**New species for the genus *Cypella* (Iridaceae: Tigridieae)**

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**Abstract**

Three new species of *Cypella* sect. *Nais* are described and illustrated for southeastern South America: *C. fronteriza*, from Artigas and Rivera Departments, northern Uruguay, and southern Rio Grande do Sul State, Brazil, *C. gloriana* restricted to central-western Rio Grande do Sul State, Brazil, and *C. pantanera* from northeastern Argentina. Data on phenology, habitat, geographic distribution, conservation, and comparison with related taxa are supplied.

**Key words*:*** Geophytes,Grasslands, South America, Taxonomy.

**Introduction**

*Cypella* Herbert (1826: t. 2637) in its narrow sense includes ca. 25 species, restricted to temperate South America and contains medium-sized plants with 1-2 flowered spathes, often yellow or orange with broadly clawed tepals. The inner tepals have glandular trichomes above a central depression, style slender lower, with well-developed branches, ending in two adaxial acute crests with a transverse stigmatic surface on the abaxial side at the base of the prolonged crests in one abaxial crest, shorter than the two adaxial crests (Ravenna 2003, Goldblatt & Manning 2008, Ravenna 2009). Some authors have a wide concept of the genus *Cypella*, including *Phalocallis* Herbert (1839: t. 3710), *Kelissa* Ravenna (1981c: 106) and *Onira* Ravenna (1983: 204) (Roitman & Castillo 2007, Goldblatt & Manning 2008, and Roitman et al. 2008). On the other hand, Chauveau et al. (2012) suggested *Cypella* as polyphyletic, while *Cypella hauthalii* is separated from the rest of the genus forming a strongly supported clade with *Onira unguiculata* (Baker 1892: 72) Ravenna (1983: 204)and *Kelissa brasilienis* (Baker 1877: 134) Ravenna (1981c: 106), while the other four studied species are recognized in another unrelated clade. *Phalocallis* was considered a separate genus to *Cypella*.

Ravenna (2003) segregated *Cypella* into three sections: Cypella, *Nais* Ravenna (1981a: 489), and Ionella. The first includes *Cypella herbertii* (Herbert 1825: t. 2599) Herbert (1826: t. 2637), the type of the genus, and its related species, the name Ionella, was not validly published, and was created by Ravenna to encompass *Cypella hauthalii* (Kuntze 1898: 304) Foster (1950: 23), and the section *Nais*, in its turn, was described based on the urceolate shape of the perigone and arcuate-recurved inner tepals, densely covered by glandular trichomes in a central depression above the blade of *Cypella aquatilis* Ravenna (1981a: 490)*,* the type of the section, *C. crenata* (Vellozo 1831: t. 67) Ravenna (1965: 312)and *C. pusilla* (Link & Otto 1828: t. 59) Bentham & Hooker ex Jackson (1893: 689). In subsequent studies, the following species were described under *Cypella* sect. *Nais*: *Cypella curuzupensis* Ravenna (1981b: 19)*, C. discolor* Ravenna (1981b: 16)*, C. laeta* Ravenna (1981b: 13)*, C. laxa* Ravenna (1981b: 15)*,* and *C. suffusa* Ravenna (2009:1). Recently, Chauveau et al. (2014) proposed *Cypella rivularis* Chauveau & Eggers in Chauveau et al. (2014: 36), but the authors did not link this species to a sectional level; however, by morphological attributes of the taxa the species safely belongs in *Cypella* sect. *Nais*, and a total of nine species can be found belonging to the group.

Current studies on the genus *Cypella* has demonstrated the diversity of the group underestimated, and the majority of the species are little known or still waiting to be described, as have previously been suggested by Ravenna (2005), Deble (2012), Deble et al. (2012a), Deble et al. (2012b), Deble et al. (2012c) and Chauveau et al. (2014). Aiming to provide continuity with an update to the genus, three new species belonging to the section *Nais* are here described, illustrated, and compared with related species. In addition, data on habitat, geographical distribution, phenology and conservation of these species are supplied.

**Material & Methods**

Investigations were performed in northeastern Argentina (Corrientes, Entre Ríos, and Misiones Provinces), southern Brazil (Paraná, Rio Grande do Sul, and Santa Catarina States), central and southern Paraguay, and Uruguay, between October 2012 and January 2015 to find wild populations of species of *Cypella.* To supplement the data, specimens of *Cypella* (including types and digital images) from the following herbaria were analyzed: CTES, FCQ, FLOR, HAS, HBR, ICN, MVM, MVFA, PACA, PY, SGO and SI (Thiers 2014). The morphological descriptions are based on all examined material, and the terminology follows Ravenna (1981a, 1981b), Goldblatt & Manning (2008), Deble et al. (2012c), and Chauveau et al. (2014). A stereoscopic microscope QUIMIS 766 was used for the elaboration of drawings, and the details were drawn based on dry plant material, as well as living plants collected and cultivated. Images were registered using a SONY DSC-HX300 photographic camera. Geographical coordinates of the collection sites and populations found were recorded using aGarmiåm GPS MAP 60 CSx GPS receiver (Global Positioning System). The software GPS TrackMaker Professional - Version 4.9 (GTM PRO) was used to draft the cartographic base, organized in the system WGS 84 (World Geodetic System 1984), resulting in the species distribution map.

**Results & Discussions**

**1. *Cypella fronteriza* Deble & F. S. Alves**, sp. nov. (Figures 1, 2, 7A–B)

**Type**:—BRAZIL. Rio Grande do Sul: Santana do Livramento, on the border with Uruguay, in the spring of the Quaraí River, in the midst of native grassland in moist soil on volcanic rock from the Serra Geral geological formation, 30° 57' 44.34'' S – 55° 43' 33.68'' W, 15 November 2014, fl., fr., *L. P. Deble, A. S. de Oliveira-Deble* & *F. S. Alves 15108* (holotype: SI!, isotypes MVFA! PACA!).

*A sectionis Nais pertinens affinis Cypellae suffusae sed spathae breviter pedunculatae, uniflorae, laminis tepalorum externiorum unguiculis angustatis, filamentis anguste filiformis, longioribus et styli rami longioribus productis bene differt.*

Plant up to 20–40 cm tall above the soil, underground stems up to 12 cm long. Bulb nearly globose to ovoid, 25–35 × 20–35 mm, prolonged in a collar up to 10 cm; cataphylls dark-brown, broadly ovate, truncate or acute at apex. Leaves at anthesis 2–6, colour? blades plicate, linear-ensiform, 14–26 × 0.2–0.5 cm. Caulinar leaf one, in the distal third of the stem, bracteiform, shape? 3.5–9.5 × 0.1–0.5 cm, at the base sheathing the stem. Flowering stems shape? 7–14 cm long, 2–3 times branched. Spathes 1–3 per branch, herbaceous, pale-green, 3.2–3.6 × 0.4–0.5 cm, bivalved, one-flowered, pedunculate; peduncles 1.4–2.8 cm long; outer valve 1.7–2.5 cm long, the inner 3–3.5 cm long, both with membranous edges covered with short parallel dark-brown longitudinal glandular strips and dots in the distal third; pedicel filiform, 3–3.5 cm long. Flowers predominately golden yellow, 40–55 mm diameter; central concavity 30–38 mm diameter, 18–25 mm depth. Tepal whorls sharply dissimilar: outer tepals oblong, 34–40 mm long, panduriform, yellow veined, concave at the base for 14.5–19 mm, reflexed distally; blades yellow, strongly panduriform, 20–28 × 15–19 mm, erect in proximal third, then revolute; claws stained purplish-brown, narrowly cuneate, 11–14 mm long, 2–2.5 mm wide at the base, and 5–6 mm wide at the apex, trichomes scattered, more abundant in the proximal half. Inner tepals arcuate-recurved, 22–28 mm long, the proximal two-thirds erect-patent, slightly inclined, then curved upward, the distal one-third incurved and strongly reclined; blades 7.5–10 mm wide, mostly yellow, with a yellow-cream central depression densely covered by glandular trichomes, surrounded by a lateral high part, yellow with purplish-brown oblique short stripes; claws stained purplish-brown, narrowly cuneate, 10–11 mm long, 1.8–2.2 mm wide at the base, and 4.5–6 mm wide at the apex, trichomes scattered, more abundant in the proximal half. Filaments slender filiform 8.4–10.5 mm long, width? slightly porrect, ochraceous to light yellow, base dilated, connected for 0.5–0.8 mm; anthers colour? oblong 8–9.5 mm × 1.4–1.8 mm; connective yellow, 0.4–0.5 mm wide, locules ochraceous, pollen often yellow or ochraceous. Ovary green, 6–8 mm × 2–3 mm. Style 8–9 mm long. Style branches channeled, 9–10 mm long, crests at the apex 3, translucent and golden-yellow, adaxial crests lanceolate, 4.5–6.5 mm long, abaxial crest deltate, 1–1.5 mm long. Capsule obovate-oblong, 10–12 mm × 7–8 mm. Seeds oblong to obconical, angulated, light-brown, epidermis papillose striate, 2–2.5 mm long.

**Phenology:**—Specimens with flowers and capsules could be found between November-January. The flowers bloom in the morning and wither around midday. On cloudy days flowers remain opened until afternoon.

**Etymology:**—The vernacular name “fronterizo” in Spanish refers to the border of two territories or countries (Sanchez, 2006); in southern Brazil, the word “fronteiriço” frequently refers to inhabitants of the border between Brazil/Uruguay (according to Ferreira, 2010). The variation “fronteriza” is applied to this new species in reference to the place of its occurrence, on the border between Brazil and Uruguay.

**Additional specimens examined (paratypes):**—BRAZIL. Rio Grande do Sul: Santana do Livramento, on the border with Uruguay, source of Quaraí River, in the midst of native grasslands in moist soil on volcanic rock, 30° 58' 43,52'' S – 55° 44' 57,88'' W, 15 November 2014, *L. P. Deble, A. S. de Oliveira-Deble & F. S. Alves 15109* (SI! MVFA!); on the border with Uruguay, source of Quaraí River, in the midst of native grasslands in moist soil on volcanic rock, 30° 58' 43,52'' S – 55° 44' 57,88'' W, 15 November 2014, *L. P. Deble, A. S. de Oliveira-Deble & F. S. Alves 15110* (SI!); in the source of Ibirapuitã River in moist soil, 30° 47’ 16,10” S − 55° 38’ 02,80” W,2 January 2015, *L. P. Deble & A. S. de Oliveira-Deble* *15111* (PACA!); in moist soils of native grasslands, 30° 38' 57,95'' S – 55° 41' 22,48'' W, 2 January 2015, *L. P. Deble & A. S. de Oliveira-Deble* *15112* (PACA!).

URUGUAY. Artigas: “suelo rocoso al margen del arroyo Sepulturas”, 35º 55' 23'' S − 56º 06' 14'' W, 24 January 2015, Berazategui, W. Duarte & A. González 2762 (MVFA).

**Distribution and habitat:**—*Cypella fronteriza* is narrowly endemic on the border between Santana do Livramento municipality, southern Brazil, and Rivera and Artigas Departments, northern Uruguay in the “front” or higher portion geomorphological unit "Cuesta de Haedo" or region of "Planalto da Campanha" (see Müller Filho 1970, IBGE 1986). The specimens range between 220–380 m, growing in relatively high interfluvial areas and sources, among native grassland in moist soil sites, generally clayey and not very deep, developing on volcanic rocks belonging to the geological formation "Serra Geral" (Gordon Júnior 1947, Paulipetro 1981, Melfi et al. 1988), sometimes the individuals also grow on stony grasslands. These specific habitats are formed mainly in small concave surface areas, which concentrate moisture and consequently give rise to the first order drainage channels, which form some of the sources of Quaraí and Ibirapuitã Rivers (Figure 2). Andrés Gonzalez (Faculdad de Agronomía, Montevideo, Uruguay) found two populations from Artigas and Rivera departments; these populations were georeferenced, but due to the small number of individuals, no vouchers were made (Andrés Gonzalez, pers. com.).

**Conservation status:**—*Cypella fronteriza* occurs in less than 100 km² and the area of occupancy is smaller than 10 km2, moreover the populations are composed by few individuals and require highly specific habitats. Silviculture and agriculture have increased in the last ten years in the area that *C. fronteriza* occurs, resulting in a direct threat to the conservation of this species by destroying the natural habitat. Two populations of *C. fronteriza* were found in the “Área de Proteção Ambiental – APA do Ibirapuitã” (Brasil 1992), a nature conservation unit ranked as sustainable use (Brasil 2000), however these populations are not completely protected, because the preferred environments of *C. fronteriza* have been intensively invaded and uncharacterized by *Eragrostis plana* Nees (Poaceae) an exotic grass, native to Africa, which has invasive and allelopathic behavior (Coelho 1986, Coelho 2000, Medeiros et al. 2004, Medeiros & Focht 2007, Medeiros et al 2009). According to the IUCN Red List (IUCN 2012) the species can be assigned as Critically Endangered (Cr, B1, B2a, b(iii), and D) due to the small extent of occurrence, reduced area of occupancy, few known individuals, highly specific habitat, and direct threats observed.

**Comments:**—*Cypella fronteriza* is easily separated from all species by its outer tepals with narrow claws, a bigger style, and stamens with narrower and longer filaments, and larger anthers. The perigone shape is very distinct and resembles the perigone of species of *Phalocallis.* Despite the morphological peculiarities, the species is undoubtedly related to *C. suffusa* and also to *C. gloriana*,described below, and can be distinguished from the former mainly by its one-flowered spathes, narrower claws of outer tepals, longer filaments and bigger anthers. From *C. gloriana* the new species differs by the pedunculate spathes, and larger floral parts. Additional features that distinguish *Cypella fronteriza* from related species are listed in the Table 1.

What about Cypella altouruguaya? They seem to be quite similar morphologically...

Indeed, in my opinon, should compare C. fronteriza with other species than the ones described in this paper.

***2. Cypella gloriana* Deble & F. S. Alves**, sp. nov. (Figures 3, 4, 7C–D)

**Type**:—BRAZIL. Rio Grande do Sul: São Vicente do Sul, Cerro da Glória, at the base of the hill in the northern flank, amid the native grasslands on place of soil sandy and stony soil, 29° 45' 29,35'' S – 55° 01' 43,07'' W, 25 October 2014, fl., fr., *L. P. Deble, F. S. Alves & M. I. P. Deble 15034* (holotype: SI! isotypes MVFA! PACA!).

*A sectionis Nais pertinens proxima Cypellae pusillae sed laminis tepalum interiorum angustis et longioribus, filamentis minoribus, porrectis et connectivis* *antherarum* *latioribus productis bene differt.*

Plant up to 8–22 cm high above the soil, underground stems up to 6 cm long. Bulb nearly globose to ovoid, slightly compressed, 12–20 × 10–20 mm, prolonged in a collar up to 3 cm; cataphylls dark-brown, broadly ovate, truncate or acute at apex. Leaves at anthesis 2–5, blades plicate, and narrowly linear-ensiform, 8–25 × 0.1–0.3 cm. Cauline leaf reduced at one bract, in the distal third of the stem, 2.5–9.5 × 0.05–0.2 cm, at the base sheathing the base of spathes. Flowering stems 7–12 cm long, unbranched or with 2–3 branches up to 1 cm long. Spathes 2–5 per branch, 2.2–3 × 0.2–0.3 cm, herbaceous, pale-green, bivalved, one-flowered, sessile or shortly pedunculate, peduncles up to 0.8 cm long; outer valve 1.2–1.8 cm long, the inner 2.1–2.9 cm long, both with membranous edges covered with short parallel dark-brown longitudinal glandular strips and dots in the distal third; pedicel filiform, 2.5–3.5 cm long. Flowers predominately golden-yellow, 25–35 mm diameter; central concavity 18–24 mm diameter, and 8–12 mm depth. Tepal whorls sharply dissimilar: outer tepals oblong, 22–27 mm long, yellow veined, concave at the base for 8.5–12 mm, reflexed distally or revolute; blades yellow, slightly panduriform, 15–20 × 10–12 mm, erect in proximal third, then revolute; claws stained purplish-brown or pale-brown, cuneate, 6.5–7.5 mm long, 2.8-3.3 mm wide at the base, and 6–7 mm wide at the apex, trichomes scattered, more abundant in the proximal half. Inner tepals arcuate-recurved, 16–20 mm long, the proximal two-thirds erect-patent, slightly inclined, then curved upward, with a depression in the distal portion, then the distal one-third incurved and strongly reclined; blades 6–7 mm wide, mostly yellow, with a shiny yellow-cream central depression densely covered by glandular trichomes, surrounded by a lateral high part yellow, without stains; claws stained purplish-brown or pale-brown, narrowly cuneate, 7–8 mm long, 1.2–1.8 mm wide at the base, and 4–5 mm wide at the apex, trichomes scattered, more abundant in the proximal half. Filaments filiform 4.5–5 mm long,width? porrect, dull-yellow, base dilated, purple stained, connected for 0.8–1.1 mm; anthers oblong 4.5–5.5 × 1.2–1.4 mm; connective light-yellow, 0.5–0.7 mm wide, locules dull-yellow, pollen greenish-yellow to ochraceous. Ovary green, 5–6 mm × 2–2.5 mm. Style 5.5–6.5 mm long. Style branches channeled, 5–6 mm long, crests at the apex 3, translucent and greenish-yellow, adaxial crests lanceolate, 1.5–2.5 mm long, abaxial crest deltate, 1 mm long. Capsule obovate, 7–10 mm × 5–6 mm. Seeds oblong to obconical, angulated, light-brown, epidermis papillose striate, 1.5–2 mm long.

**Phenology:**—Specimens with flowers and capsules were found between October-November. The flowers bloom in the morning and wither around midday. On cloudy days flowers remain opened until afternoon.

**Etymology:**— The epithet “gloriana” refers to the place of occurrence of this species, at the base of the hill denominated “Cerro da Glória”, in São Vicente do Sul Municipality, Rio Grande do Sul State, Brazil.

**Additional specimens examined (paratypes):**—BRAZIL. Rio Grande do Sul: São Vicente do Sul, on sandy grasslands, 29° 45’ 27,62” S – 55° 01’ 36,72” W, 2 November 2012, *L. P. Deble & A. S. de Oliveira-Deble 12376* (PACA!); São Vicente do Sul, Cerro da Glória, base of the Hill, sandy grasslands, among stones, 29° 45' 44,92'' S – 55° 01' 38,61'' W, 25 October 2014, *L. P. Deble, F. S. Alves & M. I. P. Deble 15035* (PACA!).

**Distribution and habitat:**—*Cypella gloriana* was only found on the northern, northwest and northeast flanks of the hill locally known as "Cerro da Glória" in São Vicente do Sul Municipality, central-western Rio Grande do Sul State, Brazil. The individuals grow at the base of the hill, in an area of colluvial deposits, where the soil is sandy and very stony, at elevations between 100–180 m. According to Reckziegel & Robaina (2008), the colluvial deposits of Cerro da Glória are the contact of two distinct lithological conditions, the medium-grained sandstone of the “Formação Guará” and the fine-grained sandstone with micaceous minerals of the “Formação Sanga do Cabral”. The lithopedological conditions resulting are peculiar and not very abundant in the region, which could explain, in part, the high level of endemism of *C. gloriana*. A restricted geographic range associated to mountains is reported for two other species of the genus, *Cypella trimontina* Ravenna (2009: 2), microendemic in the locality of Tres Cerros, La Cruz, San Martín Department, Corrientes, Argentina, and *C. magnicristata* Deble in Deble et al. (2012: 63), narrowly endemic in the range of hills of the “Cerro do Jarau”, Quaraí Municipality, Rio Grande do Sul State, Brazil.

**Conservation status:**—*Cypella gloriana* occurs in less than 10 km2 and the area of occupancy is smaller than 2 km2, where all individuals known belong to a single population. Though several individuals compose this population, the specimens are highly threatened by intensification of the agriculture and by mineral extraction, mainly to earthmoving of routes. According to the IUCN Red List (IUCN 2012) the species can be assigned as Critically Endangered (CR, B1, B2a, b(iii)) due to the small extent of occurrence, reduced area of occupancy, the single population known, decline in the quality of habitat, and a probably low genetic variability.

**Comments:**—*Cypella gloriana* is closely related to *C. pusilla,* both species are short, with sessile or almost sessile spathesandsmall flowers. In dry material, these species are difficult to distinguish. However, *Cypella gloriana* can be separated from *C. pusilla* mainly by its perigone with broader concavity and less depth, outer tepals with narrowed claws, inner tepals with blades markedly narrower, and longer upwards, and with glandular trichomes spreading in a slender area, stamens shorter, with porrect filaments, smaller anthers, and broader connective. *Cypella gloriana* differs from *C. suffusa* and *C. fronteriza* by its sessile or almost sessile spathes, and by the smaller size of all floral organs. Additional features that distinguish *C. gloriana* from its alliesare listed in the Table 1.

**3. *Cypella pantanera* Deble & F. S. Alves**, sp. nov. (Figures 5, 6, 7E–F)

**Type**:—ARGENTINA. Corrientes: San Martín, La Cruz, Provincial Route 114, close to the “Bañado Guaviravi”, in boggy land, flowers pale-yellow, 29° 10' 07,15'' S – 56° 42' 51,30'' W, 22 December 2014, fl., fr., *L. P. Deble & F. S. Alves 15181* (holotype: SI!, isotype MVFA!)

*A sectionis Nais pertinens valde proxima Cypellae laxae sed flos lutei opalescentisve, perigonium pauce urceolatum, laminis tepalorum internum patente-geniculatis, plicatis, filamentis erectis, styli rami subconnatis differt.*

Plant up to 50–120 cm high above the soil, underground stems up to 20 cm long. Bulb nearly globose, 20–30 × 20–30 mm, prolonged in a short collar up to 2 cm; cataphylls brown to stramineous, broadly ovate, acute at apex, often fimbriate. Leaves at anthesis 1–2, blades plicate, and linear-ensiform, 32–58 × 0.2–0.6 cm. The most basal cauline leaf in the proximal third of the stem, 25–54 × 0.3–1 cm, at the base sheathing the base of the stem; outer leaves gradually lower, the most distal bracteiform, ovate-lanceolate, 1.5–3.5 × 0.5–1 cm, at the base sheathing the basal part of the peduncles. Flowering stems 40–85 cm long, with 2–5 branches in the distal third. Spathes 2–5 per branch, 3.2–3.8 × 0.2–0.4 cm, herbaceous, pale-green, bivalved, one-flowered, pedunculate, peduncles 3.5–9.4 cm long; outer valve 1.9–2.5 cm long, the inner 2.2–3.7 cm long, both with membranous edges covered with sparse parallel light-brown longitudinal glandular strips; pedicel filiform, 3.5–4 cm long. Flowers yellow or whitish-cream, 40–50 mm diameter; central concavity 26–30 mm diameter, and 6–10 mm depth. Tepal whorls sharply dissimilar: outer tepals oblong, 36–40 mm long, panduriform, yellow or cream veined, concave at the base for 13–16 mm, reflexes distally; blades yellow or whitish-cream, slightly panduriform, 28–32 × 15–18 mm, with a pale-brown or purplish-brown central stripe in the proximal half, erect in proximal third, then revolute; claws white-cream or light-yellow, translucent, without stains, with the central stripe of the blades becoming erased distally, broadly cuneate, 7.5–9.5 mm long, 5.4–7.5 mm wide at the base, and 13–14 mm wide at the apex, with few trichomes scattered. Inner tepals patent-geniculate, recurved, 15–20 mm long, the proximal two-thirds patent, then curved upward, with a deep depression in the distal portion, then the distal one-third incurved and strongly reclined; blades 13–15 mm wide, plicate, mostly yellow or whitish-cream, with a darker central depression densely covered by glandular trichomes, surrounded by a lateral high part yellow or cream, with purplish-blue spots or short stripes; claws white-cream or light-yellow, translucent, without stains, cuneate, 8–9 mm long, 1.5–1.8 mm wide at the base, and 4–5 mm wide at the apex, with scattered trichomes. Filaments filiform 3–4 mm long, width? erect or slightly porrect, purple at both ends, and light-purple in the middle part, base dilated light-purple or stained purple, connected for 0.9–1.2 mm; anthers oblong 7.5–8.5 × 2–2.2 mm; connective purple at both ends, and light-purple in the middle part, 0.5–0.7 mm wide, locules ochraceous, pollen ochraceous to dark-brown. Ovary pale-green, 8–10 mm × 2.2–3 mm. Style 5–5.5 mm long. Style branches channeled, 5–6 mm long, slightly porrect, connected in the proximal half, crests at the apex 3, purplish-yellow, adaxial crests lanceolate, 4–5 mm long, abaxial crest deltate, 1–1.5 mm long, densely covered by stigmatic trichomes extending also to the proximal part of adaxial crests. Capsule clavate-oblong, 16–22 mm × 7–9 mm. Seeds not seen.

**Phenology:**—Specimens with flowers and capsules were collected between November and December. The flowers bloom in the morning and wither around midday. On cloudy days the flowers remain opened until afternoon.

**Etymology:**—The epithet “pantanera” refers to where the species naturally occurs, in the boggy soils of northeastern Argentina. In Spanish, the word “pantano” means “natural land covered by stagnant water, not very deep, with a characteristic vegetation” (Sanchez, 2006), and coincides with the exclusive habitat of the species. Moreover, locally these environments are known as “pantanos”, “esteros” “bañados” or more broadly also as "humedales”

**Additional specimens examined (paratypes):**—ARGENTINA. Corrientes: Paraje Galarza, “campo inundable, pajonal de *Andropogon lateralis*, todas las piezas florales amarillas”, 28° 06’ 02” S – 56° 40’ 61” W, 23 November 1999, *M. M. Arbo, A. Schinini & G. Seijo 8420* (CTES!). Entre Ríos: Colón, Ubajay, National Park El Pamar, in bogs, flowers yellow, 31° 53' 02,32'' S – 58° 14' 11,87'' W, 21 December 2014, *L. P. Deble & F. S. Alves 15179* (SI!); Colón, Ubajay, National Park El Pamar, in bogs, flowers whitish-cream, 31° 53' 02,32'' S – 58° 14' 11,87'' W, 21 December 2014, *L. P. Deble & F. S. Alves 15180* (SI!)

**Distribution and habitat:**—*Cypella pantanera* occurs in bogs of Entre Ríos and Corrientes Provinces, northeastern Argentina. The individuals grow exclusively in boggy soils, in the Argentinean eco-regions of “Pampa”, “Campos y Malezales”, “Esteros del Iberá” and most likely also in the eco-region of “Espinal” (for the eco-regions in Argentina see Burkart et al. 1999, Brown & Pacheco 2006). Despite are only three known populations of this species occur, it can be rather frequent because their typical habitat are very abundant in northeastern Argentina. The few collections represented in herbaria are likely due difficulty of collecting in boggy area and the visualization of vegetative part of the specimen that is easily hidden behind the grasses, Furthermore, the bulbs are usually underground about 20 cm, being difficult obtain.

**Conservation status:** — *Cypella pantanera* ranges more than 50,000 km2, and the area of occupancy known is smaller than 1,000 Km2. Only three populations have been registered, which are moreover severely fragmented. Besides this, further collections in the area of occurrence of this species are necessary to increase and update information about *C. pantanera*. This species require specialized habitat, since it was found growing only in swamp areas. These environments have been extensively used by man, suggesting the risk of *C. pantanera* undergoing endangered status. However, with the actual data available this species is previously ranked according with IUCN Red List (IUCN 2012) as Insufficient Data available.

**Comments:**—*Cypella pantanera* is easily segregated from other species of the section *Nais*, mainly by the perigone with scarcely deep central concavity, and inner tepals with plicate blade. Despite these peculiarities, this species morphologically resembles *C. crenata* and *C. laxa,* these species have like habitat grow up on bogs, display similar habit and long pedunculate spathes. However, *C. pantanera* can be distinguished from *C. crenata* by its flowers with yellow or whitish-cream tepals, the inner tepals with plicate blades, the stamens with shorter filaments and bigger anthers, and style branches connected at the proximal half. The new species differs from *C. laxa* in the following aspects: flowers with central concavity few deep and pallid translucent, blade of inner tepals plicate with a deep central depression, marked by a darker area covered by ochraceous glandular trichomes, and erect or slightly porrect style branches, with the stigmatic portion prolonged up to half of adaxial crests. The shape of perigone resembles the perigone of *C. curuzupensis*, however this species displays a lower habit and much smaller flowers. Additional features to distinguish *C. pantanera* from related species are listed in the Table 2.

It was verified that individuals with whitish-cream flowers display spathes with shorter inner valves, and consequently the pedicels stay visible in the distal third. These specimens grow sympatric with the typical individuals, however no intermediary forms were observed. Other morphological differences were not detected with further studies being necessary to check if these two variations found are enough to recognize these specimens at distinct taxonomic levels.

**Conclusion**

The total number of species in *Cypella* sect. *Nais* is now thirteen, with descriptions of *C. fronteriza*, *C. gloriana*, and *C. pantanera*. Except *C. crenata* endemic to swamp areas among “cerrado” in southern Minas Gerais State, southeastern Brazil, the other species grow exclusively in northeastern Argentina (Corrientes, Entre Ríos, and Misiones Provinces), southern Brazil (Paraná, Rio Grande do Sul, and Santa Catarina States), central and southern Paraguay, and Uruguay. The geographic distribution of these three new species reinforce the high diversity of the genus in northeastern Argentina, northern Uruguay, and southern and western Rio Grande do Sul State, Brazil, showing that the grasslands of these regions are the richest in number of taxa of *Cypella* sect. *Nais*. Moreover, the majority of these species should be recognized as threatened, mainly by the reduced distribution area of the greater part of the taxa, specific habitat of occurrence, and decline in the quality of habitat, mainly by intense use of the grasslands by man. Actions for the conservation of these environments are urgently needed so these species do not become extinct in nature.

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**FIGURE 1.** *Cypella fronteriza*. **A**. Habit. **B**. Flower, lateral view. **C**. Flower, frontal view. **D.** Inner tepal. **E**. Flowers, tepals removed. **F**. Stigmatic portion of the crests of the style branches. **G**. Spathe with immature capsule. **H**. Capsule. **I**. Seed. **J**. Leaf cross section (**A–J** from *L. P. Deble et al. 15108*).

**FIGURE 2.** Geographic distribution of *Cypella fronteriza*.

**FIGURE 3.** *Cypella gloriana*. **A**. Habit. **B**. Flower, lateral view. **C**. Flower, frontal view. **D**. Inner tepal, lateral view. **E.** Inner tepal, frontal view. **F.** Flowers, tepals removed. **G**. Stamen. **H**. Crests of the style branches. **I.** Caulinar leaf. **J**. Spathe. **K.** Capsule with immature capsule. **L.** Seed. **M**. Leaf cross section (**A–M** from *L. P. Deble et al. 15034*).

**FIGURE 4.** Geographic distribution of *Cypella gloriana*.

**FIGURE 5.** *Cypella pantanera*. **A**. Habit. **B**. Flower, lateral view. **C**. Flower, frontal view. **D**. Inner tepal. **E**. Flowers, tepals removed. **F**. Stamen. **G**. Crests of the style branches. **H** Caulinar leaf, from distal branch. I. Spathe, with immature capsule. **J**. Capsule. **K**. Leaf, cross section (**A–K** from *L. P. Deble et al. 15181*).

**FIGURE 6.** Geographic distribution of *Cypella pantanera*.

**FIGURE 7.** *Cypella fronteriza*. **A.** flower, upper view. **B**. flower, lateral view. *Cypella gloriana.* **C**. Flower, upper view. **D**. Flower, lateral view. *Cypella pantanera.* **E**. Flower, upper view. **F**. Flower, lateral view. (**A–B** from *L. P. Deble et al. 15108*; **C** from *L. P. Deble et al. 15034*; **D** from *L. P. Deble et al. 15035*; **E–F from** *L. P. Deble et al. 15181*).

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