BALDUINIA, n. 62, p.01-08, 30-VI-2018 http://dx.doi.org/10.5902/2358198033221

TAXONOMIC NOVELTIES IN SOUTHERN BRAZILIAN AMARYLLIDACEAE – II: *ZEPHYRANTHES COMUNELLOI*, A NEW SPECIES FROM SANTA CATARINA; AND LECTOTYPIFICATION OF *ZEPHYRANTHES MESOCHLOA* HERB. EX LINDL.[1]

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ABSTRACT

Zephyranthes comunelloi, a new species of Amaryllidaceae (Amaryllidoideae, Hippeastreae) that occurs in grasslands of the central-western region of Santa Catarina (Brazil) is described and illustrated. Data are provided on their habitat, ecology and geographic distribution. The new species shows morphological affinity with *Z. gratissima* and *Z. mesochloa*; differing basically in the shape of the leaves, size and color of the tepals and position of the style. We have also proposed here a lectotype for *Z. mesochloa.*
Keywords: Taxonomy; Monocot; Amaryllidoideae; Hippeastreae; Hippeastrinae.

RESUMO

[Novidades taxonômicas em Amaryllidaceae sul-brasileiras – II: *Zephyranthes comunelloi*, uma nova espécie para Santa Catarina e lectotipificação de *Zephyranthes mesochloa* Herb. ex Lindl.]. É descrito e ilustrado *Zephyranthes comunelloi*, uma nova espécie de Amaryllidaceae (Amaryllidoideae, Hippeastreae) que ocorre em campos da região centro-oeste de Santa Catarina (Brasil). São fornecidos dados sobre seu hábitat, ecologia e distribuição geográfica. A nova espécie apresenta afinidade morfológica com *Z. gratissima* e *Z. mesochloa*, diferindo basicamente pela forma das folhas, tamanho e cor das tépalas e posição do estilete. Também propusemos neste trabalho um lectótipo para *Z. mesochloa.*
Palavras-chave: Taxonomia; Monocotiledônea; Amaryllidoideae; Hippeastreae; Hippeastrinae.

INTRODUCTION

The genus *Zephyranthes* Herbert (1821: 36) (Amaryllidaceae Saint-Hilaire (1805: 134)) is currently situated in the subfamily Amaryllidoide Burnett (1835: 446), tribe Hippeastrae Herbert (1825: t. 2606*(iii)) ex Sweet (1831: t. 14), subtribe Hippeastrinae Walpers (1852: 616) (*sensu* García et al., 2014). The genus label from other taxonomic categories is no longer accepted (e.g., Zephyranthinae Baker (1878: 162), Zephyranthaceae Salisbury (1866: 133) and Zephyrantheae Hutchinson (1934: 130)). It is the second largest genus (by number of species) in Hippeastrae, containing between 88 and 115 officially accepted species; and at present there are considered to be no infrageneric categories (eMonocot, 2010; The Plant List, 2013).

The genera of Hippeastrinae show extremely complex and subtle morphological delimitations due to high levels of homoplasy (García et al., 2014). *Zephyranthes* is notably characterized by its relatively smaller size, and is morphologically only very close to *Habranthus* Herbert (1824: t. 2464) and *Haylockia* Herbert (1830: t. 1371). However its inflorescences have overhead scapes which are developed and conspicuous (*vs.* subterranean scapes which are lesser developed and inconspicuous in *Haylockia*); and are reduced to a single pedicellate and erect flower with perfectly actinomorphic perigone (*vs.* suberect flowers with slightly zygomorphic perigon in *Habranthus*) (Büneker & Bastian, 2016).

Zephyranthes exhibits a neotropical distribution, with great diversity in the extreme

[1] Recebido em 17-IV-2018 e aceito para publicação em 22-V-2018.
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south of the Americas in open vegetations, as in the "chaco", "pampa" and "espinal", where it is a conspicuous element among the community of geophyte plants. Seventeen species of *Zephyranthes* are cited for Brazil and most of them occur in the fields of the Atlantic Forest Biome and Pampa Biome in the southernmost states (Flora do Brasil 2020 under construction). For the state of Santa Catarina, six species are cited (*Zephyranthes candida* (Lindley 1823: t. 724) Herbert (1826: t. 2607), *Z. flavissima* Ravenna (1967: 28), *Z. fluvialis* Ravenna (2001: 39), *Z. lagesiana* Ravenna (2001: 40), *Z. mesochloa* Herbert ex Lindley (1830: t. 1361) and *Z. seubertii* Hume (1943: 503)), although *Z. candida* is an introduced species in the region. The Santa Catarina specimens we examined, that were previously identified as *Z. mesochloa*, belong to the new species we are proposing in this paper. Continuing the series of articles on taxonomic novelties for the Southern Brazilian Amaryllidaceae (Büneker & Bastian, 2017), we propose in this article a new species, *Zephyranthes comunelloi*. This new species is similar to *Z. mesochloa*, and to compare them properly, we have proposed a lectotype for the latter.

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, and in cultivated and herbaria specimens. 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; and digital collections of B, FLOR, K, MO, NY, P, US; with acronyms according to Thiers (2018). The photographs were taken from plants in natural habitat and in cultivation, and the drawings were based on living material.

TAXONOMIC TREATMENT

1. ***Zephyranthes mesochloa*** Herbert ex Lindley, Edwards's Botanical Register, t. 1361, 1830.

Type: Lectotype (designated here): illustration from Edwards's Botanical Register, v. 16, t. 1361, 1830 (Fig. 1).

Nomenclatural observations: Although this species has a wide distribution in the grasslands of pampa and chaco (in Paraguay, Argentina, Uruguay, and Southern Brazil), and has already been cited in a huge amount of taxonomic treatments, we could not locate any author that has typified this name; even though we have done extensive research. We can highlight the study of Ravenna (1974) who proposed several synonyms and gave an updated circumscription for the species. However, the typification of the species was not addressed.

This species was described from live material sent by Mr. Anderson from Buenos Aires to Mr. Mackay, who passed it on to W. Herbert. In the original material of this species (Lindley, 1823) it is stated that the description and the illustration provided are from Herbert, however the text is signed by Lindley; for this reason it is correct that both are cited as authors. Since we did not locate any herbarium material that could be type, we propose here as lectotype original illustration, which provides all the necessary elements for the good recognition of the species.

2. ***Zephyranthes comunelloi*** R. Bastian & Büneker, *sp. nov.*, (Figs. 2 and 3).

Species morphologice proxima Zephyranthe gratissima et Zephyranthe mesochloa. A prima differt forma foliarum (planae vs. canaliculatae), colore et longitudine tepalorum in anthese (flavescens-cremum, 3–3.7 cm vs. albus, 3.7–4.5 cm); stylo minori et erecto (0.9–1.6cm

FIGURE 1 – *Zephyranthes mesochloa* Herbert ex Lindley. Illustration extracted from Edwards's Botanical Register, v. 16, t. 1361, 1830. (Image credits: Missouri Botanical Garden, Peter H. Raven Library).

vs. 1.8–2.1 cm, cum stylo arcuato ascendente). Primo aspectu a secunda differt apparentia minori, sed etiam foliis planis largis usque ad 2.6 mm (vs. canaliculatae, largae usque ad 6 mm); stylo erecto (vs. declinatus ascendens) et lobis stigmaticis brevioribus (2 mm vs. usque ad 6 mm). Species nova etiam potest confundi cum Zephyranthe amoeana, occurrens in ipsa regione, eae faciliter differens colore tepalis in anthese (flavescens-cremum vs. viola) et foliis largioribus (3.6mm vs. usque ad 0.5 mm).

Type: BRAZIL. Santa Catarina: Água Doce, Três Pinheiros, Campo Rochoso, 12 October 2017, *T. Comunello 01* (Holotype PACA!).

Herb geophyte, terrestrial, 8–18 cm tall when flowering. *Bulb* globose 1.5–2.6 cm diam., brown; *pseudocolo* 0.8–8.6 cm long, brown. *Leaves* absent when flowering, latter up to 5, linear, adaxial face flat, abaxial face slightly rounded, up to 25 × 0.20–0.26 cm, green, glabrous, apex obtuse. *Inflorescence* one flowered; *scape* cylindrical, hollow, 8.5–12.5 × 0.18–0.2 cm, castaneous-greenish at the base, greenish in central upper part, glabrous; *bract* 1, erect, triangular, 2–2.2 × 0.7 cm, apex bifid for 0.5–0.6 cm, 10–11 nerves, greenish-pinkish-magenta with silvery scales. *Flower* erect, pedicellate; *pedicel* cylindrical, 0.8–1.6 × 0.18–0.2 cm, greenish; *perigone* infundibuliform, 2.2–2.8 × 3.7–4.4 cm; *tepals* suberect-patent during anthesis, free to connate for about 1.5–2 mm, yellowish before anthesis, yellowish-cream during anthesis, creamy-white and whitish-pink after anthesis, pinkish when fading, greenish base, adaxial face with 6–10 nerves in the middle region, nervurations 2.6–3.7 cm long with a pinkish colour; *tepals of the external whorl* oblanceolate-elliptic, 3.0–3.7 × 0.8–1 cm, apex rounded bearing a pinkish apicule; *tepals of the internal whorl* oblanceolate-eliptic, 2.9–3.2 × 0.6–0.8 cm, apex obtuse to acute; *stamens* tridynamous; *filaments* erect, creamy or white, subcylindrical, the longest 0.8–1.3 cm long, the shortest 1–5 mm long; *anthers* versatile, 5–7 mm long, yellow; *ovary* trigonous, 4–5 × 3–4 mm, green; *stylus* erect, equaling or longer than the longest stamens, 9–16 × 0.6–0.9 mm; *stigma* trifid; *stigma lobes* oblanceolate, strongly recurved, 1–2 × 0.6–1 mm, creamy. *Capsules* with three protrusions, castaneous-greenish. *Seeds* flattened, bright black.

Specimens examined (paratypes): BRAZIL. Santa Catarina: Água Doce, Field, 22 Km South of Horizonte/Paraná, 02 December 1971, *L.B. Smith & R.M. Klein 15592* (US 2743309!); Fazenda Roseira, campo natural seco e pedregoso, 26 November 2013, *S. Campestrini 819 et al.* (FLOR 0053703!).

Phenology: Flowering starts in September with the beginning of spring, lasting until December/January, the beginning of summer, when rain is still frequent. Leaf development predominantly starts together with or during inflorescence development, with very few individuals developing leaves only right after the blooming season. Seed maturation happens in ca. 7–10 days after successful pollination; depending one climatological factors it might be even faster. A latter autumn and winter dormancy is observed before a massive flowering next spring. Heavy rain or fire are very important for the successful blooming of this new species. Flowering was observed in the wild and in cultivation; and in both conditions the tepals showed colour changes throughout the blooming period, which lasts ca. 24 hours. When in bud the tepals show a yellowish colour, reaching a creamy colour just before anthesis, developing into a creamy-whitish colour in full anthesis, and finishing with a white colour which turns pink when fading away (Fig. 3). Such colour changes are not frequent in the *Zephyranthes* of Southern Brazil.

Etymology: The epithet honors Teylor Rodrigo Comunello, an environmental military policeman from the state of Santa Catarina with a degree in biological sciences, an expert in environmental law, and an active contributor to the knowledge of the flora of Santa Catarina,

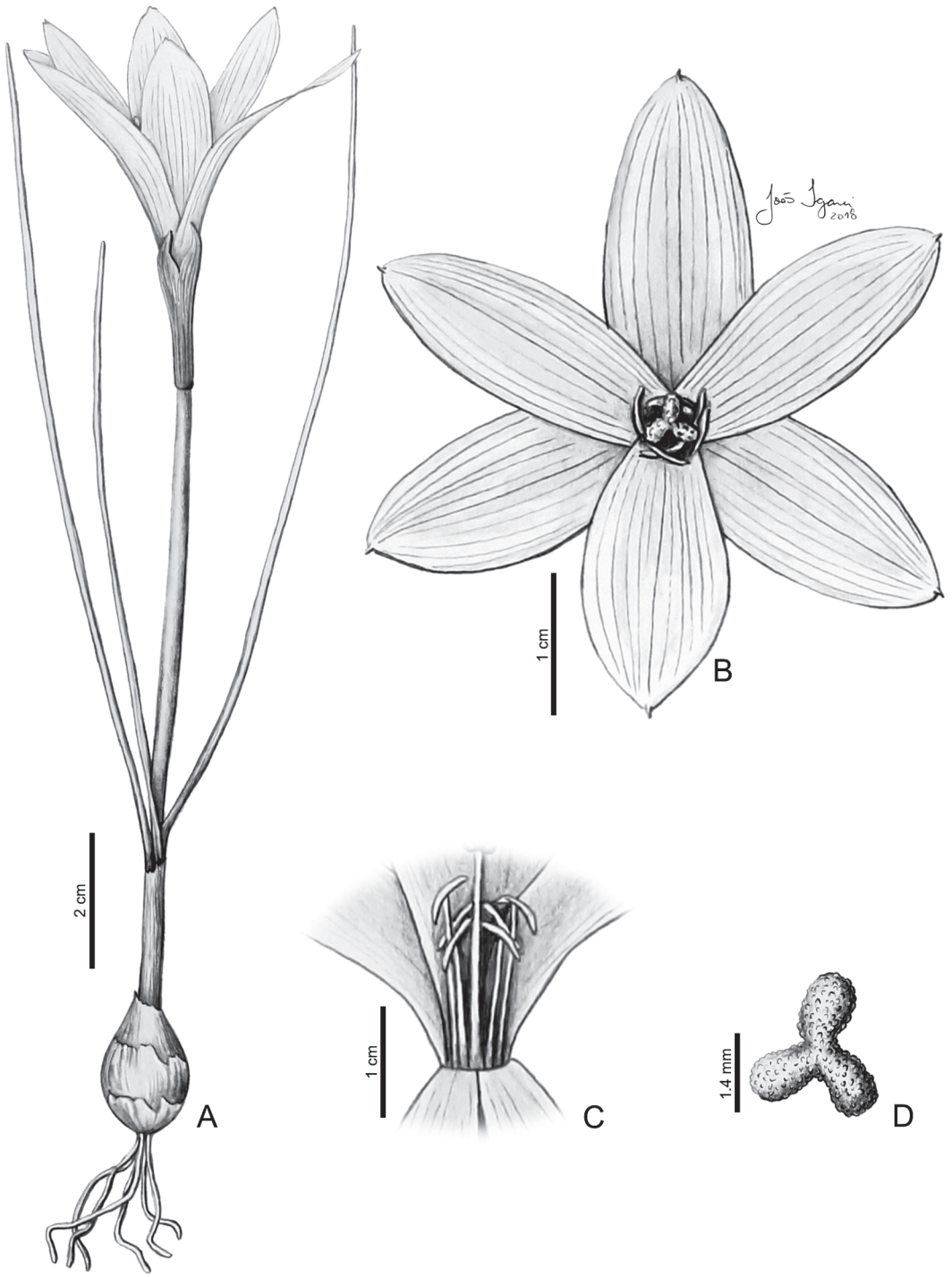

FIGURE 2 – *Zephyranthes comunelloi* R. Bastian & Büneker (*T. Comunello 01*). A – Habitus. B – Top view of flower. C – Detail of androecium. D – Stigma detail.

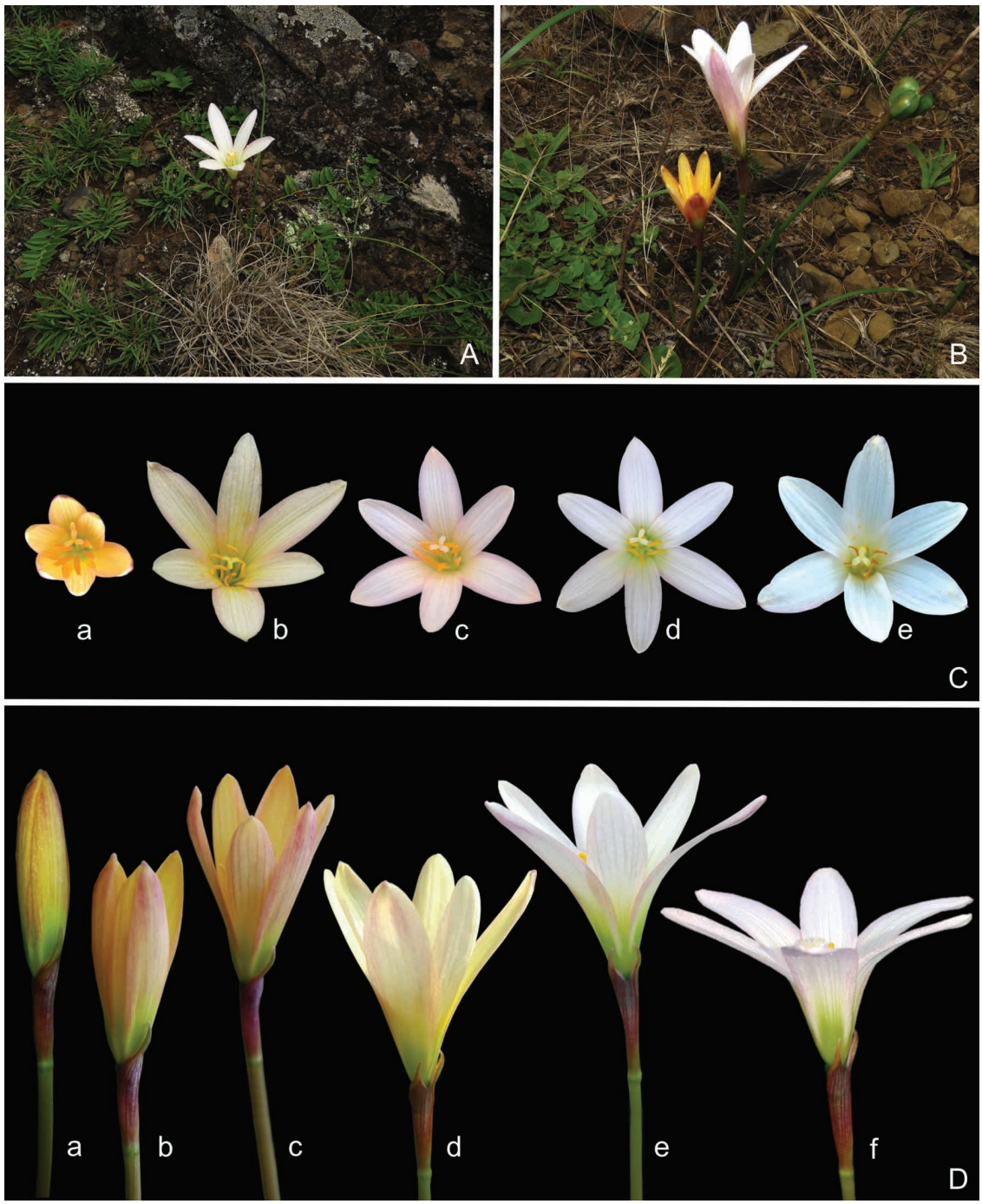

FIGURE 3 – *Zephyranthes comunelloi* R. Bastian & Büneker (*T. Comunello 01*). A –Habit during anthesis in habitat. B – Several phenological phases. Left flower in pre-anthesis; central flower in post-anthesis; on the right an immature capsule. C – Top view of the flower in various phenological stages. a – Pre-anthesis flower with yellow tepals. b-e – Flowers in anthesis and nearby stages with various coloured tepals. b – Yellowish-creamish; c – Pinkish-white; d – Pinkish-white; e – Creamy-white. D – Side view of the same flower in several stages of development (photographs obtained in periods of about 1 hour). a – Closed flower. b-e – Pre-anthesis flower opening process. f – Flower during the anthesis.

especially Orchidaceae and Amaryllidaceae.

Distribution, Habitat and Ecology: The species is known only from the municipality of Água Doce, middle-west of the state of Santa Catarina (Brazil), where it grows in a diverse range of habitats. It is less frequently found growing on rocky outcrops with very little substrate, or in swampy grasslands where it is susceptible to occasional flooding. The majority of the plants analyzed where found on chemically poor, rocky soils in open fields of the Atlantic Rainforest Biome.

Conservation Status: The species occupies an area of ca. 700 km^2, with different subpopulations within the municipality of Água Doce. It is currently abundant in all its subpopulations, though clearing of land for agricultural purposes represents a major risk for the long-term survival of the species. Further studies on the distribution of the species are necessary, so the species falls under category DD (deficit data) of IUCN (2016).

Taxonomic observations: *Zephyranthes comunelloi* is morphologically related to *Z. gratissima* Ravenna (2001: 38) and *Z. mesochloa* though it differs from both of these through many characters. The most notably differences from *Z. gratissima* are: different shape of the leaves (flat *vs*. canaliculate), different colouration of the tepals during anthesis (yellowish-cream *vs.* white), shorter tepals (3–3.7 cm *vs.* 3.7–4.5 cm), and, shorter and different stylus position (0.9–1.6 cm, erect *vs.* 1.8–2.1 cm, arched ascending). It can be differentiated from *Z. mesochloa* at a first glance by its smaller size but also through different leaves (flat, up to 2.6 mm wide *vs.* canaliculate, up to 6 mm wide), different stylus position (erect *vs*. declinate ascending), and, shorter stigma lobes (up to 2 mm *vs.* up to 6 mm). *Zephyranthes comunelloi* might be confused with *Z. amoeana* Ravenna (1999: 54) which occurs in the same region but is easily differentiated by the color of the perigone during anthesis (yellowish-cream *vs*. lilac) and the wider leaves (up to 3.6mm *vs.* 0.5 mm). It is important to note that the type material of *Z. gratissima* Ravenna (2001: 38) is not present in the Herbaria MBM, and so couldn't be accessed; though through the original description it was possible to determine that it is a different species from the species we are publishing now.

ACKNOWLEDGMENTS

The authors would like to thank André Gehlen, for his assistance with the living collection; Leila Maraschin, professor of Latin, for her assistance with the translation of the diagnosis; Ivor Tyndall, for his assistance with the English; and for Manuel J. Belgrano of Instituto de Botánica Darwinion and James Shields for providing rare literature.

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