



Survey on the tribe Tigridaeae (Iridaceae) in the Campos of Southeast South America

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Resumo. Levantamento da tribo Tigridaeae (Iridaceae) nos Campos do Sudeste da América do Sul. Iridaceae é uma das maiores famílias de monocotiledôneas e são importantes constituintes de ecossistemas campestres em todo o globo. A tribo Tigridaeae é exclusiva nas Américas, com importante centro de diversidade na região Andina, nos Campos do Sudeste da América do Sul e no México e sul dos Estados Unidos. Neste estudo é realizado o levantamento das Iridaceae-Tigridaeae nativas dos Ecossistemas Campestres do Sudeste da América do Sul (=SESA Grasslands). O SESA foi dividido em quatro regiões: *Campos*, *Campos de Altitude*, *Chaco Húmido* e *Pampa*. Um total de 65 espécies (incluindo 10 subespécies) distribuídas em 10 gêneros ocorrem no SESA. O gênero *Cypella* com 30 espécies e oito subespécies é o mais representativo, seguido por *Calydorea* (13 espécies), *Herbertia* (11 espécies) e *Gelasine* (quatro espécies e duas subespécies). Um total de 87% dos taxa ocorrentes são endêmicos do SESA, a maioria exclusivo da região dos *Campos*, que inclui 54 entidades taxonômicas, sendo 41 delas endêmicas. Os *Campos de Altitude* incluem 15 táxons, sendo seis endêmicos, o *Pampa* inclui seis entidades taxonômicas, sendo uma endêmica, enquanto o *Chaco Húmido* está representado por cinco espécies, mas não são registrados endemismos nessa última região.

Palavras-chave: Bulbosas, Campos, Campos de Altitude, Chaco Húmido, distribuição geográfica, diversidade, Pampa.

Abstract. Survey on the tribe Tigridaeae (Iridaceae) in the Campos of Southeast South America (SESA Grasslands). Iridaceae is one of the largest families of monocots and is an important constituent of grassland ecosystems across the globe. The tribe Tigridaeae is exclusive to the Americas, with an important center of diversity in the Andean region, in the Campos of Southeast South America, in Mexico and in the southern United States. In this study, a survey of the Iridaceae-Tigridaeae native to the Grassland Ecosystems of Southeast South America (=SESA Grasslands) is carried out. The SESA was divided into four regions: *Campos*, *Campos de Altitude*, *Chaco Húmido* and *Pampa*. The Iridaceae-Tigridaeae are represented by a total of 65 species (including ten subspecies), distributed in ten genera. The genus *Cypella* with 30 species and eight subspecies is the most diverse, followed by *Calydorea* (13 species), *Herbertia* (11 species) and *Gelasine* (four species and two subspecies). A total of 87% of the taxa occurring in the SESA are endemic, most of them exclusive to the *Campos* region, which includes 54 taxonomic entities, of which 41 taxa are endemic. The *Campos de Altitude* region is represented by 15 taxa, including six endemic species. The *Pampa* region includes six taxonomic entities, being one of them endemic. The *Chaco Húmido* region comprises five species, none of which are exclusive to the latter region.

Key words: Bulbous, Grasslands, High Grasslands, Humid Chaco, Geographic distribution, diversity, Pampa.

The Iridaceae are almost worldwide in distribution, and comprises one of the larger families of monocots, encompassing plants with an extraordinary diversity of large, brightly colored flowers, exceeded in their gaudiness and complexity only by the Orchid family (Goldblatt & Manning 2008). Currently, Iridaceae comprises seven subfamilies: Isophysioideae, Patersonioideae, Geosiridoideae,

Aristeioideae, Nivenioideae, Crocoideae and Iridoideae. The subfamily Iridoideae encompasses ca. 30 genera and almost 1,000 species and represent the largest evolutionary branch of Iridaceae in the Americas. Trimezieae and Tigridaeae are exclusive in this region, and all bulbous Iridaceae native in South America belongs to tribe Tigridaeae, and members of this

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tribe are important constituents on subtropical and temperate grasslands. In the flowering season in favorable years they can cover extensive areas of grasslands, being the most conspicuous plants during these periods.

Grassland ecosystems are found on all continents except Antarctica, and it is estimated that more than $\frac{1}{4}$ of the Earth's continental surface was potentially covered by these environments (Bilenca & Miñarro 2004, Azpiroz *et al.* 2012). The world's most extensive grassland ecosystems include the *Prairies* in North America, the *Puszta*s in Eastern Europe, the *Steppes* in Mongolia and China, the *Grassvelds* in South Africa, and the *Pampas* and *Campos* of Southeast South America. All these ecosystems are extremely rich in diversity, composing a complex arrangement of herbaceous species, mainly represented by the Poaceae family, which form an herbaceous carpet associated with species from other botanical families, notably Asteraceae, Fabaceae, Solanaceae, Caryophyllaceae, Verbenaceae, Plantaginaceae and several monocot families, mainly Cyperaceae, Amaryllidaceae and Iridaceae (Burkart 1975). However, these environments have been identified as the terrestrial biome where biodiversity and ecosystem services are most threatened at a global level due to the wide disparity between habitat loss and the low level of protection (Hoekstra *et al.* 2005, Henwood 2010).

The grassland ecosystems of Southeast South America (SESA, following the proposition of Azpiroz *et al.* 2012) comprise the most extensive grassland area in South America and form an arc around the Río de la Plata, covering the east and northeast of Argentina, southern Paraguay, southern Brazil and all Uruguayan territory and includes the *Pastizales del Río de la Plata* (as defined by Soriano *et al.* 1992), the *Campos de Altitude* of southern Brazil and the *Chaco húmedo* (Clay *et al.* 2008). Over time these grasslands have been widely used as pastures and, in recent decades, have been modified by industry, agriculture and replacement of native vegetation (Soriano *et al.* 1992, Overbeck *et al.* 2007) and it is estimated that more than 50% of the original vegetation cover has been altered (Bilenca & Miñarro 2004, Paruelo *et al.* 2004).

The *Pastizales del Río de La Plata* (RPG, acronym derived from Río de La Plata Grasslands) represents the most extensive grassland areas of the SESA, and includes about 760,000 km², compris-

ing, in approximate lines, the Pampean and the Espinal Phytogeographic Provinces, according to Cabrera & Willink (1980) and encompasses a significant variety of different grassland ecosystems (Bilenca & Miñarro 2004, Medan *et al.* 2011). As proposed by Soriano *et al.* (1992) comprises two regions: *Pampas* and *Campos*. The first region includes the grassland ecosystems in east-central Argentina, with six subregions: Austral Pampa, Eastern Flooded Pampa, Mesopotamic Pampa, Rolling Pampa and Western Flooded Pampa. The Campos region, in its turn, includes two eco-regions, *Campos do Sul* and *Campos do Norte*, and are distributed in all Uruguayan territory, part of the Argentine provinces of Entre Ríos, Corrientes and Misiones, and to the south of the state of Rio Grande do Sul, in Brazil (in the Brazilian portion it corresponds, in approximate lines, to the Pampa Biome, sensu IBGE 2004).

Other studies, refined the extension of the RPG and added the *Campos* of central-southern Paraguay and the *Pampa Semiárido*. The former occupies an area of about 30,000 km² and were recognized as an extension of the RPG, based on the similarity of vegetation and birdlife (Clay *et al.* 2008). The second is located in the province of La Pampa, and was added to the RPG based on vegetation characteristics. Subsequently, Brazeiro *et al.* (2012) delimited the Uruguayan territory into six different eco-regions and Modernel *et al.* (2016) presented an adaptation to the Physiognomic division of Rio Grande do Sul state (according to Fortes 1959) to segregate the different phytophysionomies of the Brazilian portion of the *Campos do Norte* and a total of 19 subregions (or eco-regions following the concept of Olson *et al.* 2001) are currently included in the RPG.

These ecosystems are characterized by flat to rolling relief with elevations below 1,200 m at the sea level. The region has mesothermal characteristics, mainly regulated by the effect of the Atlantic Ocean currents, resulting in average annual temperatures of 14°C in the southernmost portion and 18°C in the northern region (Soriano *et al.* 1992). The rainfall index varies among 1,600 mm in the northeast and 500 mm in the southwest, with great seasonal variation, determining periods of water excess and others of deficit.

Paleontological and palynological evidence suggests that grassland environments dominate the RPG at least since the Neogene (Prieto 2000, Behling 2002, Behling *et al.* 2005). Currently, it

can be recognized that the southernmost part of the region, which includes most of the province of Buenos Aires and southern Uruguay, comprises a grassland region with an average height ranging from 40-100 cm, with the dominant grasses *Stipa*, *Poa*, *Piptochaetium* and *Sorghastrum* (Burkart 1975). The phanerophyte element is infrequent, represented mainly by *Acanthostylus buniifolius*, *Baccharis* spp. and other species of Asteraceae (Cabrera 1976). In northern Uruguay, northeast Argentina and Rio Grande do Sul, the grasses *Andropogon*, *Aristida*, *Briza*, *Erianthus*, *Piptochaetium*, *Poa*, and *Stipa* are more common, while shrub-tree species are more frequent and comprise more diversity of species. (Soriano *et al.* 1992, Bilenca & Miñarro 2004). At the northern edge of the RPG, in the eastern and northeastern Rio Grande do Sul, trees and arboreal associations occurs in a mosaic associated with grassland vegetation, with typical representatives of the RPG, elements of the Paranaense and Atlantic phytogeographic provinces, and endemic elements revealing an evident transition zone between grassland and forests (Pillar & Quadros 1997, Marchiori 2002, Marchiori 2004, Boldrini *et al.* 2009). Even with a diversity that includes more than 500 species of birds, about 100 species of mammals, and more than 4,300 species of vascular plants (Andrade *et al.* 2018), only about 1% of the original range is protected (Henwood 2010). An important portion of these ecosystems has been neglected both in inventory of their diversity and in their importance (Overbeck *et al.* 2007, Chauveau *et al.* 2014).

The *Campos de Altitude* region (=High Grasslands) occurs in southern Brazil, and covers an area of approximately 60,000 km² and spreads in the states of Rio Grande do Sul, Santa Catarina and Paraná, in a mosaic with the forest vegetation of the Atlantic and Paranaense phytogeographic provinces (as defined by Cabrera & Willink [1980] these ecosystems are a phytogeographic district of the Paranaense province). The arboreal element is mainly represented by *Araucaria angustifolia*, *Drymis brasiliensis*, species of Lauraceae, Myrtaceae and Asteraceae (Behling & Pillar 2007). These open areas occur at altitudes between 700 and 1,800 m above the sea level (Overbeck *et al.* 2007). Comparatively, they are wetter places than the RPG, with average precipitation between 1,500-2,000 mm and more or less uniformly distributed throughout the year and average temperatures ranging between 10°C in the

coldest month and 22°C in the hottest month, with frequent frosts and occasional snowfall during winter (Overbeck *et al.* 2007). According to Boldrini *et al.* (2009) and Iganci *et al.* (2011) these fields are characterized by a high level of diversity and endemism, mainly of Composite and Grasses.

The *Chaco Húmedo* region (= Humid Chaco grasslands), in its turn, comprises a mosaic of palm trees and heliophile tree communities (mainly Fabaceae as *Prosopis*) associated with forests and grasslands, and correspond to District of the Chaco Húmedo of the Chaquenha Phytogeographic Province (sensu Cabrera & Willink 1980). In Argentina, it occupies the eastern portion of Formosa, Chaco and Santa Fé and central-western Corrientes, while in Paraguay, these environments are found mainly in the departments of Cordillera, Central, Paraguari and Ñeembucú, in addition to part of Concepcion and Presidente Hayes, with many often associated with savanna fragments (Cerrados). The terrain is flat and the climate is predominantly humid, with annual variations (Gorleri 2005). The annual climate average in the northeast portion is 23°C and 18°C in the southern portion, while annual rainfall is around 750 mm in the western part and about 1,300 mm in the eastern part. Dominant species include tall grasses such as *Paspalum*, *Sorghastrum* and *Andropogon* and cespitose grasses such as *Elionurus* and *Schizachirium* (Clay *et al.* 2008, Azpiroz *et al.* 2012). Species of *Panicum* and *Cyperus* are abundant in the wetter and/or periodically flooded áreas (Maturro *et al.* 2005).

The first scientific studies with the Iridaceae occurring in the SESA grasslands were carried out from sending material, such as dry specimens, bulbs and seeds to Europe performed out by naturalists, by European immigrants, and by lovers of *Scientia amabilis* residing mainly in Montevideo and Buenos Aires, during the 18th and 19th centuries. From these materials, several new genera and species were described (Herbert 1825, Lehmann 1826, Lindley 1826, Herbert 1826, Sweet 1827, Link & Otto 1828, Graham 1830, Herbert 1839, Herbert 1840, Herbert 1841 Herbert 1843, Tenore 1845, Klatt 1862, Klatt 1871, Baker 1876, Baker, 1877, Grisebach 1879, Klatt 1882, Baker 1892, Kuntze 1891, Kuntze 1898, Baker 1903, Wright 1907, Hauman-Merck 1909, Bailey 1919, Beauverd 1923, Hicken 1924, Foster 1945, Foster 1950). In this first phase of knowledge of native Iridaceae, botanists had access mainly

to dry material or cultivated plants in Europe, without additional data.

It was only in the late 19th and early 20th centuries that the native Iridaceae of SESA grasslands were studied *in loco*, highlighting unpublished studies performed by José Arechavaleta y Balpardo (1838-1912), who in their collections indicated important information on the ecology and phenology of several taxa, including the proposition of new species, which remained as *nomem nudum* (as *Cypella aprica* [= *Cypella fucata*]). Another important botanist who contributed to the knowledge of the native Iridaceae: Tigridaeae was Cornelius Osten (1863-1936), who realized several collections of Iridaceae and presented ecological and phenological data, and prepared the monograph of the genera *Calydorea* and *Herbertia* for Uruguay, with manuscripts containing a key to the identification of the species, description of taxa and environments of occurrence, including a new species, *Herbertia pulchelloides*, which was later described by Roitman & Castillo (2004) under the name of *Herbertia Crosae*. Spegazzini (1917) published several new species based in collections performed by himself in Argentina, he inferred information about the habitat, phenology and ecology of the studied species. Afterwards, a new milestone in the studies of the Iridaceae at SESA was realized by Pierfelice Ravenna (1938-), a contemporary botanist who promoted an important advance in the knowledge of native species, searching for the locations of the types of species described in pioneering works and describing new genera and species for the region, having based mainly on the analysis of live specimens (Ravenna 1964, Ravenna 1965, Ravenna 1968, Ravenna 1969, Ravenna 1977, Ravenna 1981a, Ravenna 1981b, Ravenna 1981c, Ravenna 1981d, Ravenna 1983, Ravenna 1984, Ravenna 1988, Ravenna 1989, Ravenna 2000, Ravenna 2003a, Ravenna 2003b, Ravenna 2003c, Ravenna 2005, Ravenna 2006, Ravenna 2009).

More recently, other botanists have contributed to the knowledge of the group in the regional context, including the description of new species, revision of genera, phylogenetic studies, and conservation studies (Goldblatt 1978, Roitman & Castillo 2004, Roitman & Castillo 2005, Roitman & Castillo 2007a, Roitman & Castillo 2007b, Roitman & Castillo 2008, Roitman *et al.* 2008, Eggers 2008, Hurrel *et al.* 2009, Deble 2010,

Deble 2011, Deble *et al.* 2012a, Deble *et al.* 2012b, Deble *et al.* 2012c, Chauveau *et al.* 2012, Deble & Alves 2013, Deble *et al.* 2013, Chauveau *et al.* 2014, Bonfada-Rodríguez *et al.* 2014, Deble *et al.* 2015a, Deble *et al.* 2015b, Deble *et al.* 2016, Deble & Alves 2017, Deble 2017, Pastori *et al.* 2018, Eggers *et al.* 2019, De Baltezan *et al.* 2019, Deble & Alves 2020a, Deble & Alves 2020b, Deble 2021a, Deble 2021b, Deble 2021c, Deble & Alves 2021, Deble *et al.* 2021).

As can be seen, the bibliographic references that contemplate the Iridaceae-Tigridaeae in the Campos of SESA are relatively abundant. However, there are still few studies that address the diversity of Iridaceae-Tigridaeae as a whole in the region. In this work, the list of valid species and main synonyms are presented, inferring information on the geographic distribution of all taxa listed. This study is part of the review of the Iridaceae-Tigridaeae genera occurring in the Campos of SESA, which is still in progress.

Material and Methods

To conduct this study, collections from wild populations of species of Iridaceae-Tigridaeae were performed in eastern and northeastern Argentina (Buenos Aires, Corrientes, Entre Ríos, and Misiones Provinces), southern Brazil (Paraná, Rio Grande do Sul, and Santa Catarina States), central and southern Paraguay, and all Uruguayan territory, between October 2010 and April 2021. Additionally were evaluated over 15,000 specimens of Iridaceae-Tigridaeae deposited in the following herbaria (including digital images): B, CORD, CTES, HDCF, FCQ, FLOR, G, HAS, HBR, ICN, K, LIL, LP, MVHM, MVM, MVFA, MVJB, NY, P, PACA, PY, R, RB, SGO, S, SI, SP, and US (herbaria acronym follows Thiers 2021+). Images in high resolution were consulted at Jstor Global Plants. For the delimitation of the *Campos* in the Southeast of South America (=SESA) was followed the geographic delimitation proposed by Azpiroz *et al.* (2012). For each species listed, its geographic distribution was entered in SESA. The following abbreviations were adopted for the subdivisions of SESA: *Pastizales del Río de La Plata* (=RPG), *Campos* (=C), *Pampas* (=P), *Chaco Húmedo* (=CH), and *Campos de Altitude* (=CA) (Figure 1). Information on the status of endemism of the taxa was inserted in the topic *Geographic distribution*. The following abbreviations were used referring to the political boundaries,

provinces and states of the study area: Argentina (=AR), Brazil (=BR), Paraguay (=PY), Uruguay (=UY), Buenos Aires (=BA), Corrientes (=CR),

Entre Ríos (=ER), Formosa (=FR), Misiones (=MI), Paraná (=PR), Rio Grande do Sul (=RS), Santa Catarina (=SC), and Santa Fé (=SF).

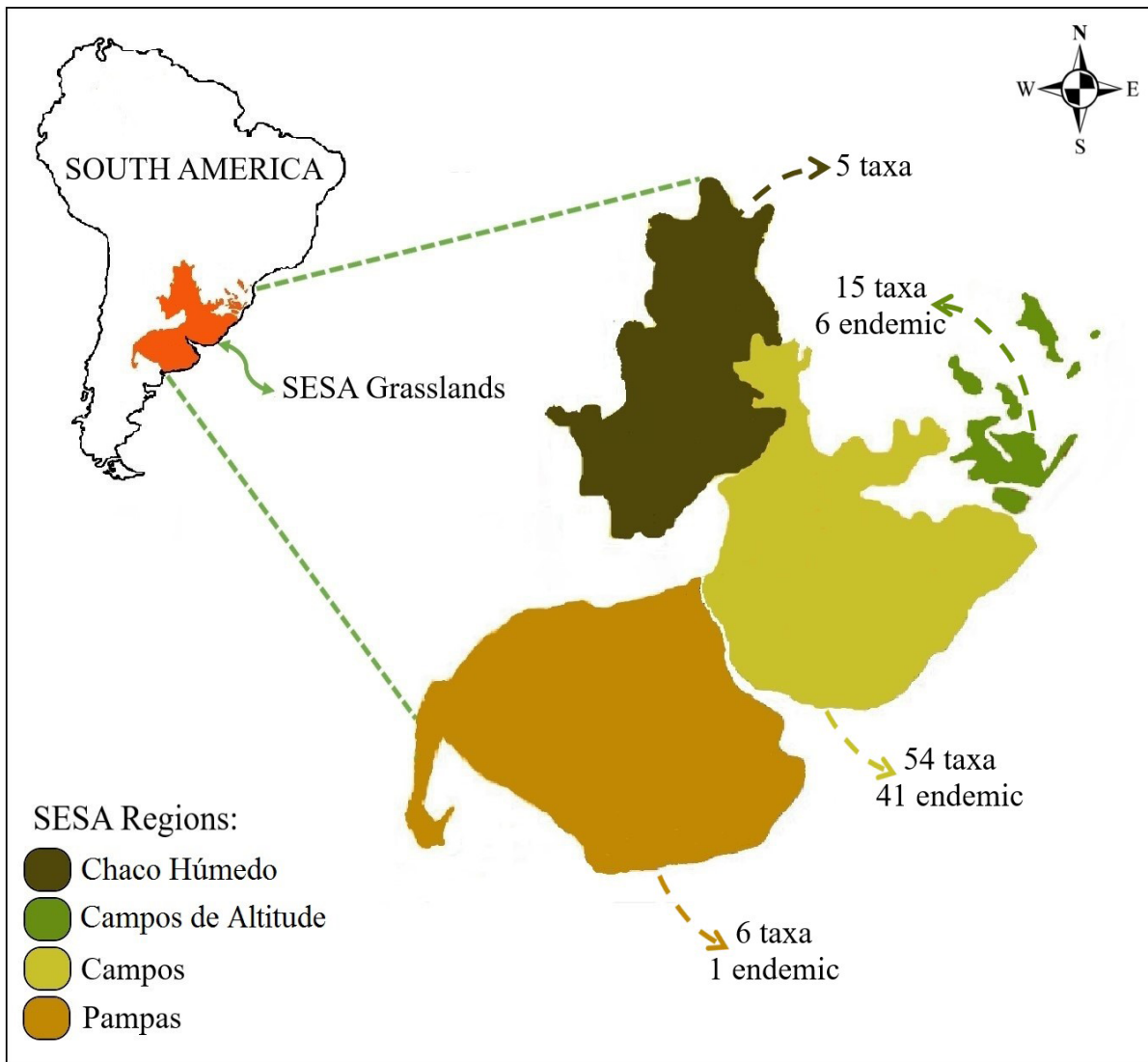


Figure 1. Regions of the SESA Grasslands and diversity of taxa of Iridaceae-Tigridaeae in each region.

Results and Discussion

The Iridaceae-Tigridaeae are represented in the *Campos* of the Southeast South America (=SESA) by a total of 65 species (with ten subspecies), distributed in ten genera. The genus *Cypella* with 30 species and eight subspecies is the most diverse, followed by *Calydorea* (13 species), *Herbertia* (11 species) and *Gelasine* (4 species and two subspecies). A total of 87% of the taxa occurring in the region are endemic to SESA, most of them exclusive to the *Campos* region (=C) of

the *Pastizales del Río de La Plata* (=RPG). The C region includes 54 taxonomic entities, of which 41 taxa are endemic, being 22 species and six subspecies of *Cypella*, eight species of *Calydorea*, eight species of *Herbertia*, one species with two subspecies of *Gelasine* and the monotypic genera *Catila*, *Kelissa* and *Onira*. The C region has 77.15% of the total inventoried taxa, with 58.6% found only in this region.

The *Campos de Altitude* region (=CA) has

15 taxa, including six endemic species, three from *Calydorea*, two from *Cypella* and one from *Gelasine*. Considering only the exclusive taxa, the CA encompasses 8.6% of the inventoried diversity. The Pampa region (=P), in turn, includes six taxonomic entities, being *Cypella Herbertii* subsp. *Wolfhueggeli* the only endemic. The Chaco Húmedo region includes five species, none of which are unique to the region.

Regarding the endemic taxa of SESA, but are not restricted to just one region were inventoried five species which occur in two regions, *Cypella* includes three species distributed in the regions C and CA, *Cypella armosa* occurs in the regions C and CH, and *Gelasine elongata*, in turn, is endemic to the C and P regions. Were identified two taxa spreading in three regions, *Cypella Herbertii* subsp. *Herbertii* is represented in the regions C, CA and P, and *Herbertia amoena*, grows in the regions C, CH and P. The diversity of the tribe Tigridaeae is impressive, while compared with the number of taxa of others botanical families. Treating only the monocotyledons of the RPG region, the recent study performed by Andrade *et al.* (2018) estimated 1,250 species, with 158 taxa endemic of RPG, representing ca. 12.5% of endemism. Considering only the currently data for the tribe Tigridaeae it is evidenced that ca. ¼ of total taxa of monocotyledons exclusive of this region belongs to this tribe.

List of genera and species

Calydorea Herbert, Edwards's Botanical Register 29 (misc.): 85. 1843. Typus: *Sisyrinchium speciosum* Hook. [= *Calydorea xiphoides* (Poeppig) Espinosa-Bustos].

Calydorea includes 21 species (Barker 2021), 13 of them occurring in the region of study. *Calydorea* encompasses two well-defined groups: the first-one includes de "Calydorea azurea group" (sensu Deble *et al.* (2018) which is restrict to the C region, and the other group comprises the "Calydorea campestris group", with the majority of species endemic of CA.

Calydorea alba Roitman & A. Castillo, Boletín Sociedad Argentina Botánica 40 (3-4): 311. 2005. Typus: URUGUAY. Artigas: "wet grasslands" 9 October 2003, G. Roitman, G. M. Tourn & M. Panziera s.n. (holotypus BAA 25500!). Figure 2A. *Geographic distribution*— Endemic of SESA, occurring in western portion of C (AR[ER, CR],

BR [RS], UY).

Calydorea approximata R.C. Foster, Contributions from the Gray Herbarium of Harvard University 155: 46. 1945. Typus: BOLIVIA. Tarija: Toldos bei Bermejo, 5 December 1903, K. Fiebrig 2944 (holotypus G00401025! isotypi GH00031369! GH00031368! U0002533! S-R-899!). Figure 2B. *Geographic distribution*— Occurs in C and CA (AR[CR, MI], BR [RS, SC, PR], UY). Wide distributed on grasslands in Bolivia, Argentina, Paraguay and Southern Brazil.

Calydorea azurea Klatt, Abh. Naturf. Ges. Halle 15: 387 (1882). Typus: ARGENTINA. Entre Rios: Concepción del Uruguay "in campis baj." April 1875, P.G. Lorentz 135 (holotypus B0247606!, isotypus CORD!). Figure 2C.

Geographic distribution— Endemic of SESA, occurring in western portion of C (AR[ER, CR], BR [RS], UY).

Calydorea basaltica Ravenna, Onira Botanical Leaflets 10 (13): 41. 2005. Typus: BRAZIL. Paraná: Guarapuava, Cantagalo "cult in Santiago Chiliae ex Bulbos in declivis lapidosis basalticis prope Cantagalo, mun. Guarapuava, Civil. Paraná Brasiliae" 4 November 1996 P.F. Ravenna 3201 (holotypus MBM!). Figure 2D.

Geographic distribution— Endemic of SESA, occurring in north CA (BR[PR]).

Calydorea campestris (Klatt) Baker, Journal of Botany, British and Foreign 14: 188. 1876. Bas. Rotherbe campestris Klatt, Linnaea 31 (5): 563. 1862. Typus: BRAZIL. Minas Gerais: Rio Grande do Sul: São Paulo: Brasilia meridionalis, St. Paulo, leg. Sellow n°4730, 4834; Minas Geraës leg. Lhotzky, Herb. Reg. Berol., leg. Dr. Widgren n° 784, Herb. Dr. Sonder. Lectotypus (Designated by Chuckr 2003): BRAZIL. São Paulo: F. Sellow 4730 (K000363161!). Figure 2E.

Geographic distribution— Occurs in CA (BR[RS, SC, PR]), wide distributed in southern and central Brazil.

Calydorea charruana Deble, Balduinia 40: 2. 2013. Typus: BRAZIL. Rio Grande do Sul: Dom Pedrito "40 km southwest of the city, on grasslands, flowers violet-blue fl., fr.," 17 October 2011, L.P. Deble & A.S. de Oliveira 10801 (holotypus PACA!). Figure 2F.

Geographic distribution— Endemic of SESA, occurring in eastern and southern portion of C (AR[ER], BR [RS], UY).

Calydorea crocoides Ravenna, Boletín Sociedad Argentina Botánica 10 (4): 311. 1965. Typus: BRAZIL. Rio Grande do Sul: São Francisco de Paula, rio Itaimbesinho, October 1959, *A. Andrade 162* (holotypus Herb. Rav., isotypus R not seen). Figure 2G.

Geographic distribution— Endemic of SESA, occurring in southern CA (BR[RS, SC]).

Calydorea longipes Ravenna, Onira Botanical Leaflets 10 (13): 41. 2005. Typus: BRAZIL. PARANÁ: Clevelandia “cult in Santiago Chiliae ex bulbis in claroris nemoribus ad Bairro da Hipica, prope Clevelandia, civit. Paraná Brasiliae” 5 November 1996, *P.F. Ravenna 3202* (holotypus: MBM). Figure 2H.

Geographic distribution— Endemic of SESA, occurring in central portion of CA (BR[SC, PR]).

Calydorea luteola (Klatt) Baker, Journal of Botany, British and Foreign 14: 188. 1876.

≡ *Boterbe luteola* Klatt, Linnaea 31: 563.1862.
≡ *Roterbe luteola* Klatt in C.F.P.von Martius & auct. suc. (eds.), Fl. Bras. 3(1): 544. 1871. [orth. var.] Typus: BRAZIL. Rio Grande do Sul State: “Brasiliae meridionalis, (...) ebenda über S. Gabriel in den nördlichsten Teil von Uruguay zurück nach Alegrete” December 1825/May 1826, *F. Sellow 3598* (holotypus B100005446 photo! isotypus K000363162 photo!). Figure 2I.

Geographic distribution— Endemic of SESA, occurring in northern portion of C (BR[RS], UY).

Calydorea minima Roitman & A. Castillo ex Deble, Bonplandia (Corrientes) 20: 39. 2011. Typus: ARGENTINA. Corrientes: San Tomé, Garruchos “cercañas de Garruchos”, 10 October 2006, *G. Roitman s.n.* (holotypus BAA 25701!)

Geographic distribution— Endemic of SESA, occurring in western portion of C (AR [ER, CR, MI], BR[RS]). Figure 2J.

Calydorea minuana Deble & F.S. Alves, Phytotaxa 253 (1): 82. 2016. URUGUAY. Artigas: Arroyo Cuaró Grande, 30°45'19.35"S and 56°45'13.63"W, 16 November 2014, *L. P. Deble et al. 15681* (holotypus SI!; Isotypi CTES! MVFA! MVM! PACA!). Figure 2K.

Geographic distribution— Endemic of SESA, occurring in western portion of C (BR [RS], UY).

***Calydorea nuda* (Herbert) Baker**, Journal of Botany, British and Foreign 14: 188. 1876. Bas. *Gelasine nuda* Herbert, Botanical Magazine 13: pl. 3779. 1840. Typus: URUGUAY. Maldonado:

Montevideo: “Tweedie ex planitiè arida prope Maldonado et Monte Video orientem versùs autumnale” (K000674117, K000674115, K000674116!). Figure 2L.

= *Boterbe gracilis* Klatt, Linnaea 31: 563. 1862. Typus: BRAZIL/URUGUAY: without specific place “Brasilia, Montevideo, leg. Sellow d560, 3134” *F. Sellow d560* (F photo Berlin negatives!)

Geographic distribution— Endemic of SESA, occurring in C (AR [ER], BR [RS], UY).

Calydorea riograndensis Deble, Bonplandia (Corrientes) 20: 36. 2011. Typus: BRAZIL. Rio Grande do Sul: Dom Pedrito “Tacuarembosinho, Sítio Santo Antônio, geófitas, entre rochas, no campo hidrófilo, fl. lilases, base vinácea”, 30°51'54"S 54°35'47"W, fl. and fr., 16 October 2009, *L.P. Deble & A.S. de Oliveira 10984* (holotypus CTES!). Figure 2M.

Geographic distribution— Endemic of SESA, occurring in northern portion of C (BR[RS]).

Catila Ravenna, Nordic Journal of Botany, Copenhagen 3 (2): 197. 1983. Typus: *Catila amabilis* Ravenna.

A monotypic genus, endemic of the SESA grasslands.

Catila amabilis Ravenna, Nordic Journal of Botany, Copenhagen 3 (2): 203. 1983. Typus: ARGENTINA. Entre Ríos: Concepción del Uruguay, “cult in Bonaria ex bulbis ad Concepción del Uruguay” *P.F. Ravenna 3* (holotypus Herb. Rav. not localized, isotypi BM000938146! K000523885!). Figure 2N.

Geographic distribution— Endemic of SESA, occurring in western portion of C (AR[ER, CR], BR [RS], UY).

Cipura Aublet, Histoire des Plantes de la Guiane françoise 1: 38. 1775. Typus: *Cipura paludosa* Aublet.

Cipura is well distributed in tropical areas of America, and ca. 12 species occurring in South America, one of them represented in the region.

Cipura paludosa

Cipura paludosa Aublet subsp. ***boliviensis*** Ravenna, Onira, Botanic Leaflets 1 (5): 40. Typus: BOLIVIA. Santa Cruz: “Culta in Bonaria ex bulbi ad Buena Vista civit, Sancta-Crucis Boliviae collectis” *P.F. Ravenna 21* December 1961 (holotypus: Herb. Rav. not seen). Figure 2O.

Geographic distribution—Occurs in northernmost portion of C and CH (PY). Widely distributed in Tropical Americas.

Cypella Herbert, *Botanical Magazine* 53: t. 2637 (text 2). 1826. Typus: *Tigridia herbertii* Herbert, *Botanical Magazine* 52: t. 2599. 1825.

= *Polia* Tenore, Cat. Orto Bot. Napoli: 92. 1845. Typus: *Polia bonariensis* Tenore, Catalogo Orto Botanico di Napoli: 92. 1845. [nom. illeg.], non *Polia* Louriero (1790).

Cypella encompasses 32 species (Deble 2020, Deble 2021) or 36 species (Barker 2021) with geographic distribution in Central and Southeast South America, the majority of them are restrict to the SESA grasslands, where prosper 30 species and eight subspecies, 22 of them exclusive of the C region.

Cypella Alonsoana Deble & F. S. Alves, Kew Bulletin 72 (3) 41: 2. 2017. Typus: URUGUAY. Tacuarembó: Valle Eden, 24.X.2015 (fl, fr), *L. P. Deble & A. S. de Oliveira 15626* (holotypus SI!, isotypi CTES!, ICN, K, PACA!). Figure 2P.

Geographic distribution— Endemic of SESA, occurring in western C (UY).

Cypella aquatilis Ravenna, Nordic J. Bot. 1: 489. 1981. Typus: BRAZIL. Rio Grande do Sul: Vacaria, “cultu in Bonaria ex bulbis in rivulo ad Faz. da Ronda pr. Vacaria civit. Rio Grande do Sul Brasiliae collectis” January 1970, *P. F. Ravenna 1037* (holotypus: Herb. Rav. not localized; isotypus: RB, not localized). Lectotypus (designated by Eggers *et al.* 2019: 748): BRAZIL. Rio Grande do Sul: Vacaria, “fazenda da Ronda, per Vacaria”, 3.I.1947, *B. Rambo s.n.* (lectotypus PACA [PACA 34747!]). Figure 2Q.

Geographic distribution— Endemic of SESA, occurring in northernmost C and CA (AR[MI], BR [RS, SC, PR]).

Cypella armosa Ravenna, *Wrightia* 7 (1): 20. 1981. Typus: PARAGUAY. Paraguari: San Bernardino, “in herbosis inundatis pr. San Bernardino, Paraguariae” 17 February 1966, *P. F. Ravenna 462* (holotypus: Herb. Rav., not localized). Lectotypus (designated by Eggers *et al.* 2019: 748): PARAGUAY. Paraguari: San Bernardino, “in herbosis inundatis pr. San Bernardino, Paraguariae” 17 February 1966, *P.F. Ravenna 462* (lectotypus K [K000322476!]). Figure 2R.

= *Cypella gracilis* (Klatt) Baker f. *humilis* Baker, Bulletin de l’Herbier Boissier 2 (3): 1102. 1903. Lectotypus (designated by Deble, 2017: 28): PARAGUAY. Depto Central: Ypacaray, “in campis humidis pr. lacu Ypacaray, Sept.” *E. Hassler 1703* (lectotypus P [P02061541 image seen!]).

Geographic distribution— Endemic of SESA, occurring in western portion of C and CH (AR[ER, CR, FR, MI, SF], BR [RS], PY).

Cypella aurinegra

Cypella aurinegra Deble & A. González subsp. *aurinegra* Phytotaxa 236: 102. 2015. Typus: URUGUAY. Cerro Largo: Cañada Yerba Sola, “11 km al norte de Puntas del Parao”, 32° 37’ 36” S and 54° 22’ 51” W, 7 April 2014 (fl.), *A. González 2250* (holotypus MVFA!). Figure 2S.

Geographic distribution— Endemic of SESA, occurring in eastern portion of C (UY).

Cypella aurinegra subsp. *albipurpurata* Deble, Darwiniana, nueva serie 9 (1): 182. 2021. Typus: URUGUAY. Cerro Largo: Aceguá, Sierra de Aceguá, en rocas, muy escasa, flores blancas”, 31°51’14.90”S and 54°14’8.73”W, 11 November 2018, *L.P. Deble & M.I.P. Deble 17128* (holotypus PACA!).

Geographic distribution— Endemic of SESA, occurring in eastern portion of C (UY).

Cypella catharinensis Ravenna, Onira Botanical leaflets 10 (13): 39. 2005. Typus: BRAZIL. Santa Catarina: São Joaquim, “camino frente al Horto de Floricultura” 14 December 1971 (fl, fr), *A. Lourteig 2180* (holotypus BAB [BAB00000505 image seen!], isotypi CTES [CTES60579!], P [P02061537 image seen!], NY [NY00507612 image seen!]).

Geographic distribution— Endemic of SESA, occurring in CA (BR [RS, SC, PR?]).

Cypella charruana Deble & F. S. Alves, Darwiniana, nueva serie, 3(2): 237. 2015. Typus: 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* (holotypus SI!, isotypus PACA!). Figure 2T.

Geographic distribution— Endemic of SESA, occurring in western portion of C (BR[RS], UY).

Cypella cruenta Deble, *Balduinia* 67: 2. 2021. Typus: BRAZIL. Rio Grande do Sul: Bagé, Pedra Grande, 28 October 2018, *L.P. Deble & M.I.P. Deble 18999* (holotypus PACA!). Figure 2U.

Geographic distribution— Endemic of SESA, occurring in eastern portion of C (BR[RS]).

Cypella curuzupensis Ravenna, *Wrightia* 7 (1): 19. 1981. Typus: PARAGUAY. Guairá: Villa Rica, “In paludibus pr. Curuzupe (ante Mbubevo), Villa-Ricae, Paraguariae”, February 1966, *P.*

F. Ravenna 463 (Herb. Rav., not localized). Neotypus (designated by Deble & Alves 2020a: 11): PARAGUAY. Guairá: Villa Rica, “Trayecto a cerro Tororo, Cordillera del Ybityrusu. En esteros, vegetación palustre” 20 April 1999, *F. Mereles* & *M. Soloaga* 7539 (neotypus FCQ0038133! isoneotypus FCQ0037895!).

Geographic distribution— Endemic of SESA, occurring in northern portion of C (PY).

Cypella discolor Ravenna, *Wrightia* 7 (1): 16. 1981. Typus: BRAZIL. Rio Grande do Sul: Quarai, “cult in Bonaria ex bulbis ad Passo da Guarda civit, Rio Grande do Sul, Brasiliae collectis” December 1967, *P. F. Ravenna* 507 (Herb. Rav., probably lost). Neotypus (Designated by Deble & Alves 2017b: 51): BRAZIL. Rio Grande do Sul: Quarai, na localidade do Passo da Guarda, em campo rupestre, [30°18'21.22”S 55°58'03.58”W], 16 December 2010, *L. P. Deble* & *A. S. Oliveira* 12901 (holotypus SI!, isoneotypus CTES!). Figure 2V.

Geographic distribution— Endemic of SESA, occurring in western portion of C (BR[RS], UY).

Cypella exilis Ravenna, *Nordic J. Bot.* 1: 492. 1981. ≡ *Polia gracilis* Klatt, *Linnaea* 31: 545. 1862. *Cypella gracilis* (Klatt) Baker, *J. Linn. Soc. Bot.* 16: 129. 1877 [non Klatt 1862 [comb. illeg.]. ≡ *Sphenostigma gracile* (Klatt) Benth. & Hook. f., *Gen. Pl.* 3 (2): 695. 1883. ≡ *Phalocallis gracilis* (Klatt) Kuntze, *Rev. Gen. Pl.* 2: 702. 1891. Lectotypus (designated by Deble & Alves 2017b: 54): BRAZIL/URUGUAY. “Habit. Brasilia meridionalis, Montevideo”, February-March 1824, *F. Sellow* d2077. Following Urban (1893: 196) the local of collection was “emenda zum Yaceguay [=Acegua], über Herval, Serra dos Tapes, nach S. Francisco de Paula [= Pelotas]” (lectotypus B0366320 leftmost specimen!). Figure 2W.

= *Cypella amplimaculata* Chauveau & L. Eggers, *Phytotaxa* 174 (1): 29. 2014. Typus: BRAZIL. Rio Grande do Sul: Piratini, BR 293, direção Bagé, 140 m” 25 October 2011, *A. M. Aita* 49 (holotypus ICN180155!).

Geographic distribution— Endemic of SESA, occurring in C and CA (BR[RS, SC], UY).

Cypella fucata Ravenna, *Wrightia* 7 (1): 18. 1981. Typus: BRAZIL. Rio Grande do Sul: Caçapava do Sul, “cult in Bonaria ex bulbis ad pedem collis ubi Gruta do Segredo est pr. Caçapava civit Rio Grande do Sul Brasiliae” December 1965, *P. F. Ravenna* 500 (Herb. Rav., not localized). Neotypus (designated by Deble & Alves 2017b: 52): BRAZIL. Rio Grande do Sul: Caçapava do Sul, “caminho para a gruta do segredo”,

23 December 2009, *L. P. Deble* & *A. S. de Oliveira* 11032 (neotypus SI!, isoneotypi CTES!, K). Figure 2X. = *Cypella osteniana* Beauv. subsp. *aurantiaca* Roitman & J. A. Castillo, *Bol. Soc. Argent. Bot.* 38 (3-4): 337. 2003. Typus: ARGENTINA. Corrientes: “Dep. Monte Caseros, cercanías de Tres Bocas” 16 April 2003, *Roitman* & *Tourn s.n.* (holotype BAB not seen).

= *Cypella aprica* Arechavaleta [nom. nud.]

Geographic distribution— Endemic of SESA, occurring in C and CA (AR[ER, CR], BR[RS, SC?], UY).

Cypella gloriana Deble & F. S. Alves, *Darwiniana*, nueva serie, 3(2): 241. 2015. Typus: BRAZIL. Rio Grande do Sul: São Vicente do Sul, Cerro da Glória, “at the base of the hill in the northern flank, native grasslands on place of soil sandy and stony soil, 25 October 2014 (fl., fr.), *L. P. Deble*, *F. S. Alves* & *M. I. P. Deble* 15034 (holotypus SI!, isotypi MVFA!, PACA!). Figure 2Y.

Geographic distribution— Endemic of SESA, occurring in C (BR[RS]).

Cypella guttata Deble & F.S. Alves, *Phytotaxa* 236: 105. 2015. Typus: URUGUAY. Artigas: Sarandy de Arapey, “cerca de 11 km nordeste da vila de Sarandy de Arapey, 30°57'45.22”S and 56°06'09.75”O, 22 October 2014, *L.P. Deble et al.* 14991 (holotypus MVFA!, isotypi SI!, ICN!). Figure 2Z.

Geographic distribution— Endemic of SESA, occurring in western portion of C (BR[RS], UY).

Cypella Hauthalii (Kuntze) R. C. Foster, *Contr. Gray Herb. Harv.* 171: 23. 1950. Bas.: *Alophia Hauthalii* Kuntze, *Rev. Gen. Pl.* 3, p. 304. 1898. ≡ *Herbertia Hauthalii* (Kuntze) Schumann, *J. bot. jahr. Syst.* 26 (1), p. 331. 1900. ≡ *Trifurcia Hauthalii* (Kuntze) Goldblatt, *Brittonia* 27, p. 384. 1975. Typus: PARAGUAY. Paraguari: Ybitimi, October 1892, *R. Hauthal s.n.* [= n. 9] (holotypus NY not seen, isotypi SI0300!, CTES!). Figure 2A'.
Geographic distribution— Endemic of SESA, occurring in northwestern C (AR[CR, MI], PY).

Cypella Herbertii

Cypella Herbertii (Herbert) Herbert subsp. *Herbertii*, *Bot. Mag.* 53: pl. 2637. 1826. Bas.: *Tigridia herbertii* Herbert, *Bot. Mag.* 52: pl. 2599. 1825. ≡ *Moraea herbertii* (Herbert) Lindley, *Bot. Reg.* 11: pl. 949. 1825 [1826]. ≡ *Phalocallis herbertii* (Herbert) Kuntze, *Rev. Gen. Pl.* 2: 702. 1891. Lectotypus (designated by Deble & Alves 2021): Original plate 2599, *Botanical Magazine* 25. 1825. Epitypus (designated by Eggers *et al.*

2019: 759): ARGENTINA. Buenos Aires, *s.d.*, *J. Tweedie 765*, second plant from right to left (epitypus K000523855 image seen!).

= *Cypella bonariensis* (Tenore) Niederl., Bol. Mens. Mus. Prod. Argent. 3 (31): 332. 1890. ≡ *Polia bonariensis* Tenore, Cat. Orto Bot. Napoli, p. 92. 1845. Typus: ARGENTINA. Buenos Aires, “cultivata nel Real Orto Botanico di Napoli” *F. Strangways s.n.* (not localized).

= *Polia brasiliensis* Tenore, Cat. Orto Bot. Napoli: 57. 1845. [nom. nud.]

= *Cypella ramosa* (Klatt) Klatt, Abhandl. Naturf. Gellesch. Un. Halle. 12: 365. 1882. ≡ *Polia ramosa* Klatt, Linnaea 31: 544. 1862. ≡ *Cypella ramosa* Beauverd, Bull. Soc. Bot. Genève ser. 2 (14): 167. 1923 [nom. superfl.]. Typus: BRAZIL/URUGUAY. “Uruguay und Rio Grande do Sul auf der Reise von Montevideo nach Porto Alegre, leg. Sellow no. 765” 1822-1823, *F. Sellow 765* (K000523858 image seen!).

= *Phalocallis herbertii* var. *normais* Kuntze, Rev. Gen. P. 3 (3): 309. 1898. Typus: ARGENTINA. Buenos Aires, Tandil, without additional data.

= *Phalocallis herbertii* var. *angustifolia* Kuntze, Rev. Gen. P. 3 (3): 309. 1898. Typus: ARGENTINA. Buenos Aires, Tandil, without additional data.

= *Phalocallis herbertii* var. *latifolia* Kuntze, Rev. Gen. P. 3 (3): 309. 1898. Typus: ARGENTINA. Buenos Aires, Tandil, without additional data.

Geographic distribution— Endemic of SESA, occurring in C, P and CA (AR[BA, ER, CR, MI], BR [RS, SC, PR], UY).

Cypella Herbertii subsp. *brevicristata* Ravenna, Not. Bol. Soc. Argent. Botánica 10 (4): 312. 1965. Typus: URUGUAY. Artigas: Artigas, “Culta in Bonaria ex bulbis collectis in septentrione Uruguay in proximus locibus urbi Artigas, in campis inter fruticis” *P.F. Ravenna 01*, November 1959 (Herb. Rav. not localized). Neotypus (designated by Deble & Alves 2017a: 21): URUGUAY. Artigas: Artigas, arroyo Pintadito, 30°25'58.91”S and 56°26'45.02”W, 6 December 2015, *L. P. Deble & F. S. Alves 15996* (neotypus SI!, isoneotypus: MVFA!).

Geographic distribution— Endemic of SESA, occurring in western C (BR [RS], UY).

Cypella Herbertii (Herbert) Herbert subsp. *reflexa* Ravenna, Wrightia 7: 22. 1981. Typus: ARGENTINA. Entre Ríos: Paraná, “prope Paraná, ad viam Maria Grande prov. Entre Ríos Argentinae” December 1969, *P. F. Ravenna 1042* (Herb. Rav. not localized). Figure 2B’.

Geographic distribution— Endemic of SESA, occurring in C (AR[ER], UY).

Cypella Herbertii subsp. *Wolffhuegelii* (Hauman) Ravenna, Not. Bol. Soc. Argent. Bot. 10: 312. 1965. Bas.: *Cypella Wolffhuegelii* Hauman-Merck, Apuntes Hist. Nat. 1: 89. 1909. Typus:

ARGENTINA. Buenos Aires: Sierra de La Ventana, no date, *Hauman-Merck s.n.* (holotypus B, image seen!, isotypus SI014011!)

Geographic distribution— Endemic of SESA, occurring in P (AR[BA]).

Cypella laeta Ravenna, Wrightia 7 (1): 13. 1981. Typus: ARGENTINA. Entre Ríos: Concordia, “Culta in Bonaria ex bulbis ad Parque San Martín [Parque Rivadavia] pr. Concordiam prov. Entre Ríos Argentinae collectis”, December 1967, *P. F. Ravenna 506* (Herb. Rav., not localized). Lectotypus (Designated by Deble & Alves 2021) ARGENTINA. Entre Ríos: Concordia, Estación Agronomica, 16 January 1927, *A. Burkart 784* (lectotypus SI!). Figure 2C’.

= *Cypella yatayphila* Ravenna, Onira Botanical leaflets 12 (1): 3. 2009. Typus: ARGENTINA. Entre Ríos: Colón, Parque Nacional El Palmar, 31°52'29”S 58°12'36”W, “patio de la Intendencia” 15-16 November 2003, *A. A. Cocucci et al. 2926* [=2916] (holotypus SI!, isotypus CTES!).

Geographic distribution— Endemic of SESA, occurring in western C (AR[ER], UY).

Cypella lapidosa Ravenna, Wrightia 7 (1): 21. 1981. Typus: ARGENTINA. Corrientes: “Dep. Santo Tomé, Garruchos, Estancia San Juan Bautista, costa del rio Uruguay, en pedregal, 20 February 1974”, *A. Krapovickas et al. 25815* (holotypus: Herb. Rav., not localized). Lectotypus (Designated by Deble & Alves 2021): ARGENTINA. Corrientes: “Dep. Santo Tomé, Garruchos, Estancia San Juan Bautista, costa del rio Uruguay, en pedregal, 20-II-1974” 20 September 1974 (fl.), *A. Krapovickas et al. 25815* (lectotypus CTES0000230!). Figure 2D’.

= *Cypella altouruguaya* Chauveau & L. Eggers, Phytotaxa 174 (1), p. 26. 2014. Typus: BRAZIL. Rio Grande do Sul: Trindade do Sul, “Estrada Trindade do Sul - Pinhalzinho, 610 m” 3 december 2011 (fl, fr), *T.B. Guimarães & L. Dal Ri 6A* (holotypus ICN [ICN173593!]).

Geographic distribution— Endemic of SESA, occurring in northwestern C (AR[CR, MI], BR[RS]).

Cypella laxa Ravenna, Wrightia 7 (1): 15. 1981. Typus: BRAZIL. Paraná: Guarapuava: “In uliginosis, circ. 2 km a Posto Agropecuario mun. Guarapuavae civit. Paranaensis Brasiliae”, 3 December 1969, *P. F. Ravenna & G. Hatschbach 1008* (holotypus Herb. Rav. not localized). Lectotypus (designated by Eggers *et al.* 2019: 752): BRAZIL. Paraná: Guarapuava: “In uliginosis, circ. 2 km a Posto Agropecuario mun. Guarapuavae civit. Paranaensis Brasiliae”, 3 December 1969,

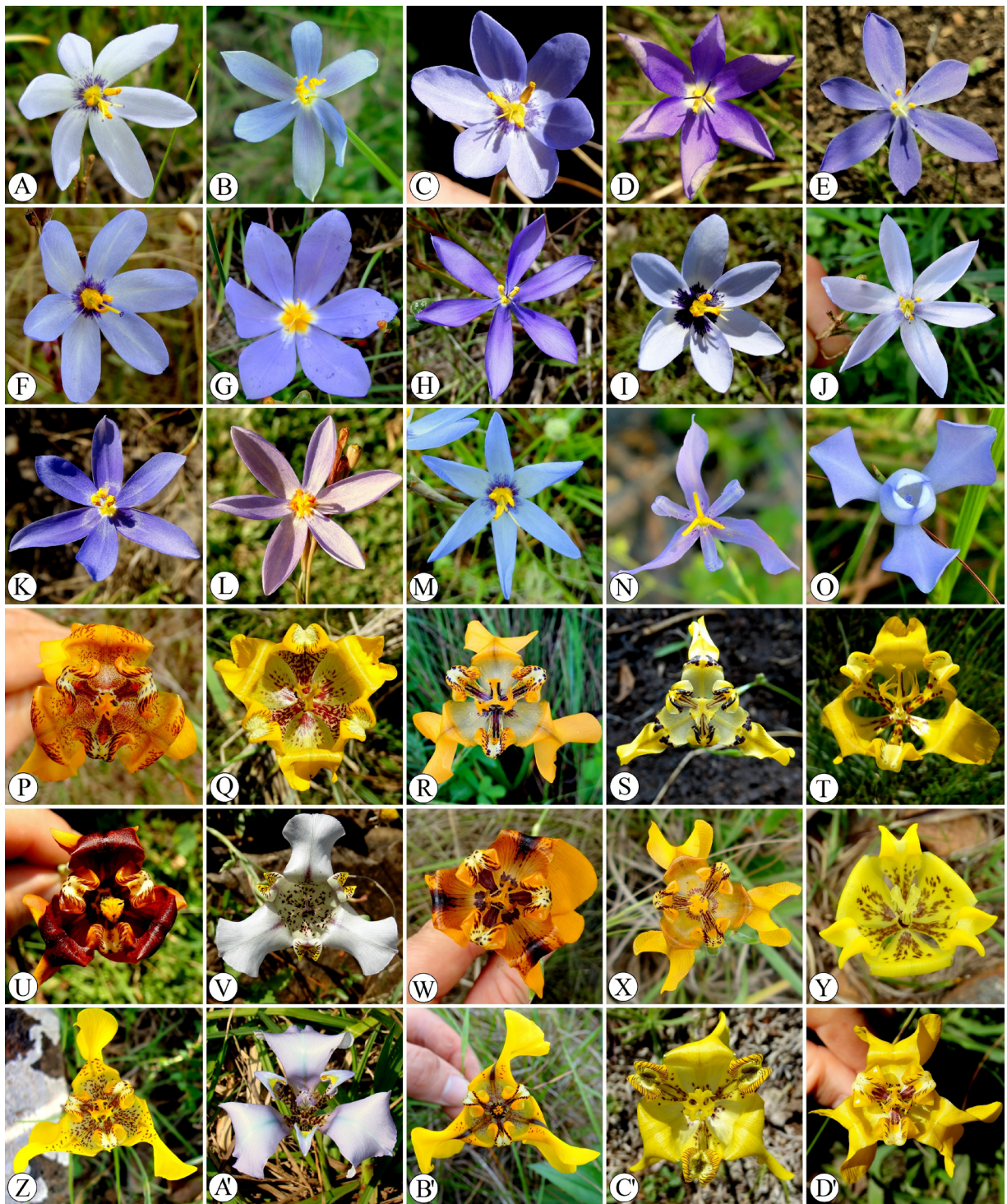


Figure 1. Diversity of the Iridaceae-Tigridiaceae in the SESA grasslands. A. *Calydorea alba*. B. *Calydorea approximata*. C. *Calydorea azurea*. D. *Calydorea basaltica*. E. *Calydorea campestris*. F. *Calydorea charruana*. G. *Calydorea crocoides*. H. *Calydorea longipes*. I. *Calydorea luteola*. J. *Calydorea minima*. K. *Calydorea minuana*. L. *Calydorea nuda*. M. *Calydorea riograndensis*. N. *Catilamabilis*. O. *Cipurapaludosa* subsp. *boliviensis*. P. *Cypella Alonsoana*. Q. *Cypella aquatilis*. R. *Cypella armosa*. S. *Cypella aurinegra* subsp. *aurinegra*. T. *Cypella charruana*. U. *Cypella cruenta*. V. *Cypella discolor*. W. *Cypella exilis*. Y. *Cypella fucata*. X. *Cypella gloriana*. Z. *Cypella guttata*. A'. *Cypella Hauthalii*. B'. *Cypella Herbertii* subsp. *reflexa*. C' *Cypella laeta*. D' *Cypella lapidosa*.

P. F. Ravenna & G. Hatschbach 1008 (lectotypus K000322475 image seen!).

Geographic distribution— Occurs in C and CA (AR[CR, MI], BR[RS, SC, PR], PY, UY). Widely distributed in Southern and Center-West Brazil and Paraguay.

Cypella luteogibbosa Deble, *Phytotaxa* 71 (1): 60. 2012. Typus: BRAZIL. Rio Grande do Sul: Quaraí, “28 km ao sul do trevo para o Passo da Guarda”, 19 October 2010, *L.P. Deble & A.S. de Oliveira 10265* (holotypus PACA!). Figure 3A.

Geographic distribution— Endemic of SESA, occurring in western C (BR[RS], UY).

Cypella magnicristata Deble, *Phytotaxa* 71 (1): 63. Typus: BRAZIL. Rio Grande do Sul: Quaraí, Jarau, 30°11'34.07"S, 56°29'58.86"W, 17 February 2011, fl., fr., *L.P. Deble & A.S. de Oliveira 12816* (holotypus: PACA!). Figure 3B.

Geographic distribution— Endemic of SESA, occurring in western C (BR[RS]).

Cypella opalina

Cypella opalina (Ravenna) Deble, *Balduinia* 66: 19. 2020. Bas.: *C. Hauthalii* subsp. *opalina* Ravenna, *Wrightia* 7 (1): 21. 1981. Typus: ARGENTINA. Corrientes: Santo Tomé, Garruchos: “Culta in Santiago ex bulbo ad ripas fluminis Uruguay pr. Garruchos prov. Corrientes Argentinae collecto” October 1980, *P.F. Ravenna 3300* (Herb. Rav., not localized). Lectotypus (designated by Deble & Alves 2020: 19): ARGENTINA. Corrientes: Santo Tomé, Garruchos: “Estancia San Juan Bautista, costa del río Uruguay, campo bajo inundado” 20 November 1974, *A. Krapovickas et al. 25807* (lectotypus CTES0000225!). Figure 3C.

Geographic distribution— Endemic of SESA, occurring in western C (AR[CR, MI], BR[RS], PY).

Cypella opalina subsp. ***minuticristata*** (Chauveau & L. Eggers) Deble, *Balduinia* 66: 19. 2020. Bas.: *Cypella Hauthalii* subsp. *minuticristata* Chauveau & L. Eggers, *Phytotaxa* 174 (1): 33. 2014. Typus: BRAZIL. Rio Grande do Sul State: Soledade, “Comunidade Margem São Bento, propriedade particular do Sr. Waldemar Freitag, 534m”, 28° 48' 52.8"S and 52° 38' 38.9"W, 2 November 2013, *L. Eggers et al. 833* (holotypus ICN!).

Geographic distribution— Endemic of SESA, occurring in northern C (BR[RS]).

Cypella Osteniana Beauverd, *Bull. Soc. Bot. Genève ser. 2* (14): 165. 1923. Typus: URUGUAY.

Minas: “loco dicto Verdun, in saxosis, perigon bräunlichweiss, innere, zurückgebogen gelb, braun marmorirt” 16 April 1908, *C. Osten 5197* (holotypus MVM018457!). Figure 3D.

Geographic distribution— Endemic of SESA, occurring in central and southern C (UY).

Cypella Pabstiana Ravenna, *Wrightia* 7 (1): 18. 1981. Typus: BRAZIL. Paraná: Guarapuava, Entre Rios, “in campis siccis graminosis ad Entre Rios mun. Guarapuava civit. Parana Brasiliae” 4.XII.1969, *P. F. Ravenna & G. Hatschbach 1013* (holotypus Herb. Rav., not localized). Lectotypus (designated by Eggers *et al.* 2019: 767): BRAZIL. Paraná: Guarapuava, Entre Rios, “campo limpo, seco”, 21 October 1969, *G. Hatschbach 22552* (lectotypus MBM 12074!).

Geographic distribution— Endemic of SESA, occurring in north CA (BR[PR]).

Cypella parviflora Ravenna ex Deble & F. S. Alves, *Kew Bulletin* 72: 47. 2017. Typus: ARGENTINA. Corrientes: Santo Tomé, Garruchos, 3 October 2015, *L. P. Deble & F. S. Alves 15619* (holotypus SI!, isotypi CTES!, ICN!, K). Figure 3E.

Geographic distribution— Endemic of SESA, occurring in western C (AR[CR]).

Cypella pusilla (Link & Otto) Benth. & Hook. f. ex B. D. Jacks., *Index Kewensis* 1: 689. 1893. Bas.: *Ferraria pusilla* Link & Otto, *Ico. Pl. Select.* 10: 125. 1828. ≡ *Herbertia pusilla* (Link & Otto) Sweet, *Hort. Brit.*, ed. 2: 497. 1830. ≡ *Polia pusilla* (Link & Otto) Klatt, *Linnaea* 31: 545. 1862. ≡ *Hesperoxiphion pusillum* (Link & Otto) Baker, *Jour. Linn. Soc., Bot.* 16: 127. 1877. ≡ *Phalocallis pusilla* (Link & Otto) Kuntze, *Rev. Gen. Pl.* 2: 702. 1891. Epitypus (designated by Deble & Alves 2017b): BRAZIL. Rio Grande do Sul State: Porto Alegre/Encruzilhada do Sul, “Brésil Province de Rio-Grande (Herbier Impérial du Brésil 294), C. Gaudichaud 1833” *F. Sellow 2599* (epitypus P [P01846365 image seen!]). Lectotypus (designated by Pastori *et al.* 2018): BRAZIL. Rio Grande do Sul: Porto Alegre, “Die zwiebeln sandte Herr Sello aus Brasilien von Porto Alegre in jahre 1826”, January 1826, *F. Sellow s.n.* *Icon. Pl. Select.* 125: pl. 59. Figure 3F.

Geographic distribution— Endemic of SESA, occurring in C (BR[RS]).

Cypella Ravenniana Deble & F.S. Alves, *Phytotaxa* 236 (2): 109. 2015. Typus: ARGENTINA. Corrientes: Santo Tomé, Garruchos, “Estancia San Juan Bautista, on stony rocky grassland,

28° 10' 20,54" S – 55° 38' 14,33" W, 22 December 2014, *L. P. Deble & F. S. Alves 15505* (holotypus SI!, isotypi CTES!, ICN, MVFA!).

Geographic distribution— Endemic of SESA, occurring in western C (AR[CR, MI], BR[RS]).

Cypella rivularis Chauveau & L. Eggers, *Phytotaxa* 174 (1): 36. 2014. Typus: BRAZIL. Rio Grande do Sul: Uruguaiana, BR 290, “aproximadamente Km 645, campo bem preservado, em baixada, em borda de pequenos riachos, 172 m”, fl. and fr. 25 November 2013, *L. Eggers et al. 869* (holotypus: ICN!). Figure 3G.

Geographic distribution— Endemic of SESA, occurring in western C (BR[RS], UY).

Cypella suffusa Ravenna Onira Botanical leaflets 12 (1): 1. 2009. Typus: ARGENTINA. Misiones: Cainguás, “predio UNLP, reserva privada, valle del arroyo Cuña Pirú, campito 1”, 27° 06' 44" S, 54° 58' 23" W, 15 March 2000, *Peralta et al.* [= *F. Biganzoli 830 et al.*] (holotypus SI!, isotypus CTES!). Figure 3H.

Geographic distribution— Endemic of SESA, occurring in northwest C (AR [MI]).

Cypella trimontina Ravenna, Onira Botanical leaflets 12 (1): 2. 2009. Typus: ARGENTINA. Corrientes: San Martín, La Cruz, Tres Cerros, 22 October 1976, *A. L. Cabrera 28162* (holotypus SI!, isotypus CTES!). Figure 3I.

Geographic distribution— Endemic of SESA, occurring in western C (AR[CR]).

Cypella uliginosa Deble & F. S. Alves, *Darwiniana*, nueva serie, 3(2): 237. 2015. Typus: 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* (holotypus SI!, isotypus MVFA!). Figure 3J.

Geographic distribution— Endemic of SESA, occurring in western C (AR [ER, CR], PY).

Gelasine Herbert

Gelasine Herbert, *Botanical Magazine* 1840: pl. 3779. Typus: *Gelasine azurea* Herbert (= *Gelasine elongata* (Graham) Ravenna)

Gelasine comprises seven species, of which four species and two subspecies are represented in the SESA Grasslands.

Gelasine caerulea (Vellozo) Ravenna, *Noticuario Mensual*, Museo Nacional de Historia Natural. Santiago de Chile 249: 8. 1977. Bas. *Sisyrinchium*

caeruleum Vellozo, *Florae Fluminensis Icones* 9: pl 66. 1831. ≡ *Alophia caerulea* (Vellozo) Chukr, *Fl. Fanerog.* Estado São Paulo 3: 128. 2003. Figure 3L.

Geographic distribution— Occurs in C and CA (AR [MI], BR [RS, SC, PR]), also in southeast and central Brazil.

Gelasine elongata (Graham) Ravenna, *Phytologia* 65: 154. 1988. Bas. *Ferraria elongata* Graham, *Edinburgh New Philosophical Journal* 9: 173. 1830. Typus: ARGENTINA. Buenos Aires: *J. Tweedie s.n.* (holotypus E? not seen). Figure 3M. = *Gelasine azurea* Herbert, *Botanical Magazine* 66: pl. 3779. 1840. *Trichonema azurea* (Herbert) Bosse, *Vollständiges Handbuch der Blumengärtnerei, oder genau Beschreibung fast aller in Deutschland...* ed. 1. 3, 3: 600. 1861. Typus: ARGENTINA/URUGUAY. Buenos Aires/Montevideo: *J. Tweedie 703* (holotypus K000363157!).

= *Herbertia stricta* Grisebach, *Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen*. Göttingen 24: 324. 1879. ≡ *Alophia stricta* (Grisebach) Kunth, *Revisio Generum Plantarum* 3 (3): 304. 1898. Typus: ARGENTINA. Entre Ríos: Concepción del Uruguay, Estancia La Cupalen, November 1877, *P.G. Lorentz s.n.* (holotypus GOET, isotypi CORD! BAB!).

Geographic distribution— Endemic of SESA, occurring in P and southern C (AR [BA, ER], BR[RS], UY).

Gelasine paranaensis Ravenna, Onira Botanical Leaflets 10 (13): 42. 2005. Typus: BRAZIL. Paraná: Tijucas do Sul, rincão, 21 October 1977, *G. Hatschbach 40442* (holotypus MBM!).

Geographic distribution— Endemic of SESA, occurring in CA (BR[RS, SC, PR]). Figure 3N.

Gelasine uruguayensis

Gelasine uruguayensis subsp. *uruguayensis* Ravenna, *Nordic Journal of Botany*, Copenhagen, 4 (3): 348. 1984. Typus: URUGUAY. Durazno: Culta in Bonaria ex bulbis in arenosis prope Molles civit, Durazno Uruguay collectis, *P.F. Ravenna 5* (holotypus Herb. Rav., isotypus MVM!). Figure 3O.

Geographic distribution— Endemic of SESA, occurring in southern and central C (BR[RS], UY).

Gelasine uruguayensis subsp. *orientalis* Ravenna, *Nordic Journal of Botany*, Copenhagen, 4 (3): 349. 1984. Typus: URUGUAY. Cerro Largo: Culta in Bonari ex bulbis ad Bella Vista et Puente de Piedra civit. Cerro-Largo Uruguay collectis November 1959, *P.F. Ravenna 6* (holotypus Herb. Rav., isotypus MVM).

Geographic distribution— Endemic of SESA, occurring in southern C (UY).

Herbertia Sweet

Herbertia includes 12 species, 11 of them occurring in the SESA grasslands (Deble, unpubl. data).

Herbertia amabilis Deble & F.S. Alves, *Candollea* 68 (1): 134. 2013. Typus: BRAZIL. Rio Grande do Sul, Júlio de Castilhos, “no campo, entre gramíneas, no solo argiloso, flores brancas”, 29°18'43”S 53°49'39”W, 23 December 2010, L. P. Deble et al. 12721 (holotypus SI, isotypus CTES, ICN). Figure 3P.

Geographic distribution— Endemic of SESA, occurring in northern C (BR[RS]).

Herbertia amatorum Wright, *Bulletin of Miscellaneous Information, Royal Gardens, Kew* 8: 321. 1907. ≡ *Trifurcia amatorum* (Wright) Goldblatt, *Brittonia* 27: 384. 1975. Typus: URUGUAY. Without specific place, “Montevideo. Cantera” 1903, *C.B. Cantera s.n.* (Cultivated in England, seemingly not preserved). Figure 3Q.

Geographic distribution— Endemic of SESA, occurring in southern C (UY).

Herbertia amoena Grisebach, *Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen* 24: 325. 1879. ≡ *Alophia amoena* (Grisebach) Kuntze, *Revisio Generum Plantarum* 3 (3): 304. 1898. ≡ *Alophia lahue* subsp. *amoena* (Grisebach) Ravenna, *Bonplandia [Corrientes]* 2 (16): 284. ≡ *Trifurcia lahue* subsp. *amoena* (Grisebach) Goldblatt, *Brittonia* 27: 384. 1975. Typus: ARGENTINA. Entre Ríos: Concepción del Uruguay, *ubique in campis*, P.G. Lorentz 497 et 604. Lectotypus (Designated by Deble 2021:3): ARGENTINA. Entre Ríos: Concepción del Uruguay, Ungemein häufig im Camp im ersten Frühling, September 1875, P.G. Lorentz 497 (CORD00005727! isolectotypus GOET004138 photo!). Figure 3R.

Geographic distribution— Endemic of SESA, occurring in C, CH and P (AR[ER, CR, MI], BR[RS], PY and UY).

Herbertia caerulea (Herbert) Herbert, *Botanical Magazine* 67: pl. 3862. 1841. Bas. *Trifurcia caerulea* Herbert, *Botanical Magazine* 66: pl. 3779. 1840. ≡ *Alophia caerulea* (Herbert) Mottet, *Dictionnaire Pratique d'Horticulture* 1: 117. 1892[1893] <non *Alophia caerulea* (Vellozo) Chukr> ≡ *Trifurcia lahue* subsp. *caerulea*

(Herbert) Goldblatt, *Brittonia* 27: 383. 1975. ≡ *Herbertia lahue* subsp. *caerulea* (Herbert) Goldblatt, *Annals of the Missouri Botanical Garden* 64: 379. 1978. Typus: UNITED STATES. Texas: “species Texana a Drummond lectae floruit Spofforthiae”. Lectotypus (designated by Deble 2021: 7): UNITED STATES. Texas: *T. Drummond* (P02065199!). Figure 3S.

= *Herbertia Drummondiana* Herbert, *Edward's Botanical Register* 28: 65. 1842. <non *Alophia drummondii* (Graham) R. C. Foster>. Typus: UNITED STATES. Texas: “in ditone Texas, Drummond” (typus: not known).

= *Iris brachystigma* Scheele, *Linnaea* 22: 348. 1849. Typus: UNITED STATES. Texas: Piny Point, *Romer s.n.* (not localized, synonym according Goldblatt 1975: 383).

= *Herbertia Watsonii* Baker, *Handbook of Irideae*: 71. 1892. Typus: UNITED STATES. Texas: San Antonio, April 1844, *V. Havard s.n.* (holotypus GH 00031343!).

Geographic distribution— Occurs in northeastern C (BR[RS]). Its geographic range includes northern Argentina and southern United States.

Herbertia Crosae Roitman & Castillo, *Brittonia* 56 (4): 361. 2004. Typus: URUGUAY. Artigas: Bella Unión, in grassy, stony places, 6 November 2002, G. Roitman & G. M. Tourn s.n. (holotypus BAA 24931). Figure 3T.

Geographic distribution— Endemic in SESA, occurring in western C (AR[CR?], BR[RS], UY).

Herbertia Darwinii Roitman & Castillo, *Boletín Sociedad Argentina Botánica* 43 (3-4): 311. 2008. Typus: ARGENTINA. Corrientes: Paso de Los Libres, Cercanías de Bompland, 9 October 2006, G. Roitman s.n. (BAA 25702!). Figure 3U.

Geographic distribution— Endemic in SESA, occurring in western C (AR [CR, MI], BR[RS], UY).

Herbertia lahue (Molina) Goldblatt, *Ann. Missouri Bot. Gard.* 64: 379. 1977 [1978]. Bas. *Ferraria lahue* Molina, *Saggio sulla storia naturale del Chili*: 110. 1810. ≡ *Alophia lahue* (Molina) Espinosa-Bustos, *Revista Chilena de Historia Natural* 26: 9. 1922. ≡ *Trifurcia lahue* (Molina) Goldblatt, *Brittonia* 27: 384. 1975. Figure 3V.

= *Herbertia lineata* Klatt, *Abh. Naturf. Ges. Halle* 15: 368. 1882. Typus: CHILE: Valdivia, “in pratis siccis leg. C. Ochsenius, W. Lechler, pl. chilensis 298 [398]” Lectotypus (designated by Deble 2021: 9): CHILE: Valdivia, “in pratis siccis pr. Valdivia, 28 November 1850, W. Lechler 298 (P02066882!).

Geographic distribution— Occurs in C, CA and P (AR[BA, ER, CR], BR[RS, SC], UY). Its geographic range includes center-eastern Argentina and Central Chile.



Figure 2. Diversity of Iridaceae-Tigridiaceae in the SESA grasslands. A. *Cypella luteogibbosa*. B. *Cypella magnicristata*. C. *Cypella opalina* subsp. *opalina*. D. *Cypella Osteniana*. E. *Cypella parviflora*. F. *Cypella pusilla*. G. *Cypella Ravenniana*. H. *Cypella rivularis*. I. *Cypella suffusa*. J. *Cypella trimontina*. K. *Cypella uliginosa*. L. *Gelasine caerulea*. M. *Gelasine elongata*. N. *Gelasine paranaensis*. O. *Gelasine uruguayensis* subsp. *uruguayensis*. P. *Herbertia amabilis*. Q. *Herbertia amatorum*. R. *Herbertia amoena*. S. *Herbertia caerulea*. I. *Herbertia Crosae*. U. *Herbertia Darwinii*. V. *Herbertia lahue*. W. *Herbertia pulchella*. X. *Herbertia quareimana*. Y. *Herbertia zebrina*. Z. *Herbertia* sp. A'. *Kelissa brasiliensis*. B'. *Larentia linearis*. C' *Onira unguiculata*. D'. *Phalocallis coelestis*.

Herbertia pulchella Sweet, British Flowers Garden 3: pl. 222. 1827. Type: British Flowers Garden 3: pl. 222. from URUGUAY: Maldonado, “Bay of Maldonado” *J. Anderson* material of herbarium not mentioned. Figure 3W.

Geographic distribution— Endemic in SESA, occurring in C (BR[RS], UY).

Herbertia quareimana Ravenna, Nordic Journal of Botany 9: 55. 1989. Typus: BRAZIL. Rio Grande do Sul: Quarai: “Culta in Bonaria ex bulbis in campis pr Quarai civit Rio Grande do Sul Brasiliae” Ravenna 999 (holotypus: not seen, isotypi MVM! RB not seen). Figure 3X.

Geographic distribution— Endemic in SESA, occurring in western C (AR [CR], BR[RS], UY).

Herbertia zebrina Deble, Darwiniana 48 (1): 93. 2010. Typus: BRAZIL. Rio Grande do Sul: Amaral Ferrador, próximo a divisa com Encruzilhada do Sul, propriedade da Pinheira, em cerro pedregoso, na subida para o topo, 30°39'55.37”S, 52°23'59.52”W, 21 December 2008, *L. P. Deble et al. 10844* (holotypus SI, isotypus CTES). Figure 3Y.

Geographic distribution— Endemic in SESA, occurring in northeastern C (BR[RS]).

***Herbertia* sp.** Figure 3Z.

Geographic distribution— An undescribed species recently discovery in RS, endemic in C (BR[RS]).

Kelissa Ravenna

Kelissa Ravenna, Adansonia 1 (3): 106. 1981. Typus: *Herbertia brasiliensis* Baker, Journal of the Linnean Society, London 16 (89): 134. 1877. = *Sympa* Ravenna, Wrightia 7 (1): 10. 1981. p.p.

Kelissa is a monotypic genus, endemic in Brazilian portion of C (Central and Southeastern Rio Grande do Sul state).

Kelissa brasiliensis (Baker) Ravenna, Adansonia 1 (1): 106. 1981. ≡ *Herbertia brasiliensis* Baker, Journal of the Linnean Society, London 16 (89): 134. 1877. ≡ *Alophia brasiliensis* (Baker) Kuntze, Revisio Generum Plantarum 3 (2): 304. 1898. ≡ *Trifurcia brasiliensis* (Baker) Goldblatt, Brittonia 27 (4): 384. 1975. ≡ *Cypella brasiliensis* (Baker) Roitman & A. Castillo, Darwiniana, 45 (2): 238. 2007. ≡ *Herbertia Drummondiana* Klatt (non Herbert), Linnaea 31: 555. 1862. Typus: BRAZIL. “Brasilia meridionalis leg. Sellow no. 1370 et 2863”. Lectotypus (designated by Ravenna 1981: 106): BRAZIL. Rio Grande do Sul: Porto Alegre/ Encruzilhada do Sul: “Brasilia meridionalis” September/October 1825, *F. Sellow 2863* (lecto-

typus B10 0248998 image seen! [mixed with *Herbertia pulchella*], isolectotypi G00098265 image seen! G00098266 image seen!). Figure 3A'. = *Sympa riograndensis* Ravenna, Wrightia 7 (1): 11. 1981. Typus: BRAZIL. Rio Grande do Sul: São Gabriel “17 km. W de Sao Gabriel, campo com baixada umida” 13.X.1971, *J. C. Lindman et al.* [p.p.] (holotypus ICN08345! [mixed with *Herbertia Darwinii*]).

Geographic distribution— Endemic in SESA, occurring in north and eastern C (BR[RS]).

Larentia Klatt, Abh. Naturf. Ges. Halle 15: 362. 1882. Typus: *Moraea linearis* Kunth.

Two or three species with disjunct distribution in Mexico and in Tropical South America. *Larentia linearis* occurs in the northernmost portion of the eco-region of Campos and in Chaco humid regions.

Larentia linearis (Kunth) Klatt, Abh. Naturf. Ges. Halle 15: 362. 1882 ≡ *Moraea linearis* Kunth in F.W.H. von Humboldt, A.J.A. Bonpland & C.S. Kunth, Nov. Gen. Sp. 1: 321. 1816. ≡ *Marica linearis* (Kunth) Ker Gawl., Irid. Gen.: 24. 1827. ≡ *Alophia linearis* (Kunth) Klatt, Linnaea 31: 558. 1862. ≡ *Sphenostigma lineare* (Kunth) Benth. & Hook.f., Gen. Pl. 3: 695. 1883. ≡ *Cypella linearis* (Kunth) Baker, Handb. Irid.: 65. 1892. Typus: VENEZUELA, “Crescit in humidis calidisque Guayanae prope El Trapiche de Farreras. Floret Junio” *A.J.A. Bonpland & F.W.H.A. von Humboldt 1069* (holotypus P00669618!). Figure 3B'.

= *Zygella graminea* S.Moore, Trans. Linn. Soc. London, Bot. 4: 494. 1895. Typus: BRAZIL. Mato Grosso: “Viget Santa Cruz, ubi reperi mens.” December 1891, *S.L. Moore 733* (holotypus NY00319559!).

= *Zygella mooreana* Hoehne, Relat. Commiss. Linhas Telegr. Estratég. Matto Grosso Amazonas 1: 19. 1910. Typus: BRAZIL. Mato Grosso: Porto Esperidiao, *Hoehne s.n.* (Original material unknown). Epitypus (designado por Goldblatt & Celis 2010: 413): Figure 58, p. 20 en Relat. Commiss. Linhas Telegr. Estratég. Matto Grosso Amazonas, 1910.

= *Cypella lilacea* Ravenna, Onira Botanical leaflets 9 (1): 3. 2003.

Geographic distribution— Occurs in northwestern C (PY), and CH (PY). Its geographic range includes the tropical South America

Onira Ravenna

Onira Ravenna, Nordic Journal of Botany 3 (2): 204. 1983. Typus: *Herbertia unguiculata* Baker, Handbook of Irideae: 72. 1892.

A monotypic genus endemic in the region of C of SESA grasslands.

Onira unguiculata(Baker) Ravenna, Nordic Journal of Botany 3 (2): 204. 1983. Bas.: *Herbertia unguiculata* Baker, Handbook of Irideae: 72. 1892. *Alophia unguiculata* (Baker)

Kuntze, Revisio Generum Plantarum 3 (2): 305. 1898. *Cypella unguiculata* (Baker) Roitman & A. Castillo, Darwiniana 45 (2): 238. 2007. Typus: BRAZIL. Rio Grande do Sul: “Habit South Brazil, Sello! (Herb. Kew)”, *F. Sellow* s.n. (holotypus: K). Figure 3C’.

Geographic distribution— Endemic in SESA, occurring in C (AR (CR), BR[RS], UY).

Phalocallis Herbert, Botanical Magazine 65: pl. 3710. 1839. Typus: *Phalocallis plumbea* Herbert (= *Phalocallis coelestis* (Lehmann) Ravenna). *Phalocallis* comprises four or five species, two of them occur in the SESA grasslands.

Phalocallis coelestis (Lehmann) Ravenna, Noticiario Mensual, Museo Nacional de Historia Natural 21 (249): 9. 1977. Bas. *Marica coelestis* Lehmann, Index Seminum. Hamburg 17. 1828. *Cypella coelestis* (Lehmann) Diels, Natürlichen Pflanzenfamilien 15a: 498. 1930. Figure 3D’.

= *Phalocallis plumbea* (Lindley) Herbert, Botanical Magazine 65: pl. 3710. 1839. *Cypella plumbea* Lindley, Edward’s Botanical Register 24(Misc.): 71. 1838.

Geographic distribution— Occurs in C, CA? and P (AR [BA, ER, CR, MI], BR[RS, SC?], UY). Its geographic range includes the Tropical and Subtropical South America (Ravenna, 2003)

Phalocallis oreophila (Spegazzini) Ravenna, Noticiario Mensual, Museo Nacional de Historia Natural 21 (249): 9. 1977. Bas. *Cypella oreophila* Spegazzini, Physis. Revista de la Sociedad Argentina de Ciencias Naturales. Buenos Aires 3: 44. 1917. Typus: ARGENTINA. Tucumán/Salta: “cuesta de San Antonio, entre Trancas y Pampa” 2000 m a.s.l., 13 January 1897, *C. Spegazzini* s.n. (holotypus LP003216!).

Geographic distribution— Occurs in north CA and CH (BR[PR], PY). Its geographic range includes the north Argentina, South Bolivia and western Paraguay.

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