

**TAXONOMIC NOVELTIES IN SOUTH BRAZILIAN AMARYLLIDACEAE - I:
HIPPEASTRUM RAMBOI A NEW SPECIES FROM RIO GRANDE DO SUL AND
LECTOTYPIFICATION OF *H. BREVIFLORUM* HERB.¹**

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ABSTRACT

Hippeastrum ramboi, a new species of Amaryllidaceae (Amaryllidoideae, Hippeastreae) endemic to the mountainous region of Rio Grande do Sul (Brazil) is described and illustrated. Data on its habitat, ecology, geographic distribution is provided and its threat status is evaluated according to IUCN criteria. The new species has morphological affinity with *H. sanctaecatharinae* and *H. breviflorum*, the last one has not been correctly typified up to date, being lectotyped here to correctly define the circumscription of this taxonomic entity in comparison to the new species.

Keywords: Taxonomy, Monocot, Amaryllidoideae, Hippeastreae, Hippeastrinae

RESUMO

[Novidades taxonômicas em Amaryllidaceae sul-brasileiras – I: *Hippeastrum ramboi*, uma nova espécie para o Rio Grande do Sul e lectotipificação de *H. breviflorum* Herb.].

É descrito e ilustrado *Hippeastrum ramboi*, uma nova espécie de Amaryllidaceae (Amaryllidoideae, Hippeastreae) endêmica da região serrana do Rio Grande do Sul (Brasil). São fornecidos dados sobre seu hábitat, ecologia e distribuição geográfica, sendo também avaliado o seu status de ameaça segundo os critérios da IUCN. A nova espécie apresenta afinidade morfológica com *H. sanctaecatharinae* e *H. breviflorum*, o último até esta data não foi corretamente tipificado, sendo aqui lectotipificado com vistas a definir corretamente a circunscrição desta entidade taxonômica em comparação a nova espécie.

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

INTRODUCTION

The genus *Hippeastrum* Herbert (1821: 31) is essentially neotropical, consisting of one with largest species diversity among the Amaryllidaceae J. Saint-Hilaire (1805: 134) and is currently situated in the subtribe Hippestrinae Walpers (1852: 616), tribe Hippeastreae Herbert (1825: t. 2606*(iii)) ex Sweet (1831: t. 14), subfamily Amaryllidoideae Burnett (1835: 446) (Chase et al., 2009, García et al., 2014). The identity of the genus *Amaryllis* Linnaeus (1753:

293) and *Hippeastrum* were the subject of deep discussions, and only a few decades ago reached a relative taxonomic-nomenclatural stability endorsed by the acceptance of the typification of a South African plant such as *Amaryllis belladonna* Linnaeus (1753: 293) (Brummitt, 1987; Goldblatt, 1984; Jarvis, 1984; Meerow et al., 1997; Ravenna, 2003; Rickett, 1958, 1964; Sealy, 1939, 1958; Tjaden, 1981; Traub, 1954, 1983). As a consequence of this typification, the genus *Hippeastrum* came to shelter all the dozens of American species that were treated as *Amaryllis*, and the latter became exclusively composed of South African species (Meerow et al., 1997).

The most relevant author on the taxonomic aspect for *Hippeastrum* was his own descriptor, William Herbert⁴, who described not only

¹ Recebido em 19-VI-2017 e aceito para publicação em 11-IX-2017.

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⁴ William Herbert (1778–1847) was a British botanist, illustrator and member of parliament for Hampshire from 1806 to 1807, and for Cricklade from 1811 to 1812. In 1814 he was ordained, and was nominated to the rectory of Spofforth in the West Riding of Yorkshire. He left

Spofforth in 1840 on his promotion to Dean of Manchester. Died suddenly at his house in 28 May

several new species, as also proposed the taxonomic circumscription that is, in general terms, used until today for the genus. Herbert (1821) first accepted as genera, for what is currently situated in the subtribe Hippeastrinae: *Coburgia* Herbert (1820: t. 2113(4)) (currently *Eusarcops* Rafinesque (1838: 11) *sensu* Büneker & Bastian (2016)), *Hippeastrum*, *Sprekelia* Heister (1755: 19), and *Zephyranthes* Herbert (1821: 36). Later Herbert (1837) conceived a new proposal for generic organization, since there was a big increase of species and genera after his first proposal. This proposal is the basis for what is accepted today in terms of generic circumscription for the current subtribe Hippeastrinae, including: *Habranthus* Herbert (1824: t. 2464), *Haylockia* Herbert (1830: t. 1371), *Hippeastrum* (including *Coburgia* and *Leopoldia* Herbert (1822: 181), currently *Eusarcops sensu* Büneker & Bastian (2016)), *Sprekelia*, and *Zephyranthes*.

The knowledge of the species of Hippeastrinae in southern Brazil has progressed little in the last decade since the last publications with taxonomic novelties refer to 2005 (e.g. Ravenna, 1970, 1999, 2001, 2002, 2005). The most recent work on taxonomy of Hippeastrinae in southern Brazil (Büneker & Bastian, 2016) revealed the general lack of typification of species, and that the correct lectotypification is necessary for most of the South Brazilian taxa in this subtribe. The investigations about the correct *typi* are extremely necessary when there is a need to clearly define the acceptable taxonomic entities and their relations with other species, being of first order of importance when taxonomic proposals such as new circumscriptions, synonyms and new species are made. Thus, here a series of articles is inaugurated with the aim to bring to light several taxonomic novelties for the Amaryllidaceae of

southern Brazil. In this article we are not only proposing a new species (*Hippeastrum ramboi*), but also the lectotypification of the species most similar to it morphologically, *Hippeastrum breviflorum*, which despite being one of the most known and abundant species of *Hippeastrum* from the southern Brazil to the present date has not a defined nomenclatural type.

MATERIAL AND METHODS

Specimens were collected for laboratory study, cultivation and herborization. The living specimens were included in the living collection of CRER Brasil (Centro de Reprodução de Espécies Raras do Brasil, Rio Grande do Sul, Brazil). The morphological variation of this new species was observed in habitat, in cultivated and in herbaria specimens. The terminology used in the description follows Büneker et al. (2016). The data on related species was obtained in the original descriptions, and from cultivated specimens and herbaria collections HAS, HDCF, ICN, MBM, PACA; digital collections of B, K, MO, NY, P, US; acronyms according Thiers (2017). The photographs were taken from plants in natural habitat and in cultivation, and the drawings were based on living material.

TAXONOMIC TREATMENT

1. *Hippeastrum breviflorum* Herbert, Amaryllidaceae, p. 137, 1837, (Figs. 1A–B, 2A). = *Amaryllis breviflora* (Herb.) Traub & Uphof, *Herbertia*, v. 5, p. 125, 1938.

Type: Lectotype (designated here): *s.l.*, *s.d.*, *Tweedie s.n.* (K 000523817!, Fig. 1A).

Nomenclatural observations: In the original description of the species Herbert (1837) cites “(...) Pl. 21 f. 4. Bot. Mag. Ined. 62. 3549. Specim. Herb. Hooker (ex Braz. Meridional?) (...) Sent by Tweedie to the Glasgow Botanic Garden, where it has flowered”. The first part of this passage cites an illustration that was probably drawn from the herbarium material sent by Tweedie (Fig. 1A), but also for having coloration, it also could be from the living specimen that flowered a year earlier at Glasgow

1847, in London. He became one of the most famous taxonomists of bulbous plants, especially the family Amaryllidaceae (Jackson, 1891; Stearn, 1952; Stafleu & Cowan, 1979).



FIGURE 1 – *Hippeastrum breviflorum* Herb. A – Lectotype, Tweedie s.n. (Image credits: herbarium K, Barcode: 000523817). B – Illustration given in the original description (Herbert, 1837) of the species, figure 4 of the plate 21 (Image credits: New York Botanical Garden, LuEsther T. Mertz Library).

Botanic Garden (Fig. 1B). Subsequently, the author refers to an unpublished illustration, effectively published in Curtis's botanical magazine, t. 3549 (Fig. 2) (Hooker, 1837), of a specimen that flowered at the Glasgow Botanic Garden in April 1836. Herbert (1837), mentions that bulbs and dried specimens were sent by Tweedie from Buenos Aires. The dry specimen to which Herbert refers nowadays is found in Herbarium K and is the most suitable material to be chosen as a lectotype (Fig. 1A). It should be noted that several authors have cited Argentina as the country of origin of the species, based on an erroneous interpretation of Herbert (1837). However, this author does not say that the plant was collected in Buenos Aires, but that it was sent from Buenos Aires to Europe along with other materials. No collection number can be observed for these specimens, and J. Tweedie's travel itinerary is not well known. Ollerton et al. (2012) and Stafleu & Cowan (1986) make generalized references to the trip, reporting that the naturalist was in southern Brazil, Uruguay and Argentina; however there is no possibility to relate the collection of *H. breviflorum* to a

specific country. However, its distribution at present time is basically restricted to humid areas in the coastal region and altitude fields of the states of Rio Grande do Sul and Santa Catarina, in Brazil, regions where Tweedie made several botanical collections, being also probable where the naturalist collected the material sent to Europe via Buenos Aires.

2. *Hippeastrum ramboi* R. Bastian & Büneker, *sp. nov.*, (Figs. 3A–D, 4A–F).

Species morphologic proxima Hippeastro brevifloro, sed primo aspectu ad Hippeastrum sanctaecatharinae valde accedit. A prima differt pseudocolo brevior (usque 4.3 cm vs. usque 8.0 cm); foliis absentibus in anthesi, nervuris centralibus conspicuis et marginibus non hialinis (vs. dilatatae in anthesi, nervuris inconspicuis et marginibus hialinis); floribus pedicellis longioribus (usque 8 cm vs. usque 6.5 cm); tepalis apice rubro (vs. albus vel roseus), longioribus (usque 6.8 cm vs. usque 5 cm); paraperigonio fimbriis irregulariter dispositis, in glomeraminibus intermissis (vs. fimbriae regulariter dispositae in annulo). A secunda



FIGURE 2 – *Hippeastrum breviflorum* Herb. Illustration extracted from Curtis's Botanical Magazine, v. 11, t. 3549, 1837. (Image credits: Missouri Botanical Garden, Peter H. Raven Library).

differt pseudocolo breviore (usque 4.3 cm vs. usque 10 cm); foliis latioribus usque 4 cm, absentibus in anthese, nervuris centralibus conspicuis, marginibus non hialinis (vs. folia usque 2 cm lata, dilatatae in anthese, nervuris inconspicuis, marginines hialinae); floribus pedicellis longioribus (usque 8 cm vs. usque 4.5 cm); tepalis coloris distinctae in margine basali nervurae centro-longitudinalis (rubicunda vs. absens); paraperigonio fimbriis attenuatis et irregulariter dispositis, in glomeraminibus intermissis (vs. fimbriae latae, regulariter dispositae, in annulo).

Type: BRAZIL. Rio Grande do Sul: Novo Hamburgo, ad fl. Feitoria p. Novo Hamburgo

ad cataractas in rupestribus, 1937, *C. Orth s.n.* (Holotype PACA 34098!).

Herb geophyte, saxicolous, forming large agglomerations, 78–94 cm tall when flowering. *Bulb* globose 7–12 cm diam., brown; *pseudocolo* 2.0–4.3 cm long, brown. *Leaves* 3–10, annual, linear, 19–98 × 2.7–4 cm, keeled at the basal portion, flattened at apex, ribbed with ca. 32 conspicuous nerves, bright green, glabrous to slightly pruinose, abaxial face glabrous, pale green, apex rounded, absent during flowering. *Inflorescence* 6–7 flowered; *scape* cylindrical, hollow, 70–86 × 2–2.5 cm, compressed at the base, pinkish-greenish-reddish at the basal portion, greenish in the middle-upper part,

nerved and slightly pruinose; *bracts* 2, free, strongly reflexed during anthesis, oblanceolate-elliptic, 5–8 × 1.1–2.7 cm, greenish-pinkish becoming papiraceous, apex obtuse-rounded; *bracteoles* 4–6, white, linear, the smaller 3–4 × 0.08–0.12 cm, the largest 3–4 × 0.2–0.3 cm, becoming papiraceous. *Flower* patent, pedicellate; *pedicel* cylindrical, 5.5–8 × 0.2–0.35 cm, pinkish-greenish; *hypanthium* 0.5–0.7 cm, greenish-reddish-ocher; *perigone* infundibuliform, larger flowers up to 7.5 cm long; *tepals* subequal, suberect-patent, arched, up to 6.8 cm long, free above the hypanthium, red, adaxial face with center longitudinal nervuration in a form of a narrow line, white-pinkish-greenish for almost half of the length, having one its margins a deep red coloration at the basal portion, followed by a slight magenta coloration and 8–13 deep red secondary nerves, abaxial face with center longitudinal nervuration, in a form of a narrow crass line, greenish-ocher for the complete length, for nearly half of its length the margins present a reddish-purplish-magenta coloration; *tepals of the external whorl* narrow-elliptic to oblanceolate, the upper one 5.6–6.8 × 1.5–2.2 cm, lateral ones 5.4–6.6 × 1.3–2.1 cm, apex rounded-apiculate to obtuse-apiculate; *tepals of the internal whorl* narrow-elliptic to oblanceolate, the lower one 5.2–6.4 × 0.9–1.2 cm, recurved, lateral ones 5.3–6.6 × 1.0–1.4 cm, apex obtuse-acute; *paraperigone* of white-pinkish fimbriae up to 3.1 mm long, irregularly arranged, partially to fully connate, forming spaced groupings of ca. 1.4–2.1 × 2.4–3.1 mm; *filaments* declinate-ascending white-pinkish at the base, red in the center a in the apical part, cylindrical, 0.8–1 mm diam., the longest 3.5–5.6 cm long, the shortest 2.5–4.7 cm long; *anthers* versatile, 0.3–0.6 cm long; *ovary* trigonous, 0.9–1.2 × 0.5–0.8 cm; *ovules* with axillary placentation, biseriate, subdiscoid; *stylus* declinate-ascending, 6.2–7.4 × 0.07–0.1 cm; *stigma* trifid; *stigma lobes* oblong-linear, recurved at anthesis, 3–4 × 0.6–1 mm, white-reddish surface. *Capsules* with three protrusions,

greenish; *seeds* flat, subdiscoid, 10–12 × 0.07–0.1 mm.

Additional specimens examined (paratype): BRAZIL. Rio Grande do Sul: Novo Hamburgo, Picada 48, 12 May 1937, *B. Rambo s.n.* (PACA 2852!); Santa Maria do Herval, saxícola às margens do rio Cadeia, 8 December 2016, flowered in cultivation, April 2017, *R.E. Bastian 112* (PACA!).

Phenology: Flowering begins mid of April, after the first colds of the fall, following a long spring and summer dormancy. Seed maturation happens in ca. 30 to 45 days, normally at the end of the fall, with leaves developing into full stage during winter and lasting until mid of spring when the species once more enters into full dormancy. Similar phenology can be observed in *Hippeastrum aulicum* (Ker Gawler 1817: 253) Herbert (1821: 31) and *Hippeastrum papilio* (Ravenna 1970: 83) Van Scheepen (*in* Meerow et al. 1997: 18), which also occur in Rio Grande do Sul, suggesting that this clear difference of seasonality between the fall-winter flowering species and the spring-summer flowering species might be of major taxonomical relevance.

Etymology: The epithet honors the Priest Balduino Rambo (1906-1961), who actively contributed to the knowledge of the Flora of Rio Grande do Sul, with his extensive collections and publications, being also the first collector of this species, in the Caf River Basin, where he was born and conducted much of his studies.

Distribution and Ecology: Occurs on the eastern edge of the Southern plateau, at the Caf River Basin in Rio Grande do Sul, Brazil, where it grows on shadowed rocks and cliffs, close to rivers and waterfalls surrounded by forests, being susceptible to occasional flooding. Seed and bulb dispersal much likely occur through the water of the rivers where it is associated.

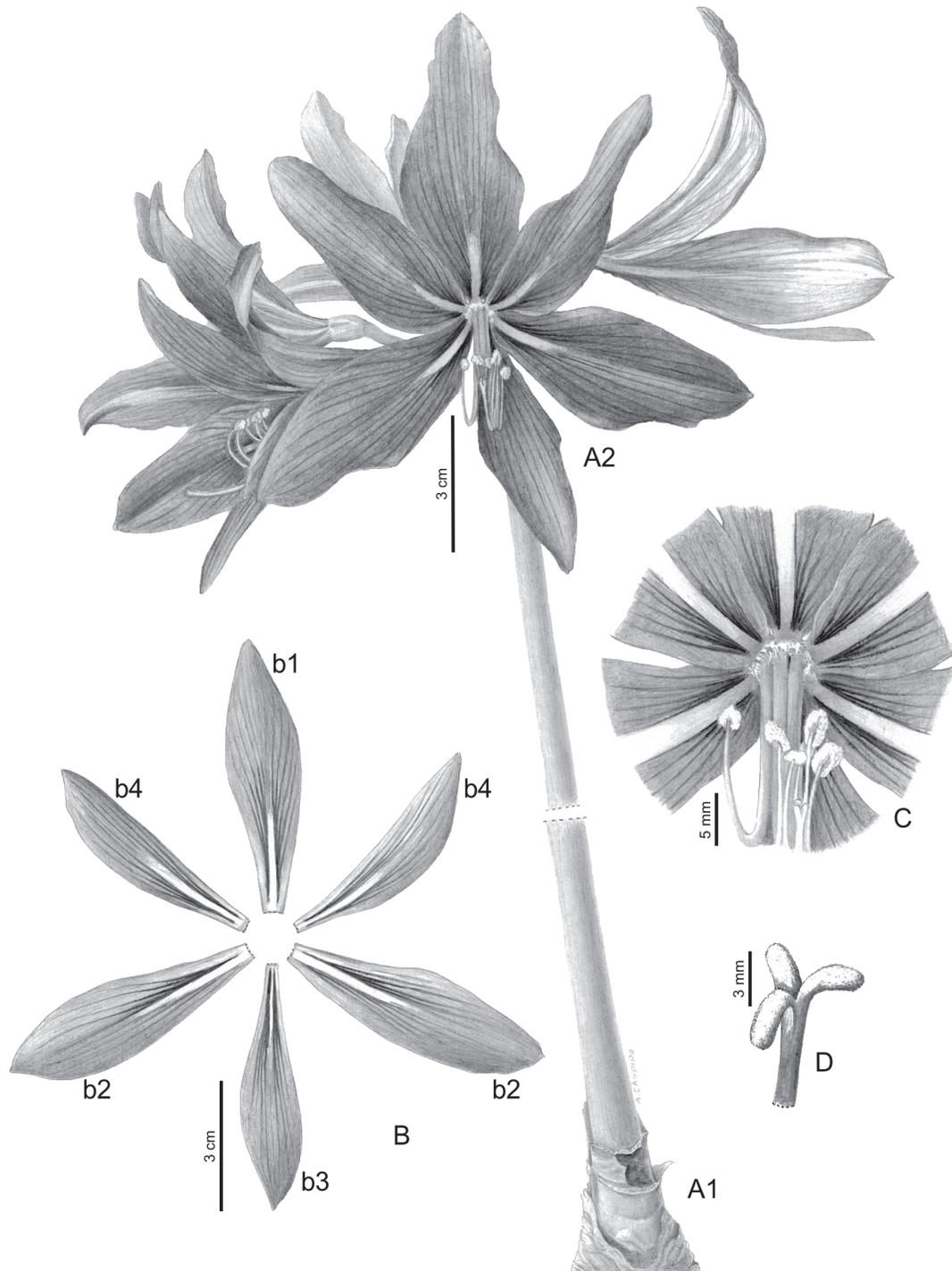


FIGURE 3 – *Hippeastrum ramboi* R. Bastian & Büneker (*R.E. Bastian 112*). A – Habitus. A1 – Fertile bulb. A2 – Inflorescence. B – Perigone. b1-b2 – Tepals of the external whorl. b1 – Upper tepal. b2 – Lateral tepals. b3-b4 Tepals of the internal whorl. b3 – Lower tepal. b4 – Lateral tepals. C – Detail of the paraperigone. D – Stigma detail.



FIGURE 4 – *Hippeastrum ramboi* R. Bastian & Büneker (*R.E. Bastian 112*). A – Habitus sterile in habitat. B – Plants in fruiting. C – Fruiting detail. D – Abaxial face of the upper portion of a sheet. E – Adaxial face of the upper portion of a sheet. F – Inflorescences. G – Detail of the inflorescence bracts.

Conservation Status: The species occurs discontinuously within an extension (EOO) of ca. 60 km² in the region of the Caí River Basin, with only 3 known populations. Hydroelectric plants and pollution of the rivers represent major threats though tourism and entertainment activities linked to sites where it is found and collection for horticultural purposes also represent risks for the species long term survival. According to criteria B1 b(i, iii, iv), c(i, iii) of IUCN (2016), it is considered an Critically Endangered species (CR).

Observations: *Hippeastrum ramboi* is morphologically related to *Hippeastrum breviflorum*. Differs from *H. breviflorum* through many characters, being the most remarkable: shorter pseudocolo (up to 4.3 cm vs. up to 8.0 cm); leaves absent during flowering (vs. developed), different leaf margins (not hyaline vs. hyaline for ca. 0.7 mm); flowers with longer pedicels (up to 8 cm vs. up to 6.5 cm), different color of the apex of the tepals (red vs. white or pinkish), longer tepals (up to 6.8 cm vs. up to 5 cm); shape of paraperigone (fimbriae irregularly arranged, forming spaced groupings vs. fimbriae regularly arranged in a form of a ring); different color of the filaments (red vs. pinkish-cream). Might also be confused with *Hippeastrum sanctaecatharinae*⁵ (Traub 1958: 32) Dutilh (in Meerow et al. 1997: 18), that occurs much northern. Differs from *H. sanctaecatharinae* through: shorter pseudocolo (up to 4.3 cm vs. up

to 10 cm); leaves absent during flowering (vs. developed), wider leaves (up to 4 cm vs. up to 2 cm); leaf margins (not hyaline vs. hyaline for ca. 0.5 mm); flowers with longer pedicels (up to 8 cm vs. up to 4.5 cm); tepals with different coloration at the base of the center longitudinal nervuration (deep red vs. absent); shape of paraperigone (narrow fimbriae irregularly arranged, forming spaced groupings vs. wider fimbriae regularly arranged in a form of a ring). *H. ramboi* can also be distinguished by the very evident leaf ribbing seen both in live and herbaria specimens and also by its phenology, flowering in mid of fall (April/May) with *H. breviflorum* and *H. sanctaecatharinae* flowering during spring (September/December), also its habitat differentiates it, being strictly saxicolous growing on rocks and with related species being terrestrials growing on very moist areas, mostly in swampy fields.

ACKNOWLEDGMENTS

The authors thank Dra. Maria Salete Marchioreto, Curator of Herbarium PACA-AGP for her kind assistance during the revision of the historical collection of Father Rambo and colleagues, to André Gehlen, for his partnership and assistance during field work and with the live collection, to the teacher of Latin, Leila Maraschin for her assistance with the translation of the diagnosis and to Mary Stiffler of the Peter H. Raven Library- Missouri Botanical Garden and James Shields for providing rare literature.

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⁵ Originally the name of the species is “*Amaryllis santacatarina*”, however the latinization of the specific epithet is notoriously incorrect. We consider the epithet in its original form an error of grammatical origin. According to articles 23.5, 32.2 and 60.1 of the International Code of Nomenclature for Algae, Fungi, and Plants (McNeill et al., 2012) errors like this should be corrected. The epithet “*santacatarina*” has a geographical origin referring to the Brazilian state of Santa Catarina, however to avoid more drastic changes to the epithet we chose to latinize following the recommendations for personal names (recommendation 60C). Thus we suggest the alteration of the epithet to “*sanctaeacatharinae*” which is an epithet suitably latinized and has already been used in other species.

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