* subcylindrical, 4.2–11.5 × 0.27–0.3 cm, reddish-green, pruinose; *hypanthium* 0.2–0.56 cm long, externally greenish in the basal portion, yellowish-reddish in the upper portion; *perigone* slightly zygomorphic, infundibuliform; *tepals* subequal, narrow-elliptic to oblanceolate, suberect, slightly arched, up to 7 cm long, free above the hypanthium, red-orange, with 7–12 barely visible nerves with slightly darker coloration, adaxial face with center longitudinally discolored in a form of white line per 1/3 of the basal portion, abaxial face with center longitudinal nervuration in form of a crass line greenish in base; *tepals of the external whorl* the upper one 1.3–2.3 cm width, lateral ones 1–2.2 cm width, apex patent-reflex, obtuse-apiculate or rounded-apiculate; *tepals of the internal whorl* the lower one 0.8–1.5 cm width, with apex erect, lateral ones 0.9–1.7 cm width, apex obtuse-rounded patent-reflex; *paraperigone* of white fimbriae up to 3 mm long, regularly arranged, connate in the base for 1.5 mm, forming a ring; fimbriae with narrow conical shape, ca. 0.2 mm width; *filaments* declinate-ascending, cylindrical, 2.4–4.6 cm long, white in the base, red in median-upper portion, adnate to the tepals for ca. 1 mm above hypanthium; *anthers* versatile, ca. 1 cm long; *ovary* trigonous, externally greenish or reddish-green, 0.5–1.1 long, 0.5–0.7 cm diam.; *ovules* with axillary placentation, biseriate, subdiscoid; *stylus* declinate-ascending, 4.5–6.2 cm long; *stigma* trifid; *stigma lobes* oblong-linear, erect

to patent at anthesis, ca. 0.7–1 × 0.3–0.5 cm, white-reddish surface, apex swollen, reflexed. *Capsules* with three protrusions, green-reddish; *seeds* flat, subdiscoid, black.

Specimens examined (paratypes): BRAZIL. Rio Grande do Sul: Passa Sete, Pitingal, 18 February 2015, *J. Schaefer* 365 (SMDB).

Phenology: The flowering of *H. multiflorum* seems to be stimulated by high temperature fluctuations. In Rio Grande do Sul, this thermal amplitude occurs mainly from late summer until the winter, which makes the flowering an episode that occurs for a long period and can vary greatly in time, depending on the annual climate. Flowering populations were observed from February to August. Regional microclimatic issues affect the flowering period of distinct populations, and this species may diverge from its flowering period in a few months, from year to year. Due to its large number of flowers, floral anthesis occurs on different days, and flowering takes about three weeks. The first flowers to open usually have been fertilized when the laggards are in full pre-flower. The floral anthesis on different days seems to be a strategy that favours genetic diversity, since it avoids endogamy. The capsules open from late fall to spring. The leaves develop during flowering (or sometimes before inflorescence) and dry from middle to late summer.

Etymology: The specific epithet “*multiflorum*” refers to the large number of flowers, possibly this is the species of *Hippeastrum* with the greatest number of flowers (up to 13).

Distribution, Habitat and Ecology: *Hippeastrum multiflorum* is a heliophyte and saxicolous species that grows only in the Rio Grande do Sul state (central-western plateau) (Fig. 3), along the rocky escarpments oriented to the north side. It is generally associated with basaltic rocks (Figure 2 A and B) but it can grow

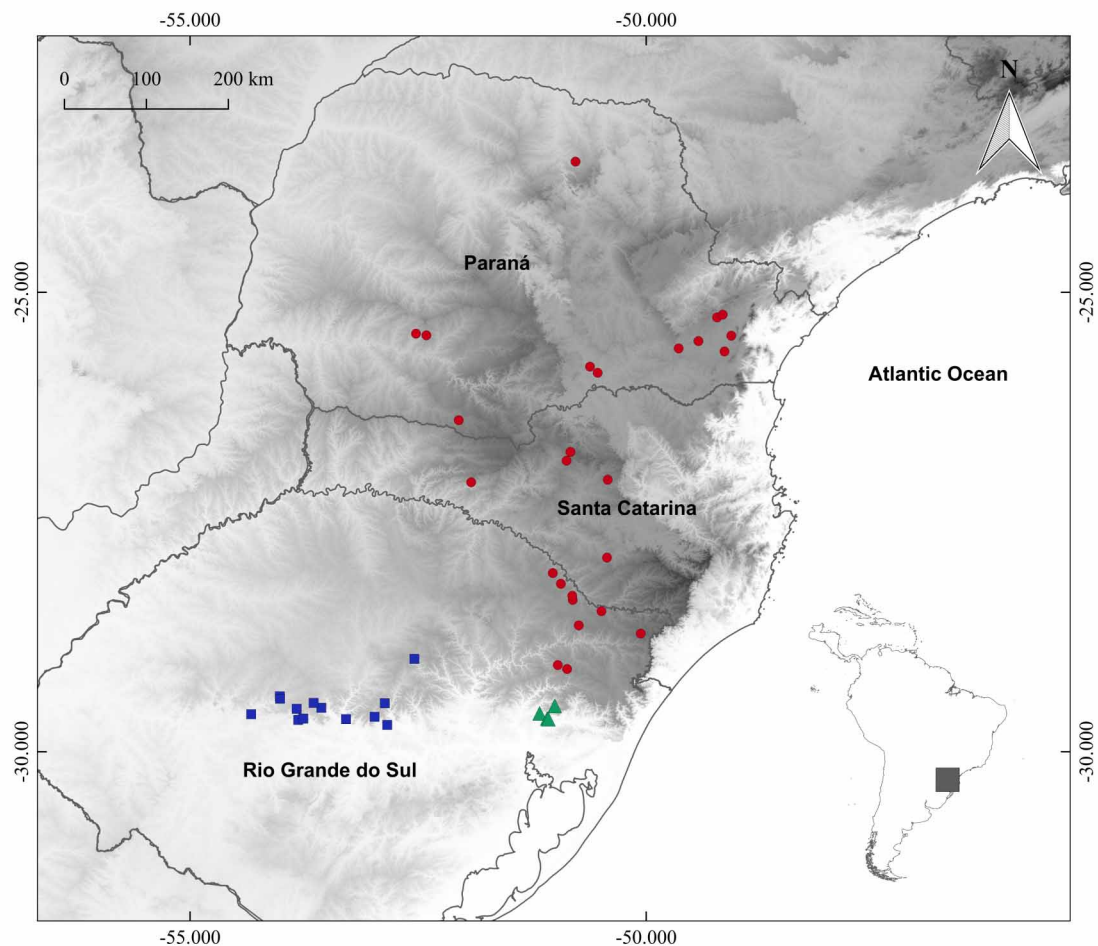


FIGURE 3 – Geographical distribution map of *H. multiflorum* (blue squares), *H. ramboi* (green triangles) and *H. sanctaecatharinae* (red circles).

in escarpments of sedimentary rocks, like sandstone (southwestern populations). Populations of this species are usually surrounded by forest vegetation (seasonal Atlantic Rain Forest). The highest individuals concentrations can be found next to middle course of the Toropi River and its tributaries. These populations are threatened by the construction of hydroelectric dams (SHPs) that will flood them (Marchiori et al., 2014; Büneker & Witeck-Neto, 2016).

We located about 30 populations of *H. multiflorum*. The number of individuals, with the exception of the populations of the Toropi River, usually does not have more than 50

individuals. The species was located in 17 municipalities: Agudo, Candelária, Faxinal do Soturno, Itaara, Ivorá, Jari, Júlio de Castilhos, Nova Palma, Paraiso do Sul, Passa Sete, Quevedos, Santa Maria, São João do Polêsne, São Martinho da Serra, São Pedro do Sul, Silveira Martins and Toropi.

Taxonomic observations: *Hippeastrum multiflorum* is morphologically related to *H. ramboi* R. Bastian & Büneker (2017: 3) and *H. sanctaecatharinae*⁶ (Traub 1958: 32) Dutilh (in

⁶ Note about the correct spelling of this binomial in Büneker & Bastian, 2017, p. 8.

Meerow et al. 1997: 18), mainly by the numerous flowers and tepals with a reddish coloration. It differs vegetatively from *H. ramboi* by the smaller size when flowering (up to 72 cm tall *vs.* up to 94 cm tall); leaves with a smaller length (up to 72 cm long *vs.* up to 98 cm long), with inconspicuous nerves (*vs.* conspicuous nerves), reddish to dark green or verdigris color, heavily pruinose (*vs.* bright green, glabrous to slightly pruinose) present during flowering (*vs.* absent). In reproductive aspect, these species differs by inflorescence with greater number of flowers (up to 13 flowers *vs.* up to 8 flowers); minor scape (up to 68 cm long *vs.* up to 86 cm long); flowers with larger pedicels (up to 11.5 cm long *vs.* up to 8 cm long); light-colored tepals (red-orange *vs.* deep red), and magenta macules missing or slightly pronounced (*vs.* magenta macules always present and very evident); paraperigonium with regularly arranged conical fimbriae, connate at the base (*vs.* fimbriae with irregular forms and irregularly arranged, forming spaced groups); and larger stigmatic lobes (up to 10 mm long *vs.* up to 4 mm long).

It differs from *H. sactaecatharinae* by the smaller pseudocolo (up to 7 cm long *vs.* up to 10 cm long); flowers with longer pedicels (up to 11.5 cm long *vs.* 4.5 cm long); light-colored tepalas (red-orange *vs.* deep red) and paraperigonium with large fimbriaes and large numbers (fimbriaes up to 3 mm long, in large numbers *vs.* fimbriaes up to 1.5 mm long, in smaller amounts). It also differs from *H. sactaecatharinae* because it occurs exclusively in on rocky escarpments with well-drained habitat with constant water deficit (*vs.* very wet, flooded habitat in perennial plots from high altitude regions of RS, SC and PR states); and its flowering phenology in summer until the winter (*vs.* spring).

In herbarium the specimens of *H. multiflorum*, when analysed only for inflorescence, can be confused with robust specimens of *Rhodophiala bifida* (Herbert 1825: 2597) Traub (1952: 156), by the shape and size

of the tepalas, pedicel size, and by bracteoles presence. They are easily differentiated by leaves (at least 2.3 cm wide, glaucous *vs.* subplanes up to 1 cm wide, glabrous, bright).

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