UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL
INSTITUTO DE BIOCIÊNCIAS
PROGRAMA DE PÓS-GRADUAÇÃO EM BOTÂNICA

Classificação infragenérica de *Sisyrinchium* L. (Iridaceae) e taxonomia das seções *Cephalanthum* e *Viperella* (*pro parte*) na Região Sul do Brasil

Tese de Doutorado

Camila Dellanhese Inácio

Porto Alegre, julho de 2017

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Tese apresentada ao Programa de Pós-Graduação em Botânica da Universidade Federal do Rio Grande do Sul, como parte dos requisitos para a obtenção do título de Doutor em Botânica

Orientadora: Profa. Dra. Lilian Eggers

Co-orientador: Dr. Olivier Chauveau

Porto Alegre, julho de 2017

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"... O que está formado, transforma-se de novo imediatamente e nós temos, se quisermos de algum modo chegar à intuição viva da Natureza, de nos mantermos tão móveis e plásticos como o exemplo que ela nos propõe. .... Cada ser vivo não é uma coisa singular, mas uma pluralidade; mesmo no caso em que nos aparece como indivíduo, persiste, contudo, como uma coleção de seres vivos autônomos, que, segundo a ideia, segundo a disposição, são iguais, mas quando se manifestam podem ser iguais ou semelhantes, desiguais ou dissemelhantes. Estes seres estão em parte originariamente já unidos, em parte encontram-se e reúnem-se. Separam-se e procuram-se de novo e provocam assim uma produção infinita de todas as maneiras e em todas as direções."

(*Ideias de Johann Wolfgang von Goethe sobre a doutrina da Morfologia, expostas no texto Zur Morphologie, de 1817*)

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RESUMO

Classificação infragenérica de *Sisyrinchium* L. (Iridaceae) e taxonomia das seções *Cephalanthum* e *Viperella* (*pro parte*) na Região Sul do Brasil

Sisyrinchium é um gênero de Iridaceae amplamente distribuído no continente americano, compreendendo cerca de 200 espécies. A riqueza de espécies em *Sisyrinchium,* no entanto não é bem conhecida tendo em vista a escassez de estudos taxonômicos na América do Sul. No Brasil, há o registro de 67 espécies que habitam diferentes biomas e ambientes, sendo que na Região Sul ocorrem 85% dos táxons reconhecidos até o momento. O monofiletismo do gênero foi comprovado em estudos filogenéticos, porém as seções existentes não corresponderam aos clados obtidos. Assim, os objetivos deste estudo foram: propor uma classificação infragenérica com base em uma filogenia, revisando a taxonomia e a nomenclatura das seções e investigar as espécies das seções *Cephalanthum* e *Viperella* (*pro parte*) ocorrentes na Região Sul do Brasil. Através de coletas a campo, revisão bibliográfica e de herbários nacionais e internacionais, análises morfológicas e moleculares obteve-se os seguintes resultados: a) subdivisão do gênero em 10 seções, caracterizadas por um conjunto de caracteres diagnósticos morfológicos e moleculares, sendo que três destas são novas; b) descrição de três espécies de *Sisyrinchium* para a Região Sul, duas com distribuição nos campos do Paraná e outra no Rio Grande do Sul e Uruguai; c) identificação e caracterização de 22 táxons da seção *Cephalanthum* e uma espécie relacionada morfologicamente e, de 18 táxons da seção *Viperella* (*pro parte*) relacionadas à *Sisyrinchium palmifolium* L. e espécies afins, apresentadas com descrições, ilustrações, fotos, mapas, comentários e chaves de identificação. Além disto, foram designados 11 lectótipos e três neótipos. Dentre os 41 táxons, cinco são exclusivos do Brasil, incluindo a Região Sul e outros Estados, e 16 táxons são exclusivos da Região Sul. Por fim, foram apresentados os registros de duas novas ocorrências de espécies para o Brasil. Os dados obtidos neste estudo permitiram ampliar os conhecimentos sobre o gênero *Sisyrinchium* e, ao mesmo tempo, apontar desafios taxonômicos ainda existentes, os quais poderão ser alvo de investigação de futuros estudos que integrem diferentes enfoques.

Palavras-chave: caracteres diagnósticos, distribuição geográfica, filogenia, nomenclatura, *Sisyrinchium palmifolium,* Sisyrinchieae, taxonomia integrativa, tipificação.

ABSTRACT

Infrageneric classification of *Sisyrinchium* L. (Iridaceae) and taxonomy of sections *Cephalanthum* and *Viperella* (*pro parte*) of Southern Brazil

Sisyrinchium is a genus of Iridaceae largely distributed in the American continent, comprising about 200 species. Species richness of *Sisyrinchium* is not well known due to the lack of comprehensive taxonomic studies in South America. In Brazil, there are 67 species that inhabit different biomes and environments, and 85% of the taxa recognized so far occur in the Southern Region. Monophyly of the genus was testified by phylogenetic studies, although the sections previously proposed did not fully correspond to the clades. Thus, the goals of this study were: propose an infrageneric classification based on phylogenetic principles, evaluating taxonomy and nomenclature of the sections and investigate the species of the sections *Cephalanthum* and *Viperella* (*pro parte*) from Southern Region of Brazil. Through fieldwork, bibliographic review and national and international herbarium reviews, morphological and molecular analyses, the following results were obtained: a) subdivision of the genus in 10 sections, wherein three are new, characterized by a set of morphological and molecular diagnostic features; b) description of three new species of *Sisyrinchium* for the Southern Region, two with distribution in the Campos of Paraná and another in Rio Grande do Sul and Uruguay; c) identification and characterization of 22 taxa of section *Cephalanthum* and one morphologically related species, and of 18 taxa of section *Viperella* (*pro parte*) related to *Sisyrinchium palmifolium* L. and allied species, with descriptions, illustrations, photos, maps, comments and identification keys. In addition, 11 lectotypes and three neotypes were designated. Among the 41 taxa, five are exclusive of Brazil, including the South Region and other states, and 16 taxa are exclusive of the Southern Region. Futhermore, register of two new occurrences of species for Brazil were indicated. The data obtained in this study provided an increase of the knowledge on genus *Sisyrinchium*, as well as pointed out taxonomic challenges that still exist and can be focused on future investigations which integrate different approaches.

Keywords: diagnostic characters, geographic distribution, integrative taxonomy, nomenclature, phylogeny, *Sisyrinchium palmifolium.* Sisyrinchieae, typification.

INTRODUÇÃO GERAL

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Iridaceae Juss.

Sisyrinchium L. pertence à família Iridaceae, representada por cerca de 2.025 espécies distribuídas em 66 gêneros (Goldblatt & Manning 2008). A família apresenta uma grande diversidade de formas, flores com cores radiantes, sendo que sua complexidade e exibição de beleza só é superada por Orchidaceae, pertencente a mesma ordem, Asparagales (Goldblatt & Manning 2008, APG IV 2016). Iridaceae possui uma ampla distribuição e tem como principal centro de diversidade o sul da África, no qual a América do Sul é o segundo centro (Goldblatt & Manning 2008). No Brasil, ocorrem 197 espécies, pertencentes a 23 gêneros, sendo 112 espécies endêmicas (Flora do Brasil 2020a).

As espécies de Iridaceae são conhecidas principalmente como ornamentais e são comercializadas mundialmente, mas a maioria destas é de origem africana e asiática. Espécies de *Crocus* L., *Iris* L., *Freesia* Eckl. ex Klatt, *Gladiolus* L., *Moraea* Mill., entre outras, são cultivadas como ornamentais (Judd *et al.* 2009) e algumas espécies nativas (*Neomarica* spp.) tem sido utilizadas atualmente (Lorenzi & Souza 2001). As espécies nativas, pelo menos na Região Sul do Brasil, muitas vezes, são inconspícuas na vegetação (o que pode ser atribuído ao curto período de florescimento e à curta duração da flor, em geral, de um dia). Com relação a estudos taxonômicos, as flores frágeis dificultam a prensagem e a visualização da morfologia, fato que desestimula a coleta, o que possivelmente explica sua menor disponibilidade de material nos herbários (Eggers 2008).

Iridaceae é constituída principalmente por ervas, anuais ou perenes, ocasionalmente arbustos com crescimento anômalo secundário ou plantas aclorofiladas saprofíticas, com caules subterrâneos do tipo rizoma, cormo ou bulbo (Goldblatt & Manning 2008). As folhas são simples, cilíndricas ou planas, uni ou bifaciais, alternas ou equitantes, dispostas ao longo do caule ou na sua base (Goldblatt & Manning 2008; Judd *et al*. 2009). O escapo floral pode ser simples ou ramificado, cilíndrico ou plano; as flores são dispostas em inflorescências determinadas, monocásios do tipo ripídio, que podem estar arranjados em sinflorescências do tipo panículas, espigas ou com pequenos ramos laterais (Goldblatt *et al.* 1998; Goldblatt & Manning 2008). As flores são trímeras, com seis tépalas livres ou unidas formando um tubo, as mais externas às vezes diferenciadas das mais internas; três estames livres ou conados, podendo apresentar tricomas ou elaióforos; ovário ínfero, tricarpelar, trilocular e com placentação axial, ramos do estilete às vezes expandido e petalóides, fruto do tipo cápsula loculicida (Judd *et al.* 2009).

A presença de elaióforos é uma característica observada em 11 famílias de angiospermas, sendo duas Monocotiledôneas (Iridaceae e Orchidaceae) e nove Eudicotiledôneas (Cucurbitaceae, Malpighiaceae, Krameriaceae, Solanaceae, Calceolariaceae, Plantaginaceae, Myrsinaceae, Scrophulariaceae e Stilbaceae) (Machado 2004, Chauveau *et al.* 2011). Em Iridaceae, os elaióforos estão presentes somente em espécies da América do Sul, das tribos Sisyrinchieae, Trimezieae e Tigrideae (Silvério *et al.* 2012), sendo a única exceção *Tritoniopsis parviflora* (Jacq.) G. J. Lewis, espécie ocorrente no sul da África (Manning & Goldblatt 2002).

Estudo com base em sequências de DNA plastidial reconheceu sete subfamílias para Iridaceae (Goldblatt *et al.* 2008), apresentadas na Tabela 1.

Tabela 1: Subfamílias de Iridaceae, número de gêneros e espécies e distribuição geográfica, de acordo com Goldblatt *et al.* (2008).

Subfamília	**N° gêneros/ n° espécies**	**Distribuição**
Isophysidoideae	1/1	Tasmânia
Patersonioideae	1/21	Austrália, Bornéu, Sumatra, Nova Guiné
Geosiridoideae	1/1	Madagascar
Aristeoideae	1/55	África subsaariana até Madagascar
Nivenioideae	3/15	África do Sul
Crocoideae	29/1.032	África, Ásia e Europa
Iridoideae	29/890	Américas, Austrália, África, Eurásia e Tasmânia

A subfamília Iridoideae, única com representantes americanos, é composta por cinco tribos (Goldblatt *et al.* 2008), e destas, três ocorrem na América do Sul: Sisyrinchieae, Trimezieae e Tigrideae (Tabela 2). As tribos americanas são monofiléticas (Goldblatt *et al.* 2008; Chauveau *et al.* 2012).

Tabela 2: Tribos de Iridoideae, principais gêneros, número de espécies e distribuição geográfica, de acordo com Goldblatt *et al.* (2008).

Tribo	**Gêneros (n° de espécies)**	**Distribuição**
Diplarreneae	*Diplarrena* (2)	Australia, Tasmânia
Irideae	*Bobartia* (15), *Dietes* (6), *Ferraria* (14), *Iris* (275), *Moraea* (200)	África, Eurásia, América do Norte
Sisyrinchieae	*Libertia* (12), *Olsynium* (12), *Orthosanthus* (10), *Sisyrinchium* (140), *Solenomelus* (2), *Tapeinia* (1)	Australásia, América do Sul, Central e do Norte
Trimezieae	*Trimezia* (12), *Neomarica* (18), *Pseudotrimezia* (12)	América do Sul e Central
Tigridieae	*Alophia* (5), *Calydorea* (16), *Cardenanthus* (8), *Cipura* (9), *Cobana* (1), *Cypella* (30), *Eleutherine* (2), *Ennealophus* (5), *Gelasine* (6), *Herbertia* (6), *Hesperoxiphion* (4), *Larentia* (5), *Mastigostyla* (15), *Nemastylus* (4), *Tigridia* (55)	América do Sul, Central e do Norte

A tribo Sisyrinchieae

A tribo Sisyrinchieae é constituída por *Sisyrinchium*, juntamente com outros cinco gêneros, conforme a Tabela 2. *Libertia* Spreng. e *Orthrosanthus* Sweet tem distribuição disjunta, o primeiro com espécies na Austrália, Nova Guiné e Nova Zelândia e outras que ocorrem no Chile, Bolívia e Colômbia, e o segundo com espécies que ocorrem na Austrália, América do Sul e Central (Goldblatt & Manning 2008). *Olsynium* Raf. está distribuído principalmente na América do Sul temperada, uma espécie no oeste da América do Norte e outra nas ilhas Falkland (Goldblatt & Manning 2008). *Sisyrinchium* está amplamente distribuído pelas Américas, e tem espécies adventícias no Oriente (Takahashi *et al.* 2015, GBIF 2016). *Solenomelus* Miers ocorre no sul dos Andes da América do Sul e *Tapeinia* Juss. está distribuída no sul da Argentina e sul do Chile (Goldblatt & Manning 2008).

Espécies de Sisyrinchieae apresentam rizomas ou raízes fibrosas, flores com filetes unidos na metade inferior ou inteiramente unidos e estiletes usualmente trifurcados com os ramos alternos às anteras, ou inteiros (Goldblatt & Manning 2008, Goldblatt *et al.* 2008). Estudos filogenéticos mostraram que os gêneros da tribo Sisyrinchieae são monofiléticos e que *Olsynium* é grupo irmão de *Sisyrinchium* (Goldblatt *et al.* 2008, Chauveau *et al.* 2011, Karst & Wilson 2012), mas características morfológicas para a separação dos gêneros não são bem delimitadas. Goldblatt & Manning (2008) distinguiram *Sisyrinchium* dos demais gêneros da tribo conforme as características apresentadas no Quadro 1. No entanto, contrariamente ao indicado abaixo, há diversas espécies de *Sisyrinchium* com o caule terete, algumas espécies sem a depressão na calaza e outros gêneros da tribo podem ter sementes marrom-escuras, indicando que estes caracteres não são sinapomórficos.

Quadro 1: Chave para os gêneros da tribo Sisyrinchieae extraída e traduzida livremente a partir da chave para os gêneros da subfamília Iridoideae (Goldblatt & Manning 2008).

1. Caules achatados, frequentemente angulados ou alados; sementes globosas ou comprimido-globosas, usualmente com uma depressão no final da calaza e sementes marrom-escuras a negras .... *Sisyrinchium*

1’. Caules teretes; sementes angulares ou oblongas, usualmente com uma calaza em crista; sementes usualmente marrom-claro a marrom-escuro 2

2. Plantas tipo “cushion plants” de até 5 cm de altura; caule florífero com um só ripídio portando uma única flor .... *Tapeinia*

2’. Plantas não do tipo “cushion plants”, mas ocasionalmente “acaulescentes”; caule florífero simples ou ramificado, ripídios com mais do que uma (até várias) flores 3

3. Plantas com folhas espaçadas, não equitantes, linear a teretes; caules ocasionalmente com um ou poucos ramos delgados; raízes engrossadas e carnosas; caule inteira ou parcialmente encoberto por bainhas foliares longas... *Olsynium*

3’. Plantas equitantes, com folhas ensiformes ou lineares; caules geralmente ramificados, ramificações laterais frequentemente curtas; raízes fibrosas 4

4. Tépalas unidas em tubo na base; flores secundas; filetes inteiramente unidos em uma coluna engrossada .... *Solenomelus*

4’. Tépalas livres na base; flores eretas; filetes unidos até metade ou mais do seu comprimento 5

5. Ovário séssil ou quase séssil, frequentemente com esparsos tricomas; tépalas subiguais, sempre azuis .... *Orthrosanthus*

5’. Ovário geralmente pedunculado, nunca piloso; tépalas externas um pouco a muito menor que as tépalas internas, geralmente brancas (azul em uma espécie) .... *Libertia*

O gênero *Sisyrinchium*

Sisyrinchium foi descrito por Linnaeu em 1753 e a etimologia do nome é duvidosa, também considerada aparentemente arbitrária (Goldblatt & Manning 2008). Uma hipótese é referente à utilização deste nome com epíteto de uma espécie de *Iris* (*I. sisyrinchium* L., descrita também em 1753), em alusão às túnicas do cormo formarem uma cobertura em camadas como pelos grosseiros (do grego, *sisyra* = “shaggy coat” segundo Goldblatt & Manning 2008, referindo-se a *Moraea sisyrinchium* (L.) Ker Gawl. cujo basiônimo é *Iris sisyrinchium*). Outra possibilidade é a origem derivada do Latim *sus* (=porco) e grego *rhynchos* (=focinho), em alusão a porcos que cavam o solo em busca de raízes de plantas com bulbos, conforme relato de Pliny e Theophrastus (Hooker 1830 *apud* Goldblatt & Manning 2008).

O gênero *Sisyrinchium* é o maior gênero de Iridaceae distribuído no continente americano, com cerca de 140 espécies de acordo com Goldblatt *et al.* (2008) e 216 espécies conforme World Checklist of Iridaceae (Barker 2014). Para o Brasil, há o registro de 67 espécies e 10 subespécies, e na Região Sul ocorrem 56 espécies e 10 subespécies (Flora do Brasil 2020b). As espécies deste gênero são ervas anuais ou perenes, rizomatosas, com raízes fibrosas, frequentemente engrossadas e carnosas ou tuberosas. Possuem folhas planas ou cilíndricas, basais ao caule florífero, o qual é simples ou ramificado e as sinflorescências são terminais ou axilares. As flores têm simetria radial, com tépalas livres ou unidas na base, subiguais, de cor alva, azul, roxa, rósea ou amarela. Os estames apresentam filetes unidos até a metade ou formando uma coluna estaminal, frequentemente glandular-pubescente (Goldblatt & Manning 2008). Uma característica relevante para muitas espécies do gênero é a presença de elaióforos na coluna estaminal, os quais se apresentam como tricomas glandulares produtores de óleos (Cocucci & Vogel 2001). Cerca de 35% das espécies de *Sisyrinchium* possuem elaióforos tricomáticos que podem estar localizados na coluna estaminal ou na face adaxial das tépalas, às vezes em ambas regiões (Chauveau *et al.* 2011). A presença ou a ausência dos elaióforos em *Sisyrinchium* foi abordada no estudo de Chauveau *et al.* (2011), no qual foi um importante caráter para a discussão das relações filogenéticas e da distribuição geográfica das espécies. Por exemplo, elaióforos estão presentes em diversas espécies da América do Sul, no entanto, as espécies da América Central e do Norte apresentam tricomas não produtores de óleo (Chauveau *et al.* 2011).

A monofilia de *Sisyrinchium* foi comprovada nos estudos filogenéticos de Chauveau *et al.* (2011) e Karst & Wilson (2012). Chauveau *et al.* (2011) utilizaram a combinação de regiões codificantes e não codificantes dos genomas mitocondrial, plastidial e nuclear para a análise filogenética, totalizando oito marcadores moleculares, além da caracterização de tricomas glandulares produtores de óleo presentes nas flores, abrangendo 85 espécies do continente americano. Os resultados evidenciaram que a presença de tricomas produtores de óleo evoluiu três vezes independentemente no gênero. Os autores também apontaram a América do Sul como o centro de dispersão do gênero, com rotas de distribuição para as regiões subandinas da Argentina e Chile e outra para a bacia do Rio Paraná. Em sua análise filogenética, Karst & Wilson (2012) utilizaram DNA plastidial e nuclear, incluindo 60 espécies.

A classificação infragenérica de *Sisyrinchium* foi primeiramente proposta por Klatt (1861-1862a), sendo novas proposições apresentadas por Baker (1877) e Bentham & Hooker (1883), conforme especificado na Tabela 3. Passados cerca de 100 anos, Rudall *et al.* (1986), utilizando caracteres diferentes dos até então usados, como a anatomia foliar e o número cromossômico, constatou que as seções *Bermudiana* e *Echthronema* eram sustentadas, mas *Eriphilema* e *Nuno* não. Estudo posterior (Goldblatt *et al.* 1990) evidenciou que as espécies de *Eriphilema* e *Nuno* correspondiam ao gênero *Olsynium* e foi proposta a classificação de *Sisyrinchium* em dois subgêneros: *Sisyrinchium* e *Echthronema* (Herb.) Goldbl., baseados em morfologia floral e vegetativa, anatomia foliar e número cromossômico. O subgênero *Sisyrinchium* abrangeu espécies com flores azuis a purpúreas, raramente esbranquiçadas com nervuras purpúreas, filetes unidos quase até o ápice formando uma coluna estaminal, mesofilo foliar alongado não axialmente e não lobado e número básico de cromossomos = 8 (Goldblatt *et al.* 1990). O subgênero *Echthronema* foi caracterizado por flores amarelas, coluna estaminal com filetes unidos na base ou até a metade e então livres, mesofilo foliar alongado axialmente e lobado, número básico de cromossomos = 9 e, secundariamente, 8 ou 17 (Goldblatt *et al.* 1990). As últimas propostas para seções foram elaborada por Ravenna (2000, 2002b, 2003b), também com base em caracteres morfológicos (Tabela 3). Estudos filogenéticos (Chauveau *et al.* 2011, Karst & Wilson 2012) revelaram que as subdivisões das seções apresentadas por Ravenna (2000, 2002b, 2003b) não são monofiléticas, assim como a divisão em dois subgêneros, constatando a necessidade de estudos envolvendo caracteres morfológicos, citológicos e ecológicos, além de estudos filogenéticos com outros marcadores moleculares, visando uma melhor compreensão dos padrões de especiação.

Tabela 3: Histórico das seções propostas para *Sisyrinchium*, número de espécies consideradas e caracteres utilizados.

Referência	**Seções**	**N° espécies**	**Caracteres usados**
Klatt (1861-1862b)	*Sisyrinchium* *Androsolen* *Spathirhachis*	42	Forma da folha, caule florífero, posição da sinflorescência, união dos filetes
Baker (1877)	*Sisyrinchium* *Androsolen* *Spathirhachis* *Cephalanthum*	48	Caule florífero, disposição das espatas na sinflorescência
Bentham & Hooker (1883)	*Bermudiana* *Echthronema* *Eriphilema* *Nuno*	ca. 50	Forma e cor do perigônio, união dos filetes
Ravenna (2000, 2002b, 2003b)	*Sisyrinchium* *Echthronema* *Spathirachis* *Lenitium* *Hydastylus* *Scirpeocharis* *Segetia* *Viperella*	ca. 120	Folhas basais e caulinares, caule florífero, bráctea terminal, união dos filetes e presença de tricomas/elaióforos na coluna estaminal, posição da sinflorescência

Principais estudos taxonômicos e florísticos com *Sisyrinchium* nas Américas

Na América do Norte, muitas das espécies de *Sisyrinchium* foram descritas ou revisadas por Bicknell (1896, 1899a, b, c, d, e, f, 1900a, b, 1901, 1904) e posteriormente tipificadas por Ward (2014). O estudo mais recente e abrangente é o de Cholewa & Henderson (2002) que contém 37 espécies, com descrições, distribuição geográfica e chave de identificação. Outros trabalhos são os de Espejo-Serna & López-Ferrari (1998) em Veracruz (México) e de Espejo-Serna *et al.* (2010) em Bajío e regiões adjacentes (México).

Na América Central, há os estudos florísticos de Standley & Steyermark (1946) na Guatemala, Woodson & Schery (1945) no Panamá, Goldblatt (2003) na Costa Rica, enquanto Henrich & Goldblatt (1987, 1994) abrangeram locais na América Central e do Norte (Texas, EUA), México, Costa Rica e Guatemala.

Na América do Sul, destaca-se o estudo de Johnston (1938) que apresenta uma revisão do gênero para o Uruguai, Paraguai e Brasil, incluindo 28 espécies, uma chave de identificação, oito descrições de espécies novas e importantes comentários para as demais espécies. Outro pesquisador que se destacou no estudo de iridáceas para a Argentina, Brasil, Chile e Paraguai foi o botânico chileno Pierfelice Ravenna, que publicou principalmente em revistas próprias (Onira e Botanica Austral). Ravenna apresentou estudos de revisão do gênero *Sisyrinchium* em 16 partes, com a primeira em Wrightia (Ravenna 1981) e as outras em Onira, sendo que em nove há espécies ocorrentes no Brasil (Ravenna 1988a, 1988b, 1991, 2000, 2001a, 2002a, 2002b, 2003b, 2006), além de outro estudo publicado no periódico Bonplandia (Ravenna 1968). Dentre as espécies novas publicadas por Ravenna, algumas descrições foram baseadas em apenas uma coleta, realizada décadas antes, como é o caso de *S. elegantulum* Ravenna, cujo exemplar é de 1965 e a publicação é de 2006 (Ravenna 2006). Além disso, nos trabalhos, não há ilustrações ou chaves dicotômicas para a separação das espécies, muitos holótipos foram preservados em seu herbário privado cujo acesso não é possível, muitos materiais indicados para outros herbários não são encontrados e, para algumas espécies, há parátipos não pertinentes. Por fim, há indicação de que o Herbário Ravenna foi incendiado (Amaral 2011).

Espécies de *Sisyrinchium* foram apresentadas em diversas floras de estados e países sul-americanos por: Macbride (1936) no Peru; Vargas (1944) em Cuzco, Peru; Ravenna (1968) em Buenos Aires, Argentina; Ravenna (1969) na Patagônia, Argentina; Rodriguez-Rios (1986) no Chile; Ravenna (2001b) na região de Cuyo, Argentina e Ravenna (2003) no Paraguai. No Catálago de Plantas Vasculares do Conesul (Roitman *et al.* 2008) estão listadas 91 espécies de *Sisyrinchium* com ocorrência na Argentina, Sul do Brasil, Chile, Paraguai e Uruguai, sendo 61 consideradas endêmicas.

Estudos taxonômicos e florísticos com *Sisyrinchium* no Brasil

O primeiro estudo do gênero no Brasil foi apresentado por Klatt (1871) na Flora Brasiliensis com o reconhecimento de 21 espécies, das quais oito haviam sido descritas pelo próprio autor (Klatt 1861-1862a). Posteriormente, Johnston (1938) apresentou espécies brasileiras, conforme mencionado anteriormente, e afirmou que a América do Sul é provavelmente o local de origem e o centro de dispersão do gênero, relatando também a dificuldade de estudo com *Sisyrinchium*. A partir de 1968 até 2006, Ravenna publicou cerca de 25 espécies novas para o Brasil, mas não há uma publicação de revisão taxonômica para o Brasil. E novas espécies continuaram a ser descobertas (Aita *et al.* 2013), como demonstraram Sobral & Stehmann (2009) que enfatizaram a importância de mais coletas e estudos para enriquecer o conhecimento da flora do Brasil. Estes pesquisadores listaram 2.785 espécies de angiospermas descritas de 1990 a 2006, incluindo 15 espécies de *Sisyrinchium*.

Publicações mais amplas e recentes referentes à taxonomia de *Sisyrinchium* não existem no Brasil, e estes estudos mais abrangentes são importantes, pois além de ser fonte de consulta para trabalhos botânicos e ecológicos, na taxonomia, evitam o surgimento de sinônimos (Dayrat 2005), o que é comum no gênero. Encontram-se caracterizações de 14 espécies de *Sisyrinchium* em levantamentos florísticos de diferentes localidades brasileiras. A maioria dos estudos ocorreu na região Sudeste: no Parque Estadual das Fontes do Ipiranga, São Paulo (Wanderley & Toledo 1986); na Serra do Cipó, Minas Gerais (Chukr 1992) e no Parque Estadual da Serra do Mar, São Paulo (Takeuchi *et al.* 2008), com a descrição de duas a três espécies de *Sisyrinchium* em cada estudo. Também para São Paulo, a Flora do Estado destaca-se como o estudo mais abrangente (Chukr & Capellari Jr. 2003), incluindo oito espécies de *Sisyrinchium* e a indicação de quatro lectótipos. Para a região do Brasil Central há o levantamento de Iridaceae do Distrito Federal (Dias 2010), com três espécies de *Sisyrinchium*. Para o Nordeste do Brasil, recentemente foi publicado o levantamento de Iridaceae da Bahia (Oliveira *et al.* 2016) com 24 espécies, sendo quatro de *Sisyrinchium*. E, na Região Sul, há o estudo de Iridaceae no Morro dos Perdidos na Serra de Araçatuba, Paraná (Vieira *et al.* 2003) e no Parque Estadual de Itapuã em Viamão, Rio Grande do Sul (Eggers 2008), com a apresentação de quatro e sete espécies do gênero, respectivamente. Além destes estudos florísticos, para espécies da seção *Hydastylus* (*sensu* Ravenna) ocorrentes na Região Sul há uma pesquisa com caracteres morfológicos e análise de agrupamento com base em 36 acessos que resultou na formação de oito grupos, sendo que dois correspondem a espécies novas, mas para 17 acessos não há um agrupamento preciso, indicando a necessidade de mais coletas para melhor caracterizar esses acessos (Aita 2009). Também para a seção *Hydastylus*, um trabalho foi desenvolvido abordando caracteres anatômicos foliares na diferenciação das espécies (Aita 2013).

Em alguns grupos de espécies de *Sisyrinchium*, estudos com base em caracteres citogenéticos e moleculares têm sido mais abundantes. Espécies do complexo *S. palmifolium* L. foram analisadas e foi determinado o número cromossômico, o comportamento meiótico, a viabilidade e a morfologia do pólen, o cariótipo e o conteúdo do DNA, mostrando algumas diferenças entre as espécies (Picolli 2012, 2015). Um estudo de diversidade genética de *Sisyrinchium decumbens* Ravenna, endêmico da região Sul, foi realizado em três populações, onde foi constatado que a maior variação ocorreu ao nível intrapopulacional e não entre as populações (Picolli 2015). Espécies das seções *Hydastylus* e *Viperella sensu* Ravenna (clado IV de acordo com Chauveau *et al.* 2011) na Região Sul do Brasil também foram investigadas quanto a variabilidade genética, evolução, origem de poliploides e estruturação populacional (Miz 2013), assim como espécies das seções *Lenitium* e *Scirpeocharis sensu* Ravenna (clado V de acordo com Chauveau *et al.* 2011) (Fachinetto 2014). A biologia reprodutiva de *S. sellowianum* Klatt e de *S. platycaule* Baker, pertencentes também a seção *Lenitium* foi estudada por Fachinetto (2014). Brisolara-Corrêa (2011) analisou espécies do complexo *S. vaginatum* Spreng., caracterizando o tamanho do genoma e a ocorrência de poliploidia, além de descrever o sistema reprodutivo de *S. vaginatum*. Para *S. micranthum* Cav., em estudo realizado ao nível populacional, as análises moleculares mostraram que as populações da espécie são altamente estruturadas, com baixo fluxo genético entre elas (Tacuatiá *et al.* 2012a). *Sisyrinchium micranthum* apresenta grande variabilidade morfológica, sendo possível distinguir três morfotipos, que já foram caracterizados ao nível citogenético e molecular, evidenciando comportamento meiótico regular e a existência de acessos que podem ter mais de uma ploidia (Tacuatiá *et al.* 2012b). Além deste, há também uma caracterização química e morfométrica destes morfotipos (Indrusiak 2010), que objetivou melhor conhecer a espécie e sua variabilidade, e um estudo envolvendo o tamanho do genoma e poliploidização (Tacuatiá *et al.* 2016). Nestes estudos, constatou-se que a variabilidade genética intrapopulacional é maior e que a diferenciação genética entre as populações indica alta estruturação (Souza-Chies *et al.* 2012).

Estudo com DNA barcode também foi realizado com espécies de *Sisyrinchium* e outros gêneros de Sisyrinchieae, mas a técnica não se mostrou eficiente para a separação ao nível específico, com modesta taxa de identificação (Alves *et al.* 2014). Os autores sugerem que este resultado pode estar associado a eventos de reticulação, *incomplete lineage sorting*, poliploidia e uma taxonomia complexa.

Táxons complexos, com história evolutiva recente, casos de poliploidia e hibridização, necessitam de estudos com diferentes abordagens. Uma taxonomia baseada somente em caracteres morfológicos não se mostrou estável para *Sisyrinchium* após a realização de análises filogenéticas (Chauveau *et al.* 2011; Karst & Wilson 2012). Isto não significa que não se deve usar os dados morfológicos e que se utilize somente caracteres moleculares. Estes conjuntos de dados não devem ser vistos como competitivos, uma visão ainda adotada por pesquisadores conservadores (Dayrat 2005), mas servem para mostrar a importância da taxonomia integrativa com múltiplas abordagens para que os táxons sejam compreendidos de modo mais amplo.

Objetivo geral

Propor uma classificação infragenérica de *Sisyrinchium* com base em filogenia, fornecendo um conjunto de caracteres diagnósticos morfológicos e moleculares para as seções e investigar as espécies das seções *Cephalanthum* e *Viperella* (*pro parte*) ocorrentes na Região Sul do Brasil, a fim de contribuir para o conhecimento da taxonomia do gênero.

Objetivos específicos

- Revisar a taxonomia e a nomenclatura das seções de *Sisyrinchium*.
- Revisar a taxonomia e a nomenclatura das espécies de *Sisyrinchium* das seções *Cephalanthum* e *Viperella* (*pro parte*), que ocorrem na Região Sul do Brasil.
- Evidenciar através de ilustrações, fotos e descrições os principais caracteres diagnósticos para a distinção das espécies.
- Confeccionar chaves dicotômicas para a identificação dos táxons confirmados.
- Fornecer dados sobre o habitat, período de floração e frutificação e a distribuição geográfica dos táxons.

Apresentação da tese

A presente tese está estruturada em três capítulos, sendo os dois primeiros escritos em forma de artigo, conforme as normas dos periódicos. As figuras e tabelas referentes a cada artigo foram incluídas no texto para facilitar a leitura, não seguindo as normas de submissão.

O primeiro capítulo trata da revisão da classificação infragenérica de *Sisyrinchium* tendo como base uma filogenia ampliada, cuja primeira autoria foi compartilhada com Olivier Chauveau, que desenvolveu as análises moleculares. Este manuscrito está aceito para publicação no periódico *Taxon.*

O segundo capítulo apresenta a descrição de três espécies novas para a Região Sul e será submetido para o periódico *Phytotaxa*.

O terceiro capítulo aborda a revisão taxonômica das seções *Cephalanthum* e *Viperella* (*pro parte*), ambas *sensu* Inácio *et al.* (2017, no prelo), no qual os resultados estão redigidos em inglês, visando a futura submissão de artigos, um de cada seção. Para melhor compreensão deste capítulo, foram redigidos os tópicos Introdução e Material e Métodos, referentes ao mesmo.

Ao final, a tese conta com o item Considerações Finais, com comentários gerais e particulares a algumas espécies.

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CAPÍTULO 1: An updated phylogeny and infrageneric classification of the genus *Sisyrinchium* (Iridaceae): challenges of molecular and morphological evidence

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An updated phylogeny and infrageneric classification of the genus *Sisyrinchium* (Iridaceae): challenges of molecular and morphological evidence

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Abstract Taxon delimitation and classification remains one of the fundamental bases of evolutionary studies and is especially challenging because processes by which new biological entities arise are complex and non-linear over time, although continuous. *Sisyrinchium* (ca. 140 to 216 taxa) is one of the most species-rich genera of Iridaceae, largely widespread in the Americas. Recent molecular phylogenetic studies have shown that the systematics of the genus is in need of substantial revision. Different data sources were investigated to establish an updated infrageneric classification based on phylogenetic principles. Monophyletic sections of *Sisyrinchium* were circumscribed using a new phylogenetic framework established from an increased sampling of taxa (107 species), and complementary approaches were combined to provide the most comprehensive infrageneric treatment of the genus proposed so far. Additionally, numerous molecular synapomorphies were identified to reinforce previous taxonomic treatments of tribe Sisyrinchieae (six genera) at the generic level. Major lineages of *Sisyrinchium* were concordantly resolved with mostly strong to full support by the DNA regions used in the study and ten sections characterized by unique combinations of molecular, morphological and geographical diagnostic characters were recognized. The phylogenetic trees respectively based on plastid + mitochondrial and nuclear ITS DNA regions were generally congruent except for two unplaced species (i.e. *S. chilense* and *S. elegantulum*) for which ancestral reticulation events were detected. New circumscriptions were provided for seven sections (i.e. *Hydastylus*, *Segetia*, *Echthronema*, *Spathirhachis*, *Viperella*, *Cephalanthum* and *Sisyrinchium*) while three sections (*Trichoparcus*, *Morphanthus* and *Rhizilineum*) were newly described. This work constitutes a robust contribution to elucidate the systematics of *Sisyrinchium* and emphasizes the need of integrative taxonomic approaches using multiple data sources, not only to improve the delimitation of taxa but also to investigate their evolutionary history.

Keywords diagnostic characters, integrative taxonomy, Iridoideae, molecular phylogenetics, Sisyrinchieae, reticulate evolution

Supplementary Material Electronic Supplement (Tables S1–S18, Figures S1–S2), matrix and optimization of morphological and geographical characters as well as alignments of DNA sequences are available in the Supplementary Data section of the online version of this article at http://ingentaconnect.com/content/iapt/tax

■ INTRODUCTION

The New World genus *Sisyrinchium* L. encompasses about 140 species and is the largest genus of Iridaceae in the Americas (Goldblatt & Manning, 2008). However, the species richness of the genus is still not firmly established and 216 taxa are recognized by the World Checklist of Iridaceae (Barker, 2014). Although *Sisyrinchium* is well characterized and strongly circumscribed as monophyletic according to morphological (Goldblatt & al., 1990) and molecular phylogenetic data (Chauveau & al., 2011; Karst & Wilson, 2012), the large number of infrageneric taxa, together with the lack of consistent species recognition and delimitation, has led to conflicting interpretations of taxonomic descriptions and resulted in a high number of synonyms (e.g. Cholewa & Henderson, 1984; Henrich & Goldblatt, 1987; Rudall & al., 1986; Calderón de Rzedowski, 1988; Goldblatt & Manning, 2008; Karst & Wilson, 2012).

Sisyrinchium belongs to tribe Sisyrinchieae, along with five other genera: *Libertia* Spreng. (ca. 12 spp.), *Olsynium* Raf. (ca. 12 spp.), *Orthrosanthus* Sweet (10 spp.), *Solenomelus* Miers (two spp.) and *Tapeinia* Juss. (one sp.), distributed mainly in Americas, with only a few species from Australasia (Goldblatt & Manning, 2008). The tribe encompasses species with rhizomatous rootstock or fibrous roots, flowers with filaments connected in the lower half or entirely united in a staminal column, and style usually divided into three branches extending between or above the anthers, or entire (Goldblatt & Manning, 2008, Goldblatt & al., 2008).

Species of *Sisyrinchium* are mostly rhizomatous perennial herbs and present plane or terete (cylindrical) leaves. The basic inflorescence is a rhipidium (a fan-shaped cymose inflorescence in which the lateral branches lie in the same plane and are suppressed alternately on each side), which can be terminal or axillary. Rhipidia are enclosed in two more or less leafy bracts, the valves of the spathe, and grouped or not in synflorescences, subtended or not by a bract called terminal because it is the more distal bract of the flowering stem before the synflorescence. The flowers have subequal tepals, usually patent, in white, blue, purple, pink or yellow color. The androecium has filaments basally or totally connate as a staminal column (Goldblatt & Manning, 2008), and an important feature for many South American species is the presence of trichomal elaiophores distributed on the staminal column (Chauveau & al., 2011, Silvério & al., 2012). The style of the gynoecium is entire or divided into three short to long branches, and seeds are globose or subglobose, often with a depression at the chalazal end, with seed coat dark brown to blackish (Goldblatt & Manning, 2008). Members of the genus can be found in various habitats and grow in dry to wet soils, sometimes in bedrocks, grasslands, prairies, swamps, along disturbed roadsides or in forest edges, and are distributed from sea level to high altitude areas, including the Andean region.

Sisyrinchium is closely related to *Olsynium* and *Solenomelus* (Goldblatt & al., 1990; Goldblatt & al., 2008; Chauveau & al., 2011), the three genera being separated by distinct combinations of morphological features (Goldblatt & al., 1990). However, traits considered as diagnostic for *Sisyrinchium* and *Olsynium* encompass most but not all species included in each genus and are sometimes shared by species of both genera.

Infrageneric classifications of *Sisyrinchium* based primarily on morphology were successively established over the last two centuries. The first proposal was presented by Klatt (1861–1862), with about 40 species organized in three sections supported by vegetative and floral traits: sect. *Sisyringium* Lem., sect. *Androsolen* Lem. and sect. *Spathirhachis* Klotzsch. Baker (1877) recognized ca. 48 species, maintained the three sections already described and proposed section *Cephalanthum* Baker to accommodate species with sessile spathes gathered in an agglomerate synflorescence. Bentham & Hooker (1883) rearranged *Sisyrinchium* species in sect. *Bermudiana* Benth. & Hook.f., sect. *Echthronema* (Herb.)

Benth. & Hook.f., sect. *Eriphilema* (Herb.) Benth. & Hook.f. and sect. *Nuno* Benth. & Hook.f. and used reproductive traits, such as perigon shape and detailed features of the androgynoecium, to define each infrageneric subdivision. More recently leaf anatomy and chromosome numbers provided additional supports to sections *Bermudiana* and *Echthronema*, but were inconsistent for sections *Eriphilema* and *Nuno* (Rudall & al., 1986). A conjunction of traditional morphological, leaf anatomical and chromosomal data was used to infer the first phylogeny of the American species of Sisyrinchieae (Goldblatt & al., 1990) and led to the reinstatement of the genus *Olsynium*, with species of sections *Eriphilema* and *Nuno* included. The remaining sections of *Sisyrinchium* defined by Bentham & Hooker (1863) were treated as subgenera *Sisyrinchium* (for sect. *Bermudiana*) and *Echthronema* (Herb.) Goldblatt. Subsequently, *Sisyrinchium* was subdivided by Ravenna (2000, 2002b, 2003b) in eight sections with regard to vegetative and reproductive morphological characters. Sections *Sisyrinchium*, *Echthronema*, *Spathirhachis*, *Lenitium* Ravenna, *Hydastylus* (Dryand. ex Salisb.) Ravenna, *Scirpeocharis* Ravenna, *Segetia* Ravenna and *Viperella* Ravenna contained about 120 species, mainly from South America. Phylogenetic analyses based on eight molecular markers and 85 species of *Sisyrinchium* on the one hand (Chauveau & al., 2011), and on two molecular markers and 60 species on the other hand (Karst & Wilson, 2012) have shown that most of the subdivisions recognized in the previous classifications were not monophyletic.

The DNA barcode paradigm was also tested for 88 species of *Sisyrinchium*, combining one nuclear and two plastid DNA barcode candidates, but failed to distinguish species properly and the results were probably influenced by reticulation, polyploidy, incomplete lineage sorting and a challenging taxonomy (Alves & al., 2014). For example, *S. micranthum* Cav. presents the widest geographical distribution among *Sisyrinchium* species and a striking phenotypical plasticity with various combinations of morphological features and ploidy levels (Chauveau & al., 2011, Tacuatiá & al., 2012a, 2012b, 2016). Observations among *S. micranthum* polyploids suggest that they are cytogenetically stabilized (Tacuatiá & al., 2012b) and that diploidization processes are underway (Tacuatiá & al., 2016). Even though genome duplication followed by gene loss and diploidization is recognized as one of the major driving forces for speciation along the evolutionary history of angiosperms (Jiao & al., 2011), molecular, geographical, cytogenetical and morphological data do not indicate that morphotypes or cytotypes of *S. micranthum* may be yet recognized as different species. Within such a framework, the diploid *S. laxum* Otto ex Sims is currently considered as a synonym of *S. micranthum* (Tacuatiá & al., 2016), which includes diploid, tetraploid and hexaploid cytotypes. This polyploid complex, together with the closely related tetraploid species *S. rosulatum* E.P.Bicknell, forms one of the major monophyletic groups within *Sisyrinchium* (Chauveau & al., 2011).

This body of observations emphasizes the difficulty to provide a reliable infrageneric classification of *Sisyrinchium* using a traditional morphology-based framework and that multiple and complementary lines of evidences are necessary to identify, delimit and describe the major subdivisions of the genus. To achieve this goal, the approach called integrative taxonomy (Dayrat, 2005; Padial & al., 2010) was used in this study and morphological, biogeographical and molecular data were combined for generic and infrageneric comparisons among Sisyrinchieae. Information was organized according to a three-step workflow. First of all, since the highly informative set of DNA regions previously developed for the tribe have contributed substantially to the investigation of evolutionary processes at the infrageneric taxonomic level within *Sisyrinchium* (Chauveau & al., 2011; Karst & Wilson, 2012; Alves & al., 2014), plastid, mitochondrial and nuclear DNA sequences were obtained from an increased taxonomic sampling. Based on the principle of monophyly, the major lineages present within the study group were identified using the phylogenetic framework inferred from the molecular data set and conflicting topologies were investigated. In a second step, molecular diagnostic characters were distinguished and selected for each lineage in agreement with a growing number of publications using molecular data as part of a formal taxonomic description (Sarkar & al., 2008; Goldstein & DeSalle, 2011; Jörger & Schrödl, 2013). Finally, morphological and biogeographical data were combined with molecular information to provide an updated infrageneric classification of *Sisyrinchium* with a taxonomic description, including a diagnosis and a name, for each subdivision recognized.

■ MATERIALS AND METHODS

Taxonomic and molecular sampling. — Taxa sampled, voucher information and GenBank accession numbers are given in Table S1 (Electr. Suppl.). A total of 110 taxa of *Sisyrinchium* (171 accessions) were sampled, representing ca. 50% or ca. 70% of the species diversity in this genus (according to Barker (2014) or Goldblatt & Manning (2008), respectively) with 96 published species, 11 unpublished taxa from South and Southeast Brazil, and additionally three subspecies and varieties. This sampling design covers the entire distribution range of the genus and all subgeneric arrangements proposed in the literature (Bentham & Hooker, 1883; Goldblatt & al., 1990; Karst & Wilson, 2012; Ravenna, 2000, 2002b, 2003b). More than 45% of these taxa were represented by two accessions from distinct geographic origins, while 16 different samples were selected for the *S. micranthum* complex. Beyond *S. rosulatum,* seven different morphotypes of *S. micranthum* represented by one to three samples from distinct geographical origins were defined according to the categories CI, CII and CIII established by Tacuatiá & al. (2012b) and flower color (Electr. Suppl.: Table S1). Based on recent phylogenies (Chauveau & al., 2011, 2012), 14 outgroup species were selected from Trimezieae (*Neomarica candida* (Hassl.) Sprague), the sister tribe to Sisyrinchieae (Goldblatt & al., 2008; Chauveau & al., 2012), and from four of the other five genera in Sisyrinchieae: *Libertia* (two spp.), *Olsynium* (seven spp.), *Orthrosanthus* (two spp.) and *Solenomelus* (two spp.). Plant material was mostly sampled from the wild or from cultivated specimens obtained from seeds collected in the wild and held in botanical gardens or national collections. This study generated 665 new sequences and 815 sequences previously published (Alves & al., 2014; Chauveau & al., 2011, 2012) were also used to perform the subsequent phylogenetic analyses (Electr. Suppl.: Table S1).

DNA isolation, amplification and sequencing. — Total genomic DNA of newly sequenced specimens was extracted from 10-15 mg silica-gel dried leaf material using a modified CTAB protocol with volumes adjusted to 2 mL tubes (Doyle & Doyle, 1990). A combination of nine coding and non-coding DNA regions previously used by Chauveau & al. (2011, 2012) was selected: three coding cpDNA genes (*rpoC1*, *rpoB* and *matK*), two cpDNA intergenic spacers (*psbA-trnH* and *trnQ-rps16*), one cpDNA intron (*matK-5'trnK*), two mtDNA introns (*nad1-2/3* and *nad4-1/2*) and the nrDNA ITS (ITS1–5.8S–ITS2). Primers used to amplify each DNA region and additional primers used for sequencing are given in Chauveau & al. (2011, 2012). PCR amplifications were performed using a Verity 96–Well thermal cycler (Applied Biosystems, Foster City, CA, USA) in a 50 µL total volume reaction consisting of 15–50 ng of genomic DNA, 0.5 µM of each primer, 100 µM dNTP, 1× GoTaq flexi buffer, 2 mM $MgCl_2$, 1.25U Taq DNA polymerase GoTaq G2 Hot Start Polymerase (Promega, Madison, WI, USA). The *rpoC1*, *rpoB* and *psbA-trnH* loci were successfully amplified with the addition of DMSO (2 µL) to the PCR mix. The detailed PCR conditions for each DNA locus used in this study are given in Chauveau & al. (2011, 2012). Each DNA region was amplified as a single fragment except in a few cases where internal primers originally designed for sequencing were used to amplify the targeted region in smaller fragments. PCR products were purified and sequenced in an ABI 3500 xL Genetic Analyzer (Applied Biosystems, Foster City, CA, USA) at the Molecular Biology and Genetic

Engineering Centre of the State University of Campinas (CBMEG/UNICAMP, SP, Brazil). Raw forward and reverse sequences for each sample were assembled with CodonCode Aligner 6.0.2 (CodonCode Corp., Dedham, MA, USA); ambiguous bases were corrected after examination of chromatograms, and consensus sequences were edited. Sequences of all DNA regions used in this study were obtained for 100% of the taxonomic sample except 35% of the *matK* coding region and the *matK-5'trnK* intron that were obtained for only 22% of the samples (Electr. Suppl.: Table S1).

Alignment and phylogenetic analyses. — Sequences were aligned with MAFFT 7 (Katoh & Standley, 2013) and manually adjusted using MEGA6 (Tamura & al., 2013). All detected polymorphisms (SNPs) and insertion-deletions (indels) were checked and further validated using a base quality threshold above 20. Unambiguously aligned gaps of the non-coding regions (excluding missing data) and shared by two or more taxa were coded with SeqState 1.4.1 (Müller, 2005), according to the Modified Complex Indel Coding approach (Simmons & al., 2007). Phylogenetic analyses were conducted on each DNA region separately (single region analyses) and on plastid and mitochondrial markers combined (organelle data set), since the comparison of the resulting topologies of cpDNA and mtDNA regions did not reveal significantly supported incongruences. Conflicts among the different data sets were explored through visual comparison of tree topologies and support values. Significantly supported incongruences were only considered among genera and major infrageneric clades identified within *Sisyrinchium*. Incongruent topologies were considered significant with parsimony and/or likelihood bootstrap support values (PBS and LBS, respectively) ≥70% and/or Bayesian posterior probability (PP) ≥0.95 (Pirie, 2015; Tkach & al., 2015), whereas a minimum of 85% bootstrap support (Baker & al., 2011; Tkach & al., 2015) or 0.99 posterior probability were considered as threshold value for strongly supported incongruence. In all cases only two strong incongruences related to the phylogenetic relationships of two species were observed between the plastid and mitochondrial data combined on the one hand, and the ITS data set on the other hand. Since concatenation is justified if the data are mostly congruent and the exceptions, such as individual conflicting taxa, are excluded (Lecointre & Deleporte, 2005; Pirie, 2015), phylogenetic analyses of combined molecular data from all three genomic compartments were performed excluding the sequences responsible for incongruences (three-genome analysis).

Maximum parsimony (MP) analyses were conducted for each data set using the parsimony criterion in PAUP* v.4.0b10 (Swofford, 2002). Parsimony ratchet (Nixon, 1999) searches consisting of 20 independent replicates of 201 iterations with 15% of characters reweighted and one best-scoring tree retained per iteration were scripted using PAUPRat (Sikes & Lewis, 2001) and run in PAUP*. Strict consensus trees were calculated from all most-parsimonious trees and the robustness of nodes was evaluated using MP with 1000 bootstrap replicates of new heuristic searches (100 random addition replicates, TBR branch swapping and multrees on). Maximum likelihood (ML) analyses were performed with RAxML 8.2.0 (Stamatakis, 2014) using the GTRGAMMA model (GTR model + optimization of substitution rates + Γ model of rate heterogeneity) for the DNA partitions and the BINGAMMA model (model for binary substitution + Γ model of rate heterogeneity) for the gap-coded characters. The data sets were partitioned for each gene, intron or spacer region, and codon position in the regions coding for proteins (Electr. Suppl.: Table S2) to accommodate locus-specific variations. Gap-coded characters were also partitioned by locus. To assess the stability of the tree topology and branch length values, 100 independent ML searches with different randomized stepwise addition parsimony starting trees were conducted to find the best-scoring ML tree, and branch support (LBS) was evaluated by 1000 pseudo-replicates of non-parametric standard bootstrap tests. Bayesian inference (BI) analyses were run using MrBayes 3.2.6 (Ronquist & al., 2012). The most appropriate evolutionary model for each data set and data partition among the data sets (Electr. Suppl.: Table S2) was selected according to the Akaike information criterion implemented by MrModeltest 2.3 (Nylander, 2004). Gap-coded characters were included as additional datatype and treated using a standard discrete model with variable rates (Ronquist & al., 2011). Two independent Markov chain Monte Carlo (MCMC) runs, each with four Markov chains (one cold and three heated) starting with a random tree, were performed simultaneously, sampling every 100th generation. The different data sets were run for 4×10^6 to 8×10^6 generations and the run convergence was assessed for each data set by examining the average deviation of split frequencies (<0.01), the Effective Sample Size (ESS >200) and the Potential Scale Reduction Factor (0.99< PSRF <1.01). All other parameters were default values. In all analyses, the first 25% trees from each run were discarded as burnin. Resulting trees from the two independent runs were then pooled to produce one 50% majority-rule consensus tree and Bayesian posterior probabilities (PP) were generated for the resulting tree.

Phylogenetic trees resulting from all three analyses (MP strict consensus tree, ML best-scoring tree and BI majority-rule tree) were rooted on *Neomarica candida* and combined to manually build highly conservative consensus trees that summarize the three analyses at once. For each data set considered, a given node was kept in the consensus tree only if the bootstrap support for MP or ML was ≥70% or if the PP was ≥0.95 and in the absence of topological conflict among the MP, ML and BI trees. Such consensus trees were assembled for the ITS and for the combined cpDNA + mtDNA data sets in order to identify potential incongruences between them. The consensus trees based on the whole data set analyses, excluding or not the taxa responsible for incongruent relationships, were constructed accordingly.

Assessment of putative hybridization and incongruence between molecular data sets. — Incongruences related to species-phylogenetic relationships between the combined cpDNA + mtDNA and the ITS data sets were explored using consensus networks as implemented in the program SplitsTree v.4.14.4 (Huson & Bryant, 2006). In order to compare strongly supported relationships and to minimize phylogenetic uncertainties, a consensus tree from each data set that recovered only nodes with bootstrap value ≥85% in MP or ML analysis or PP ≥0.99 in BI analysis was used to construct the consensus network. Based on the results of ML bootstrap analyses, internode certainty (IC) and internode certainty all (ICA) values (Salichos & Rokas, 2013; Salichos & al., 2014), as well as alternative topologies for the conflicting bipartitions, were assessed with RAxML to further evaluate the reliability of the conflicting relationships estimated from the cpDNA + mtDNA and ITS data sets.

Topological conflicts among phylogenetic methods. — Conflicting topologies observed among MP, ML and BI estimations for a given data set are frequently attributed to long-branch attraction (LBA) by parsimony, but non-randomly distributed missing data are also known to be potentially problematic for maximum likelihood and Bayesian MCMC methods (e.g. Qin & al., 2009; Simmons, 2014a). Therefore, since large portions of missing data are distributed in the *matK* coding region and the *matK-5'trnK* intron, both LBA artefact and phylogenetic bias caused by missing data were tested when topological conflicts were detected among phylogenetic methods.

Significantly supported conflicts among MP, ML and BI analyses for a given data set were only considered among genera and major infrageneric clades identified within *Sisyrinchium*. Conflicting topologies among phylogenetic methods were regarded as significant following the same threshold values retained to consider incongruent topologies among data sets. The long-branch extraction method (Bergsten, 2005) was used when an LBA artefact was suspected, while characters with missing data were excluded to investigate the effect of ambiguities on both topology and branch support, and the resulting reduced matrices were re-analysed independently with MP, ML and BI as described above.

Detection of diagnostic molecular characters. — Based on the taxonomic sampling and the molecular standard markers of the present study, the Characteristic Attribute Organization System (CAOS) (Sarkar & al., 2008; Bergmann & al., 2009) was used to discover diagnostic molecular characters that characterize the genera *Olsynium*, *Sisyrinchium* and *Solenomelus*, as well as each subdivision of *Sisyrinchium* and the two species that displayed incongruent phylogenetic relationships and cannot be placed in the infrageneric classification. The detection of diagnostic molecular characters was not considered for *Libertia* and *Orthrosanthus* because these genera were under-represented and diverged near the root of the phylogeny. From a given data set, the CAOS algorithm identifies diagnostic character states (see below), named Characteristic Attributes (CAs) to distinguish a clade from its sister clade at any node of a guide tree (Jörger & Schrödl, 2014). The resulting diagnostic framework can be used for subsequent classification into the taxonomic groupings defined from the guide tree (Zou & al., 2011; Hassold & al., 2016). The search for diagnostic characters was performed for each DNA marker separately, using the web-based CAOS workbench (Sarkar & al., 2008). Both aligned DNA sequences and best scoring ML topologies obtained from combined (i.e. cpDNA + mtDNA and three-genome analysis) and ITS phylogenetic estimations were imported into MESQUITE 3.10 (Maddison & Maddison, 2016) and exported as nexus file formats for the CAOS-Analizer. The outputs of the CAOS-Analyzer were used for the CAOS-Barcoder in order to detect CAs, including homogeneous (one character state existing across all members of a given clade but never in the sister clade) and heterogeneous (different character states present in all members of a given clade but absent in the sister clade) pure CAs. Simple (single nucleotide position) and compound (multiple contiguous nucleotide positions) pure CAs were considered. However, CAs recognized with this software could be pleisiomorphic or homoplasic conditions because CAOS algorithm only compared a clade to its direct sister clade and not to the whole set of specimens investigated (Jörger & Schrödl, 2013). It was therefore necessary to increase the range across which these characters were determined and to reconstruct their evolutionary history along the phylogeny. To enhance the reliability of the results obtained with CAOS, the consensus trees from combined and ITS analyses were used to conduct character optimizations with the MP method implemented in MESQUITE 3.10 for each molecular diagnostic character previously identified. However, phylogenetic relationships among the earliest diverging sections of *Sisyrinchium* remained unresolved (see Fig. 1) because topological conflicts were observed among phylogenetic methods. Since the evaluation of a state as apomorphic depends on the topology, the consensus topologies were manipulated in MESQUITE 3.10 to generate a set of trees which includes all possible evolutionary relationships among these major lineages, as well as between them and the rest of the genus (see Fig. 2). The resulting composite topologies had no branch lengths and character optimizations were performed separately on each putative tree. The character states were treated as unordered, allowing any transition among states. In this conservative approach, diagnostic single or compound nucleotide characters retained for the molecular diagnoses were 1) synapomorphies, showing no homoplasy, with ancestral and derived state identified and 2) character states shared exclusively by all members of a given genus, infrageneric subdivision or species, but whose ancestral state remained ambiguous. Heterogeneous pure CAs were reported as additional information. The single gene alignments which formed the reference basis for the selection of diagnostic nucleotides are available in fasta format as supplementary material in the Electronic Supplement section of the online version of this article. Diagnostic nucleotides were reported with positions in the reference alignment.

Morphological and biogeographical data. — To identify traditional taxonomic characters for each infrageneric subdivision of *Sisyrinchium*, binary and multistate discrete morphological and biogeographical traits were scored for all species included in the current study. Variations in nine vegetative and 17 reproductive characters as well as in the pattern of species geographic distribution (Table 1) were recorded in the PROTEUS database (Sauquet, 2016). These data were predominantly obtained from original descriptions and type specimens, complemented by a diversity of literature sources listed in the Electronic Supplement section (Table S3), personal field observations, living collections held in botanical gardens at Université Paris-Sud (France) and in Porto Alegre (Brazil), and specimens from the following herbaria: B, CTES, CORD, CUZ, F, G, GH, GOET, ICN, K, MBM, MO, MVM, NY, P, RB, S, SGO and SI (acronyms according to Thiers, 2016). The operational geographic units were defined according to the biogeographic provinces of South and Central America recognized by Morrone (2006) for the Neotropical region, the South American transition zone and the Andean region. The ecological regions (level I) distinguished by the Commission for Environmental Cooperation were used for North America and the Mexican transition zone (CEC, 1997). A matrix, provided in nexus format as supplementary material in the Electronic Supplement section, was then output from PROTEUS and imported into MESQUITE 3.10 with the consensus tree of the total evidence data set to trace the evolutionary history of each character using parsimony. Following the realization of high levels of homoplasy in these morphological characters in *Sisyrinchium* and the main taxonomic scope of this paper, we do not discuss the evolution of these characters in detail here. However, the data set and these analyses allowed us to identify unique combinations of morphological character states for each major clade of the genus, which we then used to establish a reliable taxonomic key and to describe the infrageneric subdivisions of *Sisyrinchium*. Characters and character states are listed in Table 1 and taxa sampled in the current study were assigned into the different sections according to morphological and molecular characters.

Table 1. Morphological and biogeographical characters evaluated for infrageneric delimitations in *Sisyrinchium*.

Character	Character states
1. Life cycle	(0) annual; (1) perennial.
2. Root thickness	(0) fibrous and slender; (1) fleshy; (2) tuberous.
3. Rhizome	(0) absent or inconspicuous; (1) present, short; (2) present, long.
4. Basal leaves	(0) absent; (1) present.
5. Cauline leaves or bracts along the stem	(0) absent; (1) present.
6. Leaf shape	(0) plane; (1) cylindrical.
7. Terminal bract	(0) absent; (1) present.
8. Spathes	(0) pedunculate; (1) sessile or subsessile; (2) both.
9. Floriferous stem shape and margin	(0) ancipitate, obviously winged; (1) cylindrical, not winged; (2) ancipitate, slightly winged.
10. Tepals fusion	(0) free tepals; (1) united tepals (any extension).
11. Perigon shape	(0) disk shaped; (1) cup shaped; (2) infundibuliform.
12. Filaments fusion	(0) connate nearly to the top; (1) connate at different lengths (never to the top).
13. Floral trichomes location	(0) not applicable; (1) staminal column; (2) staminal column + adaxial side of tepals; (3) adaxial side of tepals.
14. Trichomes distribution along the staminal column	(0) not applicable; (1) lower forth part or less; (2) more than a fourth part; (3) the full extent (with similar density).
15. Trichomes density at the base of the staminal column	(0) not applicable / absence; (1) sparse (less than 50% coverage of the surface with trichomes); (2) moderate (50 to 90% coverage); (3) dense (elaiophores; more than 91% coverage).
16. Crown of trichomes below the anthers	(0) absent; (1) present.
17. Staminal column shape	(0) cylindrical; (1) carboy-shaped; (2) conical.
18. Anther attachment	(0) versatile; (1) not versatile.
19. Style branching	(0) entire; (1) inconspicuously trifurcated; (2) conspicuously trifurcated.
20. Stigmatic regions/anthers relative position	(0) above the anthers; (1) hidden by the anthers; (2) style arms alternate to the anthers.
21. Flower colour	(0) yellow; (1) white; (2) lilac, pale blue or light bluish violet; (3) bluish violet or dark bluish violet; (4) yellow, white or lilac.
22. Inflorescence type	(0) simple; (1) compound = synflorescence; (2) mixed, occasionally simple and compound.
23. Synflorescence type	(0) not applicable; (1) spiciform; (2) fasciculiform; (3) paniculiform; (4) corymbiform; (5) none of the preceding states, but branched with conspicuous internodes.
24. Synflorescence internodes	(0) not applicable; (1) long (lax aspect); (2) short (congested aspect).
25. Number of rhipidia per floriferous stem	(0) one; (1) few rhipidia (two to 10); (2) more than 10 rhipidia.
26. Capsule shape	(0) 1:1 (globose, subglobose); (1) 2:1 (ovoid, obovoid, ellipsoid, pyriform); (2) 3-4:1 (obloid).

Character	Character states
27. Biogeographical regions, subregions	(0) Taiga; (1) Northern Forests; (2) Northwestern Forested Mountains; (3) Marine West Coast Forest; (4) Eastern Temperate Forests (5) Great Plains; (6) North American Deserts; (7) Mediterranean California; (8) Southern Semi-Arid Highlands; (9) Temperate Sierras; (10) Tropical Wet Forests; (11) Neotropical region/ Chiapas; (12) Neotropical region, Easter Central America; (13) Neotropical region, Western Panamanian Isthmus; (14) Neotropical region, Cerrado; (15) Neotropical region, Chaco; (16) Neotropical region, Pampa; (17) Neotropical region, Brazilian Atlantic Forest; (18) Neotropical region, Parana Forest; (19) South American transition zone, North Andean Paramo; (20) South American transition zone, Coastal Peruvian Desert; (21) South American transition zone, Puna; (22) South American transition zone, Prepuna; (23) Andean region, Central Chilean; (24) Andean region, Subantartic; (25) Andean region, Patagonian; (26) Hawaii; (27) Bermuda; (28) Tropical Dry Forests; (29) South American transition zone, Monte; (30) Neotropical region, Maracaibo, Venezuelan Coast, Magdalena, Cauca, Yungas.

RESULTS

Phylogenetic analyses. —The number of characters, as well as the Maximum Parsimony statistics (number of variable and parsimony informative characters, number of most parsimonious trees, tree length, consistency (CI) and retention (RI) indices) in separate and combined data sets alignments, including nucleotides and coded gaps, are presented in Table 2. Unless otherwise stated, the names of infrageneric groups of *Sisyrinchium* species refer to the updated nomenclature presented in the current study.

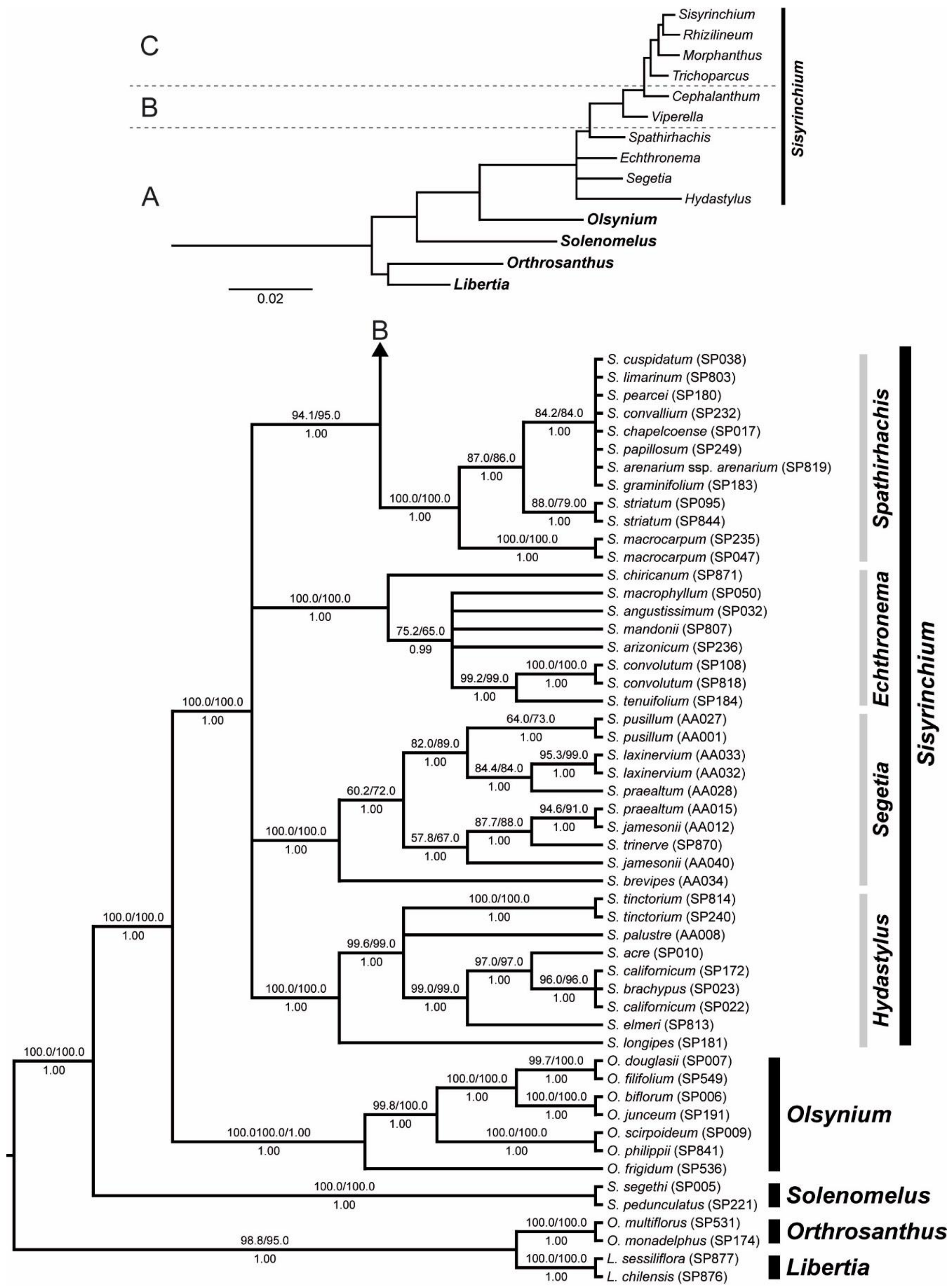
Independent analyses of each DNA marker (data not shown) revealed that the regions used in this study, taken separately, were useful to resolve generic relationships in Sisyrinchieae, but were not informative enough to support most of the infrageneric relationships within *Sisyrinchium*. Since no significantly supported incongruence was detected among tree topologies obtained from the different separate analyses of plastid and mitochondrial markers, all cpDNA and mtDNA data sets were combined into a single matrix for subsequent analyses. Contrastingly, such incongruent placements were detected between the plastid + mitochondrial and the ITS topologies for *Sisyrinchium chilense* Hook. and *S. elegantulum* Ravenna. Therefore, all DNA markers were concatenated for three-genome analyses, excluding the species responsible for the incongruences outlined

Table 2. Lengths and indices for the resulting most parsimonious tree in parsimony analysis of separated and combined data sets. CI and RI are respectively the consistency and retention indices of most parsimonious topologies.

DNA data set	Number of: Characters	Variable characters (%)	Parsimony informative characters (%)	Most parsimonious trees	Tree length	CI	RI
rpoC1	508	43 (8.4%)	31 (6.1%)	4014	63	0.73	0.95
rpoB	472	67 (14.2%)	47 (9.9%)	4020	83	0.86	0.98
matK-trnK	1889	365 (19.3%)	182 (9.6%)	4004	490	0.80	0.93
trnH-psbA + [coded indels]	642 + [18]	80 + [18] (11.8%)	49 + [18] (10.1%)	3814	187	0.56	0.92
trnQ-rps16 + [coded indels]	2108 + [99]	393 + [99] (22.3%)	248 + [99] (15.7%)	3940	695	0.76	0.95
nad1-2/3 + [coded indels]	1880 + [31]	106 + [31] (7.1%)	59 + [31] (4.7%)	4020	166	0.85	0.96
nad4-1/2 + [coded indels]	1704 + [12]	91 + [12] (6.0%)	54 + [12] (3.8%)	3923	144	0.75	0.96
cpDNA + mtDNA	9203 + [160]	1145 + [160] (13.9%)	670 + [160] (8.8%)	3916	1966	0.71	0.93
ITS	776	384 (49.5%)	281 (36.2%)	3854	1067	0.55	0.88
Three-genome matrix	9967 + [160]	1529 + [160] (16.6%)	951 + [160] (11.0%)	3364	3139	0.63	0.90

Notes: numbers into brackets are numbers of characters resulting from indel-coding.

above. The resulting consensus topology is presented in Fig. 1, while consensus trees obtained from the combined cpDNA + mtDNA and the ITS data sets are respectively reported in Fig. S1 and S2 (Electr. Suppl.). The MP strict consensus tree recovered from the parsimony ratchet analysis of the three-genome matrix required 3232 transformations (CI = 0.61; RI = 0.90), whereas ML searches produced a best-scoring ML tree with –ln L = 34545 and 110459 trees were retained from the Bayesian analysis and summarized into a 50% majority-rule consensus tree. Tree topologies resulting from the MP, ML and BI approaches were largely congruent as shown by the number of clades in the consensus tree significantly supported by PBS, LBS and PP. All genera of Sisyrinchieae included in the current study were fully supported (PBS = 100%, LBS = 100%, PP = 1.0) and the phylogenetic relationships observed among them were strongly to fully supported. *Libertia* and *Orthrosanthus* formed a strongly supported clade (PBS = 98.8%, LBS = 95%, PP = 1.0) sister to the remaining genera of the tribe, *Solenomelus* and *Olsynium* being successive sister clades to *Sisyrinchium* with full supports (PBS = 100%, LBS = 100%, PP = 1). According to the topology and node support values, ten major monophyletic groups of species (i.e., *Hydastylus*, *Segetia*, *Echthronema*, *Spathirhachis*, *Viperella*, *Cephalanthum*, *Trichoparcus*, *Morphanthus*, *Rhizilineum* and *Sisyrinchium*) were recovered within the genus *Sisyrinchium* (Fig. 1). The *Hydastylus*, *Segetia*, *Echthronema*, *Spathirhachis*,



C
B
A
Sisyrinchium
Rhizilineum
Morphanthus
Trichoparcus
Cephalanthum
Viperella
Spathirhachis
Echthronema
Segetia
Hydastylus
Olsynium
Solenomelus
Orthrosanthus
Libertia
0.02
S. cuspidatum (SP038)
S. limarinum (SP803)
S. pearcei (SP180)
S. convallium (SP232)
S. chapelcoense (SP017)
S. papillosum (SP249)
S. arenarium ssp. arenarium (SP819)
S. graminifolium (SP183)
S. striatum (SP095)
S. striatum (SP844)
S. macrocarpum (SP235)
S. macrocarpum (SP047)
S. chiricanum (SP871)
S. macrophyllum (SP050)
S. angustissimum (SP032)
S. mandonii (SP807)
S. arizonicum (SP236)
S. convolutum (SP108)
S. convolutum (SP818)
S. tenuifolium (SP184)
S. pusillum (AA027)
S. pusillum (AA001)
S. laxinervium (AA033)
S. laxinervium (AA032)
S. praealtum (AA028)
S. praealtum (AA015)
S. jamesonii (AA012)
S. trinerve (SP870)
S. jamesonii (AA040)
S. brevipes (AA034)
S. tinctorium (SP814)
S. tinctorium (SP240)
S. palustre (AA008)
S. acre (SP010)
S. californicum (SP172)
S. brachypus (SP023)
S. californicum (SP022)
S. elmeri (SP813)
S. longipes (SP181)
O. douglasii (SP007)
O. filifolium (SP549)
O. biflorum (SP006)
O. junceum (SP191)
O. scirpoideum (SP009)
O. philippii (SP841)
O. frigidum (SP536)
S. segethi (SP005)
S. pedunculatus (SP221)
O. multiflorus (SP531)
O. monadelphus (SP174)
L. sessiliflora (SP877)
L. chilensis (SP876)

Fig. 1A

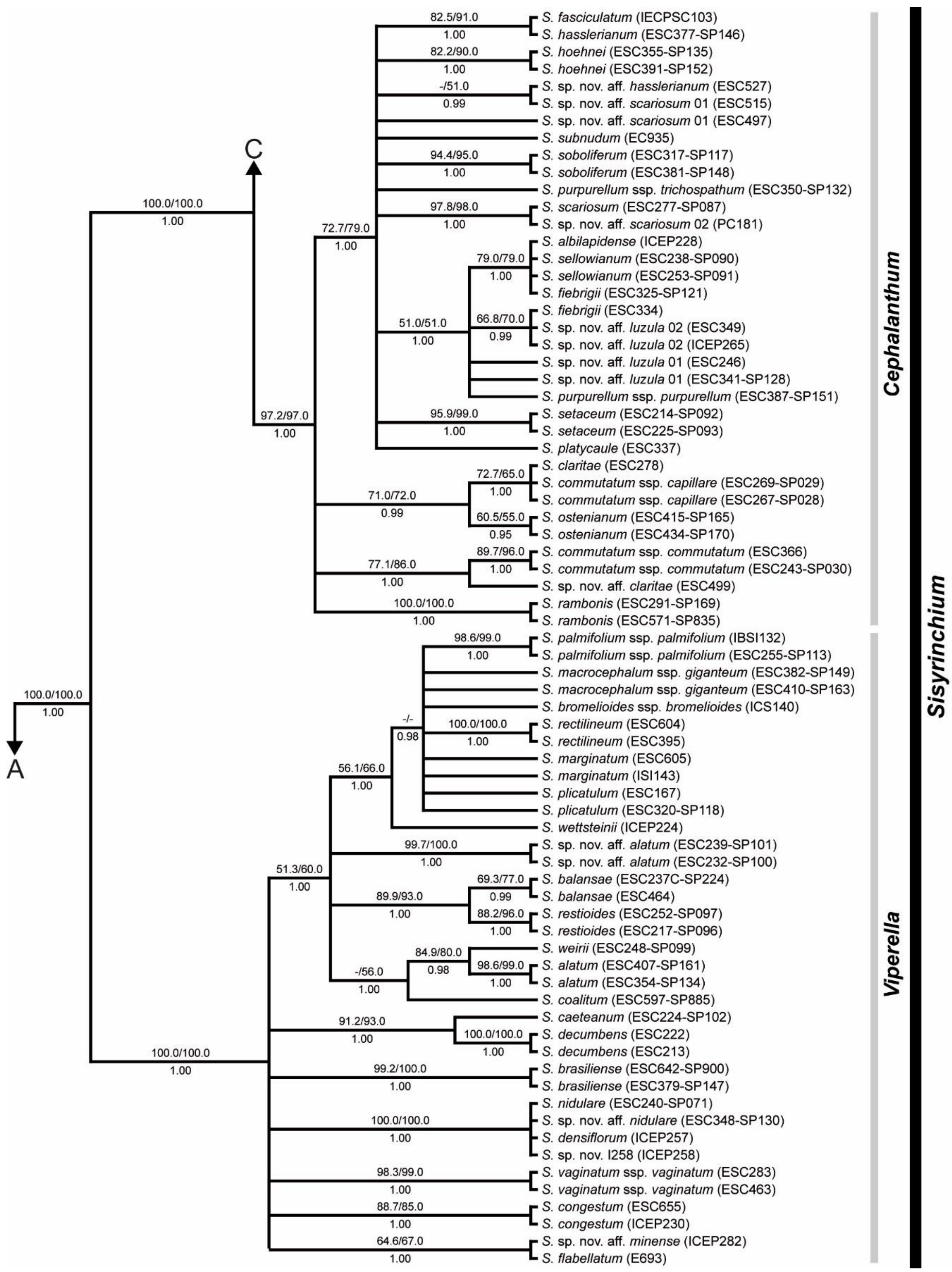

C
A
100.0/100.0
1.00
82.5/91.0
1.00
S. fasciculatum (IECPSC103)
S. hasslerianum (ESC377-SP146)
82.2/90.0
1.00
S. hoehnei (ESC355-SP135)
S. hoehnei (ESC391-SP152)
-/51.0
0.99
S. sp. nov. aff. hasslerianum (ESC527)
S. sp. nov. aff. scariosum 01 (ESC515)
S. sp. nov. aff. scariosum 01 (ESC497)
S. subnudum (EC935)
94.4/95.0
1.00
S. soboliferum (ESC317-SP117)
S. soboliferum (ESC381-SP148)
S. purpurellum ssp. trichospathum (ESC350-SP132)
97.8/98.0
1.00
S. scariosum (ESC277-SP087)
S. sp. nov. aff. scariosum 02 (PC181)
72.7/79.0
1.00
S. albilapidense (ICEP228)
79.0/79.0
1.00
S. sellowianum (ESC238-SP090)
S. sellowianum (ESC253-SP091)
S. fiebrigii (ESC325-SP121)
S. fiebrigii (ESC334)
51.0/51.0
1.00
66.8/70.0
0.99
S. sp. nov. aff. luzula 02 (ESC349)
S. sp. nov. aff. luzula 02 (ICEP265)
S. sp. nov. aff. luzula 01 (ESC246)
S. sp. nov. aff. luzula 01 (ESC341-SP128)
S. purpurellum ssp. purpurellum (ESC387-SP151)
97.2/97.0
1.00
95.9/99.0
1.00
S. setaceum (ESC214-SP092)
S. setaceum (ESC225-SP093)
S. platycaule (ESC337)
S. claritae (ESC278)
72.7/65.0
1.00
S. commutatum ssp. capillare (ESC269-SP029)
S. commutatum ssp. capillare (ESC267-SP028)
71.0/72.0
0.99
60.5/55.0
0.95
S. ostenianum (ESC415-SP165)
S. ostenianum (ESC434-SP170)
89.7/96.0
1.00
S. commutatum ssp. commutatum (ESC366)
77.1/86.0
1.00
S. commutatum ssp. commutatum (ESC243-SP030)
S. sp. nov. aff. claritae (ESC499)
100.0/100.0
1.00
S. rambonis (ESC291-SP169)
S. rambonis (ESC571-SP835)
100.0/100.0
1.00
98.6/99.0
1.00
S. palmifolium ssp. palmifolium (IBSI132)
S. palmifolium ssp. palmifolium (ESC255-SP113)
S. macrocephalum ssp. giganteum (ESC382-SP149)
S. macrocephalum ssp. giganteum (ESC410-SP163)
S. bromelioides ssp. bromelioides (ICS140)
-/-
0.98
100.0/100.0
1.00
S. rectilineum (ESC604)
S. rectilineum (ESC395)
S. marginatum (ESC605)
56.1/66.0
1.00
S. marginatum (ISI143)
S. plicatulum (ESC167)
S. plicatulum (ESC320-SP118)
S. wettsteinii (ICEP224)
99.7/100.0
1.00
S. sp. nov. aff. alatum (ESC239-SP101)
S. sp. nov. aff. alatum (ESC232-SP100)
51.3/60.0
1.00
69.3/77.0
0.99
S. balansae (ESC237C-SP224)
89.9/93.0
1.00
S. balansae (ESC464)
88.2/96.0
1.00
S. restioides (ESC252-SP097)
S. restioides (ESC217-SP096)
84.9/80.0
0.98
S. weirii (ESC248-SP099)
98.6/99.0
1.00
S. alatum (ESC407-SP161)
-/56.0
1.00
S. alatum (ESC354-SP134)
S. coalitum (ESC597-SP885)
91.2/93.0
1.00
S. caeteanum (ESC224-SP102)
100.0/100.0
1.00
S. decumbens (ESC222)
100.0/100.0
1.00
S. decumbens (ESC213)
99.2/100.0
1.00
S. brasiliense (ESC642-SP900)
S. brasiliense (ESC379-SP147)
S. nidulare (ESC240-SP071)
100.0/100.0
1.00
S. sp. nov. aff. nidulare (ESC348-SP130)
S. densiflorum (ICEP257)
S. sp. nov. I258 (ICEP258)
98.3/99.0
1.00
S. vaginatum ssp. vaginatum (ESC283)
S. vaginatum ssp. vaginatum (ESC463)
88.7/85.0
1.00
S. congestum (ESC655)
S. congestum (ICEP230)
64.6/67.0
1.00
S. sp. nov. aff. minense (ICEP282)
S. flabellatum (E693)
Cephalanthum
Viperella
Sisyrinchium

Fig. 1 B

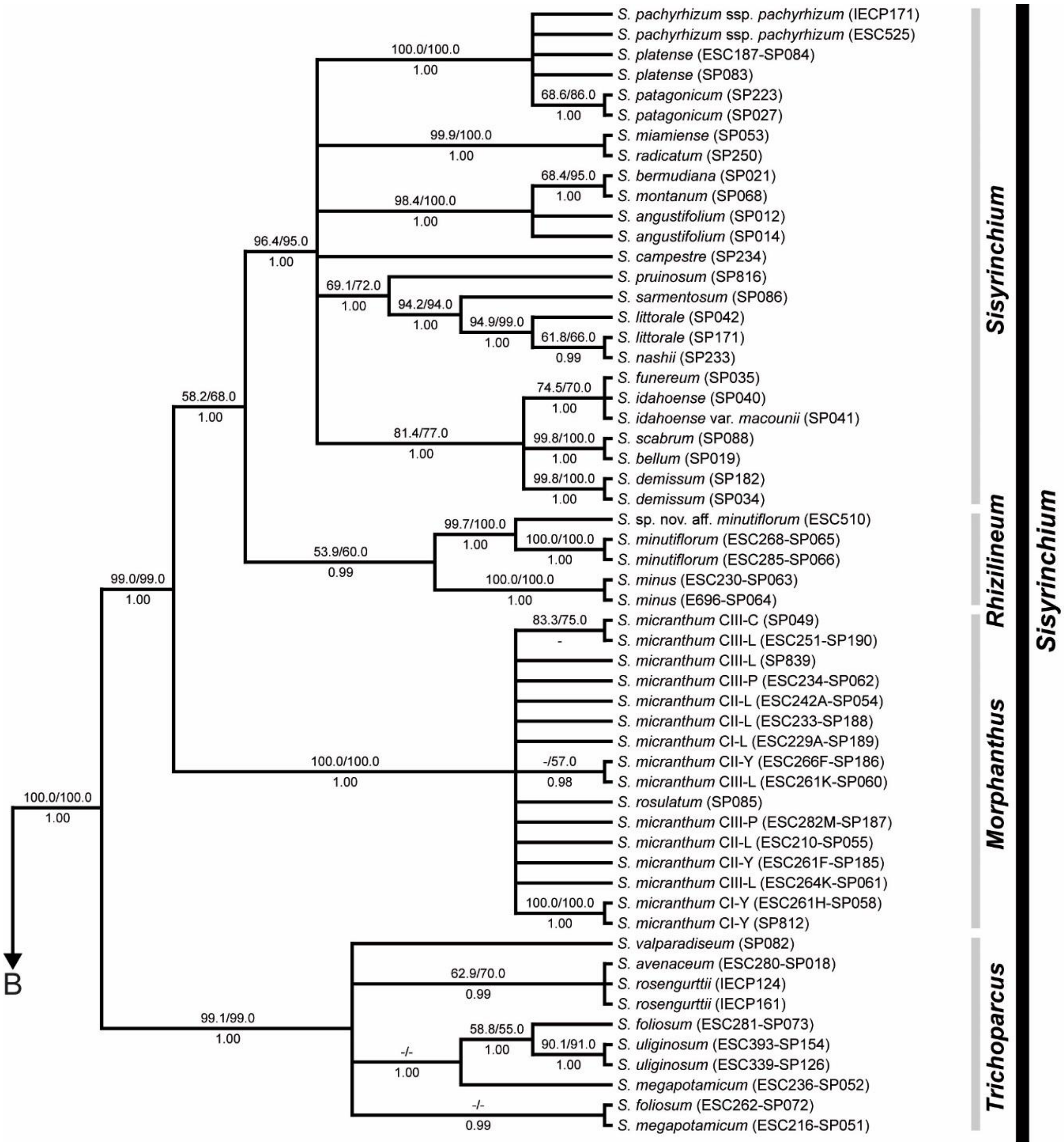


Fig. 1A–C. ML best-scoring phylogram and strict consensus tree based on the strict consensus tree of the parsimony ratchet, the estimated maximum likelihood tree and the Bayesian 50% majority rule consensus tree obtained from the analyses of the whole molecular data set, the conflicting species (*Sisyrinchium chilense* and *S. elegantulum*) being excluded from the taxonomic sampling (total congruent data set) . The tree is rooted using *Neomarica candida* as outgroup. Support values indicated above branches follow the order PBS/LBS whereas PP are reported below branches. Bootstrap supports and posterior probabilities for a given node are provided only if one of the values reached the following thresholds: PBS ≥70% or LBS ≥70% or PP ≥0.95. A dash (-) indicates support value of less than 50% for PBS and LBS or less than 0.95 for PP. Vertical bold black bars indicate the genera of Sisyrinchieae while bold grey bars show the infrageneric classification established in the present study for the genus *Sisyrinchium*. Section names follow the revised taxonomic treatment.

Viperella and *Morphanthus* clades were fully supported, while strong support was observed for *Cephalanthum* (PBS = 97.2%, LBS = 97%, PP = 1), *Trichoparcus* (PBS = 99.1%, LBS = 99%, PP = 1) and *Sisyrinchium* (PBS = 96.4%, LBS = 95%, PP = 1). *Rhizilineum* was only strongly supported in Bayesian analysis (PP = 0.99) but weakly supported in MP and ML analyses (PBS = 53.9%, LBS = 60%). Relationships among *Hydastylus*, *Segetia* and *Echthronema* remained unresolved because MP, ML and BI analyses disagreed in the placement of *Hydastylus* and *Segetia* (Fig. 2D). *Hydastylus* was the earliest diverging section in MP analysis with strong support (PBS = 86.1%). The same relationship was observed in the ML best-scoring topologies but was only weakly supported (LBS = 56%), whereas BI analysis placed *Segetia* sister to the rest of the genus, this relationship being strongly supported (PP = 0.99). The backbone relationships among the other sections of *Sisyrinchium* were strongly to fully supported, except the dichotomy between sect. *Rhizilineum* and sect. *Sisyrinchium*, which was only weakly supported in MP and ML analyses (PBS = 58.2%, LBS = 68%) but fully supported in BI analysis (PP = 1).

Phylogenetic resolution and node support values were significantly improved by the combination of molecular data from all three genomic compartments. However, even though consensus topologies obtained from the organelle data set on the one hand, and the ITS matrix on the other hand, were mostly congruent, both phylogenetic hypotheses revealed additional information and critical differences. The MP strict consensus tree recovered from the plastid + mitochondrial data set required 2021 (vs. 1164 for the ITS alignment) transformations (CI = 0.69 vs. 0.50; RI = 0.93 vs. 0.86), whereas ML searches produced a best-scoring ML tree with –ln*L* = 26138 (vs. 7047) and 88462 (vs. 59995) trees were retained from the Bayesian analysis and summarized into a 50% majority-rule consensus tree. According to the topology and the node support values of the consensus trees obtained after analyses of the organelle (Electr. Suppl.: Fig. S1) and the ITS (Electr. Suppl.: Fig. S2) matrices, strong incongruences related to the phylogenetic relationships of *S. chilense* and *S. elegantulum* were detected. While both species fell within the *Cephalanthum* group with moderate to full support (PBS = 71.8%, LBS = 80%, PP = 1) in the combined plastid + mitochondrial DNA analysis, the two species fell into a distantly related clade with weak to full support (PBS = 59.8%, LBS = 70%, PP = 1) in the ITS phylogeny. Consequently, *S. chilense* and *S. elegantulum* were not assigned to one of the ten major monophyletic groups recognized within the genus and were considered unplaced. Moreover, in the cpDNA + mtDNA topology, *Rhizilineum* (PBS = 72.8%, LBS = 82%, PP = 0.99) and *Sisyrinchium* (PBS = 82.8%, LBS = 94%, PP = 1.00) clades were moderately to fully supported, as was the relationship between the two lineages (PBS = 77.5%, LBS = 89%, PP = 1.00), but such relationships were not resolved in the ITS tree. Species included in *Rhizilineum* and *Sisyrinchium* clades (as circumscribed by the three-genome topology) formed a polytomy, together with the strongly supported *Morphanthus* lineage (PBS = 99.1%, LBS = 100%, PP = 1.00), *S. chilense* and *S. elegantulum* (Electr. Suppl.: Fig. S2C). Relationships among *Hydastylus*, *Segetia* and *Echthronema* remained unresolved in the consensus topology obtained from the organelle data set. Parsimony and probability-based analyses disagreed in the placement of *Hydastylus* and *Segetia* (Fig. 2A). *Hydastylus* was the earliest diverging section in the MP analysis with weak support, whereas the ML and BI analyses placed *Segetia* as sister to the rest of the genus with weak (ML) or full (BI) support. Such discordant phylogenetic relationships were not observed in MP, ML and BI analyses of the ITS matrix and *Hydastylus* was the earliest diverging lineage of *Sisyrinchium* with weak to full support (PBS = 93.1%, LBS = 68%, PP = 1.0).

Assessment of putative hybridization and incongruence between molecular data sets. — Most of the conflicting taxon relationships identified in the consensus network (Fig. 3A) were observed within five (i.e. *Segetia*, *Viperella*, *Cephalanthum*, *Morphanthus* and *Sisyrinchium*) out of the ten major clades previously recognized and involved either closely related species or different samples of the same species, except for *S. chilense* and *S. elegantulum*. The contradictory relationships detected for these two species fell deep in the phylogeny and the internode certainty values obtained for the conflicting strongly supported nodes (*Cephalanthum* + *S. chilense* + *S. elegantulum* in the cpDNA + mtDNA tree and *Morphanthus* + *Rhizilineum* + *Sisyrinchium* + *S. chilense* + *S. elegantulum* in the ITS tree) were moderate (IC = ICA = 0.57, IC = 0.42 and ICA = 0.44, respectively) showing that competing topologies received low support from ML bootstrap analyses. Moreover, a critical inspection of these topologies revealed that they were uninformative with respect to the phylogenetic relationships of the unplaced taxa. Based on these results, we considered that the two conflicting relationships were reliable and well supported in both cpDNA + mtDNA and ITS data sets. Consequently, a hybridization network was constructed with SplitsTree to explain differences between source trees as reticulation events. Based on the topology obtained (Fig. 3B), the speciation process of *S. chilense* and *S. elegantulum* involved at least one hybrid origin between the ancestors of *Cephalanthum* and *Morphanthus* + *Rhizilineum* + *Sisyrinchium* clades.

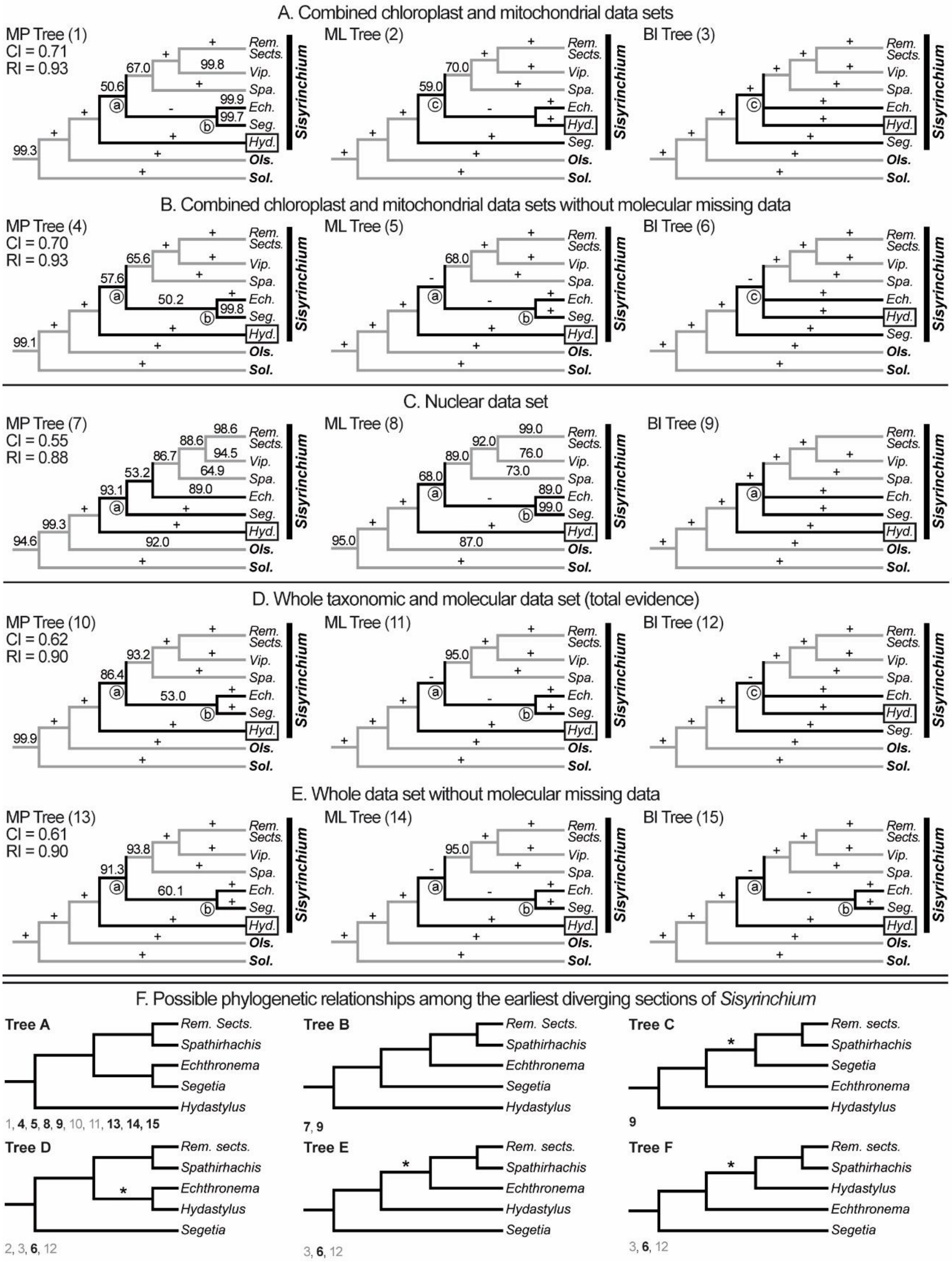
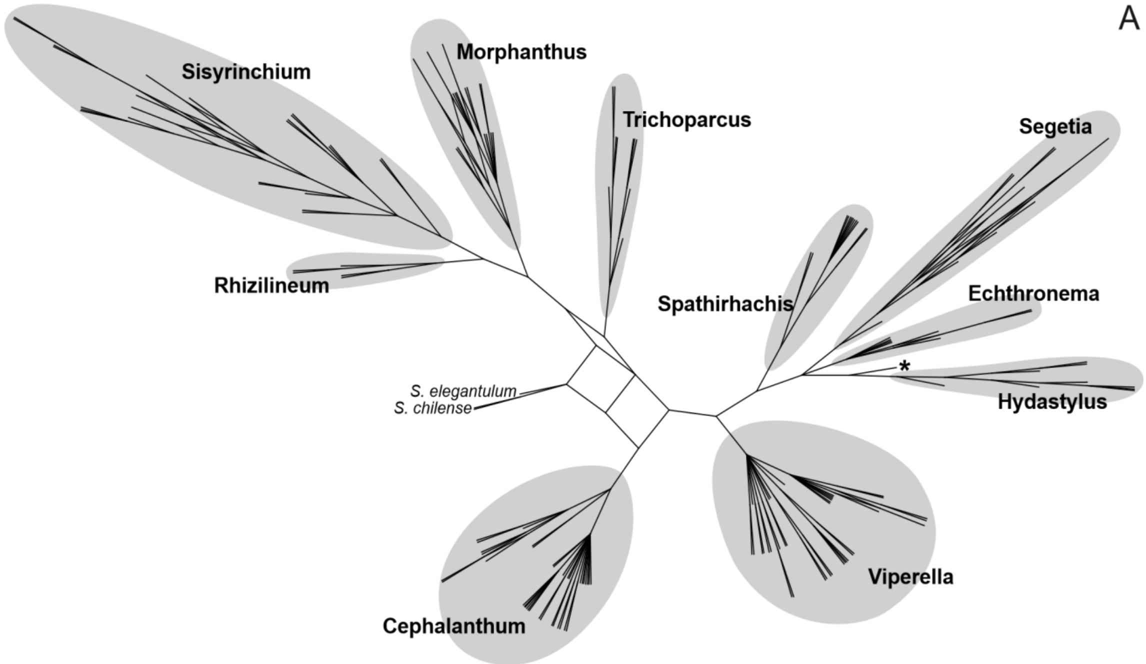


Fig. 2A–F. Alternative relationships among the earliest-diverging clades of *Sisyrinchium*. A–E, MP strict consensus tree, ML best-scoring tree and BI 50% majority rule consensus tree obtained from the phylogenetic analyses of five different data sets. Clade credibility values for a given node are provided if PBS ≥50% or LBS ≥50% or PP ≥0.95. A plus sign (+) means full support, whereas a dash (-) indicates support value of less than 50% for PBS and LBS or less than 0.95 for PP. Nodes marked with a, b and c show critical relationships among the earliest-diverging sections of *Sisyrinchium*. Clade names are abbreviated as follows: *Sol.* = *Solenomelus*, *Ols.* = *Olsynium*, *Hyd.* = *Hydastylus*, *Seg.* = *Segetia*, *Ech.* = *Echthronema*, *Spa.* = *Spathirhachis*, *Vip.* = *Viperella*, *Rem. Sects.* = Remaining Sections. F, Alternative topologies deduced from the MP, ML and BI analyses of the five data sets (A–E). Trees obtained from the different analyses and compatible with a given hypothesis are listed below each alternative topology. Nodes not supported (PBS <50%, LBS <50%, PP <0.95) in any of the analyses listed are indicated with an asterisk (*). Section names follow the revised taxonomic treatment.



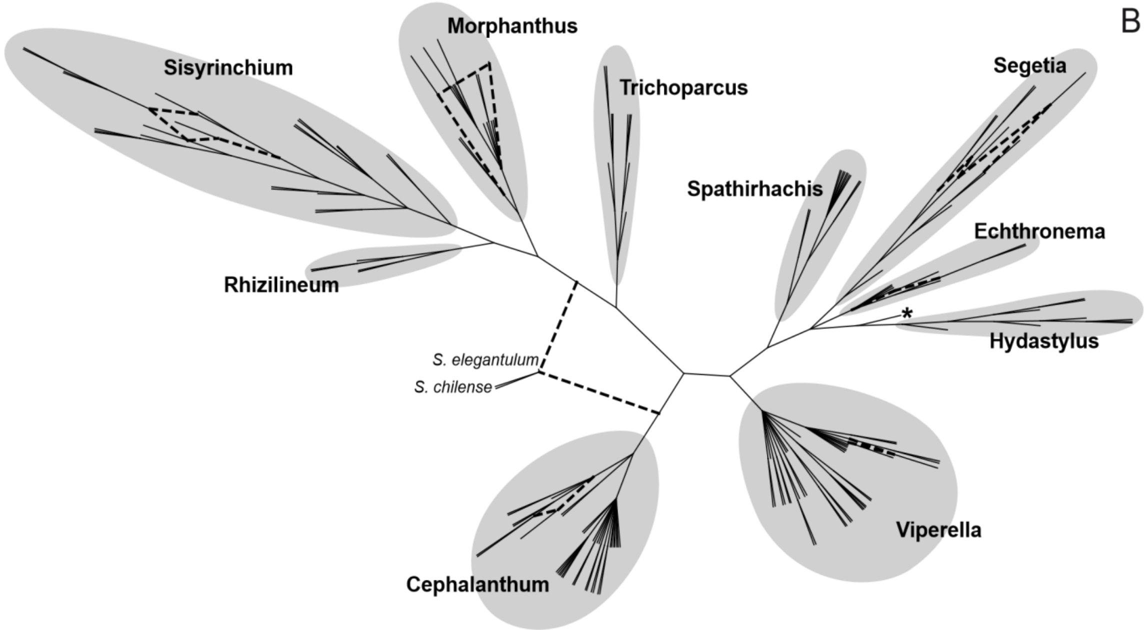


Fig. 3A–B. Networks constructed from strongly supported nodes (PBS ≥85% or LBS ≥85% or PP ≥0.99) from cpDNA + mtDNA and ITS consensus trees. Major lineages of *Sisyrinchium* are shaded in grey and section names are in bold and follow the revised taxonomic treatment. The species names indicate conflicting taxa and the root is shown with an asterisk (*). **A**, Consensus network. **B**, Hybridization network – reticulation events are indicated with dashed lines.

Topological conflicts among phylogenetic methods. — The MP, ML and BI trees disagreed in the relative placement of *Hydastylus* and *Segetia* with *Echthronema* for matrices of cpDNA + mtDNA (Fig. 2A) and three-genome data sets (Fig. 2D). The respective phylograms suggested that a long-branch attraction artefact could be responsible for the topological conflicts observed. The sister relationship of *Hydastylus* and *Echthronema* in the MP and ML trees was investigated as a potential LBA artefact but the exclusion of *Echthronema* from the phylogenetic analyses did not modify any relationships (results not shown). Missing data were observed in the *matK* coding region (568 of the 1889 nucleotide positions) and the *matK-5'trnK* intron (284 nucleotide positions) of most terminals of *Hydastylus*, *Segetia*, *Echthronema* and *Spathirhachis*, only one accession of each clade being entirely sequenced. Then, the effect of non-randomly distributed missing data among characters was also investigated and reduced matrices were re-analysed independently with MP, ML and BI methods. Exclusion of nucleotide positions with missing data from the cpDNA + mtDNA matrix did not modify the MP strict consensus topology but higher support values were obtained for nodes a and b, even though these relationships are still weakly supported (Figs. 2A–B). The topology of the ML best-scoring tree was modified and relationships became consistent with the MP tree but support for nodes a and b were <50%, whereas results of BI analysis were not altered except for the support value of node c, which fell from 1.00 to 0.92 (not supported). Exclusion of missing data from the three-genome data set did not modify MP, ML and BI topologies. However, higher support values were obtained for nodes a (PBS = 91.5%, LBS = 64.0%) and b (PBS = 59.1%, LBS = 55.0%) in MP and ML analyses and support value for node c decrease from 0.99 to 0.86 (not supported) in BI analysis (Figs. 2D–E). The comparison of the phylogenetic hypotheses obtained from all analyses of the different data sets tested in the current study (Figs. 2A–E) revealed six alternative topologies for the relationships among the earliest diverging sections of *Sisyrinchium* (Fig. 2F). All six possible topologies were used to conduct searches for diagnostic molecular characters. However, MP, ML and BI analyses performed from the data sets without missing data (Figs. 2B, C and E) favoured systematically the placement of *Hydastylus* sister to the rest of the genus, except for the BI analyses of the organelle and three-genome data sets, but the sister relationship of *Segetia* to the remaining species of *Sisyrinchium* was not supported.

Generic and infrageneric classification. — A total of 251 informative polymorphisms were identified for diagnostic purposes across the DNA markers used in this study: 48% at the genus level and 52% at the infrageneric level within *Sisyrinchium*. Plastid, mitochondrial and nuclear markers were useful at both taxonomic levels. Diagnostic positions from the chloroplast genome were almost equally distributed between generic and infrageneric levels (49% vs. 51%, respectively) whereas more than 61% of the ITS polymorphisms and only about 40% of the mitochondrial ones have contributed to the characterization of the infrageneric subdivisions of *Sisyrinchium*. A unique combination of molecular character states distributed among DNA regions of the three genomes was revealed for each genus of Sisyrinchieae. The molecular diagnosis of *Solenomelus* (Electr. Suppl.: Table S4), *Olsynium* (Electr. Suppl.: Table S5) and *Sisyrinchium* (Electr. Suppl.: Table S6) contained respectively 46, 29 and 34 synapomorphies, with few further diagnostic characters whose plesiomorphic condition remained ambiguous. Additionally, six heterogeneous pure CAs were reported for *Sisyrinchium*. The ten monophyletic groups identified in the phylogenetic analyses have provided the basis for a new infrageneric classification of *Sisyrinchium*. Based on the phylogenetic hypothesis and on morphological and molecular characters we could assign 108 of the 110 *Sisyrinchium* taxa included in the current study to one of the ten sections recognized hereafter. The species *S. chilense* and *S. elegantulum* were not placed in this classification ("incertae sedis") because their phylogenetic relationships were attributed to ancient reticulation events but remained uncertain. Consequently, they should not be assigned to a specific infrageneric subdivision using the description of the sections or the identification key. However, diagnostic molecular polymorphisms were identified to characterize each unplaced species (Electr. Suppl.: Tables S7–S8). The parsimony optimizations of morphological and biogeographical characters on the consensus tree obtained from the phylogenetic analyses of the concatenated data set are available in nexus format as supplementary material in the Electronic Supplement section of the online version of this article. They revealed that single traits were not synapomorphic for any section. However, each infrageneric subdivision of the genus was characterized by a unique combination of morphological character states (see Table 3).

Description of the *Sisyrinchium* sections and taxonomic key

Sisyrinchium sect. ***Hydastylus*** (Dryand. ex Salisb.) Ravenna in Onira 5(4): 17. 2000 ≡ *Hydastylus* Dryand. ex Salisb. in Trans. Hort. Soc. London 1: 310. 1812 – Type: *Hydastylus californicus* (Ker Gawl.) Salisb. (= *Sisyrinchium californicum* (Ker Gawl.) Dryand.)

Table 3. Comparison of morphological and biogeographical characters among sections of *Sisyrinchium*. Bold text indicates unique combination of character states for each infrageneric subdivision of the genus.

Section	Roots	Caulinar leaves	Floriferous stem; bracts	Flower color; Perigon shape	Filament fusion; staminal column shape; style branching	Flower trichomes: density; location	Inflorescence or synflorescence characterization	Capsule	Biogeographic distribution
Hydastylus	Fibrous and slender or fleshy	Absent	**Ancipitate and obviously winged/ absent**	Yellow; disk shaped	At different lengths but never to the top; cylindrical; conspicuously trifurcate	**Absent**	**Inflorescence simple**	Obloid to obovoid, rarely globose	North America (southern), Central America, South America (western)
Segetia	Fibrous and slender or fleshy	Absent	**Ancipitate and slightly winged or terete (rarely ancipitate and obviously winged); absent, except terminal**	Yellow; disk shaped	**At different lengths but never to the top**; cylindrical; conspicuously trifurcate	**Absent**	**Inflorescence simple (rarely synflorescence fasciculiform)**	**Obloid**	South America (western)
Echthronema	Fleshy or tuberous	Absent	**Ancipitate and obviously winged; present, except terminal**	Yellow; disk shaped	**At different lengths but never to the top**; cylindrical; conspicuously trifurcate	**Absent or sparse; staminal column**	**Synflorescence, branched, with conspicuous internodes**	Obloid to obovoid, rarely globose or subglobose	North America (southwestern), Central America, South America (western)
Spathirhachis	Fibrous and slender, fleshy or tuberous	Absent	Ancipitate and obviously winged; usually present, except terminal (always absent)	Yellow; usually disk shaped, rarely cup shaped	**At different lengths but never to the top (rarely connate nearly to the top)**; cylindrical or rarely conical; conspicuously trifurcate	Elaiophores or occasionally absent; adaxial side of tepals + absent or sparse to moderate, occasionally elaiophores; staminal column	**Synflorescence, spiciform, with conspicuous internodes**	Ellipsoid to obovoid or ovoid, rarely globose	South America (southwestern)
Viperella	Fibrous and slender or fleshy	**Absent (when synflorescence) or present (when inflorescence simple, except *S. caeteanum*)**	**Ancipitate and obviously winged; absent (when inflorescence simple) or absent, except terminal (when synflorescence or *S. caetanum*)**	Yellow; disk shaped or exceptionally infundibuliform	**At different lengths but never to the top**; cylindrical or exceptionally conical; conspicuously trifurcate	**Absent**	**Synflorescence (when spiciform, short internodes and infundibuliform perigon) or inflorescence simple**	**Globose, subglobose, obovoid or ellipsoid**	South America (central, southeastern)

Table 3. Continued.

Section	Roots	Caulinar leaves	Floriferous stem; bracts	Flower color; Perigon shape	Filament fusion; staminal column shape; style branching	Flower trichomes: density; location	Inflorescence or synflorescence characterization	Capsule	Biogeographic distribution
Cephalanthum	**Fibrous and slender**	Absent	Ancipitate and obviously or slightly winged, or terete; absent, except terminal (usually present)	yellow, white or lilac; disk shaped or exceptionally cup shaped	**Nearly to the top or exceptionally connate at different lengths**; cylindrical; entire or inconspicuously trifurcated	**Dense elaiophores or moderate at the base of the staminal column and hirsute above or just hirsute (rarely sparse); staminal column**	**Synflorescence, fasciculiform (rarely inflorescence simple) with short internodes**	Globose, rarely ovoid	South America (central, southeastern)
Trichoparcus	Fibrous and slender or rarely fleshy	Absent	Ancipitate and obviously winged; present, except terminal	Yellow; disk shaped or with spreading tepals	**Nearly to the top (rarely connate at different lengths)**; cylindrical; entire, inconspicuously or conspicuously trifurcate	**Sparse or absent(rarely dense elaiophores when fibrous roots); staminal column**	**Synflorescence, branched, with conspicuous internodes (rarely spiciform with short internodes)**	Globose to obovoid, ellipsoid	South America (southeastern)
Morphanthus	**Fibrous and slender**	Absent	Ancipitate and obviously winged; present, except terminal	Yellow, white or lilac; **cup shaped**	**At different lengths but never to the top; carboy-shaped**; conspicuously trifurcate	**Dense elaiophores; staminal column + row of oil glandular trichomes along middle vein; adaxial side of tepals**	Synflorescence branched with conspicuous internodes	Globose	North America (eastern), Central America, South America
Rhizilineum	**Fibrous and slender**	Absent	Ancipitate and obviously winged; present, except terminal	**Lilac; disk shaped with spreading tepals**	**Nearly to the top**; cylindrical; entire	**Dense elaiophores or moderate; staminal column**	Synflorescence branched with conspicuous internodes	Globose to obovoid, ellipsoid	North America (central, southern), Central America, South America (southeastern)
Sisyrinchium	Fibrous and slender or fleshy	Absent	Ancipitate and obviously winged; present, except terminal	Lilac, bluish violet (rarely yellow); **disk shaped (rarely cup shaped or spreading tepals if fleshy roots and elaiophores)**	**Nearly to the top**; cylindrical or exceptionally carboy-shaped; entire or inconspicuously trifurcated	**Sparse (rarely more dense); staminal column**	**Synflorescence branched (rarely inflorescence simple)**	Mainly globose or subglobose, but also obovoid, ellipsoid, ovoid, pyriform or obloid	North America, South America (southwestern)

Perennial herbs, rhizome short with fibrous and slender or fleshy roots. *Leaves* basal, plane, ensiform. *Floriferous stem* simple, ancipitate, obviously winged, without bracts along the stem, terminal bract absent. *Inflorescence* with one terminal rhipidium, spathes sessile (Fig. 4A). *Perigon* disk shaped, yellow. *Filaments* connate at different lengths but never to the top, staminal column cylindrical, glabrous. *Anthers* versatile. *Style* conspicuously trifurcate, alternate to the anthers. *Capsule* obloid to obovoid, rarely globose.

Section *Hydastylus* revealed 65 molecular synapomorphies (single and compound nucleotide positions), distributed among all DNA regions used in the present study. The list of synapomorphies and additional diagnostic character states are given in Table S9 (Electr. Suppl.).

Species assigned. – *Sisyrinchium acre* H.Mann, *S. brachypus* (E.P.Bicknell) J.K.Henry, *S. californicum* (Ker Gawl.) Dryand., *S. elmeri* Greene, *S. longipes* (E.P.Bicknell) Kearney & Peebles, *S. palustre* Diels., *S. tinctorium* Kunth.

Notes and taxonomic history. – Salisbury created the genus *Hydastylus* in 1812 following Dryander's suggestion (Salisbury, 1812) to accommodate *H. californicus*. Numerous North American species described predominantly by E.P. Bicknell were incorporated afterwards (Bicknell, 1900). Ravenna recognized *Hydastylus* as a section of *Sisyrinchium* (Ravenna, 2000) with 17 species listed initially, mainly from South America, except the type *S. californicum*, and *S. tinctorium*. According to Ravenna's description, this section contained not only species with one single terminal spathe with valves not subtended by bract but also taxa with few to many spathes or with only one single terminal spathe, the valves being subtended by a terminal bract. Species of the two latter categories were respectively transferred to sect. *Viperella* and sect. *Segetia* in our classification. The name *Hydastylus* was maintained for this section in the present study since the corresponding clade recovered in the phylogeny with full support (Fig. 1A) included the type species designated by Ravenna for the section together with six other sampled taxa.

Distribution. – North America, South-western region in forested temperate mountains, coastal regions and hills of Gulf of Mexico; Central America, in Chiapas and Western Panamanian Isthmus; western South America, in North Andean Paramo and Puna; Hawaiian archipelago.

Sisyrinchium sect. ***Segetia*** Ravenna in Onira 8(13): 52. 2003b – Type: *Sisyrinchium unispathaceum* Klatt

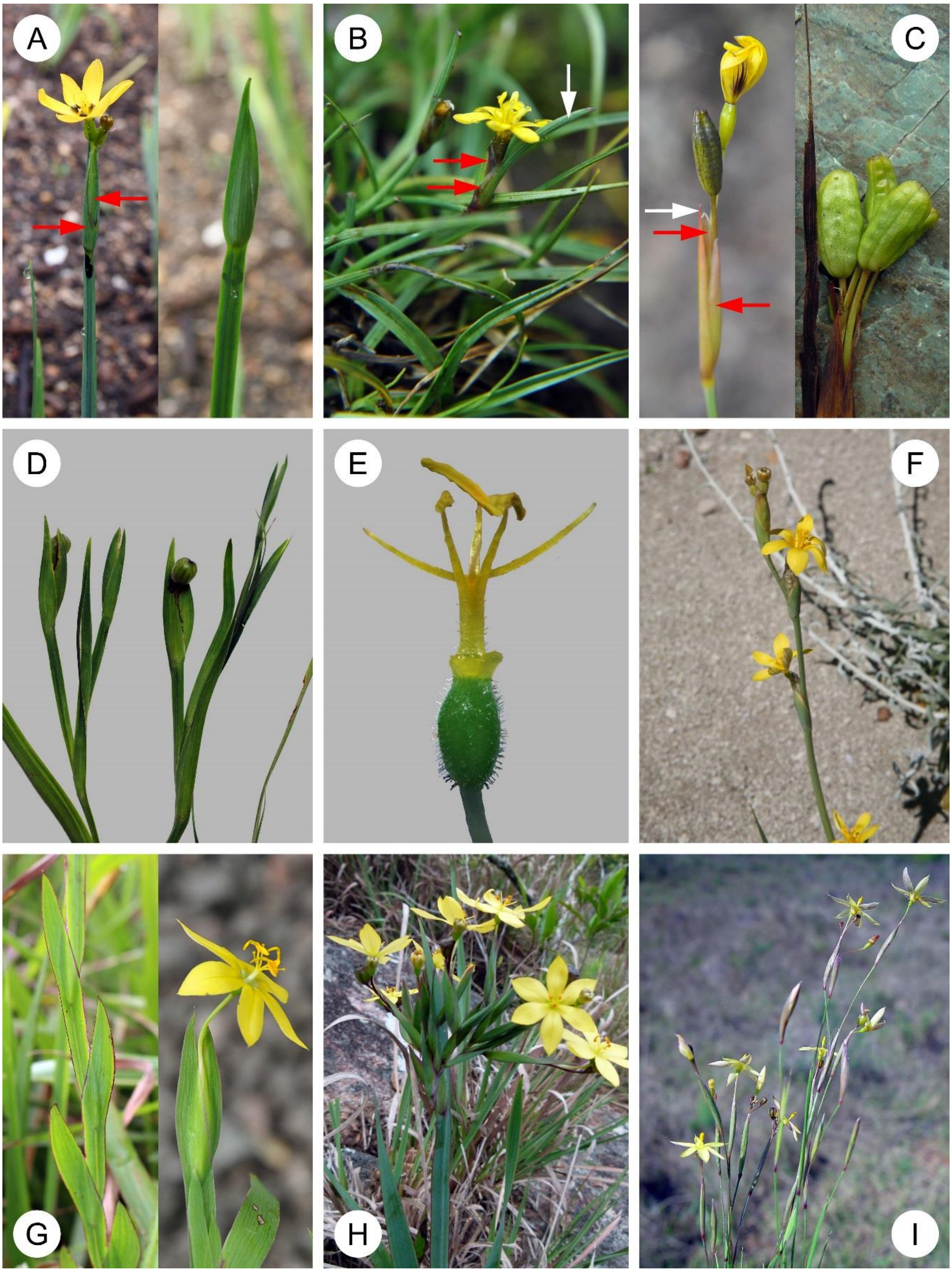


Fig. 4. Morphological features for characterization of sections *Hydastylus*, *Segetia*, *Echthronema*, *Spathirhachis*, *Viperella* and *Trichoparcus*: *S.* sect. *Hydastylus*: **A,** *S. californicum* (Ker Gawl.) Dryand. – inflorescence simple, spathe valves (red arrows) not subtended by a terminal bract, floriferous stem ancipitate. Sect. *Segetia*: **B,** *S. pusillum* Kunth – inflorescence simple, spathe valves (red arrows) subtended by a terminal bract (white arrow); **C,** *S. jamesonii* Baker (left side) and *S. laxinervium* Ravenna (right side) – terminal bract (white arrow), spathe valves (red arrows) and capsule obloid. Sect. *Echthronema*: **D,** *S. chiricanum* Woodson – synflorescence branched with bracts along the stem; **E,** *S. tenuifolium* Humb. & Bonpl. ex Willd. – flower with filaments connate at the base with sparse trichomes and style conspicuously trifurcated. Sect. *Spathirhachis*: **F,** *S. convallium* Ravenna – synflorescence spiciform with long internodes. Sect. *Viperella*: **G,** *S. alatum* Hook. – caulinar leaves (left side) and inflorescence simple (right side); **H,** *S. palmifolium* L. – synflorescence corymbiform. Sect. *Trichoparcus*: **I,** *S. megapotamicum* Malme – synflorescence branched with conspicuous internodes.

Perennial herbs, rhizome short with fibrous and slender or fleshy roots. *Leaves* basal, subterete or plane, narrowly linear to ensiform. *Floriferous stem* simple, ancipitate, slightly winged, or terete, rarely obviously winged, without bracts along the stem, terminal bract present. *Inflorescence* with one terminal rhipidium, infrequently *synflorescence* fasciculiform, with few rhipidia, spathes sessile, rarely subsessile, valves of spathe subtended by the terminal bract (Fig. 4B). *Perigon* disk shaped, yellow. *Filaments* connate at different lengths but never to the top, staminal column cylindrical, glabrous. *Anthers* versatile. *Style* conspicuously trifurcate, alternate to the anthers. *Capsule* obloid (Fig. 4C).

A unique combination of synapomorphies was reported at six independent nucleotide positions distributed among two cpDNA markers and the mtDNA regions for all species of sect. *Segetia*. Detailed information is given in Table S10 (Electr. Suppl.).

Species assigned. – *Sisyrinchium brevipes* Baker, *S. jamesonii* Baker, *S. laxinervium* Ravenna, *S. praealtum* Kraenzl., *S. pusillum* Kunth, *S. trinerve* Baker.

Notes and taxonomic history. – The original description of sect. *Segetia* encompassed four species (*S. trinerve*, *S. pusillum*, *S. venezolense* Ravenna and the type species, *S. unispathaceum*) from the Andean region of Argentina, Bolivia, Peru, Ecuador and Venezuela (Ravenna, 2003b). Among the species listed by the author, our sampling included only the two former species, which fell in a fully supported clade together with three species of sect. *Hydastylus sensu* Ravenna (2002a, 2003b) and *S. jamesonii* (Fig. 1A). The morphological description of sect. *Segetia* was slightly expanded to accommodate all these species but the main characters formerly used by Ravenna were maintained. It was not possible to sample the type species of the section for phylogenetic inference. However, original description and type specimens of *S. unispathaceum* (*Mandon 1219*, B!, G!, P!; photos, NY!, S!) were carefully studied and, based on the unique combination of morphological characters identified for each section, this species fall within sect. *Segetia* as currently circumscribed.

Distribution. – Western South America, mainly in Puna ecoregion, but also in the Coastal Peruvian Desert and the North Andean Paramo.

Sisyrinchium sect. ***Echthronema*** (Herb.) Benth. & Hook.f. in Gen. Pl. 3(2): 698. 1883 ≡ *Echthronema* Herb. in Edward's Bot. Reg. 29: Misc. Matter 85 (nº 136). 1843. – Lectotype (designated by Goldblatt *et al*. in Syst. Bot. 15(3): 507. 1990): *Sisyrinchium tenuifolium* Kunth

= *Sisyrinchium* sect. *Sipacapa* Ravenna in Onira 5(4): 18. 2000. – Type: *Sisyrinchium tenuifolium* Kunth

Perennial herbs, rhizome short with fleshy or tuberous roots. *Leaves* basal, plane, linear to ensiform. *Floriferous stem* few branched, ancipitate, obviously winged, with bracts along the stem, terminal bract absent. *Synflorescence* branched, with conspicuous internodes, few rhipidia, spathes pedunculate (Fig. 4D). *Perigon* disk shaped, yellow. *Filaments* connate at different lengths but never to the top, staminal column cylindrical, glabrous or rarely with sparse trichomes (Fig. 4E). *Anthers* versatile. *Style* conspicuously trifurcate, alternate to the anthers (Fig. 4E). *Capsule* obloid to obovoid, rarely globose or subglobose.

Species belonging to sect. *Echthronema* revealed molecular synapomorphies at 13 independent nucleotide positions listed in Table S11 (Electr. Suppl.) and distributed among cpDNA and nrDNA markers.

Species assigned. – *Sisyrinchium angustissimum* (B.L.Rob. & Greenm.) Greenm. & C.H.Thomps., *S. arizonicum* Rothr., *S. chiricanum* Woodson, *S. convolutum* Nocca, *S. macrophyllum* Greenm., *S. mandonii* Baker, *S. tenuifolium* Humb. & Bonpl. ex Willd.

Notes and taxonomic history. – The genus *Echthronema* was described by Herbert (1843) based only on androgynoecium features. The list of species provided with the diagnosis included six species names corresponding to four currently accepted species (*S. californicum, S. convolutum, S. graminifolium* Lindl. and *S. tenuifolium*). In a later revision, Bentham & Hooker (1883) proposed the section *Echthronema* to accommodate species with yellow flowers and filaments fused in a tube (Rudall & al., 1986). In 1990, a phylogenetic study based on morphological, leaf anatomical and basic chromosome number characters reinstated *Echthronema* at a subgeneric rank typified by *S. tenuifolium* (Goldblatt & al., 1990). More recently, Ravenna (2000) described the section *Sipacapa* and used the same species to typify this new subdivision of *Sisyrinchium*. However, the author realized that the type species designated for the section was explicitly included in the genus *Echthronema* by Herbert and decided to replace the name *Sipacapa* according to the principle of priority (Ravenna, 2003b). The name *Echthronema* was maintained for this section in the present study since the corresponding clade recovered in the phylogeny with full support (Fig. 1A) encompassed the type species designated by Ravenna for the section together with six other sampled taxa. Even though yellow flowers with glabrous filaments seems usual in the section, sparse secretory trichomes were observed along the lower part of the staminal column in some species (*S. arizonicum, S. macrophyllum* and *S. tenuifolium*), but they did not produce oil (Chauveau & al., 2011; Silvério & al., 2012).

Distribution. – North America, South-western region, in deserts, semi-arid highlands and Temperate Sierras; Central America, in Chiapas and western Panamanian Isthmus; western South America, in North Andean Paramo and Puna.

Sisyrinchium sect. ***Spathirhachis*** Klotzsch ex Klatt in Linnaea 31: 93. 1861–1862. – Lectotype (designated by Ravenna in Onira 5(4): 18. 2000): *Sisyrinchium striatum* Sm.

Perennial herbs, rhizome short or long with fibrous and slender, fleshy or tuberous roots. *Leaves* basal, plane to ensiform, or subulate. *Floriferous stem* simple, ancipitate, obviously winged, or terete, usually with bracts along the stem, terminal bract absent. *Synflorescence* spiciform, with conspicuous internodes, few rhipidia, spathes sessile or pedunculate (Fig. 4F). *Perigon* usually disk shaped, rarely cup shaped, yellow. Tepals with adaxial side with oil glandular trichomes (elaiophores), rarely not. *Filaments* connate at different lengths but never to the top, or rarely connate nearly to the top, staminal column cylindrical or rarely conical, glabrous or with sparse to moderate oil-producing trichomes, occasionally with elaiophores at the base. *Anthers* versatile, or rarely not. *Style* conspicuously trifurcate, alternate to the anthers or occasionally inconspicuously trifurcated. *Capsule* ellipsoid to obovoid to ovoid, rarely globose.

More than 85% of the 16 molecular synapomorphies (single and compound nucleotide positions) reported for the section were found among the cpDNA regions while only two synapomorphic character states were identified in the nrDNA marker at different independent nucleotide positions as shown in Table S12 (Electr. Suppl.).

Species assigned. – *Sisyrinchium arenarium* Poepp. subsp. *arenarium*, *S. chapelcoense* Ravenna, *S. convallium* Ravenna, *S. cuspidatum* Poepp., *S. graminifolium* Lindl., *S. limarinum* Ravenna, *S. macrocarpum* Hieron., *S. papillosum* R.C.Foster, *S. pearcei* Phil., *S. striatum* Sm.

Notes and taxonomic history. – Section *Spathirhachis* was described by Klatt (1862), bringing together plants with linear and ensiform leaves, filaments of the androecium basally connate, rhipidia arranged in spikes, with incurvate rachis and spathiform bracts. Species of sect. *Spathirhachis* were merged in sect. *Echthronema* by Bentham & Hooker (1883) and Ravenna (2000) reinstated the section in part taking into account only the species with spiciform synflorescence distributed from Chile to West and Southwest Argentina (Ravenna 2003b).

The type species, *S. striatum*, as well as eight other species listed by Ravenna for sect. *Spathirhachis* were retrieved within a fully supported clade together with *S. graminifolium*

(Fig. 1A). Then, the description of the section was slightly modified to accommodate this latter species. Ravenna recognized 27 species for the section, but the presence vs. absence of floral trichomes was not properly registered for most of species described by the author (Ravenna, 2000, 2002a, 2002b, 2003a, 2005, 2006, 2007, 2009). In our sampling, *S. convallium* was the only species devoid of floral oil-producing trichomes.

Distribution. – South America, in Prepuna and in the Andean region, from Central Chile to Patagonia and Subantartic region.

Sisyrinchium sect. ***Viperella*** Ravenna in Onira 7(6): 40. 2002b. – Type: *Sisyrinchium vaginatum* Spreng.

Perennial herbs, rhizome present or not, conspicuous or not, short or long with fibrous and slender or fleshy roots. *Leaves* basal or cauline, plane, linear to ensiform. *Floriferous stem* simple, ancipitate, obviously winged, with leaves (Fig. 4G) or not, terminal bract present or not. *Inflorescence* with one terminal rhipidium and valves of spathe not subtended by bract (occasionally accompanied by axillary inflorescences) or *synflorescence* cymose (monochasial) usually fasciculiform, occasionally paniculiform, corymbiform or spiciform with inconspicuous internodes, one to ten to many rhipidia, spathes sessile or pedunculate (Fig. 4H). *Perigon* disk shaped or exceptionally infundibuliform, yellow. *Filaments* connate at different lengths but never to the top, staminal column cylindrical or exceptionally conical, glabrous. *Anthers* versatile. *Style* conspicuously trifurcate, alternate to the anthers. *Capsule* globose to subglobose, obovoid or ellipsoid.

The taxa of *Sisyrinchium* sampled, which fell in *Viperella* clade, revealed seven molecular synapomorphies (single and compound nucleotide positions) for the section. Most of these diagnostic characters were provided by the cpDNA regions, together with one additional heterogeneous pure CA, whereas only one synapomorphic occurrence was found in the nrDNA marker. All results are detailed in Table S13 (Electr. Suppl.).

Species assigned. – *Sisyrinchium alatum* Hook., *S. balansae* Baker, *S. brasiliense* (Ravenna) Ravenna, *S. bromelioides* R.C.Foster subsp. *bromelioides*, *S. caeteanum* Ravenna, *S. coalitum* Ravenna, *S. congestum* Klatt, *S. decumbens* Ravenna, *S. densiflorum* Ravenna, *S. flabellatum* Aita & L.Eggers, *S. macrocephalum* Graham subsp. *giganteum* Ravenna, *S. marginatum* Klatt, *S. nidulare* (Hand.-Mazz.) I.M.Johnst., *S. palmifolium* L. subsp. *palmifolium*, *S. plicatulum* Ravenna, *S. rectilineum* Ravenna, *S. restioides* Spreng., *S.* sp. nov. aff. *alatum* Hook., *S.* sp. nov. aff. *minense* Ravenna, *S.* sp. nov. aff. *nidulare* (Hand.-

Mazz.) I.M.Johnst., *S.* sp. nov. I258, *S. vaginatum* Spreng. subsp. *vaginatum*, *S. weirii* Baker, *S. wettsteinii* Hand.-Mazz.

Notes and taxonomic history. – Section *Viperella* was described by Ravenna (2002b) with eight species listed initially and characterized by two distinctive morphological characters (i.e. caulescent plants with many short caulinate leaves and basal leaves absent or conspicuously reduced). In our sampling, the type species designated by the author fell in a fully supported monophyletic lineage of 24 species and subspecies (Fig. 1B) belonging to two different sections *sensu* Ravenna: *Viperella* and *Hydastylus* in part (Ravenna, 2000, 2002b). From a morphological point of view, this taxonomic group displayed an uncommon diversity of vegetative traits but appeared quite similar in flower morphology and coloration. Moreover the phylogenetic framework revealed that neither *Viperella* nor *Hydastylus* species were monophyletic within this lineage, even though various evolutionary relationships remained unresolved. Consequently, the name *Viperella* was maintained in the current study since the corresponding fully supported clade (Fig. 1B) encompassed the type species designated by Ravenna. The morphological description was expanded to accommodate variations of vegetative characters and to include floral traits for diagnostic purpose.

Distribution. – South America, in the ecoregions of Cerrado, Chaco, Pampa, Brazilian Atlantic Forest, Parana Forest, *Araucaria angustifolia* forest, with high diversity in Brazil.

Sisyrinchium sect. ***Cephalanthum*** Baker in J. Linn. Soc., Bot. 16 (pt. 1): 119. 1877. Pro parte. – Lectotype (here designated): *Sisyrinchium ostenianum* Beauv.

= *Sisyrinchium* sect. *Scirpeocharis* Ravenna in Onira 5(4): 17. 2000. – Type: *Sisyrinchium luzula* Klotzsch *ex* Klatt

= *Sisyrinchium* sect. *Lenitium* Ravenna in Onira 5(4): 18. 2000. – Type: *Sisyrinchium soboliferum* Ravenna

Perennial herbs, rhizome present or not, conspicuous or not, short, with fibrous and slender roots. *Leaves* basal, plane or terete. *Floriferous stem* simple, ancipitate, obviously or slightly winged, or terete, without bracts along the stem, terminal bract usually present. *Synflorescence* cymose (monochasial), fasciculiform (Fig. 5A) or rarely *inflorescence*, one to ten or many rhipidia, spathes sessile or pedunculate. *Perigon* disk shaped or exceptionally cup shaped, yellow, white or lilac. *Filaments* connate nearly to the top, or exceptionally connate at different lengths, staminal column cylindrical, usually with elaiophores at the base (Fig. 5B), or trichomes moderate on the basis of the staminal column and hirsute above or all hirsute, or rarely with sparse trichomes. *Anthers* basifixed, rarely versatile. *Style* entire or inconspicuously trifurcated, apparent or hidden by the anthers. *Capsule* globose, rarely ovoid.

A unique combination of synapomorphies given in Table S14 (Electr. Suppl.) was reported for all species of sect. *Cephalanthum* at three independent nucleotide positions distributed only in the nrDNA marker.

Species assigned. – *Sisyrinchium albipidense* Ravenna, *S. commutatum* Klatt subsp. *capillare* (Baker) Ravenna, *S. commutatum* Klatt subsp. *commutatum*, *S. fasciculatum* Klatt, *S. fiebrigii* I.M.Johnst., *S. hasslerianum* Baker, *S. hoehnei* I.M.Johnst., *S. ostenianum* Beauverd, *S. platycaule* Baker, *S. purpurellum* Ravenna subsp. *purpurellum*, *S. purpurellum* subsp. *trichospathum* Ravenna, *S. rambonis* R.C.Foster, *S. scariosum* I.M.Johnst., *S. sellowianum* Klatt, *S. setaceum* Klatt, *S. soboliferum* Ravenna, *S.* sp. nov. aff. *claritae* Herter, *S.* sp. nov. aff. *hasslerianum* Baker, *S.* sp. nov. aff. *luzula* Klotzsch ex Klatt, *S.* sp. nov. aff. *scariosum* I.M.Johnst. 01, *S.* sp. nov. aff. *scariosum* I.M.Johnst. 02, *S. subnudum* I.M.Johnst.

Notes and taxonomic history. – In an attempt to provide an updated subgeneric treatment of *Sisyrinchium*, Baker (1877) created the section *Cephalanthum* to accommodate species with simple floriferous stem and numerous spathes grouped in a congested synflorescence. The description of the section was modified later by Diels (1930) to incorporate only species with filaments connate almost to the top, excluding species belonging to sect. *Viperella* in the present study. One of the main traits of *Cephalanthum* is the fasciculiform synflorescence, a common feature shared by more than 91% of the 24 taxa reported in the corresponding strongly supported clade (Fig. 1B), *S. setaceum* and *S. rambonis* being the only species with a single terminal rhipidium. According to Ravenna's subgeneric taxonomic treatment, members of this lineage were distributed among sections *Scirpeocharis* and *Lenitium*, except *S. rambonis*, which fell in sect. *Sisyrinchium*. The phylogenetic relationships observed in the current study showed that neither *Scirpeocharis* nor *Lenitium* formed monophyletic groups even though various evolutionary relationships remained unresolved in the *Cephalanthum* clade. Section

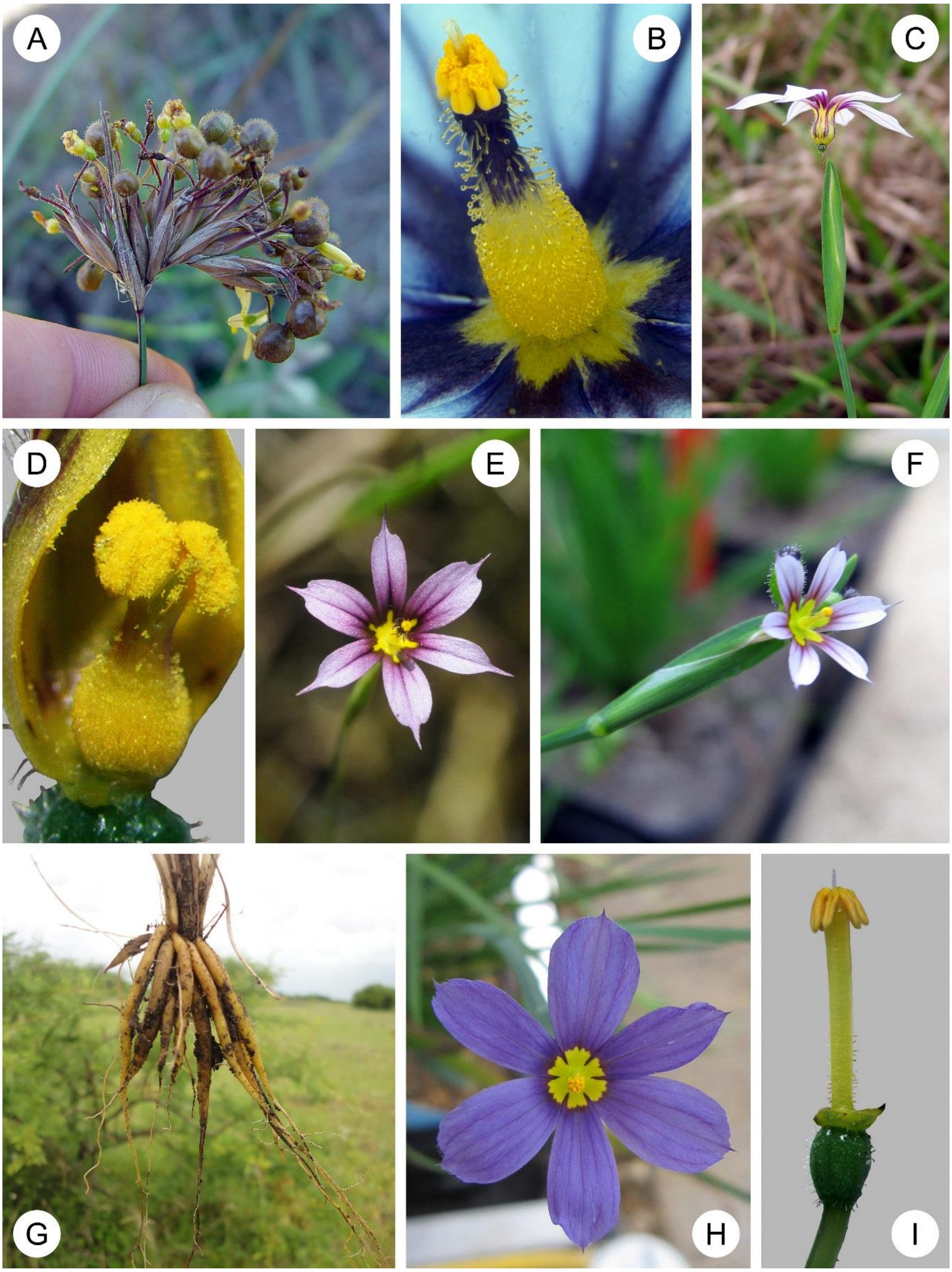


Fig. 5. Morphological features for characterization of sections *Cephalanthum*, *Morphanthus*, *Rhizilineum* and *Sisyrinchium*: *S.* sect. *Cephalanthum*: **A,** *S. hasslerianum* Baker – synflorescence fasciculiform; **B,** *S. scariosum* I.M.Johnst. – filaments connate to the top, elaiophores on the basis of staminal column. Sect. *Morphanthus*: **C,** *S. micranthum* Cav. – perigon cup shaped. **D,** *S. micranthum* Cav. – staminal column carboy-shaped with elaiophores. Sect. *Rhizilineum*: **E,** *S. minutiflorum* Klatt and **F,** *S. minus* Engelm. & A.Gray – perigon disk shaped with lilac spreading tepals. Sect. *Sisyrinchium*: **G,** *S. pachyrhizum* Baker – fleshy roots; **H,** *S. angustifolium* Mill. – flower bluish violet; **I,** *S. bellum* S.Watson – staminal column with sparse trichomes.

Scirpeocharis gathered species with terete floriferous stem, while sect. *Lenitium* grouped plants with ancipitate floriferous stem and often flaccid leaves (Ravenna, 2000) but members of both sections shared pseudolateral and congested synflorescences, flowers with filaments connate nearly to the top and trichomes densely distributed at the base of the staminal column. However, *Sisyrinchium* sp. nov. aff. *luzula* 01, an unpublished taxon included in the current sampling, diverged from these common features since filaments were only connate at the base with sparse trichomes. The diagnosis of the section was improved to embrace species with floral trichomes and many sessile rhipidia in a congested pseudolateral synflorescence, but also to incorporate the minor morphological variations observed in few species and related to the diagnostic characters listed in the description. The lectotype was selected among *Cephalanthum* species because *S. ostenianum* is readily distinguished by conspicuous morphological features (Beauverd, 1922) and displays the most common diagnostic character states of the section.

Distribution. – South America, in the ecoregions of Cerrado, Chaco, Pampa, Brazilian Atlantic Forest, Parana Forest, *Araucaria angustifolia* forest, with high species richness in South Brazil.

Sisyrinchium sect. ***Trichoparcus*** C.D.Inácio, Chauveau & L.Eggers, **sect. nov.** – Type: *Sisyrinchium uliginosum* Ravenna

Diagnosis: *Sisyrinchium sect. Trichoparcus differs from sect. Cephalanthum, its sister clade, by the branched synflorescence with conspicuous internodes versus fasciculiform synflorescence.*

Perennial herbs, rhizome present or not, conspicuous or not, short, with fibrous and slender or fleshy roots. *Leaves* basal, plane. *Floriferous stem* branched or simple, ancipitate, obviously winged, with bracts along the stem, terminal bract absent. *Synflorescence* branched with conspicuous internodes (Fig. 4I) or rarely spiciform with short internodes, two to ten to more rhipidia, spathes sessile or pedunculate. *Perigon* disk shaped or with spreading tepals, yellow. *Filaments* connate nearly to the top, or exceptionally connate at different lengths, staminal column cylindrical, trichomes usually sparse, rarely absent and infrequently true trichomal elaiophores according to Vogel's definition (Vogel, 1974). *Anthers* basifixed or rarely versatile. *Style* entire, inconspicuously or conspicuously trifurcate, apparent or hidden by the anthers. *Capsule* globose to obovoid, ellipsoid.

A combination of synapomorphies given in Table S15 (Electr. Suppl.) was reported for all species of sect. *Trichoparcus* at four single and one compound nucleotide positions distributed only in two cpDNA regions.

Species assigned. – *Sisyrinchium avenaceum* Klatt, *S. foliosum* I.M.Johnst., *S. megapotamicum* Malme, *S. rosengurttii* I.M.Johnst., *S. uliginosum* Ravenna, *S. valparadiseum* Ravenna.

Notes and taxonomic history. – The strongly supported clade *Trichoparcus* included six sampled species (Fig. 1C) with yellow flowers mainly distinguished by a cylindrical staminal column mostly with sparse trichomes, entire style and branched synflorescence with conspicuous internodes. The two closely related species *S. avenaceum* and *S. rosengurttii* display a divergent morphology with filaments only partially united, trifurcated style and spiciform synflorescence; while *S. foliosum* is discerned by the presence of elaiophores. The type species presently designated for sect. *Trichoparcus* was unequivocally monophyletic in our study (Fig. 1C). Moreover, *S. uliginosum* is easily identified by distinctive morphological traits (Ravenna, 1981) and exhibits the most common diagnostic character states of the section.

Distribution. – South America, in the ecoregions of Chaco, Pampa, Parana Forest and *Araucaria angustifolia* forest.

Etymology. – The name *Trichoparcus* refers to the few trichomes usually present at the base of the staminal column.

Sisyrinchium sect. ***Morphanthus*** C.D.Inácio, Chauveau & L.Eggers, **sect. nov.** – Type: *Sisyrinchium micranthum* Cav.

Diagnosis: *Sisyrinchium sect. Morphanthus differs from sect. Trichoparcus, its sister clade, by a cup shaped perigon, a carboy-shaped staminal column with elaiophores at the base and a line of trichomes along the mid-vein at the adaxial side of tepals, while sect. Trichoparcus presents disk shaped perigon with ascending or truly spreading tepals, cylindrical staminal column with trichomes usually sparse, rarely absent or forming an elaiophore, and no trichomes at the adaxial side of tepals.*

Annual herbs, rhizome absent with fibrous and slender roots. *Leaves* basal, plane. *Floriferous stem* branched, ancipitate, obviously winged, with bracts along the stem, terminal bract absent. *Synflorescence* branched with conspicuous internodes, two to ten rhipidia, spathes pedunculate. *Perigon* conspicuously cup shaped (Fig. 5C), yellow, white or lilac. Tepals with adaxial side with oil glandular trichomes. *Filaments* connate at different lengths but never to the top, staminal column carboy-shaped, with elaiophores at the base (Fig. 5D). *Anthers* basifixed. *Style* conspicuously trifurcate, alternate to the anthers. *Capsule* globose.

Taxa belonging to sect. *Morphanthus* revealed molecular synapomorphies at two single and three compound nucleotide positions listed in Table S16 (Electr. Suppl.) and distributed among one cpDNA region and the nrDNA marker.

Species assigned. – *Sisyrinchium micranthum* Cav., *S. rosulatum* E.P.Bicknell.

Notes and taxonomic history. – Ravenna created seven infraspecific subdivisions in an attempt to account for the morphological diversity of *S. micranthum* (Ravenna, 2001a). However, plants often present contradictory combinations of character states and the subspecies and forms published by Ravenna are not presently accepted (Chauveau & al., 2011; Barker, 2014). The morphological variations observed in *S. micranthum* were represented in the current study by 15 accessions distributed in seven morphotypes, which were retrieved together with *S. rosulatum* in the fully supported *Morphanthus* clade (Fig. 1C). Both species were included by Ravenna (2001b) in the section *Sisyrinchium* but the supports obtained for the monophyly of this lineage, together with clear morphological and molecular differences with regards to the related taxa, led us to recognize *Morphanthus* as a separated section. The type species selected for the section was the first formally described and *S. micranthum* is the most widespread member of sect. *Morphanthus*.

Distribution. – North America, in Eastern Temperate Forests; Central America; South America in diverse ecoregions of the Neotropical region and the South American transition zone, from Venezuela to northern Argentina.

Etymology. – The name of the section is based on the high level of floral plasticity of the type species.

Sisyrinchium sect. ***Rhizilineum*** C.D.Inácio, Chauveau & L.Eggers, **sect. nov.** – Type: *Sisyrinchium minus* Engelm. & A.Gray

Diagnosis: *Sisyrinchium sect. Rhizilineum differs from sect. Morphanthus, its sister clade, by a disk shaped perigon with spreading tepals and filaments connate nearly to the top, while sect. Morphanthus presents a cup shaped perigon and filaments connate at different lengths but never to the top.*

Annual herbs, rhizome absent with fibrous, thin and slender roots. *Leaves* basal, plane. *Floriferous stem* branched, ancipitate, obviously winged, with bracts along the stem, terminal bract absent. *Synflorescence* branched with conspicuous internodes, two to ten rhipidia, spathes pedunculate. *Perigon* disk shaped with spreading tepals, lilac (Fig. 5E-F). *Filaments* connate nearly to the top, staminal column cylindrical, with oil-producing trichomes forming elaiophores or not. *Anthers* basifixed. *Style* entire, usually hidden by the anthers. *Capsule* globose to obovoid, ellipsoid.

Species belonging to sect. *Rhizilineum* revealed a single molecular synapomorphy located in the *matK* region of the cpDNA (Electr. Suppl.: Table S17).

Species assigned. – *Sisyrinchium minus* Engelm. & A.Gray, *S. minutiflorum* Klatt, *S.* sp. nov. aff. *minutiflorum* Klatt.

Notes and taxonomic history. – In our study, the section *Rhizilineum* was represented by a monophyletic lineage of three species (Fig. 1C), one of them being still unpublished. This clade was strongly supported in Bayesian analysis with weak support in MP and ML analyses (Figs. 1C–S3C). However, the section was clearly separated from the rest of the genus by a set of robust characteristics as follows: annual species, oil-producing trichomes distributed on a cylindrical staminal column and style entire. The type species presently designated for sect. *Rhizilineum* formed the earliest diverging lineage of the section (Fig. 1C) and displays the most common character states considered as diagnostic in the current description.

Distribution. – North America, in Central and South USA and in the Great Plains of North Mexico; South America, in the ecoregions of Chaco, Pampa, Brazilian Atlantic Forest, Parana Forest and *Araucaria angustifolia* forest.

Etymology. – The name of the section refers to the thin, slender roots of annual plants.

Sisyrinchium sect. ***Sisyrinchium*** Lem. ex Klatt in Linnaea 31: 68. 1862 – Type: *Sisyrinchium bermudiana* L., nom. cons.

= *Sisyrinchium* sect. *Bermudiana* Benth. & Hook.f. in Gen. Pl. 3(2): 699. 1883. – Type: *Sisyrinchium bermudiana* L.

Perennial herbs, rhizome present or not, conspicuous or not, short, with fibrous and slender or fleshy roots (Fig. 5G). *Leaves* basal, plane. *Floriferous stem* branched or simple, ancipitate, obviously winged, with bracts or rarely not. *Inflorescence* or *synflorescence*, branched, with conspicuous internodes, sometimes with both, usually up to ten rhipidia, occasionally one or less than ten, spathes sessile or pedunculate, with bracts along the stem, terminal bract absent. *Perigon* disk shaped or rarely with spreading tepals or cup shaped, lilac, bluish violet (Fig. 5H), rarely yellow. *Filaments* connate nearly to the top, staminal column cylindrical (exceptionally carboy-shaped), with sparse trichomes (Fig. 5I), rarely moderate or dense. *Anthers* basifixed. *Style* entire or inconspicuously trifurcated, usually above the anthers. *Capsule* mainly globose or subglobose, but also obovoid, ellipsoid, ovoid, pyriform or obloid.

A unique combination of two synapomorphies (single nucleotide positions) distributed among two cpDNA regions was reported for all species of sect. *Sisyrinchium* and is given in Table S18 (Electr. Suppl.).

Species assigned. – *Sisyrinchium angustifolium* Mill., *S. bellum* S.Watson, *S. bermudiana* L., *S. campestre* E.P.Bicknell, *S. demissum* Greene, *S. funereum* E.P.Bicknell, *S. idahoense* E.P.Bicknell, *S. idahoense* var. *macounii* (E.P.Bicknell) Douglass M.Hend., *S. littorale* Greene, *S. miamense* E.P.Bicknell, *S. montanum* Greene, *S. nashii* E.P.Bicknell, *S. pachyrhizum* Baker subsp. *pachyrhizum*, *S. patagonicum* Phil. ex Baker, *S. platense* I.M.Johnst., *S. pruinosum* E.P.Bicknell, *S. radicatum* E.P.Bicknell, *S. sarmentosum* Suksd. ex Greene, *S. scabrum* Schltdl. & Cham.

Notes and taxonomic history. – The strongly supported clade *Sisyrinchium* encompassed 19 species of our taxonomic sampling (Fig. 1C) that were previously assigned to the section *Sisyrinchium sensu* Ravenna. The type species of the genus designated by Linnaeus (1753) was retrieved in this clade as well as the vast majority of North American species characterized by lilac to blue flowers with filaments connate nearly to the top in a cylindrical column and covered in the lower half by trichomes sparsely distributed. Contrastingly, the species from South America (*S. pachyrhizum*, *S. patagonicum* and *S. platense*) showed several specific morphological features in relation to the common characteristics observed for the North American species of the section.

Distribution. – North America, in almost entire USA, except in Arctic Cordillera, Tundra, Hudson Plain and Greenland; South America, in Andean region of Central Chile and Subantartic and ecoregions of Chaco and Pampa.

The taxonomic key to the sections provided below contains mainly character states related to the inflorescence (when only one rhipidium is present) and/or to the synflorescence (compound inflorescence with more than one rhipidium). The number of rhipidia, synflorescence type and/or branching, presence of terminal bract and internode length are essential distinctive features. However, floral and vegetative traits, as well as fruit characteristics are often critical to account for morphological differences among and within sections.

Key to *Sisyrinchium* sections

1. Flowers without trichomes or elaiophores ……………...……………………….. 2
1. Flowers with trichomes or elaiophores 8
2. Synflorescence or terminal rhipidium with a terminal bract …………………....... 3
2. Synflorescence or terminal rhipidium without a terminal bract 4
3. Fruit obloid …………………………………………………...…... ***S.*** sect. ***Segetia***
3. Fruit globose to subglobose, obovoid or ellipsoid ……………………………………
   …………………………………...…. ***S.*** sect. ***Viperella*** (*S. palmifolium* and allies)
4. Inflorescence with one terminal rhipidium ……...…………………………………… 5
4. Synflorescence with two or more rhipidia 6
5. Basal leaves inconspicuous (if present very short); cauline leaves present ......……………………..………………..… ***S.*** sect. ***Viperella*** (*S. vaginatum* and allies)
5. Basal leaves conspicuous; cauline leaves absent ……….…..… ***S.*** sect. ***Hydastylus***
6. Style entire ……………...……………... ***S.*** sect. ***Trichoparcus*** (*S. megapotamicum*)
6. Style conspicuously trifurcated ...………………………………………………... 7
7. Synflorescence not branched, spiciform ...…. ***S.*** sect. ***Spathirhachis*** (*S. convallium*)
7. Synflorescence branched …...……………………………….. ***S.*** sect. ***Echthronema***
8. Synflorescence spiciform ……...…………………………………………………… 9
8. Synflorescence fasciculiform or branched, rarely simple …..…………………… 10
9. Synflorescence with long internodes (longer than the length of the spathes) ………..
   ………………………………………………….................. ***S.*** sect. ***Spathirhachis***
9. Synflorescence with short internodes (shorter than the length of the spathes) ………
   ………………….……………. ***S.*** sect. ***Trichoparcus*** (*S. avenaceum, S. rosengurtii*)
10. Synflorescence with terminal bract ……..………………...…. ***S.*** sect. ***Cephalanthum***
10. Synflorescence without terminal bract …….……………………………………... 11
11. Plants conspicuously stoloniferous or plants erect with setaceous leaves ……………
    …………………...…….……… ***S.*** sect. ***Cephalanthum*** (*S. rambonis, S. setaceum*)
11. Plants erect with leaves obviously plane, never setaceous ……….……………… 12
12. Perigon cup shaped 13
12. Perigon disk shaped ……………...………………………………………….…. 14
13. Filaments connate at different lengths but never to the top; roots fibrous and slender, never fleshy .... ***S.*** sect. ***Morphanthus***
13. Filaments connate nearly to the top; roots fleshy . ***S.*** sect. ***Sisyrinchium*** (*S. platense*)

14. Plants annual …………...................................…………...…… ***S.*** **sect.** ***Rhizilineum***

14. Plants perennial …………………………….....................................……… 15

15. Filaments connate at different lengths but never to the top …………………………..
……...….… ***S.*** sect. ***Echthronema*** (*S. arizonicum, S. macrophyllum, S. tenuifolium*)

15. Filaments connate nearly to the top …..……………………………………………16

16. Flowers bluish violet, lilac .…………..……………………... ***S.*** sect. ***Sisyrinchium***

16. Flowers yellow ………………………………………………………………… 17

17. Staminal column with sparse oil-producing trichomes at the base ………………..…
……………………………. ***S.*** sect. ***Trichoparcus*** (*S. uliginosum*, *S. valparadiseum*)

17. Staminal column with elaiophores or with moderate density of oil-producing trichomes at the base …….…………...………………………………………… 18

18. Roots fibrous and slender …..……………..….... ***S.*** sect. ***Trichoparcus*** (*S. foliosum*)

18. Roots fleshy …...……….... ***S.*** sect. ***Sisyrinchium*** (*S. patagonicum, S. pachyrhizum*)

■ DISCUSSION

This study presents the most comprehensive molecular phylogeny of *Sisyrinchium* and allied genera, with a set of taxonomic samples covering most of the range area of the genus but also all previously described infrageneric subdivisions. The genera *Libertia* and *Orthrosanthus* are sister to the remaining genera of Sisyrinchieae, with *Solenomelus* and *Olsynium* showing successive sister-relationships to *Sisyrinchium*. Such phylogenetic placements are fully congruent with tree topologies established in recent phylogenetic studies (Goldblatt & al., 2008, Chauveau & al., 2011, 2012, Karst & Wilson, 2012).

From the ten sections defined on the basis of our phylogenetic analyses, seven (*Hydastylus*, *Segetia*, *Echthronema*, *Spathirhachis*, *Viperella*, *Cephalanthum* and *Sisyrinchium*) were re-circumscribed and three new sections (*Trichoparcus*, *Morphanthus* and *Rhizilineum*) were recognized. All sections were strongly to fully supported in three-genome analyses, except sect. *Rhizilineum*, which was only weakly supported in MP and ML analyses.

The phylogenetic relationships among the three early-diverging sections *Hydastylus*, *Segetia* and *Echthronema* remain unresolved. The inclusion of various species from western South America revealed a strongly supported *Segetia* clade, which was a lineage represented by a single species (*S. jamesonii*) in the phylogeny of Chauveau & al. (2011) and was retrieved as the Caespispathum clade in Karst & Wilson (2012). Besides *S. praealtum* and

S. jamesonii that are also included in our sampling, *S. caespitificum* Kraenzl. and a sample of *S. palmifolium* from Peru fell into this clade. While the morphological description of *S. caespitificum* (see Urban, 1908) is consistent with sect. *Segetia* as it was re-circumscribed in the present work, *S. palmifolium* is not found in Peru (Ravenna, 2009; Karst & Wilson, 2012). The study of the specimen used by Karst & Wilson (2012), as well as the vouchers listed by Vargas (1944) for this species in Peru show that they belong to sect. *Segetia* and are different from the typical *S. palmifolium*, which is currently included in sect. *Viperella*. Sections *Hydastylus* and *Echthronema* were also previously retrieved in Chauveau & al. (2011) as clades I and II, and were recovered in Karst & Wilson (2012) as sections *Hydastylus* and *Sipacapa*, respectively. Besides various species included in our sampling, *S. transluscens* (E.P.Bicknell) Espejo & López-Ferr. was sampled by the latter authors and fell within sect. *Hydastylus*. This species from northwestern Mexico was initially described for the genus *Hydastylus* by Bicknell (1900) and shows morphological features fully consistent with the characteristics established for the section in the present study. Contrastingly, the placement of a specimen identified as *S. tenuifolium* within sect. *Hydastylus* by Karst & Wilson (2012) is incongruent with the phylogenetic relationships observed in our study for this species. Moreover, the sect. *Echthronema sensu* Ravenna, initially named *Sipacapa*, was typified with *S. tenuifolium*, which morphological characterisation is inconsistent with the species recovered in *Hydastylus.* Our results suggest that the identification of this specimen should be verified by the authors.

In the present study, sect. *Hydastylus* was the earliest-diverging clade of *Sisyrinchium* in any of the trees obtained from phylogenetic analyses of the nrDNA region (Fig. 2C and Electr. Suppl.: Fig. S2). Conflicting topologies were detected among parsimony and probability-based methods for the cpDNA + mtDNA data set, the same sister-relationship being observed for MP analysis, whereas ML and BI analyses placed sect. *Segetia* sister to the remaining sections of the genus. Complementary phylogenetic analyses without missing data have shown that the ML and BI analyses of cpDNA + mtDNA and three-genome data sets might have been locally biased by ambiguities (missing data), whereas higher supports were reported for the MP topologies. Such topological conflict, wherein probability-based methods interpret ambiguity as support, are common and this was demonstrated in the context of non-randomly distributed missing data but also when characters are only scored for few terminals (Simmons, 2012a, 2012b; Bertels & al., 2014). Simmons (2014a, 2014b) established that, in these cases, parsimony-based topologies and branch-support values should be preferred. However, since the phylogenetic relationships among sects. *Hydatylus*, *Segetia* and *Echthronema* were still inconsistent among MP, ML and BI trees in the absence of missing data, six alternative topologies were considered (Fig. 2F). In this context, relationships among the earliest-diverging sections remained unresolved, even though MP and ML methods provided identical relationships and the placement of *Segetia* sister to the rest of the genus was not supported in BI topology when non-randomly distributed missing data were removed from both organelle and three-genome data sets (Figs. 2B and E).

Species of sections *Hydastylus* and *Segetia* are very similar morphologically, although they differ by the presence of a terminal bract subtending the spathe valves in sect. *Segetia* and the obviously winged floriferous stem in sect. *Hydastylus*. Members of sect. *Echthronema* are clearly distinct from species of both former sections by the compound inflorescence (= synflorescence) and the presence of bracts along the stem. These sections present flowers without trichomes and only few exceptions occurred among *Echthronema* species with some trichomes sparsely distributed along the staminal column (Chauveau & al., 2011). Moreover, oil-secretion was not detected by structural observations and histochemical tests performed in floral trichomes of *S. tenuifolium* (Silvério & al. 2012), the type species of the section. Members of these three sections range from north-western South America to south-western North America through Central America, but species of sect. *Segetia* are distributed in the southern part of this area, while taxa included in sect. *Echthronema* are found mostly in the northern part.

Section *Spathirhachis* is sister to the remaining sections of *Sisyrinchium*. Species of this taxonomic group are easily recognized by the spiciform synflorescence with long internodes. Elaiophores evolved probably one time at the base of *Spathirhachis* and are present on the staminal column and/or the adaxial side of tepals of almost all species included in this clade (Cocucci & Vogel, 2001; Chauveau & al., 2011, 2012; Silvério & al., 2012). This section was also recovered as clade III by Chauveau & al. (2011) and by Karst & Wilson (2012) at the same taxonomic rank with two additional taxa (*S. arenarium* subsp. *adenostemon* (Phil.) Ravenna and *S. nanum* Phil.) whose morphological features fit with the delimitation of the section established in the present study.

Section *Viperella*, as currently circumscribed, includes species of former sections *Viperella* and *Hydastylus sensu* Ravenna, embracing plants with flowers devoid of floral trichomes. In vegetative state, the section encompasses plants with (*S. vaginatum* and allies) or without cauline leaves (*S. palmifolium* and allies). Section *Viperella* is equivalent to clade IV of Chauveau & al. (2011) and the Megacephalum clade of Karst & Wilson (2012), although this second study did not include species from the sect. *Viperella sensu* Ravenna.

Ravenna (2000) distinguished sect. *Lenitium* from sect. *Scirpeocharis* by the presence of ancipitate versus terete floriferous stem, but both taxonomic entities were not monophyletic. Therefore, species of these two former sections were grouped together in sect. *Cephalanthum* of the present study and are recognized mostly by their fasciculiform synflorescence and flowers showing filaments connate nearly to the top with elaiophores distributed at the base of the staminal column. A similar monophyletic group named clade V was previously identified in the phylogenetic study of Chauveau & al. (2011). Karst & Wilson (2012), on the other hand, just sampled two species of sect. *Lenitium sensu* Ravenna that were recovered together with a specimen of *S. minutiflorum* from Venezuela. However, the identification of the latter sample should be verified since the species occurs only from Southern Brazil to Northeastern Argentina (Barker, 2014) and is included in sect. *Rhizilineum* of the current study. The species diversity of sect. *Cephalanthum* as of the previous section *Viperella* is actually centred in Southern Brazil and restricted to South America with very few species occurring in the north western part of the continent.

Trichoparcus, *Morphanthus* and *Rhizilineum* are sections newly recognized in this study. Sect. *Trichoparcus* encompasses species from southeast South America, mostly with plane leaves, branched synflorescence, and filaments connate nearly to the top. However, the section is characterized by a high level of morphological plasticity, which is reflected by the number of paths used in the identification key to discriminate members of this taxonomic group from the rest of the genus. Karst & Wilson (2012) did not sample *Trichoparcus* species but they were recovered by Chauveau & al. (2011) in a monophyletic group named clade VI. Section *Morphanthus* corresponds to clade VII of Chauveau & al. (2011) and to Mesmeria clade of Karst & Wilson (2012). While sect. *Morphanthus* encompasses *S. rosulatum* and seven different morphotypes of *S. micranthum*, three additional species were recovered in the Mesmeria clade (*S. exile* E.P.Bicknell, *S. iridifolium* Kunth and *S. dasyspathum* (Ravenna) Ravenna). However, the two former taxa are respectively synonyms of *S. rosulatum* and *S. micranthum* (Barker, 2014) and the presence of the latter species in this clade is quite unexpected because it was described in sect. *Lenitium sensu* Ravenna (Ravenna, 1981, 2009), which was merged in sect. *Cephalanthum* in the current study, and this placement is robustly supported by the morphological description of the species. Moreover, sections *Cephalanthum* and *Morphanthus* are characterized by two different sets of molecular synapomorphies located in the ITS region and the comparison of nrDNA sequences confirmed that the sample used by Karst & Wilson (2012) belongs to sect. *Morphanthus* and that it is probably not *S. dasyspathum*. Section *Rhizilineum* is equivalent to clade VIII recovered by Chauveau & al. (2011) and was apparently not represented in the study conducted by Karst & Wilson (2012) since *S. minutiflorum*, the only member of this section included in the study, was probably misidentified. However, a sample from Mexico, identified as *S. cernuum* (E.P.Bicknell) Kearny, was included in sect. *Sisyrinchium* by Karst & Wilson (2012) and recovered sister to the rest of the section in a phylogenetic relationship similar to sect. *Rhizilineum*. Comparison of DNA sequences not only showed that this sample is a member of sect. *Rhizilineum* in the current updated classification, but also that the *matK* and ITS sequences of this specimen were identical, except for one position in the nrDNA, to sequences obtained for *S. minus* in our study, a species also partly distributed in Mexico. Consequently, the identification of this sample should be considered as doubtful, even more because the morphological features of *S. cernuum* do not match with sect. *Rhizilineum* but with sect. *Hydastylus*. These taxonomic comments show that, although few species are supposedly included in sects. *Morphanthus* and *Rhizilineum*, both taxonomic groups are strongly supported by molecular and morphological evidences.

While sections *Morphanthus* and *Rhizilineum* range widely from the south of North America to Northeastern Argentina, the remaining section *Sisyrinchium* includes mainly species distributed in North America and characterized by a staminal column sparsely covered with trichomes devoid of lipidic secretion. Oil-producing trichomes are restricted to the few species found in South America. North American species of the genus were treated by Cholewa & Henderson (2002) and 41 taxa were extensively described with an identification key provided. Among the species sampled by Karst & Wilson (2012) and recovered in sect. *Sisyrinchium*, six species from North America (*S. albidum* Raf., *S. atlanticum* E.P.Bicknell, *S. capillare* E.P.Bicknell, *S. fuscatum* E.P.Bicknell, *S. mucronatum* Michx., *S. xerophyllum* Greene) and two from South America (*S. azureum* Phil., *S. macranthum* Griseb.) were not included in our sampling. The information provided by Cholewa & Henderson (2002) for the North American species as well as the types and original descriptions (Philippi, 1860; Grisebach, 1879) examined for the South American species showed unequivocally that, on a morphological point of view, all these species belong to sect. *Sisyrinchium*.

The two species *S. chilense* and *S. elegantulum* remained unplaced in the updated classification because the speciation process of both species involved at least one hybrid origin, which has probably taken place between ancestors of two major sublineages of the genus *Sisyrinchium* (i.e. *Cephalanthum* and *Morphanthus* + *Rhizilineum* + *Sisyrinchium*). However, they are clearly distinct geographically and morphologically. Distributed in western South America, *S. chilense* was placed in sect. *Sisyringium* by Klatt (1861–1862) and Baker (1877), and accommodated afterwards in sect. *Sisyrinchium* by Ravenna (2006). This species exhibits morphological features typical of sect. *Sisyrinchium* as defined in our classification. Ravenna (2006) described *S. elegantulum*, a species from Southern Brazil, in sect. *Scirpeocharis,* which is currently merged in sect. *Cephalanthum.* The morphological affinities of *S. chilense* with species of sect. *Sisyrinchium* on the one hand, and *S. elegantulum* with *Cephalanthum* species on the other hand, could suggest that these species originated from distinct reticulation events, but the resolution of various phylogenetic relationships should be improved within both lineages to test this hypothesis.

Integrating and evaluating information from different types of data and methodologies within a formalized framework is now widely considered as the most efficient approach to define and test taxonomic hypotheses (Pessoa & al., 2012; Carsten & al., 2013; Pante & al., 2015). A first exploratory step based on molecular genetic data was used in this study to detect highly divergent lineages in an evolutionary context. One of the major challenges for molecular-driven taxonomy is to select the appropriate monophyla and evaluate them against each other (de Queiroz, 2007; Jörger & Schrödl, 2013). Phylogenetic hypotheses with strong support values for all major clade relationships were primarily selected and alternative topologies were evaluated when conflicting or unresolved relationships were detected. In a second step, morphological, molecular and biogeographical data were combined to characterize and test the robustness of each major lineage identified within *Sisyrinchium*. In character-based taxonomy, the description of taxa should be established from characteristic differences observed among closely related taxonomic groups and, ideally, from synapomophies (Jörger & Schrödl, 2013). The diagnostic morphological characters used in the previous infrageneric classifications, such as presence vs. absence of cauline leaves or ancipitate vs. terete flowering stems (Ravenna, 2000; 2002b; 2003b), were not distinctive in the current taxonomic and phylogenetic context, as were all morphological and biogeographical characters tested in this study. However, distinct combinations of morphological character states were found to characterize each section. Among these traits, the fusion of the filaments, but also the presence of elaiophores and the type of synflorescence (used for the first time at this taxonomic level), were especially valuable and displayed useful variation along the evolutionary history of the genus. The set of morphological character states provided to distinguish each section was here completed by molecular traits. To enhance the robustness of the DNA diagnostic characters, they were determined for each section in relation to all other lineages of the same taxonomic rank, rather than just to the respective sister taxon as is the default in CAOS. Moreover, reconstructions of ancestral sequences were conducted to support homology and differentiate between apomorphic and plesiomorphic character states. However, we are aware that the description of taxa based on molecular data might contain errors in the form of incorrectly assumed apomorphies, especially in the context of incompletely sampled lineages (Jörger & Schrödl, 2013), but we believe that the combination of morphological and molecular diagnostic characters provides a strongly supported taxonomic framework for future studies (e.g., see Kadereit & al., 2012; Ornelas-Gatdula & al., 2012; Aduse-Poku & al., 2016).

Taxonomic delimitations are frequently hard to establish based only on morphology (Dayrat, 2005; Padial & al., 2010), especially when recent phylogenetic divergences, reticulate evolution, ongoing speciation and high phenotypic plasticity are detected (Duminil & al., 2012) as was found for the genus *Sisyrinchium* (e.g. Henderson, 1976; Cholewa & Henderson, 1984, Tacuatiá & al., 2012a, 2012b, 2016). In fact, the results obtained in the current study confirmed that all previous infrageneric classifications based on morphological data alone did not reflect phylogenetic relationships. Morphology-based taxonomy was predominant during more than 250 years, but new methods and data, especially molecular, are now available and widely applied for systematics and taxonomic purposes (Padial & al., 2010). From 2006 to 2013, almost 50% of the scientific publications related to species delimitation and based on the integrative taxonomy approach used two different categories of characters and 89.7% of these studies combined molecular and morphological characters (Pante & al., 2015). However, the number of different data types and criteria needed to define taxa and their relationships vary according to the taxonomic level considered and the approach applied (Carstens & al., 2013; Pante & al., 2015). Results of the current study show that, even though molecular and morphological evidence were relevant for the identification and delimitation of the different sections within *Sisyrinchium*, the most derived infrageneric subdivisions (*Morphanthus*, *Rhizilineum* and *Sisyrinchium*) were not easily distinguished using these data, and relationships among the early-diverging sections remained unresolved. The delimitation of taxa that have low levels of genetic divergence, because diversification is either too recent or happened too fast, remains a challenging task (Pessoa & al., 2012). Complementary approaches, such as phylogeography, comparative anatomy, cytology and ecology, should be used to improve our knowledge in an evolutionary context.

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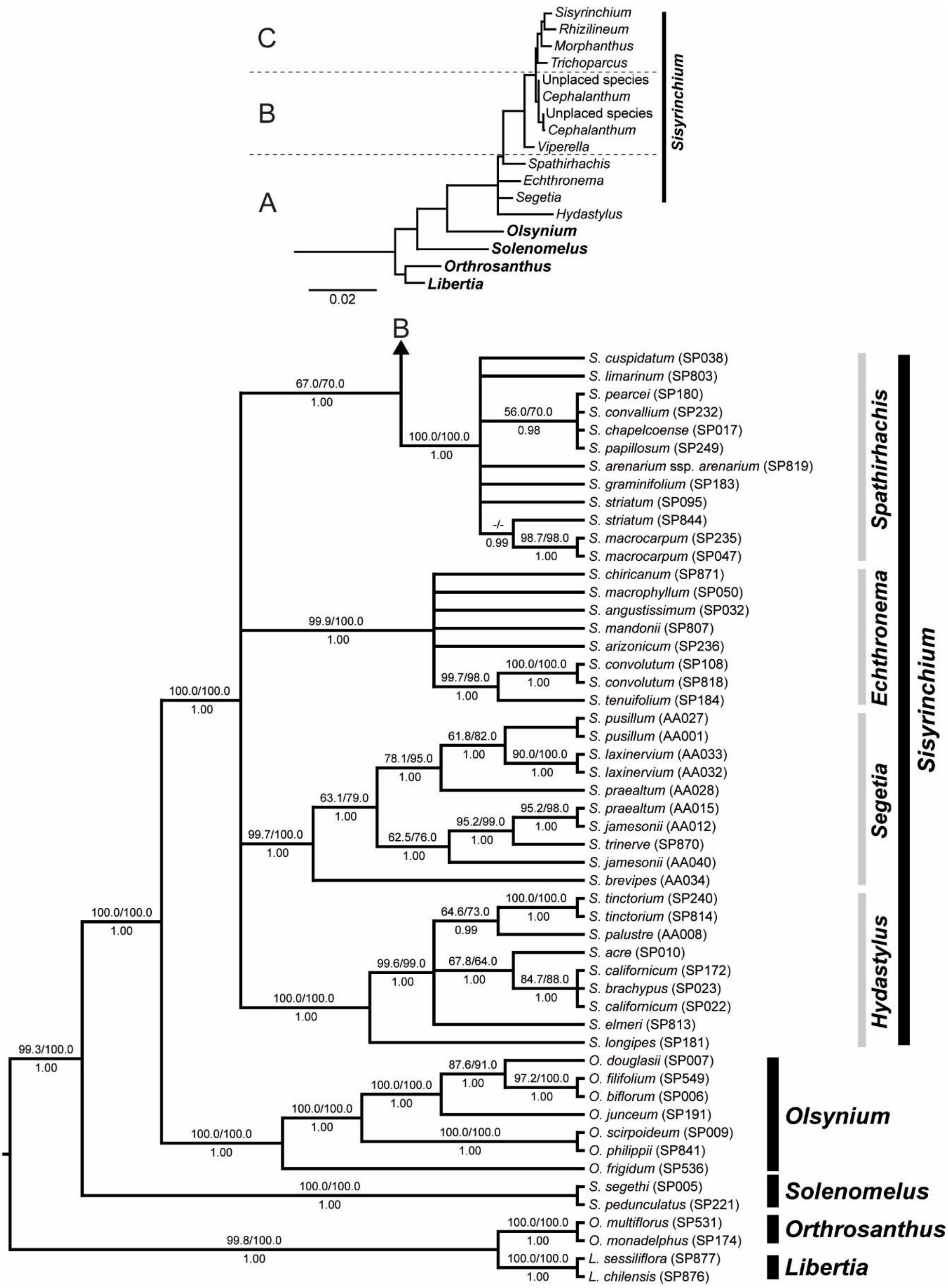
Supplementary Material


C
B
A
Sisyrinchium
Rhizilineum
Morphanthus
Trichoparcus
Unplaced species
Cephalanthum
Unplaced species
Cephalanthum
Viperella
Spathirhachis
Echthronema
Segetia
Hydastylus
Olsynium
Solenomelus
Orthrosanthus
Libertia
Sisyrinchium
0.02
B
S. cuspidatum (SP038)
S. limarinum (SP803)
S. pearcei (SP180)
S. convallium (SP232)
S. chapelcoense (SP017)
S. papillosum (SP249)
S. arenarium ssp. arenarium (SP819)
S. graminifolium (SP183)
S. striatum (SP095)
S. striatum (SP844)
S. macrocarpum (SP235)
S. macrocarpum (SP047)
S. chiricanum (SP871)
S. macrophyllum (SP050)
S. angustissimum (SP032)
S. mandonii (SP807)
S. arizonicum (SP236)
S. convolutum (SP108)
S. convolutum (SP818)
S. tenuifolium (SP184)
S. pusillum (AA027)
S. pusillum (AA001)
S. laxinervium (AA033)
S. laxinervium (AA032)
S. praealtum (AA028)
S. praealtum (AA015)
S. jamesonii (AA012)
S. trinerve (SP870)
S. jamesonii (AA040)
S. brevipes (AA034)
S. tinctorium (SP240)
S. tinctorium (SP814)
S. palustre (AA008)
S. acre (SP010)
S. californicum (SP172)
S. brachypus (SP023)
S. californicum (SP022)
S. elmeri (SP813)
S. longipes (SP181)
O. douglasii (SP007)
O. filifolium (SP549)
O. biflorum (SP006)
O. junceum (SP191)
O. scirpoideum (SP009)
O. philippii (SP841)
O. frigidum (SP536)
S. segethi (SP005)
S. pedunculatus (SP221)
O. multiflorus (SP531)
O. monadelphus (SP174)
L. sessiliflora (SP877)
L. chilensis (SP876)
Spathirhachis
Echthronema
Segetia
Hydastylus
Sisyrinchium
Olsynium
Solenomelus
Orthrosanthus
Libertia
67.0/70.0
1.00
100.0/100.0
1.00
56.0/70.0
0.98
-/-
0.99
98.7/98.0
1.00
99.9/100.0
1.00
100.0/100.0
1.00
99.7/98.0
1.00
100.0/100.0
1.00
61.8/82.0
1.00
90.0/100.0
1.00
78.1/95.0
1.00
63.1/79.0
1.00
95.2/98.0
1.00
95.2/99.0
1.00
99.7/100.0
1.00
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1.00
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100.0/100.0
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1.00
97.2/100.0
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100.0/100.0
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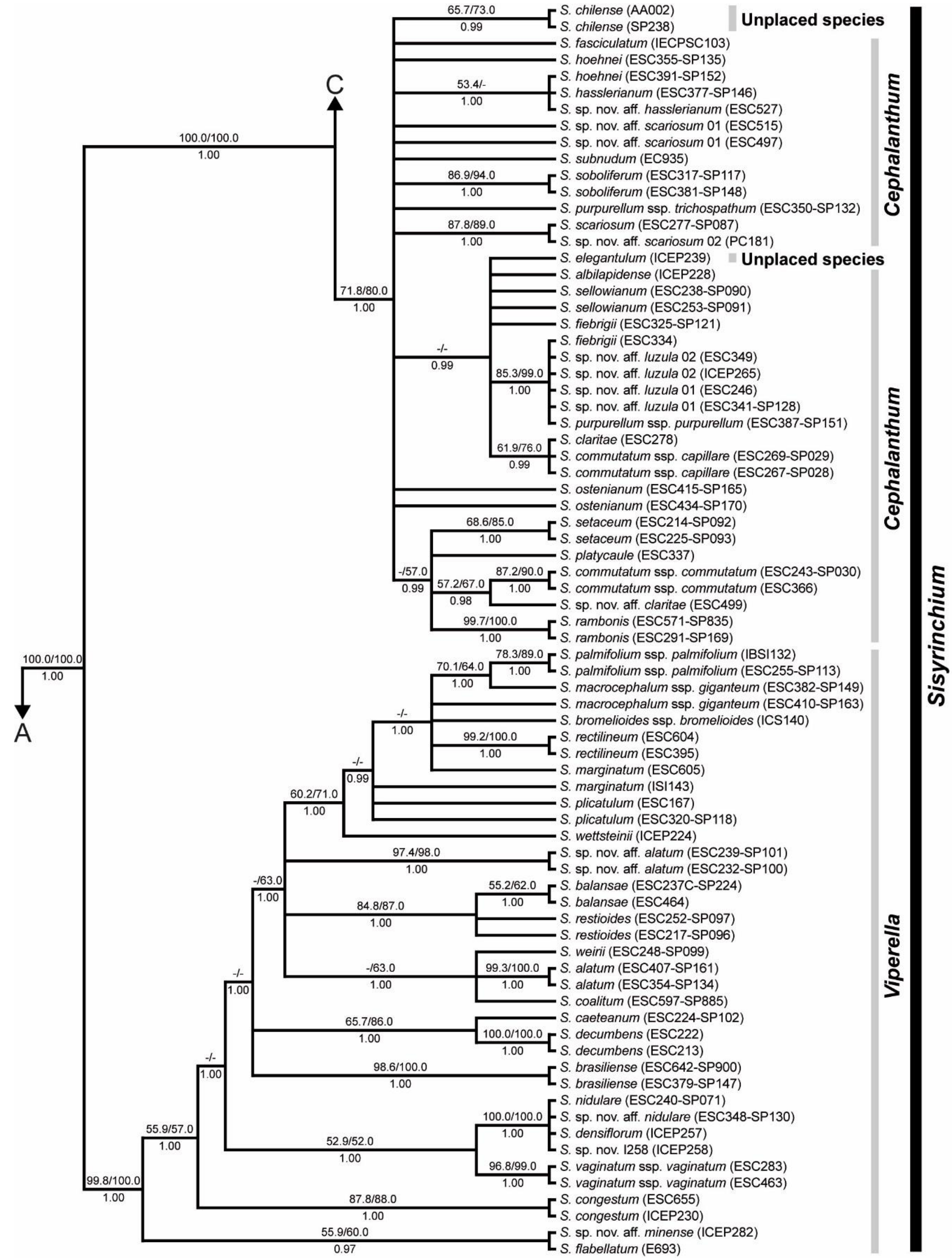
Fig. S1A



S. chilense (AA002)
S. chilense (SP238)
Unplaced species
S. fasciculatum (IECPSC103)
S. hoehnei (ESC355-SP135)
S. hoehnei (ESC391-SP152)
S. hasslerianum (ESC377-SP146)
S. sp. nov. aff. hasslerianum (ESC527)
S. sp. nov. aff. scariosum 01 (ESC515)
S. sp. nov. aff. scariosum 01 (ESC497)
S. subnudum (EC935)
S. soboliferum (ESC317-SP117)
S. soboliferum (ESC381-SP148)
S. purpurellum ssp. trichospathum (ESC350-SP132)
S. scariosum (ESC277-SP087)
S. sp. nov. aff. scariosum 02 (PC181)
Cephalanthum
S. elegantulum (ICEP239)
Unplaced species
S. albilapidense (ICEP228)
S. sellowianum (ESC238-SP090)
S. sellowianum (ESC253-SP091)
S. fiebrigii (ESC325-SP121)
S. fiebrigii (ESC334)
S. sp. nov. aff. luzula 02 (ESC349)
S. sp. nov. aff. luzula 02 (ICEP265)
S. sp. nov. aff. luzula 01 (ESC246)
S. sp. nov. aff. luzula 01 (ESC341-SP128)
S. purpurellum ssp. purpurellum (ESC387-SP151)
S. claritae (ESC278)
S. commutatum ssp. capillare (ESC269-SP029)
S. commutatum ssp. capillare (ESC267-SP028)
S. ostenianum (ESC415-SP165)
S. ostenianum (ESC434-SP170)
S. setaceum (ESC214-SP092)
S. setaceum (ESC225-SP093)
S. platycaule (ESC337)
S. commutatum ssp. commutatum (ESC243-SP030)
S. commutatum ssp. commutatum (ESC366)
S. sp. nov. aff. claritae (ESC499)
S. rambonis (ESC571-SP835)
S. rambonis (ESC291-SP169)
Cephalanthum
S. palmifolium ssp. palmifolium (IBSI132)
S. palmifolium ssp. palmifolium (ESC255-SP113)
S. macrocephalum ssp. giganteum (ESC382-SP149)
S. macrocephalum ssp. giganteum (ESC410-SP163)
S. bromelioides ssp. bromelioides (ICS140)
S. rectilineum (ESC604)
S. rectilineum (ESC395)
S. marginatum (ESC605)
S. marginatum (ISI143)
S. plicatulum (ESC167)
S. plicatulum (ESC320-SP118)
S. wettsteinii (ICEP224)
S. sp. nov. aff. alatum (ESC239-SP101)
S. sp. nov. aff. alatum (ESC232-SP100)
S. balansae (ESC237C-SP224)
S. balansae (ESC464)
S. restioides (ESC252-SP097)
S. restioides (ESC217-SP096)
S. weirii (ESC248-SP099)
S. alatum (ESC407-SP161)
S. alatum (ESC354-SP134)
S. coalitum (ESC597-SP885)
S. caeteanum (ESC224-SP102)
S. decumbens (ESC222)
S. decumbens (ESC213)
S. brasiliense (ESC642-SP900)
S. brasiliense (ESC379-SP147)
S. nidulare (ESC240-SP071)
S. sp. nov. aff. nidulare (ESC348-SP130)
S. densiflorum (ICEP257)
S. sp. nov. I258 (ICEP258)
S. vaginatum ssp. vaginatum (ESC283)
S. vaginatum ssp. vaginatum (ESC463)
S. congestum (ESC655)
S. congestum (ICEP230)
S. sp. nov. aff. minense (ICEP282)
S. flabellatum (E693)
Viperella
Sisyrinchium
C
A

Fig. S1B

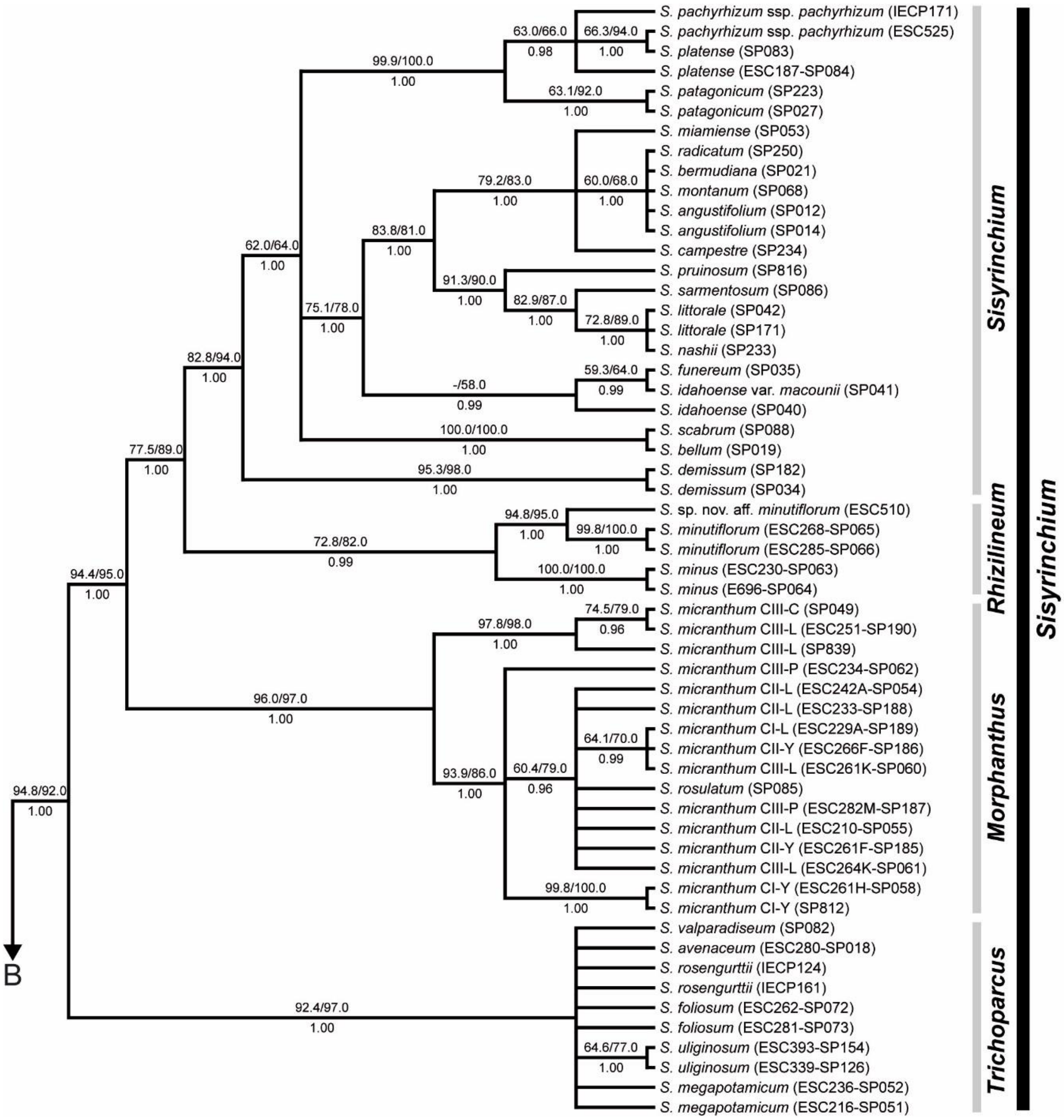


Fig. S1A–C. ML best-scoring phylogram and strict consensus tree based on the strict consensus tree of the parsimony ratchet, the estimated maximum likelihood tree and the Bayesian 50% majority rule consensus tree obtained from the analyses of the combined chloroplast and mitochondrial data set. The tree is rooted using *Neomarica candida* as outgroup. Support values indicated above branches follow the order PBS/LBS whereas PP are reported below branches. Bootstrap supports and posterior probabilities for a given node are provided only if one of the values reached the following thresholds: PBS ≥70% or LPB ≥70% or PP ≥0.95. A dash (-) indicates support value of less than 50% for PBS and LPB or less than 0.95 for PP. Vertical bold black bars indicate the genera of Sisyrinchieae while bold grey bars show the infrageneric classification established in the present study for the genus *Sisyrinchium*. Section names follow the revised taxonomic treatment.

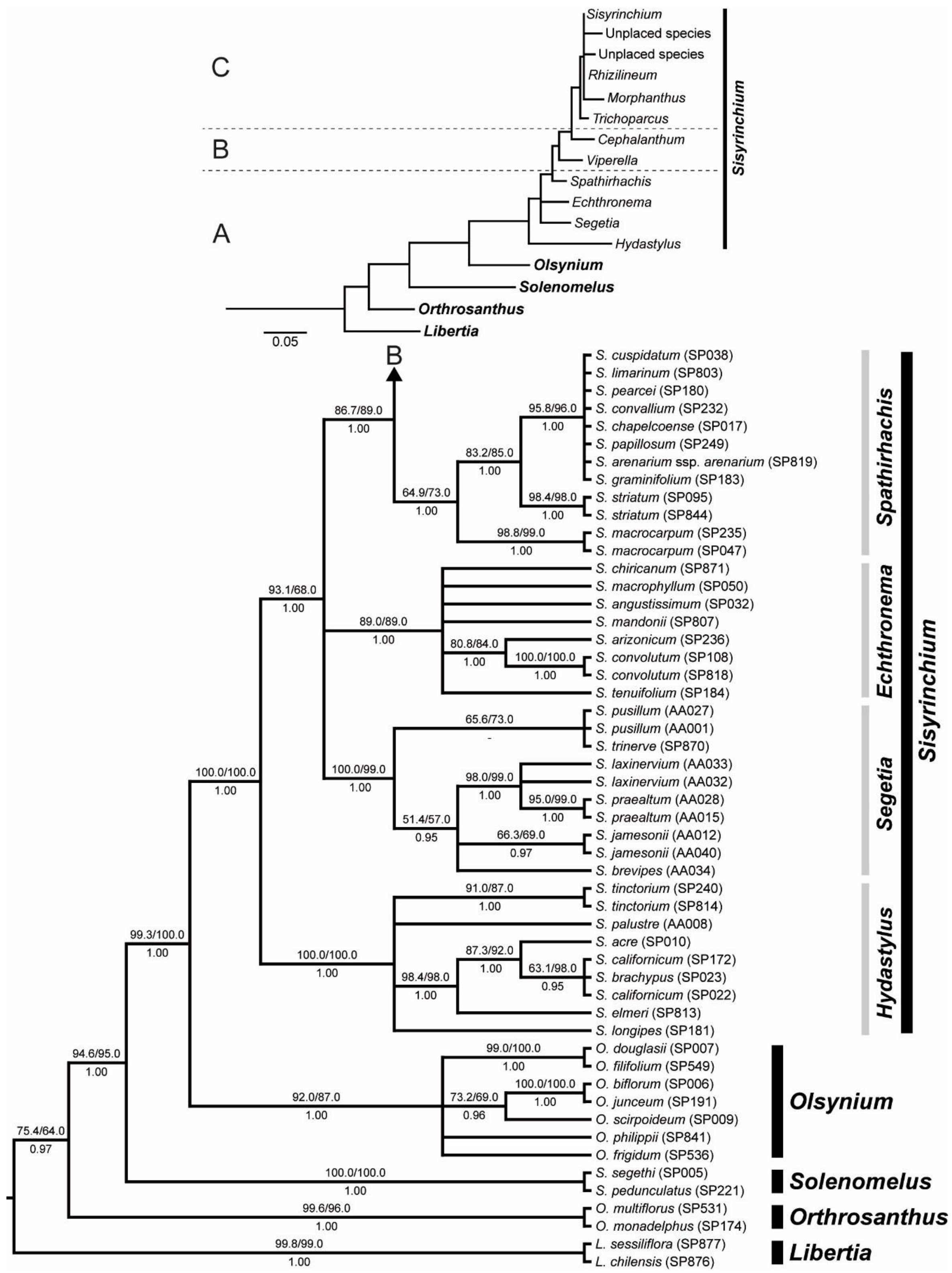

Sisyrinchium
Unplaced species
Unplaced species
Rhizilineum
Morphanthus
Trichoparcus
Cephalanthum
Viperella
Spathirhachis
Echthronema
Segetia
Hydastylus
Olsynium
Solenomelus
Orthrosanthus
Libertia
C
B
A
0.05
Sisyrinchium
S. cuspidatum (SP038)
S. limarinum (SP803)
S. pearcei (SP180)
S. convallium (SP232)
S. chapelcoense (SP017)
S. papillosum (SP249)
S. arenarium ssp. arenarium (SP819)
S. graminifolium (SP183)
S. striatum (SP095)
S. striatum (SP844)
S. macrocarpum (SP235)
S. macrocarpum (SP047)
S. chiricanum (SP871)
S. macrophyllum (SP050)
S. angustissimum (SP032)
S. mandonii (SP807)
S. arizonicum (SP236)
S. convolutum (SP108)
S. convolutum (SP818)
S. tenuifolium (SP184)
S. pusillum (AA027)
S. pusillum (AA001)
S. trinerve (SP870)
S. laxinervium (AA033)
S. laxinervium (AA032)
S. praealtum (AA028)
S. praealtum (AA015)
S. jamesonii (AA012)
S. jamesonii (AA040)
S. brevipes (AA034)
S. tinctorium (SP240)
S. tinctorium (SP814)
S. palustre (AA008)
S. acre (SP010)
S. californicum (SP172)
S. brachypus (SP023)
S. californicum (SP022)
S. elmeri (SP813)
S. longipes (SP181)
O. douglasii (SP007)
O. filifolium (SP549)
O. biflorum (SP006)
O. junceum (SP191)
O. scirpoideum (SP009)
O. philippii (SP841)
O. frigidum (SP536)
S. segethi (SP005)
S. pedunculatus (SP221)
O. multiflorus (SP531)
O. monadelphus (SP174)
L. sessiliflora (SP877)
L. chilensis (SP876)
B
86.7/89.0
1.00
95.8/96.0
1.00
83.2/85.0
1.00
64.9/73.0
1.00
98.4/98.0
1.00
98.8/99.0
1.00
93.1/68.0
1.00
89.0/89.0
1.00
80.8/84.0
1.00
100.0/100.0
1.00
65.6/73.0
-
100.0/100.0
1.00
100.0/99.0
1.00
98.0/99.0
1.00
95.0/99.0
1.00
51.4/57.0
0.95
66.3/69.0
0.97
91.0/87.0
1.00
99.3/100.0
1.00
100.0/100.0
1.00
87.3/92.0
1.00
63.1/98.0
0.95
98.4/98.0
1.00
94.6/95.0
1.00
99.0/100.0
1.00
100.0/100.0
1.00
92.0/87.0
1.00
73.2/69.0
0.96
75.4/64.0
0.97
100.0/100.0
1.00
99.6/96.0
1.00
99.8/99.0
1.00
Spathirhachis
Echthronema
Segetia
Hydastylus
Sisyrinchium
Olsynium
Solenomelus
Orthrosanthus
Libertia

Fig. S2A

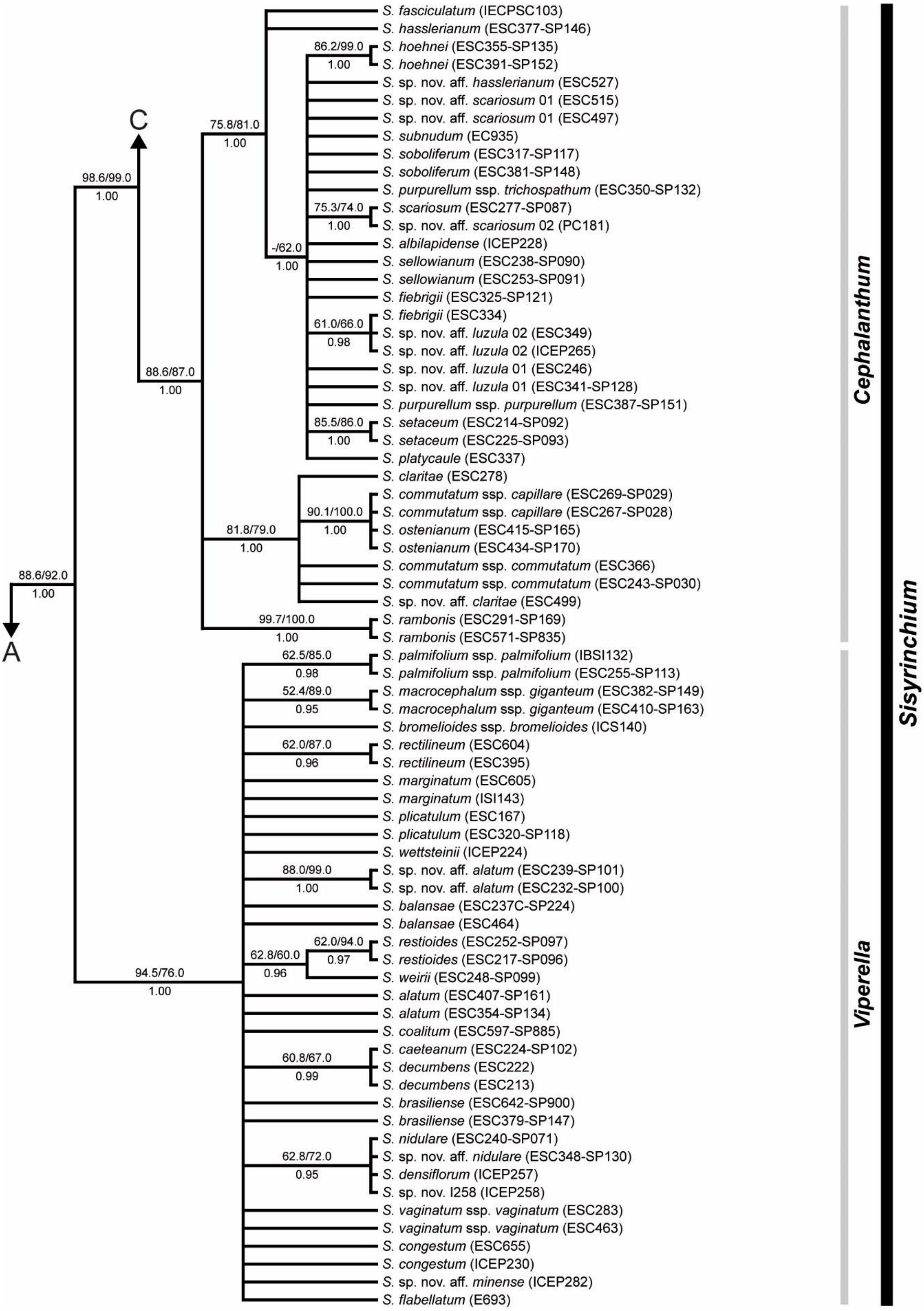

S. fasciculatum (IECPSC103)
S. hasslerianum (ESC377-SP146)
86.2/99.0
1.00
S. hoehnei (ESC355-SP135)
S. hoehnei (ESC391-SP152)
S. sp. nov. aff. hasslerianum (ESC527)
S. sp. nov. aff. scariosum 01 (ESC515)
S. sp. nov. aff. scariosum 01 (ESC497)
S. subnudum (EC935)
S. soboliferum (ESC317-SP117)
S. soboliferum (ESC381-SP148)
S. purpurellum ssp. trichospathum (ESC350-SP132)
75.3/74.0
1.00
S. scariosum (ESC277-SP087)
S. sp. nov. aff. scariosum 02 (PC181)
S. albilapidense (ICEP228)
-/62.0
1.00
S. sellowianum (ESC238-SP090)
S. sellowianum (ESC253-SP091)
S. fiebrigii (ESC325-SP121)
S. fiebrigii (ESC334)
61.0/66.0
0.98
S. sp. nov. aff. luzula 02 (ESC349)
S. sp. nov. aff. luzula 02 (ICEP265)
S. sp. nov. aff. luzula 01 (ESC246)
S. sp. nov. aff. luzula 01 (ESC341-SP128)
S. purpurellum ssp. purpurellum (ESC387-SP151)
85.5/86.0
1.00
S. setaceum (ESC214-SP092)
S. setaceum (ESC225-SP093)
S. platycaule (ESC337)
S. claritae (ESC278)
S. commutatum ssp. capillare (ESC269-SP029)
90.1/100.0
1.00
S. commutatum ssp. capillare (ESC267-SP028)
S. ostenianum (ESC415-SP165)
S. ostenianum (ESC434-SP170)
S. commutatum ssp. commutatum (ESC366)
S. commutatum ssp. commutatum (ESC243-SP030)
S. sp. nov. aff. claritae (ESC499)
99.7/100.0
1.00
S. rambonis (ESC291-SP169)
S. rambonis (ESC571-SP835)
C
75.8/81.0
1.00
98.6/99.0
1.00
88.6/87.0
1.00
81.8/79.0
1.00
88.6/92.0
1.00
A
62.5/85.0
0.98
S. palmifolium ssp. palmifolium (IBSI132)
S. palmifolium ssp. palmifolium (ESC255-SP113)
52.4/89.0
0.95
S. macrocephalum ssp. giganteum (ESC382-SP149)
S. macrocephalum ssp. giganteum (ESC410-SP163)
S. bromelioides ssp. bromelioides (ICS140)
62.0/87.0
0.96
S. rectilineum (ESC604)
S. rectilineum (ESC395)
S. marginatum (ESC605)
S. marginatum (ISI143)
S. plicatulum (ESC167)
S. plicatulum (ESC320-SP118)
S. wettsteinii (ICEP224)
88.0/99.0
1.00
S. sp. nov. aff. alatum (ESC239-SP101)
S. sp. nov. aff. alatum (ESC232-SP100)
S. balansae (ESC237C-SP224)
S. balansae (ESC464)
62.0/94.0
0.97
62.8/60.0
0.96
S. restioides (ESC252-SP097)
S. restioides (ESC217-SP096)
S. weirii (ESC248-SP099)
94.5/76.0
1.00
S. alatum (ESC407-SP161)
S. alatum (ESC354-SP134)
S. coalitum (ESC597-SP885)
60.8/67.0
0.99
S. caeteanum (ESC224-SP102)
S. decumbens (ESC222)
S. decumbens (ESC213)
S. brasiliense (ESC642-SP900)
S. brasiliense (ESC379-SP147)
62.8/72.0
0.95
S. nidulare (ESC240-SP071)
S. sp. nov. aff. nidulare (ESC348-SP130)
S. densiflorum (ICEP257)
S. sp. nov. I258 (ICEP258)
S. vaginatum ssp. vaginatum (ESC283)
S. vaginatum ssp. vaginatum (ESC463)
S. congestum (ESC655)
S. congestum (ICEP230)
S. sp. nov. aff. minense (ICEP282)
S. flabellatum (E693)
Cephalanthum
Viperella
Sisyrinchium

Fig. S2B

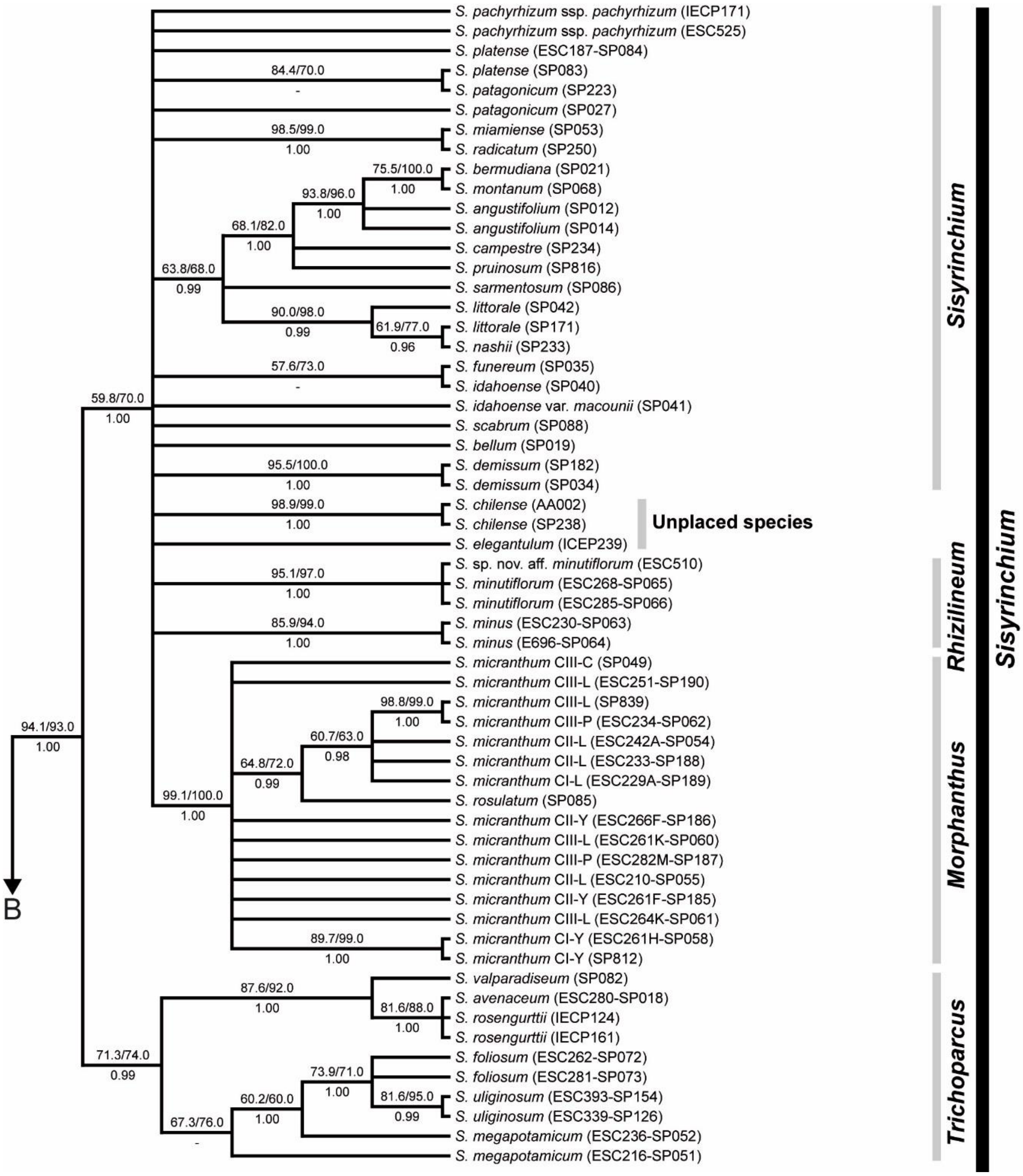


Fig. S2A–C. ML best-scoring phylogram and strict consensus tree based on the strict consensus tree of the parsimony ratchet, the estimated maximum likelihood tree and the Bayesian 50% majority rule consensus tree obtained from the analyses of the nuclear data set. The tree is rooted using *Neomarica candida* as outgroup. Support values indicated above branches follow the order PBS/LBS whereas PP are reported below branches. Bootstrap supports and posterior probabilities for a given node are provided only if one of the values reached the following thresholds: PBS ≥70% or LBS ≥70% or PP ≥0.95. A dash (-) indicates support value of less than 50% for PBS and LBS or less than 0.95 for PP. Vertical bold black bars indicate the genera of Sisyrinchieae while bold grey bars show the infrageneric classification established in the present study for the genus *Sisyrinchium*. Section names follow the revised taxonomic treatment.

Table S1: Voucher information, Geographical origin and GenBanK accession numbers of samples from Sisyrinchium and allies.

- Excel format (devido as dimensões, não foi possível anexar aqui. Estará disponível quando o artigo for publicado)

Table S2. Dataset partitions for Maximum Likelihood (ML) and Bayesian Inference (BI) analyses and evolutionary models used in BI.

Data partition	No. of positions (without primers)	Partition by codon position	Model
cpDNA partition			
rpoC1 (partial sequence)	508	X	GTR+I
rpoB (partial sequence)	472	X	GTR+Γ
matK (partial sequence)	1605	X	GTR+Γ
matK-5'*trnK* intron (complete sequence)	283		GTR+Γ
psbA (partial sequence)	53	X	K80
psbA-rps19 spacer (complete sequence)	162		HKY+Γ
rps19 (complete sequence - negative strand)	279	X	GTR
rps19-trnH spacer (complete sequence)	148		F81+I
trnQ (partial sequence)	48		K80
trnQ-rps16 spacer (partial sequence)	2058		GTR+Γ
mtDNA partition			
5'-nad1 exon 2 (partial sequence)	60		F81
nad1 exon 2 (complete sequence)	82	X	HKY
nad1 intron 2 (complete sequence)	1738		HKY+Γ
nad4 intron 1 (complete sequence)	1427		GTR+I+Γ
nad4 exon 2 (partial sequence)	277	X	HKY+Γ
nuDNA partition			
Internal Transcribed Spacer 1 (complete sequence)	293		GTR+Γ
5.8S ribosomal RNA (complete sequence)	164		K80+Γ
Internal Transcribed Spacer 2 (complete sequence)	277		GTR+Γ
28S ribosomal RNA (partial sequence)	42		K80+Γ

Notes: partition by codon position = partition coding for protein.

Table S3. Bibliographic references used for species characterisation in PROTEUS.

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Table S4. Set of molecular diagnostic characters of *Solenomelus* Miers.

Marker	Diagnostic character with position in alignment
rpoC1	10 [A>G]; 286 [A>G]; 337 [G>A]; 472 [T>C]
rpoB	65 [A>G]; 447 [A>G]
matK	19 [G>A]; 79 [G>A]; 201 [C>G]; 205 [G>A]; 356 [A>C]; 445 [A>G]; 733 [G>T]
psbA-trnH	83 [A>C]; 92 [G>A]; 204 [C>T]; 612 [G>T]
trnQ-rps16	280 [C>A]; 372 [C>T]; 373 [G>T]; 1048 [G*]; 1565 [G*]; 1590 [G*]; 1612 [A*]; 1613 [abs.>A]; 1614 [abs.>G]; 1616 [abs.>A]; 1749 [abs.>T]; 1750 [abs.>T]; 2031 [T>C]
nad1-2/3	271 [A>C]; (1005 to 1006) [TC>GA]; (1076 to 1080) [abs.> GGGAC]; (1256 to 1257) [CTACC>abs.]; 1331 [G>T]; 1577 [T>G]; 1642 [C>G]; 1725 [C>G]
nad4-1/2	(619 to 622) [CTGT>abs.]; 1157 [A>T]
ITS	31 [A>T]; 66 [C>T]; 117 [C>A]; 183 [C*]; 189 [G>C]; 197 [A*]; 198 [C>A]; 213 [abs.>A]; (457 to 458) [CC>abs.]; 476 [G>abs.]; 491 [G>abs.]; (631 to 632) [abs.>TG]

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side. * are diagnostic character for the genus but the plesiomorphic character state remains ambiguous. Numbers in parentheses are compound character attributes. Abs.: character state = absent.

Table S5. Set of molecular diagnostic characters of *Olsynium* Raf.

Marker	Diagnostic character with position in alignment
rpoC1	178 [T>C]; 439 [C>T]
matK	88 [G>A]; 136 [C>T]; 191 [C>T]; 274 [T>C]; 293 [G>A]; 392 [C>A]; 427 [T>C]; 990 [G>C]
psbA-trnH	97 [C>T]; 534 [T>A]; 544 [T>G]; 620 [C>T]
trnQ-rps16	86 [C>T]; 209 [abs.>T]; (538 to 545) [GTATCCCC>abs.]; 548 [T>A]; 667 [A>G]; 754 [T>C]; (909 to 911) [abs.>TTG]; 985 [C*]; 1015 [A*]; 1048 [T*]; 1087 [T*]; 1172 [T*]; 1703 [A>G]; 2018 [G*]
nad1-2/3	1491 [C>G]
nad4-1/2	451 [G>A]; 881 [T>C]; (916 to 917) [GA>TC]; 1298 [G>A]
ITS	652 [A>T]; 668 [G>A]

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side. * are diagnostic character for the genus but the plesiomorphic character state remains ambiguous. Numbers in parentheses are compound character attributes. Abs.: character state = absent.

Table S6. Set of molecular diagnostic characters of *Sisyrinchium* L.

Marker	Diagnostic character with position in alignment	Heterogeneous single pure CAs
rpoC1	130 [C>T]; 257 [A>G]; 289 [G>A]; 358 [G>A]	-
rpoB	74 [G>A]; 186 [A>C]; 212 [A>C]	-
matK	2 [A>G]; 31 [C>T]; 216 [A>C]; 559 [C>A]; 582 [A>G]; 771 [G>C]; 979 [T>G]	145 [C>A, T in ESC214, ESC268, ESC285, ESC510]
psbA-trnH	41 [T>C]	-

Marker	Diagnostic character with position in alignment	Heterogeneous single pure CAs
trnQ-rps16	57 [C>A]; 100 [G>A]; 356 [C>T]; 366 [C>T]; (481 to 490) [GCTTTCTATT>abs.]; 1775 [abs.>A]; (2007 to 2008) [abs.>TA]; 2018 [T*]; 2078 [C>T]	50 [T>G, A in SP108, SP818]; 112 [G>T, abs. in section 04]; 396 [G>A, abs. in SP027]; 603 [T>G, abs. in SP034, SP182]
nad1-2/3	335 [C>T]; 1012 [T>C]; 1520 [C>A]; 1596 [T>C]	190 [G>C, abs. in ESC248]
nad4-1/2	668 [G>A]; 719 [G>T]; 787 [G>T]	-
ITS	135 [G>A]; 168 [G>C]; 253 [T>A]; 694 [C>T]	-

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side. * are diagnostic character for the genus but the plesiomorphic character state remains ambiguous. Numbers in parentheses are compound character attributes. Abs.: character state = absent.

Table S7. Set of molecular diagnostic characters of *Sisyrinchium elegantulum* Ravenna

Marker	Diagnostic character with position in alignment (in reference sequence)
trnQ-rps16	1516 [G>A]; (1659 to 1667) [CGTAATAAT>abs.]
ITS	106 [G>T]; 242 [G>A]

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side. Numbers in parentheses are compound character attributes. Abs.: character state = absent.

Table S8. Set of molecular diagnostic characters of *Sisyrinchium chilense* Hook.

Marker	Diagnostic character with position in alignment (in reference sequence)
rpoC1	275 [C>T]
ITS	118 [G>A]

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side.

Table S9. Set of molecular diagnostic characters of section *Hydastylus* (Dryand. ex Salisb.) Ravenna.

Marker	Diagnostic character with position in alignment (in reference sequence)
rpoC1	212 [G>A]
rpoB	18 [C>T], 229 [G>A]; 400 [C>T]; 454 [C>A]
matK	468 [C>T]; 581 [C>A]; 742 [G>A]; 864 [G>T]; 904 [T>C], 940 [G>A]; 1014 [G>A]
psbA-trnH	18 [C>T]; 27 [G>A]; 94 [C>T]
trnQ-rps16	144 [C>T]; 158 [C>T]; 238 [T>A]; 273 [G>A]; 280 [C>T]; 296 [T>G]; 326 [A>C]; 395 [A>T]; 407 [G>A]; 433 [G>abs.]; 496 [C>A]; 593 [G>A]; 632 [C>T]; (712 to 713) [TC>GT]; 772 [A>C]; 814 [G>C]; 1304 [A>G]; 1352 [T>C]; 1406 [C>A]; 1457 [T>G]; 1473 [G>T]; 1574 [C>T]; 1624 [A>C]; 1647 [T>C]; (1718 to 1725) [abs.>ATATAAAA]; (1776 to 1781) [TTATTA>abs.]
nad1-2/3	424 [G>A]; (813 to 820, exc. 816) [GGGCATT>abs.]; (1053 to 1056) [abs.>TATA]; (1057 to 1061) [GGGCC>abs.]; (1123 to 1129) [GGGCGAC>abs.]; 1145 [T>C]; (1630 to 1632) [GCC>TTA]

Marker	Diagnostic character with position in alignment (in reference sequence)
nad4-1/2	(655 to 659) [TTCAA>abs.]; 680 [A>G]; (778 to 784, exc. 780) [AAGTTC>abs.]; 812 [C>T]; 1199 [A>C]
ITS	89 [C>A]; 138 [A>abs.]; 174 [A>C]; 179 [T>A]; 218 [abs.>G]; 230 [T>A]; 272 [T>C]; 274 [T>A]; 409 [T>C]; 525 [G>A]; 538 [C*]; 718 [T>C]; 725 [T>C]

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side. * are diagnostic character for the section but the plesiomorphic character state remains ambiguous. Numbers in parentheses are compound character attributes. Abs.: character state = absent.

Table S10. Set of molecular diagnostic characters of section *Segetia* Ravenna.

Marker	Diagnostic character with position in alignment (in reference sequence)
rpoB	106 [G>A]; 182 [C>T]
trnQ-rps16	1514 [C>T]
nad1-2/3	1479 [G>T]
nad4-1/2	553 [G>A]; 750 [C>T]

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side.

Table S11. Set of molecular diagnostic characters of section *Echthronema* (Herb.) Benth. & Hook.

Marker	Diagnostic character with position in alignment (in reference sequence)
rpoC1	389 [G>A]
rpoB	367 [C>A]
psbA-trnH	113 [A>G]; 144 [T>C]
trnQ-rps16	87 [A>T]; 433 [G>C]; 504 [C>T]; 1739 [A>G]; 1983 [abs.>A]
ITS	96 [G>T]; 243 [A>T]; 603 [C>A]; 676 [T>C]

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side. Abs.: character state = absent.

Table S12. Set of molecular diagnostic characters of section *Spathirhachis* Klotzsch ex Klatt.

Marker	Diagnostic character with position in alignment (in reference sequence)
rpoB	223 [C>T]; 239 [G>A]
matK	211 [C>T], 466 [T>C]; 630 [A>T]
psbA-trnH	244 [G>A]
trnQ-rps16	2 [A>G]; (109 to 113) [CATTT>abs.]; (123 to 126) [abs.>GTTT]; 223 [T>A]; 302 [T>G]; 1393 [G>A]; 1452 [abs.>T]; 1581 [abs.>T]
ITS	23 [C>A]; 183 [A>G]

Marker	Diagnostic character with position in alignment (in reference sequence)

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side. Numbers in parentheses are compound character attributes. Abs.: character state = absent.

Table S13. Set of molecular diagnostic characters of section *Viperella* Ravenna.

Marker	Diagnostic character with position in alignment (in reference sequence)	Heterogeneous single pure CAs
rpoB	199 [T>A]	445 [T>A, G in ICEP282]
matK	931 [T>C]	-
trnQ-rps16	189 [G>A]; (214 to 223, exc. 218 to 222) [ATTTT>abs.]; 331 [T>C]; 497 [C>G]	-
ITS	651 [C>T]	-

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side. Numbers in parentheses are compound character attributes. Abs.: character state = absent.

Table S14. Set of molecular diagnostic characters of section *Cephalanthum* Baker.

Marker	Diagnostic character with position in alignment (in reference sequence)
ITS	252 [G>C]; 564 [G>A]; 574 [G>A]

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side. *: are derived character states for the section, but the derived trait is shared with few other species of Sisyrinchieae included in the studies (homoplasy).

Table S15. Set of molecular diagnostic characters of section *Trichoparcus* C.D.Inácio, Chauveau & L.Eggers.

Marker	Diagnostic character with position in alignment (in reference sequence)
psbA-trnH	498 [T>G]
trnQ-rps16	119 [G>T]; 501 [C>T]; 672 [abs.>C]; (1803 to 1819) [abs.>TTATAATTATATTATTA]

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side. Numbers in parentheses are compound character attributes. Abs.: character state = absent.

Table S16. Set of molecular diagnostic characters of section *Morphanthus* C.D.Inácio, Chauveau & L.Eggers.

Marker	Diagnostic character with position in alignment (in reference sequence)
trnQ-rps16	(1365 to 1369) [abs.>TAATT]; (1586 to 1590) [ATATC>abs.]
ITS	255 [G>T]; 490 [A>T]; (662 to 663) [AT>TA]

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side . Numbers in parentheses are compound character attributes. Abs.: character state = absent.

Table S17. Set of molecular diagnostic characters of section *Rhizilineum* C.D.Inácio, Chauveau & L.Eggers.

Marker	Diagnostic character with position in alignment (in reference sequence)
matK	70 [C>T]

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side.

Table S18. Set of molecular diagnostic characters of section *Sisyrinchium* Lem. ex Klatt.

Marker	Diagnostic character with position in alignment (in reference sequence)
rpoC1	275 [C>A]
trnQ-rps16	1777 [T>A]

Notes: Character states in square brackets are plesiomorphic on left side and synapomorphic on right side.

CAPÍTULO 2: Three new species of *Sisyrinchium* (Iridaceae) from *Campos* of South America

Artigo a ser submetido ao periódico *Phytotaxa*

Three new species of *Sisyrinchium* (Iridaceae) from *Campos* of South America

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Abstract

Species of *Sisyrinchium* from Southern Brazil represent 28% of the genus diversity throughout the Americas and 85% of Brazil. However, species are still being discovered and three new species are presented here: *Sisyrinchium pampeanum* from the Pampa Biome and *S. diversicarpum* and *S. sectiandrum* from the Atlantic Forest Biome. The taxa are described, illustrated and taxonomic comments, conservation status and comparisons with related species are provided.

Key words: Atlantic Forest biome, endemism, Pampa biome, taxonomy

Introduction

Sisyrinchium Linnaeus (1753: 954) is the largest genus of Iridaceae in the Neotropics, with more than 200 species cited in the World Checklist of Iridaceae (Barker 2014), surpassing the 140 species estimative of Goldblatt & Manning (2008). However, an accurate total number of taxa is still uncertain, due both to the need of a precise synonym revision for North and South American species and to the discovery of new species. For Brazil, 67 species and 10 subspecies are recorded (Flora do Brasil 2020), and the greatest number of taxa is distributed in the Southern region, representing 36% and 71% of the total and the Brazilian species of the genus, respectively.

Species of *Sisyrinchium* grow in dry or wet grasslands and in forest edges at sea level or high altitudes, in different types of soil, mainly in the Atlantic Forest, Cerrado and Pampa biomes. In Southern Brazil, the grasslands in the South of Rio Grande do Sul state are characterized by a single-layer stratum and belong to the Pampa Biome while the natural grasslands of the North of Rio Grande do Sul and Santa Catarina Plateaus and at a smaller extension of Paraná occur in mosaics with forests and/or with wood components and belong to the Atlantic Forest Biome (IBGE 2004, Overbeck *et al.* 2007). For Southern Brazil, the term *Campos* is applied to denominate this vegetation (Overbeck *et al.* 2007). This study aims to describe and illustrate three new species of *Sisyrinchium*: *S. pampeanum, S. diversicarpum* and *S. sectiandrum*.

Description of the new taxa

Sisyrinchium pampeanum C.D.Inácio & L.Eggers, **sp. nov.** (Figs 1 and 2)

Sisyrinchium pampeanum resembles S. scariosum, but differs by its cup-shaped perigon and conical staminal column, basally with elaiophores for 1.1–1.5 mm long.

Type:—BRAZIL. Rio Grande do Sul: Santana do Livramento, parte baixa do Morro Tabatinga, na borda da mata, 213 m, 30°52'36.7"S, 55°8'44.7"W, 7 November 2013, *C.D. Inácio et al. 147* (holotype ICN!, isotypes MBM!, SI!, MVM!).

Perennial herb, erect, up to (11–)27.5–57 cm tall. Rhizome inconspicuous, with slender and fibrous roots. Basal leaves, erect, terete, (6–)12–50 × 0.05–0.11 cm, glabrous, acute. Flowering stem simple, erect, terete, 5–48 × 0.05–0.15 cm, with a terminal bract (1–)4–15(–20) cm long, proximally membranaceous for 1.5–2 mm. Synflorescence fasciculiform, (1–)3–10(–14) rhipidia, congested between the base of the terminal bract and an opposite bract, 8.2–13.1(–18.1) mm long, cuspidate to aristate, awn 1–8.6 mm long, margin conspicuously membranaceous for 0.9–2.3 mm wide. Rhipidium 2–5 flowers, subsessile, peduncle 1–4 mm long, sometimes subtended by a sterile bract with membranaceous margin and scabrous keel. Spathes bivalved, lower valve 9.3–10.3(–13.9) × 1.5–2.6 mm, upper (8.1–)10.8–15.6 × 1.5–2.5(–3.2) mm, acute to cuspidate, margin membranous for 1–1.5 mm. Pedicel longer than spathes, 10–18 mm long, with light yellow straight capitate trichomes, 0.5 mm long. Perigon cup shaped, flaring distally; mostly white, internally yellow to chestnut, fauces brown to vinaceous, 12–16 mm diameter (fresh flower). Tepals subequal, 6.7–9.9 × (2.4–)3.3–4 mm, connate 0.5 mm at base, oblanceolate, emarginate-apiculate, with three dark veins and sparse trichomes at both sides and margin. Filaments light yellow or inconspicuously vinaceous, connate in a staminal column, 2.3–2.6 mm long, basally conical with oil-producing trichomes (elaiophores) for 1.1–1.5 mm, then with sparse trichomes. Anthers yellow, basifixed, 0.4-0.6 mm long. Ovary globose, 1.2–1.9 mm long and wide, pubescent, with light yellow straight capitate trichomes. Style yellow, entire, 3.2–3.6 mm long, with stigmatic region displaced above the anthers. Capsule globose to subglobose, 3.5–4.8 × 3.5–5.3 mm, brown, pilose.

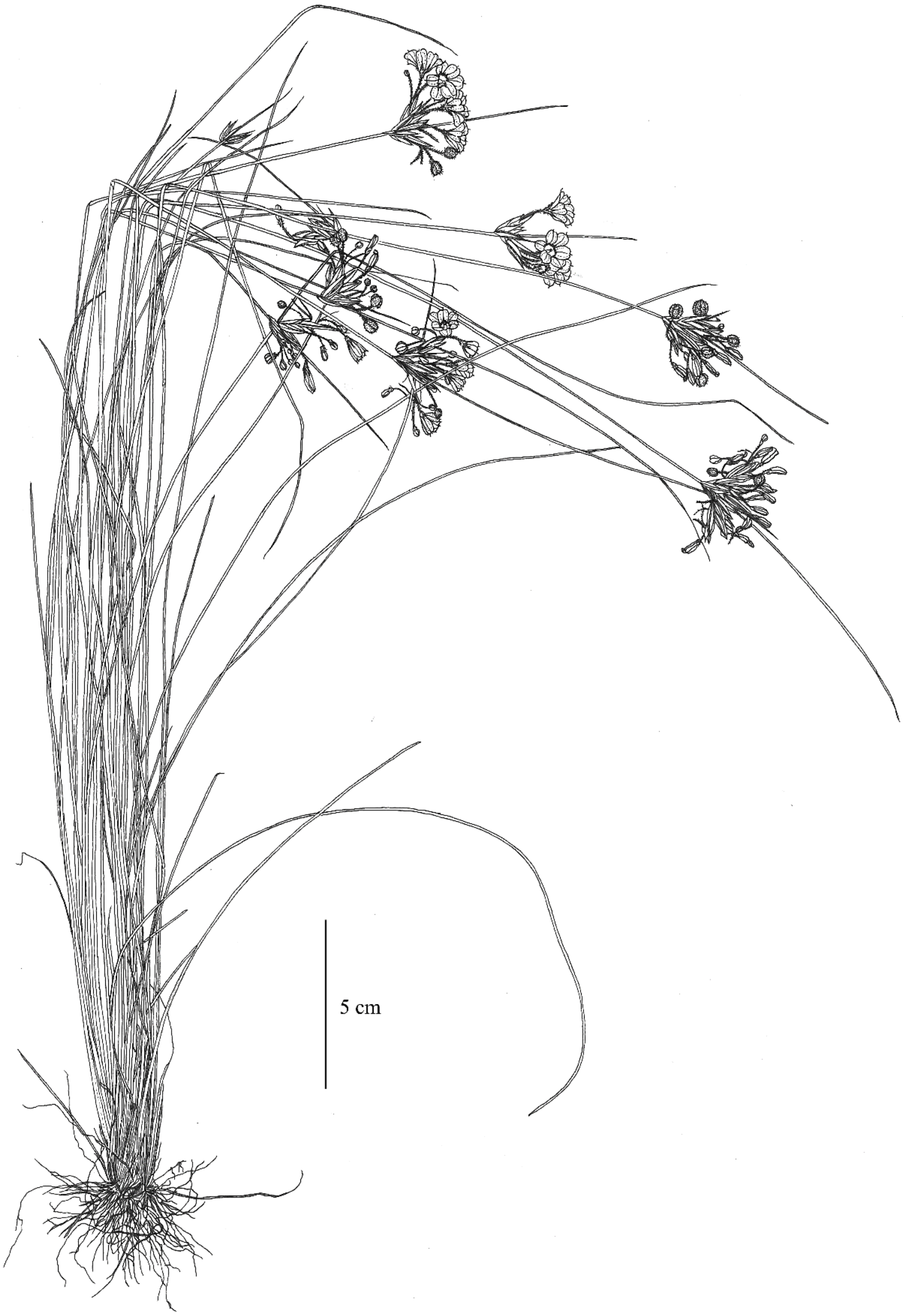

FIGURE 1. Habit of *Sisyrinchium pampeanum* C.D.Inácio & L.Eggers. From *C.D. Inácio et al. 147* (ICN), drawing by Anelise Scherer.

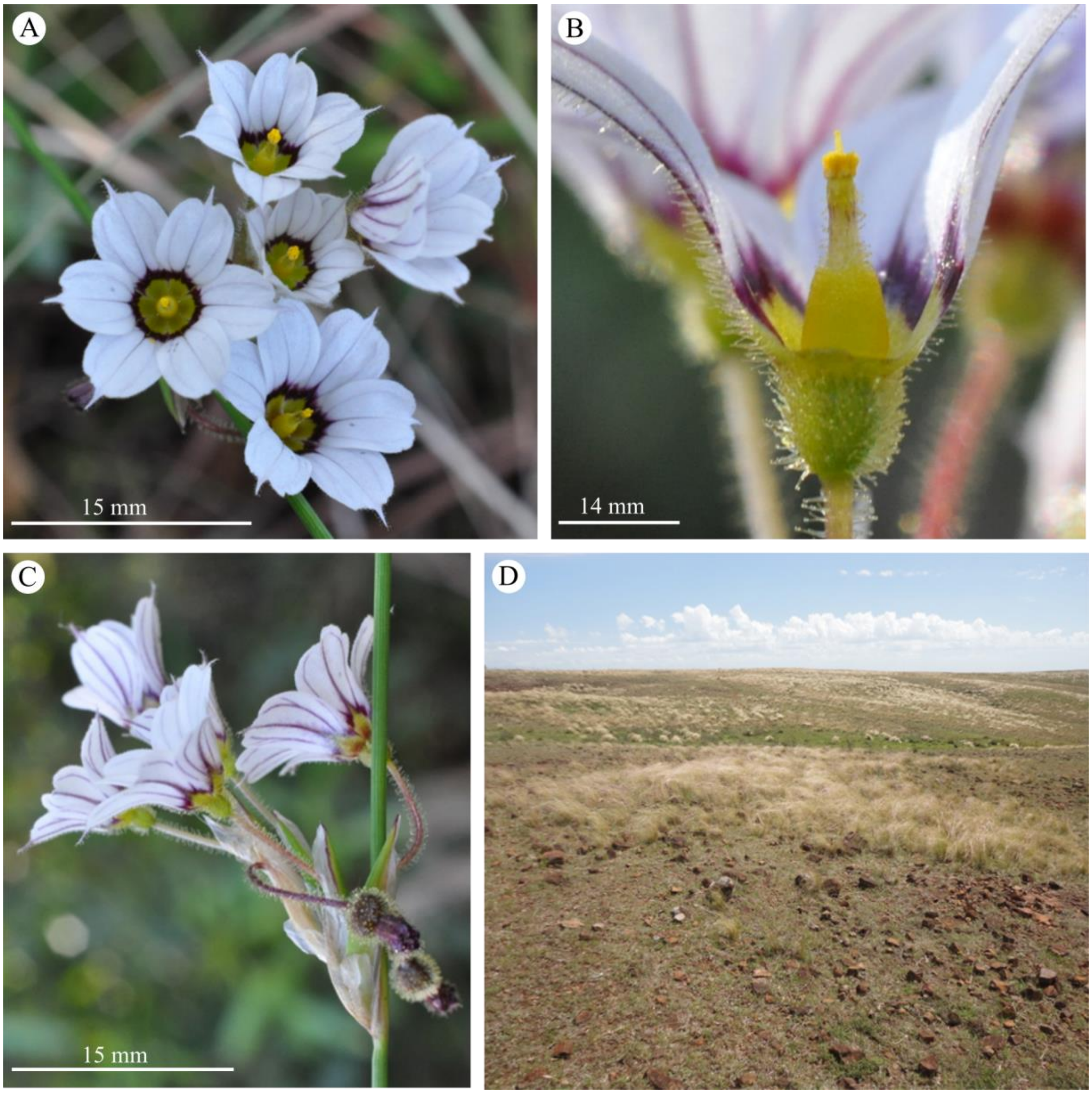

FIGURE 2. *Sisyrinchium pampeanum* C.D.Inácio & L.Eggers. **A.** Flowers in frontal view. **B.** Flowers in lateral view with two removed tepals, showing androgynoecium. **C.** Synflorescence. **D.** Habitat in *Campos* vegetation, Uruguay. From A to C: *C.D. Inácio et al. 147* (ICN), D: *C.D. Inácio et al. 151* (ICN).

Distribution and Habitat:—*Sisyrinchium pampeanum* is known from the Western region of Rio Grande do Sul, Brazil (Fig. 3), at Santana do Livramento and Quaraí municipalities, and from North of Uruguay, Artigas province. Plants occur in forest edges and in grassland matrix, in small tussocks, being frequent at the collection sites. The elevation records range from 150 to 439 m a.s.l. The species distribution is restricted to the Pampa Biome.

Phenology:—Flowering and fruiting from October to November.

Conservation Status:—According to the IUCN Red List guidelines (IUCN 2016), the species is considered Endangered (EN), with subcriteria B1 (a) and (b)iii: continuing decline of extent of occurrence and a decline of quality of habitat due to loss or reduction of the natural distribution by agricultural expansion of crops, cattle or contamination by agrochemicals. The species is not reported in conservation units of the region.

Etymology:—The species is named in reference to its distinctive geographical distribution in the Pampa Biome.

Paratypes:— BRAZIL. Rio Grande do Sul: Santana do Livramento, Morro Tabatinga, 16 October 2009 (fl), *L. Eggers & T.T. Souza-Chies 497* (ICN!); Santana do Livramento, estrada secundária a partir da BR 293, 288 m, 30°45'9.1"S e 55°39'31.0"W, 4 November 2010 (fl), *E.M. Stiehl-Alves & L. Dal Ri 7* (ICN!); Santana do Livramento, Fazenda Santo Antônio, divisa com Uruguai, 9 November 2009 (fl, fr), *I. Boldrini*, *R. Trevisan & R. Setubal 1604* (ICN!); Quaraí, RS 377, Cerro do Jarau, 151 m, 30°11'43.56"S, 56°29'19.32"W, 17 October 2009 (fl), *L. Eggers & T.T. Souza-Chies 515* (ICN!); Quaraí, S30 17.542, W55 58.684, 1 November 2010 (fl, fr), *P.J. Silva Filho & M. Grings 1031* (ICN!); Quaraí, Cerro do Jarau, 28 October 2011 (fl, fr), *Aita 89* (ICN!). URUGUAY. Artigas: Cuaro, Ruta 4, approximately km 170, 439 m, 30°37'50.9"S, 56°39'48.4"W, 8 November 2013 (fl, fr), *C.D. Inácio et al. 151* (ICN!, MVM!).

Taxonomic relationships:—*Sisyrinchium pampeanum* belongs to sect. *Cephalanthum* Baker (*sensu* Inácio *et al.* 2017, accepted), characterized by taxa with fasciculiform synflorescences, filaments connate nearly to the top and usually with dense trichomes (elaiophores) (occasionally, moderate at the base of the staminal column). The species presents terete leaves and flowering stems, differing from related taxa by the very distinctive cup-shaped perigon. *Sisyrinchium scariosum* I.M. Johnston (1938: 386) is morphologically the most similar species, differing by the spreading tepals and the cylindrical arrangement of elaiophores, compared to the conical display of *S. pampeanum*. Both species present similar or even sobreposition of measurements of plant height, leaf length and width, floriferous stem length and width, flower number per rhipidium, pedicel length, flower diameter, anther length and ovary length and width (Table 1). However, length of the lower and upper valves of the spathes, extension of fused tepals and flower color are important to distinguish the taxa (Table 1). The cup-shaped flower and the color of tepals may resemble some variations of *S. pachyrhizum* Baker (1876: 269), but the fleshy roots and flat leaves of this species are very characteristic.

TABLE 1. Morphological characters retained to compare *Sisyrinchium pampeanum* and *S. scariosum.*

Character/Species	***S. pampeanum***	***S. scariosum****
Plant height (cm)	(11–)27.5–57	14–63
Leaf length (cm)	(6–)12–50	12–32
Leaf width (mm)	0.5–1.1	0.5–0.9
Floriferous stem length (cm)	(13.5–)18–48	9.5–57
Floriferous stem width (mm)	0.5–1.5	0.7–1
Terminal bract length (cm)	(1.5–)4–15(–20)	1.5–7.8
Peduncle length (mm)	1–4	0.3–1.8
Lower valve length (mm)	9.3–10.3(–13.9)	6–8.5
Lower valve width (mm)	1.5–2.6	1–1.7
Upper valve length (mm)	(8.1–)10.8–15.6	7.5–9.8
Upper valve width (mm)	1.5–2.5(–3.2)	1.2–1.7
Flower number / rhipidium	2–5	2–4
Pedicel length (mm)	7–18	7–13
Scarious margin of spathe width (mm)	1–1.5	0.5–1
Flower diameter (mm)	13–17	12.8–19.7
Perigon shape	Cup-shaped	Disk-shaped
Tepal length (mm)	6.7–9.9	6.1–8.1
Tepal width (mm)	(2.4–)3.3–4	2.8–3.8
Fused tepals length (mm)	0.5	0.2–0.3
Tepal base color	Proximally yellow to chestnut for more than 1 mm, followed by a brown to vinaceous disk	Proximally purple (proximal yellow disk, if present, less than 0.8 mm)
Staminal column length (mm)	2.3–2.6	(2.5–)2.7–3
Staminal column color above elaiophores	Inconspicuously vinaceous or light yellow	Usually purple
Anther length (mm)	0.4–0.7	0.3–0.8
Style length (mm)	3.2–3.6	3.5–4.1
Style length above anthers (mm)	0.1–0.5	0.1–0.8
Elaiophore extension(mm)	1.1–1.5	0.6–1
Ovary length (mm)	1.1–1.9	1–1.4
Ovary width (mm)	1–1.7	1–1.5
Fruit length (mm)	3.5–4.8	2–4
Fruit width (mm)	3.5–5.3	2.5–5

* Measured specimens (vegetative traits):—BRAZIL. Rio Grande do Sul: Arroio dos Ratos, 25 October 2013, *C.D. Inácio, O. Chauveau & A.P. Schmitz 135* (ICN!); Viamão, 27

November 2014, *C.D. Inácio, M.B. Lizarazo & A.P. Schmitz 298* (ICN!); Quaraí, 19 May 2012, *L. Eggers & O. Chauveau 712* (ICN!); Dom Pedrito, 20 November 2012, *L. Eggers et al. 776* (ICN!); Paraná: Candói, 31 October 2014, *C.D. Inácio et al. 256* (ICN!); Curitiba, 25 November 1903, *Dusen 2247* (paratype, GH!). ARGENTINA. Misiones: Posadas, 15 October 2013, *C.D. Inácio et al. 102* (ICN!). URUGUAY. Rio Negro: 10 November 2013, *C.D. Inácio et al. 170* (ICN!); Cerro Largo, 12 November 2013, *C.D. Inácio et al. 181* (ICN!); Maldonado, 19 November 1939, *Rosengurtt B2717* (paratype, GH!); Cerro Largo, December 1937, *Rosengurtt B2366* (paratype, GH!). Measured specimens (reprodutive traits, fresh flowers):—BRAZIL. Rio Grande do Sul: Porto Alegre, 26 November 2014, *C.D. Inácio & L. Tacuatiá 297* (ICN!); Viamão, 27 November 2014, *C.D. Inácio, M.B. Lizarazo & A.P. Schmitz 298* (ICN!).

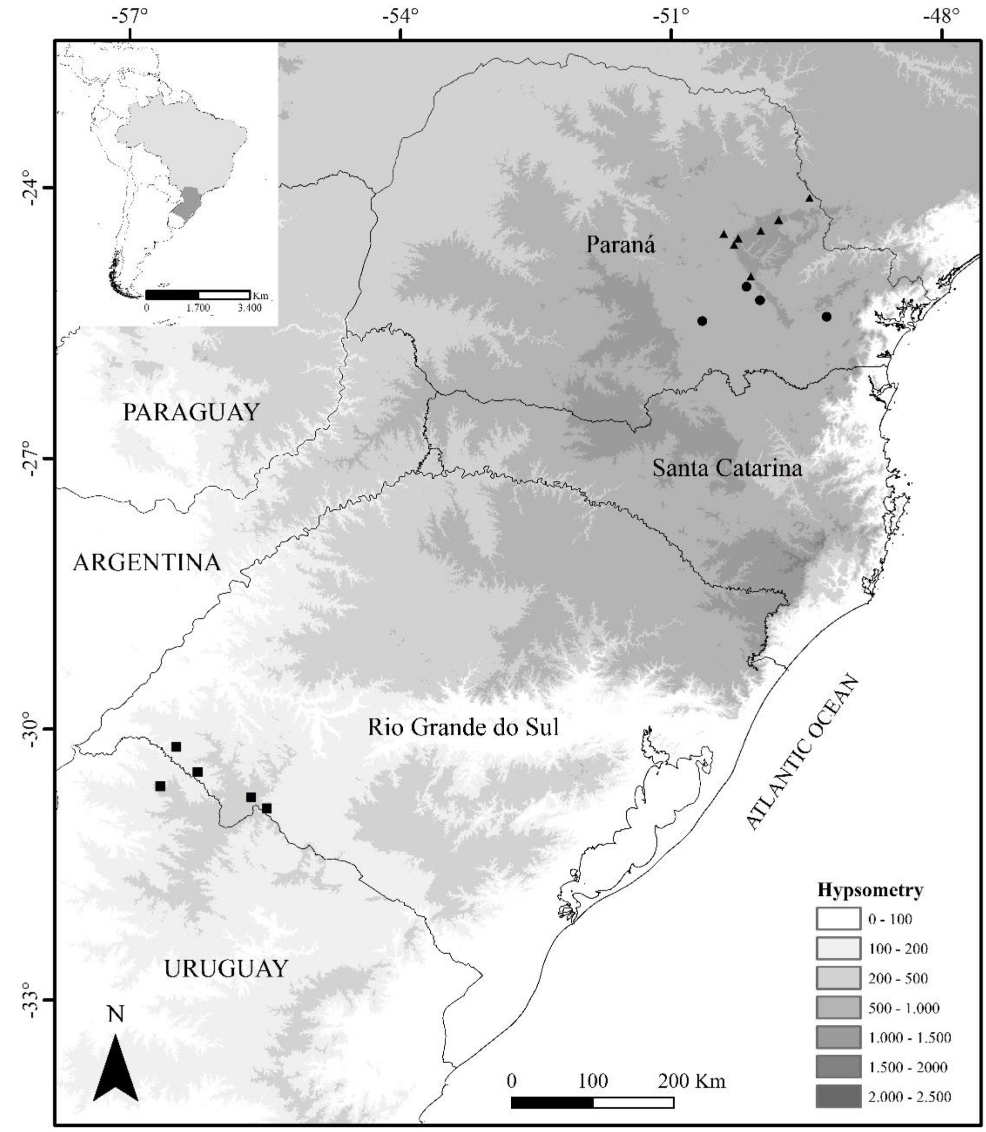

FIGURE 3. Distribution map of *Sisyrinchium pampeanum* (squares), *S. diversicarpum* (circles) and *S. sectiandrum* (triangles) in Southern Brazil and Uruguay border.

Sisyrinchium diversicarpum C.D.Inácio & L.Eggers, sp. nov. (Figs 4 and 5)

Sisyrinchium diversicarpum resembles S. nidulare differing by the verrucose ovaries and fruits, and leaves with papillose surface and ciliate margins.

Type:—BRAZIL. Paraná: Ponta Grossa, Parque Estadual de Vila Velha, 843 m, 25°14'40.0"S, 50°00'47.6"W, 29 August 2015, *C.D. Inácio & E.D. Lozano 302* (holotype ICN!, isotypes MBM!, RB!, SPF!, SI!, NY!, P!).

Perennial herb, caespitose, up to (17–)30–56(–70) cm tall. Rhizome thickened, with fleshy roots. Basal leaves linear, 12−56(−70) × 0.3–0.7 cm, papillose, acute, margin thickened, ciliate. Flowering stem simple, erect, narrowly winged, 0.5−3.2 × 0.3−0.4 cm, often hidden by leaf sheaths, with a terminal bract 4−19 cm long, and an opposite bract 3−6.8 cm long. Synflorescence cyme, 4−8 rhipidia. Rhipidium 2−4 flowers, pedunculate, peduncle 4−21 mm long, subtended by sterile bracts. Spathes bivalved, lower valve 18.2−27.5 × 2.7−4.4 mm, upper 17.3−24.3 × 2.3−3.7 mm, acute to acuminate, margin narrowly membranaceous. Pedicel longer than spathes, (12−)19−35 mm long, glabrous. Perigon disk shaped, yellow, (3.3−)3.5−4 cm diameter (fresh flower). Tepals subequal, 13.7−18.6 × 6.7−9.1 mm, connate 0.5 mm at base, oblanceolate, acute to acuminate, with central vein strongly marked at adaxial side, glabrous. Filaments yellow, basally connate for 0.9−1.3 mm, then 1.2−1.9 mm free, ascending to patent, glabrous. Anthers yellow, versatile and incurved when dehiscent, 4.2−5.8 mm long. Ovary subglobose, 2.9−4.5 × 2.7−3.5 mm, conspicuously verrucose. Style yellow, 0.9−1.3 mm long, glabrous, style branches 3−3.4(−4.1) mm long, alternate to the stamens, ascending to patent, stigma capitate to truncate, papillose. Capsule globose, 7−12 × 7−10 mm, tawny when immature to terracotta and sometimes black in dry material, shinny, distinctly verrucose.

Distribution and Habitat:—*Sisyrinchium diversicarpum* was collected in Southern Brazil, in three municipalities of Paraná: Ponta Grossa, Palmeira and Curitiba (Fig. 3), in the Atlantic Forest Biome. It occurs in grasslands or savannah vegetation, usually above 800 m a.s.l. The species can be found in the Parque Estadual de Vila Velha conservation unit, where it forms large populations. Plants of *S. diversicarpum* inhabit fire prone environments inside the Park.

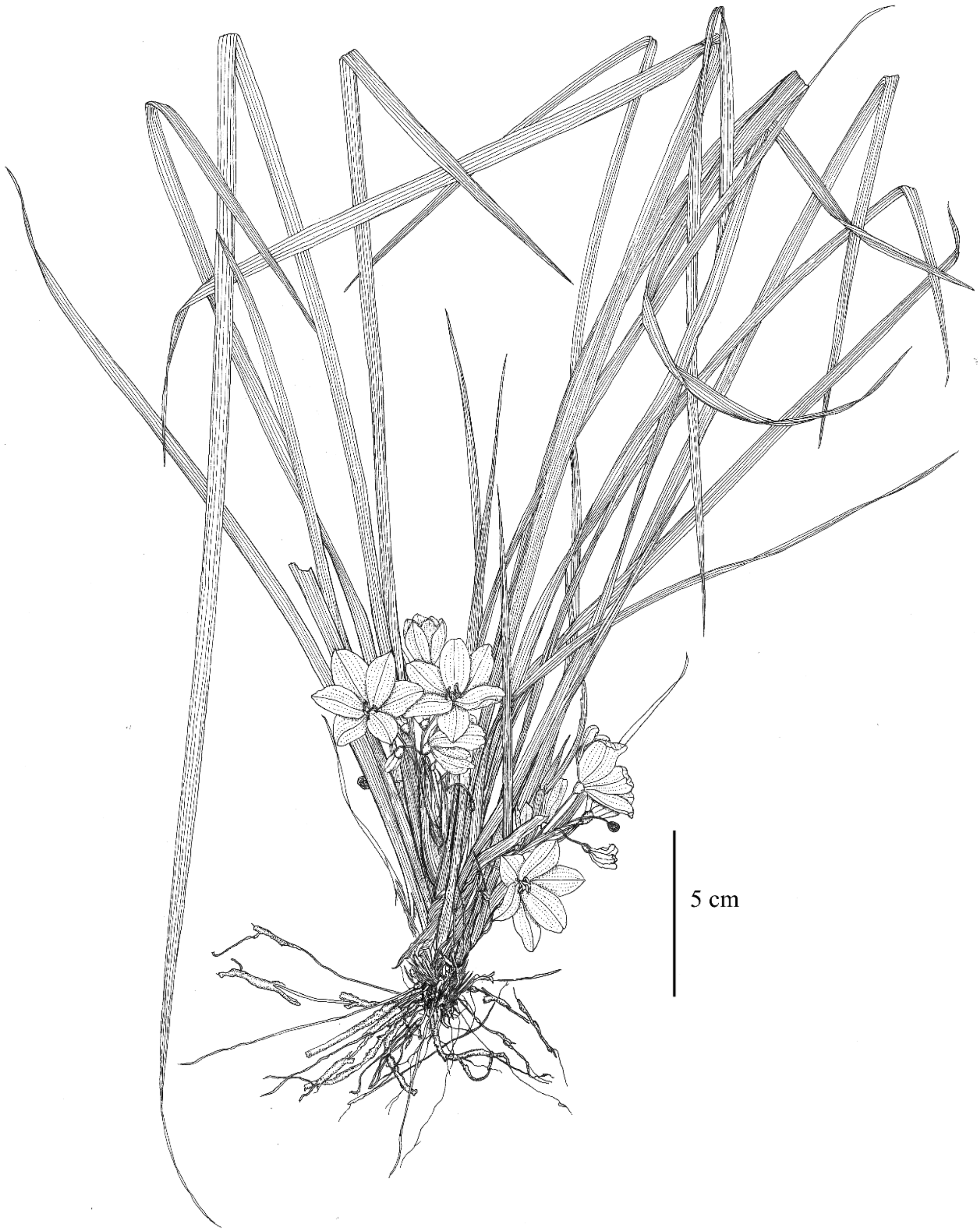

FIGURE 4. Habit of *Sisyrinchium diversicarpum* C.D.Inácio & L.Eggers. From *C.D. Inácio & E.D. Lozano 302* (ICN), drawing by Anelise Scherer.

Phenology:—Flowering and fruiting from August to November.

Conservation Status:—According to the IUCN Red List guidelines (IUCN 2016), the species is considered to be Endangered (EN), with subcriteria B1 (a) and (b)iii: continuing decline of extent of occurrence and decline of quality of habitat due to loss or reduction of the natural distribution by agricultural expansion of crops. Recent collections are just from conservation areas, since the vegetation in which this species was currently found in Paraná is depleted, in disappearance process (Cervi *et al.* 2007).

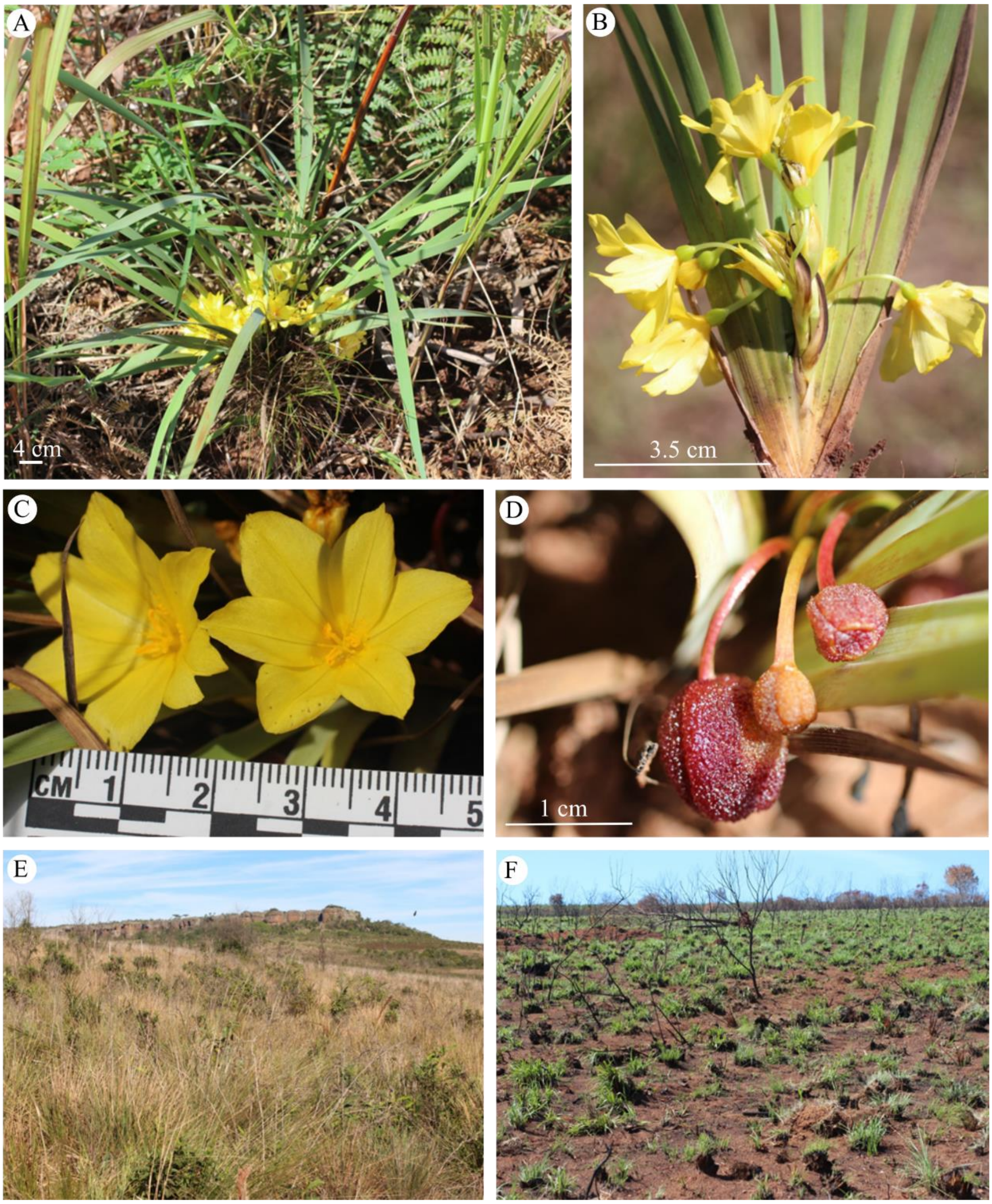

FIGURE 5. *Sisyrinchium diversicarpum* C.D.Inácio & L.Eggers. **A.** Habit. **B.** Synflorescence. **C.** Flowers. **D.** Fruits verrucose. **E.** Habitat, grassland in Parque Estadual de Vila Velha, Paraná, Brazil. **F.** Grassland after fire, Parque Estadual de Vila Velha. From *C.D. Inácio & E.D. Lozano 302* (ICN).

Etymology:—The species name is a reference to the remarkable distinctive ovaries and fruits, which present an unusual verrucose surface.

Paratypes:— BRAZIL. Paraná: Ponta Grossa, Parque Estadual de Vila Velha, 1 November 2014 (fr), *C.D. Inácio et al. 258* (ICN!). Ponta Grossa, Anfiteatro, 5 September 1966 (fl), *G. Hatschbach & O. Guimarães 14638* (MBM! NY! NY! UPCB! US!); Ponta Grossa, Fazenda Rivadávia, 4 August 1965 (fl), *G. Hatschbach 12649* (MBM! MBM! US!); Curitiba, Fazenda Padre Inácio, estrada Curitiba-Palmeira, 10 km antes de Palmeira, 16 October 1947 (fl), *G. Tessmann s.n.* (MBM 271187!); Irati, 15 September 1966 (fl), *J. Lindeman & H. Haas 2468* (MBM!, RB!); Palmeira, perto da rede da linha do trem, 18 August 2005 (fl), *W. Maschio 489* (MBM! RB!); Palmeira, Córrego das Antas, 11 October 1989 (fl), *J. Cordeiro & J.M. Silva 646* (MBM! UPCB! US!).

Taxonomic relationships:—*Sisyrinchium diversicarpum* belongs to sect. *Viperella* Ravenna (*sensu* Inácio *et al.* 2017, accepted), which is characterized by species with synflorescence with terminal bract, flowers without trichomes and filaments connate at different lengths but never to the top. The species was incorrectly identified as *S. nidulare* (Handel-Mazzetti) I.M. Johnston (1938: 383) in exsiccates of collections made in 1947, 1965 and 1966. In first appearance, the two species strongly resemble, they present sobreposition or similar measurements of plant height, leaf length and width, terminal and secondary bracts length, peduncle length, valves length and width and pedicel length (Table 2). However, careful observation on fruit surface, leaf indumentum and margin allow differentiation. In plants collected without flowers or fruits, leaf characters should be analyzed with caution for a correct identification. In *S. diversicarpum*, the verrucose fruit surface, the papillose leaf surface and the ciliate margin contrast with the glossy fruit surface and the glabrous leaf surface and margins of *S. nidulare*. Other features as flowering stem length, flower diameter and ovary width can also be useful to distinguish *S. diversicarpum* and *S. nidulare* (Table 2).

TABLE 2. Morphological characters retained to compare *Sisyrinchium diversicarpum* and *S. nidulare*.

Character/Species	***S. diversicarpum***	***S. nidulare****
Plant height (cm)	Up to 70	Up to 51
Leaf length (cm)	12−56(−70)	(11.5−)16−51
Leaf width (mm)	3–7	2−8

Character/Species	***S. diversicarpum***	***S. nidulare****
Leaf surface	papillose	glabrous
Leaf margin	ciliate	entire
Floriferous stem length (cm)	0.5−3.2	0.5−16
Floriferous stem width (mm)	3−4	2−4.5
Terminal bract length (cm)	4−19	5−21(−28)
Secondary bract length (cm)	3−6.8	4−9.5(−12)
Peduncle length (mm)	4−21	3−15(−20)
Lower valve length (mm)	18.2−27.5	20.7–30.3
Lower valve width (mm)	2.7−4.4	3.1–5.1
Upper valve length (mm)	17.3−24.3	23.8–29.2
Upper valve width (mm)	2.3−3.7	3.1–4.4
Flower number / riphidium	2−4	2–4
Pedicel length (mm)	(12−)19−35	16−31
Flower diameter (cm)	(3.3−)3.5−4	2.4−3.3
Tepal length (mm)	13.7−18.6	15−19
Tepal width (mm)	6.7−9.1	6−7.3
Fused tepals length (mm)	1(−1.2)	1.2−1.5(−1.8)
Connate filaments length (mm)	0.9−1.3	1−1.5
Free filaments length (mm)	1.2−1.9	1−2.5
Anther length (mm)	4.2−5.8	5.5−6.8(−7.6)
Undivided style length (mm)	0.9−1.3	1.5−2.2
Style branches length (mm)	3−3.4(−4.1)	3.5−4
Ovary length (mm)	2.9−4.5	3−3.9
Ovary width (mm)	2.7−3.5	1.5−2.5
Fruit length (mm)	7−12	5−9
Fruit width (mm)	7−10	4−7
Ovary and fruit surface	verrucose	glabrous

* Measured specimens (vegetative traits):—BRAZIL. Paraná: Pinhão, 14 October 2007, *L. Eggers & T.T. Souza-Chies 240* (ICN!); Balsa Nova, 29 August 2015, *C.D. Inácio & E.D. Lozano 301* (ICN!); Balsa Nova, 7 October 1996, *C.B. Poliquesi & J. Cordeiro 601* (FLOR! NY! PEL!); Palmeira, 29 August 2015, *C.D. Inácio & E.D. Lozano 305* (ICN!); Curitiba, 5 October 1908, *Dúsen 6815* (GH!, MO!, NY!); Curitiba, 15 September 1915, *Dúsen 17185* (GH!, NY!, US!); Pinhais, 29 October 1908, *Dúsen 7107* (GH!, MO!, US!); Lapa, 14 November 1988, *G. Hatschbach & J. Cordeiro 52527* (US!); São José dos Pinhais, 3 September 1961, *G. Hatschbach 8199* (US!); Santa Catarina, Campo Alegre, 18 October 1957, *Reitz & Klein 5313* (US!). Measured specimens (reprodutive traits):—BRAZIL. Paraná: Pinhão, 14 October 2007, *L. Eggers & T.T. Souza-Chies 240* (ICN!); Balsa Nova, 29 August 2015, *C.D. Inácio & E.D. Lozano 301* (ICN!).

Sisyrinchium sectiandrum C.D.Inácio & L.Eggers, **sp. nov.** (Figs 6 and 7)

Sisyrinchium sectiandrum resembles S. fiebrigii, but differs by the staminal column basally connate for less than 1 mm with sparse or no trichomes.

Type:—BRAZIL. Paraná: Sengés, Serra do Mocambo, 8 October 1971 (fl, fr), *G. Hatschbach 27163* (MBM!).

Perennial herb, erect, up to (28–)39–70 cm tall. Rhizome inconspicuous, with slender and fibrous roots. Basal leaves, erect, terete, 17–34 × 0.08–0.12 cm, glabrous, acute, sometimes with conspicuous sheaths 5–6.5 cm long and rudimentary lamina, 1.5–13 cm long. Flowering stem simple, erect, terete, 26–68 × 0.1–0.17 cm, with a terminal bract 1.4–17.5 cm long, proximally enlarged and membranaceous for 5.4–10.3(–16.1) mm. Synflorescence fasciculiform, 7–18 riphidia, congested at the base of the terminal bract and an opposite bract, 4.2–8.4 mm long, cuspidate to aristate, awn 1.2–7(–12.2) mm, margin membranaceous of 0.5–0.8 mm wide. Rhipidium 3–4 flowers, subsessile, peduncle 0.5–2.5 mm long. Spathes bivalved, lower valve 5.5–8.9 × 1.5 mm, upper 6–10.5 × 1–1.3 mm, acute to cuspidate, margin membranous for 0.5–0.7 mm. Pedicel longer than spathes, 7–15 mm long, with sparse translucent trichomes. Perigon disk shaped, yellow, 8.5–9 mm diameter (flowers in exsiccates). Tepals subequal, (4.1–)4.8–6.4 × (2.1–)2.4–2.7 mm, elliptic to oblanceolate, apiculate to emarginate-apiculate, with three vinaceous veins at adaxial side and reddish surface with sparse trichomes at abaxial side. Filaments yellow, basally connate for 0.5−0.7 mm, then free for 0.8−1.3 mm, ascending to patent, with or without sparse trichomes at the base. Anthers yellow, basifixed, 0.8−1.3 mm long. Ovary globose, 1–1.3 mm long and wide, pilose. Style yellow, entire, 2.5–3.1 mm long, with stigmatic region displaced above the anthers. Capsule globose, 2.4–3.8 × 2.3–4.1 mm, brown, with sparse trichomes.

Distribution and Habitat:—*Sisyrinchium sectiandrum* was collected in the northeast region of the state of Paraná, Brazil (Fig. 3), in the municipalities of Carambeí, Jaguariaíva, Piraí do Sul, Sengés and Tibagi, in the Atlantic Forest Biome. The elevation records range from 1127 to 1254 m a.s.l. The species occurs in grasslands marked by rocky outcrops and populations usually consist of sparse individuals.

Phenology:—Flowering and fruiting from August to November.

Conservation Status:—According to the IUCN Red List guidelines (IUCN 2016), the species is considered to be Endangered (EN), with subcriteria B1 (a) and (b)iii: continuing decline of extent of occurrence and a decline of quality of habitat due to loss or reduction of the natural distribution by silvicultural and agricultural expansion.

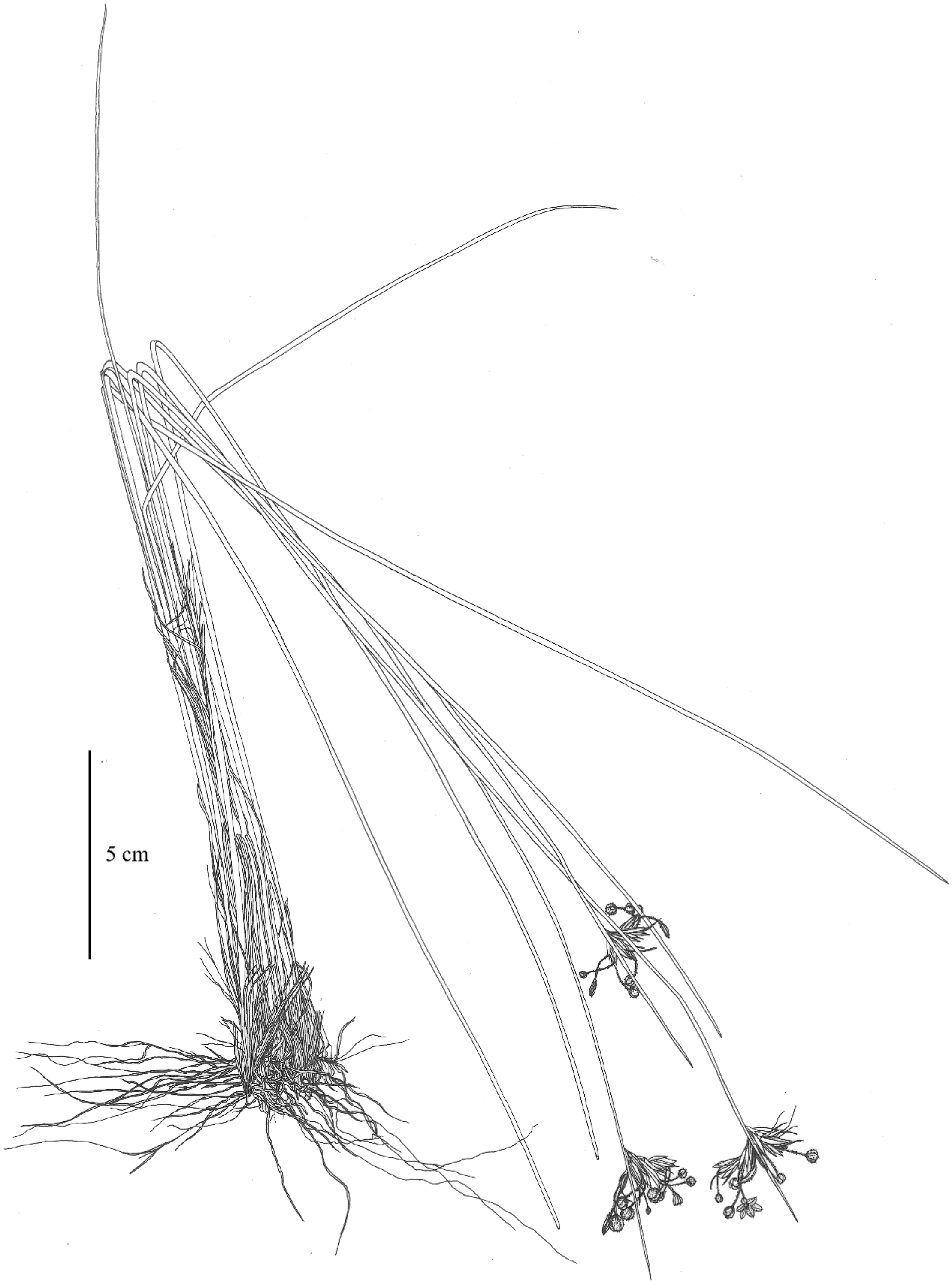

FIGURE 6. Habit of *Sisyrinchium sectiandrum* C.D.Inácio & L.Eggers. From *G. Hatschbach 27163* (MBM), drawing by Anelise Scherer.

FIGURE 7. *Sisyrinchium sectiandrum* C.D.Inácio & L.Eggers. **A.** Flower. **B.** Androgynoecium showing free filaments. **C.** Synflorescence with fruits and flower with removed tepals showing androgynoecium. **D.** Habitat in disturbed grassland, with *Pinus* sp., Paraná, Brazil. From A: *L. Eggers et al. 630* (ICN), B to D: *C.D. Inácio et al. 265* (ICN).

Etymology:—The species is named in reference to the predominantly free filaments which is a striking trait in similar taxa with terete leaves.

Paratypes:— BRAZIL. Paraná: Carambeí, Alto Carambeí, estrada para rio São João, 2 November 2013 (fl), *M.E. Engels & E.D. Lozano 1954* (MBM!); Jaguariaíva, PR 151 aproximadamente Km 229, 1130 m, 24°21'18.5"S, 49° 48'22.1"'W, 1 November 2014 (fl), *C.D. Inácio et al. 265* (ICN!, MBM!, CTES!, RB!); Jaguariaíva, PR 151 em direção a Ponta Grossa, próximo a Jaguariaíva, 1127 m, 24°21'17.4"S, 49°48'22.1"W, 27 October 2008 (fl, fr), *L. Eggers & T.T. Souza-Chies 349* (ICN!); Jaguariaíva, Parque Estadual do Cerrado, margem do rio Santo Antonio, 26 August 2000 (fl), *V. Linsingen 219* (MBM!); Piraí do Sul, PR 090 (estrada secundária de Piraí do Sul a Ventania), aproximadamente Km 156.5, 24°28'37.8" S, 50°00'16.5" W, 1254 m, 20 November 2010 (fl), *L. Eggers & T.T. Souza-Chies 630* (ICN!); Piraí do Sul, PR 090, km 162.2, 24°26'37.4"S, 50°01'43,2"W, 1180 m, 21 November 2010 (fl), *L. Eggers & T.T. Souza-Chies 645* (ICN!); Tibagi, Rio Tibagi, 6 September 1966 (fl), *G. Hatschbach & O. Guimarães 14689* (MBM!, NY!); Tibagi, Rio Tibagi, margem direita, próximo a ponte, 7 October 1994 (fl, fr), *D.C. Lemos et al. s.n.* (FUEL 14527); Tibagi, Guaterlá, sítio São Sebastião, propriedade da Sra. Júlia, 21 September 2013 (fl), *E.L. Siqueira et al. 719* (UFMT!).

Taxonomic relationships:—The new species belongs to sect. *Cephalanthum* Baker (*sensu* Inácio *et al*. 2017, accepted) and resembles other taxa with terete leaves and scapes. However, staminal column is very particular, exhibiting connate filaments solely at the base, with half or more of the length free. Plants with terete leaves and full-length connected filaments usually present purple or vinaceous flowers, such as South Brazilian *S. purpurellum* Ravenna (2002: 24) and *S. pendulum* Ravenna (2002: 23). Plants with yellow flowers and terete floriferous stems occur mainly in Central-West Brazil, such as *S. luzula* Klotzsch ex Klatt (1861–1862: 89), and *S. burchelii* Baker (1892: 57), which, however, present leaves with rudimentary lamina. *Sisyrinchium fiebrigii* I.M. Johnston (1938: 384), described for Paraguay but distributed in South Brazilian states of Rio Grande do Sul and Paraná as well, is the most similar taxon of *S. sectiandrum* in vegetative state, since it has conspicuous leaf lamina. Both species also present sobreposition or similar measurements of plant height, leaf lamina length and width, floriferous stem length and width, peduncle length, valves length and width, pedicel length and fruit length and width (Table 3). However, *S. fiebrigii* differs by the long staminal column with filaments connate almost to the top, free for just 0.1 to 0.4 mm, bearing oil-trichomes (elaiophores) for 0.4 to 0.5 mm long, compared with the smaller column with free filaments at the top, with no or with a 0.2 mm extension of trichomes, in *S. sectiandrum* (Table 3).

TABLE 3. Morphological characters retained to compare *Sisyrinchium sectiandrum* and *S. fiebrigii*.

Character/Species	***S. sectiandrum***	***S. fiebrigii****
Plant height (cm)	(28−)39−69.5	30−80
Leaf – lamina length (cm)	17−34	18−60
Leaf – lamina width (mm)	0.8−1.2	0.9−1
Leaf – sheath length (cm)	5−6.5	4.5−14
Rudimentary leaf – lamina length (cm)	1.5−13	0.4−2.7
Rudimentary leaf – sheath length (cm)	5−10.5	4.5−8.5
Floriferous stem length (cm)	26−68	16−63
Floriferous stem width (mm)	1−1.7	0.9−1.3
Terminal bract length (cm)	1.4−17.5	2.8−9.5
Terminal bract – enlarged base length	5.4−10.3(−16.1)	9.9−11.7
Terminal bract – enlarged base consistency	membranaceous	papyraceous
Peduncle length (mm)	0.5−2.5	0−5
Lower valve length (mm)	5.5−8.9	6.5−8
Lower valve width (mm)	1.5	1.2−1.5
Upper valve length (mm)	6−10.5	7−10
Upper valve width (mm)	1−1.3	1−2
Flower number / rhipidium	3−4	1−4
Pedicel length (mm)	7−15	15
Scarious margin of spathes width (mm)	0.5−0.7	0.5
Opposite bract length (mm)	4.2−8.4	6.8−11
Opposite bract awn length (mm)	1.2−7(−12.2)	3−10.7
Scarious margin of opposite bract width (mm)	0.5−0.8	0
Flower diameter (mm)	8.5−9.9	9.5−11.8
Tepal length (mm)	(4.1−)4.8−6.4	4.5−5.5
Tepal width (mm)	(2.1−)2.4−2.7	2−2.5
Connate filaments length (mm)	0.5−0.7	1.2−1.5
Free filaments length (mm)	0.8−1.3	0.1−0.4
Anther length (mm)	0.8−1.3	0.4−1
Style length (mm)	2.5−3.1	2.5−3.1
Style length above anthers (mm)	0.5−1.3	0.2−0.3
Elaiophore extension (mm)	0−0.2	0.4−0.5
Ovary length (mm)	1−1.3	0.9−1
Ovary width (mm)	1−1.3	0.6−0.9
Fruit length (mm)	2.4−3.8	2.5−3
Fruit width (mm)	2.3−4.1	2.8−5

* Measured specimens (vegetative and reproductive traits):—BRAZIL. Paraná: Ponta Grossa, 27 October 2008, *L. Eggers & T.T. Souza-Chies 352* (ICN!); Campo Largo, 22 September 1976, *L.T. Dombrowski 6430* (MBM!).

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CAPÍTULO 3: Taxonomia de *Sisyrinchium* L. (Iridaceae): seções *Cephalanthum* e *Viperella* (*pro parte*) na Região Sul do Brasil

Taxonomia de *Sisyrinchium* L. (Iridaceae): seções *Cephalanthum* e *Viperella* (*pro parte*) na Região Sul do Brasil

Introdução

Sisyrinchium é o maior gênero de Iridaceae distribuído no continente americano (Goldblatt & Manning 2008) com 216 espécies (Barker 2014). Dez seções foram caracterizadas com base morfológica e molecular, com alto suporte filogenético (Inácio *et al.* 2017, no prelo), dentre as quais, seis apresentam espécies ocorrentes no Brasil. Segundo os dados apresentados na classificação infragenérica, quatro das seis seções com representantes brasileiros apresentam poucas espécies, sendo três delas não exclusivas da América do Sul (Inácio *et al.* 2017, no prelo). A seção *Sisyrinchium* Lem. ex Klatt é composta principalmente por espécies norte-americanas, no entanto, na amostragem filogenética, três táxons estão distribuídos no sul da América do Sul, e dois ocorrem no sul do Brasil. A seção *Rhizilineum* C.D.Inácio, Chauveau & L.Eggers tem seus três representantes com ocorrência no sul da América do Sul, sendo que uma das espécies também ocorre nas Américas Central e do Norte. A seção *Morphanthus* C.D.Inácio, Chauveau & L.Eggers está composta por diversos morfotipos de *S. micranthum* distribuídos amplamente no continente americano e por *S. rosulatum* E.P. Bicknell, da América do Norte. A seção *Trichoparcus* C.D.Inácio, Chauveau & L.Eggers foi apresentada com seis espécies ocorrentes no sul da América do Sul, cinco delas com registro para o Brasil.

As outras duas seções, *Cephalanthum* Baker e *Viperella* Ravenna (*sensu* Inácio *et al.* 2017, no prelo), objeto do presente estudo, estão representadas por 24 táxons cada uma, distribuídos do centro para o sul da América do Sul, com alta riqueza no Brasil. A seção *Cephalanthum* está composta por espécies que anteriormente pertenciam às seções *Scirpeocharis* Ravenna e *Lenitium* Ravenna, separadas por apresentar caule florífero terete ou ancipitado alado, respectivamente (Ravenna 2000, 2003b). No entanto, de acordo com estudos filogenéticos constituem um único clado (Chauveau *et al.* 2011; Inácio *et al.* 2017, no prelo), suportado por apresentarem flores com elaióforos ou tricomas em diferentes densidades na coluna estaminal, e sinflorescência fasciculiforme na maioria das espécies. Já na seção *Viperella* (*sensu* Inácio *et al.* 2017, no prelo) encontram-se espécies antes classificadas nas seções *Hydastylus* (Dryand. ex Salisb.) Ravenna (em parte) e *Viperella sensu* Ravenna (2002b), eram separadas principalmente pela ausência e presença de folhas caulinares, respectivamente, mas apresentam idêntica morfologia floral.

O conjunto de caracteres morfológicos que define a seção *Cephalanthum* é: raízes fibrosas e finas; coluna estaminal com filetes unidos até quase o topo ou excepcionalmente conados a diferentes alturas, usualmente com elaióforos na base, ou densidade moderada de tricomas na base e hirsutos acima, ou apenas hirsuto, raramente com tricomas esparsos; sinflorescência fasciculiforme, raramente simples, com curtos entrenós (Inácio *et al.* 2017, no prelo). Além destas características que agrupam a seção, as espécies apresentam folhas basais planas ou teretes, perigônio aplanado ou excepcionalmente formando um tubo na base, de cor amarela, branca ou lilás, estilete inteiro ou inconspicuamente trifurcado, cápsulas globosas ou raramente ovóides. *Sisyrinchium elegantulum*, que ocorre no sul do Brasil, apresenta as características morfológicas da seção *Cephalanthum*, mas esta espécie evidenciou incongruências entre o DNA plastidial + mitocondrial e o DNA nuclear e, provavelmente tem origem híbrida a partir de um ancestral da seção *Cephalanthum* e outro da linhagem *Morphanthus* + *Rhizilineum* + *Sisyrinchium* (Inácio *et al.* 2017, no prelo).

Para a seção *Viperella*, os caracteres diagnósticos são: ausência de folhas caulinares (quando sinflorescência) ou presença (quando inflorescência simples, exceto *S. caeteanum*); caule florífero ancipitado e obviamente alado, ausência de brácteas, exceto a terminal (quando sinflorescência ou *S. caeteanum*); coluna estaminal com filetes conados a diferentes alturas, mas nunca até o topo; flores sem tricomas; sinflorescência (quando espiciforme, curtos entrenós e perigônio infundibuliforme) ou inflorescência simples; cápsula globosa, subglobosa, obovóide ou elipsóide (Inácio *et al.* 2017, no prelo). Outras características desta seção, mas que não a define são: raízes fibrosas e finas, ou carnosas; flores com perigônio aplanado ou excepcionalmente infundibuliforme, flores amarelas; estilete conspicuamente trifurcado e alterno às anteras. A seção *Viperella* (*sensu* Inácio *et al.* 2017, no prelo) agrupa duas importantes espécies de *Sisyrinchium* e táxons relacionados, as quais diferem expressivamente em morfologia: *S. palmifolium* e *S. vaginatum.* Estes dois táxons são provavelmente as espécies mais citadas e presentes em coleções de herbários, embora em seu conjunto, abranjam outras espécies relacionadas, pouco citadas e conhecidas. Este trabalho é um primeiro esforço para auxiliar na elucidação destes problemas.

No Brasil, não há estudos abrangentes que incluam as espécies das seções *Cephalanthum* e *Viperella*. Algumas poucas espécies foram brevemente descritas em estudos florísticos, a maioria deles concentrados no sudeste do Brasil (Wanderley & Toledo 1986, Chukr 1992, Takeuchi *et al.* 2008, Chukr & Capellari Jr. 2003). Na Região Sul há os trabalhos do Morro dos Perdidos no Paraná (Vieira *et al.* 2003) e do Parque Estadual de

Itapuã no Rio Grande do Sul (Eggers 2008), com a apresentação de uma e quatro espécies destas seções, respectivamente. Espécies da seção *Hydastylus sensu* Ravenna (2003) foram estudadas quanto à caracterização da anatomia foliar, sendo também apresentadas breves caracterizações de espécies (Aita, 2013), no entanto, este trabalho não se trata de uma revisão taxonômica, visto que não contempla a revisão de herbários e não fornece informações particulares sobre as espécies.

Tendo em vista a escassez de estudos taxonômicos em *Sisyrinchium* e a importância destes para botânicos, biólogos conservacionistas e ecólogos, este trabalho objetivou revisar as espécies das seções *Cephalanthum* e *Viperella* (*pro parte*), apresentando a revisão nomenclatural, descrições, ilustrações, fotos, dados de fenologia, habitat e distribuição geográfica, além de chaves de identificação.

Material e Métodos

Trabalhos de campo com foco em *Sisyrinchium* foram realizados desde 2003 até 2016, principalmente na região Sul do Brasil, mas também em áreas limítrofes como Uruguai e parte do nordeste da Argentina. O material coletado foi depositado no herbário ICN e duplicatas foram enviadas aos herbários CTES, MVM, MBM.

Coleções dos seguintes herbários foram examinadas através de visitas e/ou empréstimos de material: B, BA, BAA, CTES, FLOR, FUEL, FURB, G, GH, HAS, HB, HBR, HUCS, HUEM, HURG, IAC, ICN, K, LP, MBM, MO, MPUC, MVFA, MVJB, MVM, NY, P, PACA, PEL, R, RB, SI, SPF, UEC, UPCB, US, WU. Imagens de tipos foram obtidas dos herbários F, GH e S (acrônimos segundo Thiers 2017).

O material analisado foi comparado com as descrições originais e com os tipos nomenclaturais sempre que disponíveis. As descrições apresentadas neste trabalho foram baseadas na análise de caracteres morfológicos vegetativos e reprodutivos que abrangessem a variação morfológica de cada táxon. Para os táxons com até dois exemplares para análise foram utilizadas também as informações do protólogo. As medições foram feitas com o uso de paquímetro digital e estruturas da flor foram medidas em estereomicroscópio. As medições das flores foram feitas a partir de material preservado em álcool/glicerol (70:30), de flores das exsicatas reidratadas, ou em campo. A terminologia adotada seguiu Beentje (2016) e Goldblatt & Manning (2008). Para a caracterização da densidade dos tricomas na coluna estaminal seguiu-se os mesmos critérios adotados em Inácio *et al.* (2017, no prelo): a) esparso (com menos que 50% de cobertura da superfície da coluna estaminal com tricomas; b) moderado (50 a 90% de cobertura); c) denso (elaióforos; mais que 91% de cobertura).

Dados relativos a distribuição geográfica, ambiente de ocorrência e período de floração e frutificação dos táxons são provenientes das informações contidas nas etiquetas das exsicatas dos herbários, das próprias coletas e de dados bibliográficos, quando indicados. As regiões fisiográficas ou geomorfológicas do Paraná, Santa Catarina e Rio Grande do Sul apresentadas na distribuição das espécies está de acordo com Maack (1981), Prates *et al.* (1989) e Fortes (1959), respectivamente. Quanto as formações vegetais no sul do Brasil seguiu-se a proposta de Iganci *et al.* (2011).

Os mapas de distribuição foram confeccionados no programa ArcGIS 10.3, utilizando as coordenadas geográficas originais quando disponíveis ou foram atribuídas a partir do centroide do município ou de localidades específicas através do programa Google Earth. As figuras contemplam desenhos de hábitos e sinflorescências (estas, quando relevantes) e fotografias obtidas a campo e em estereomicroscópio. As ilustrações foram digitalizadas e retrabalhadas no programa Inkscape. As fotos utilizadas são dos autores, exceto quando indicado na legenda.

O "Material examinado selecionado" contém uma amostra de cada município de ocorrência do táxon, podendo haver até duas quando houver registro em unidades de conservação. Quando o táxon apresentou um número reduzido de amostras todo o material examinado foi listado. As coletas em locais externos à área de estudo estão apresentadas em "Material examinado adicional". Ao final desta tese, em anexo, há a listagem do material examinado que não consta neste capítulo. Algumas abreviações foram empregadas no material examinado: *s. loc.* = sem localidade, *s.d.* = sem data, *s.col.* = sem coletor e *s.n.* = sem número de coletor.

Lectotificações e neotipificações foram realizadas para as espécies em que somente haviam síntipos, ou o holótipo não foi encontrado ou estava designado para o Herbário Ravenna, o qual é inacessível.

Os táxons estão apresentados em ordem alfabética dentro de cada seção. A seção *Cephalanthum* (Parte 1) está composta por todos os táxons ocorrentes na Região Sul do Brasil e a seção *Viperella* (Parte 2) está representada pelos táxons que correspondiam à seção

Hydastylus sensu Ravenna (2000), o que inclui *S. palmifolium* e espécies de morfologia semelhante. As espécies novas não foram incorporadas a este capítulo, mas foram incluídas nas chaves. Em decorrência da similaridade morfológica de *S. elegantulum* em relação a outros táxons da seção *Cephalanthum*, o tratamento taxonômico desta espécie foi incluído ao final da seção e à chave.

Resultados e Discussão

Sisyrinchium L., Sp. Pl.: 954 (1753).

Type: *Sisyrinchium bermudianum* L.

= *Hydastylus* Dryand. ex Salisb., Trans. Hort. Soc. London 1: 310 (1812). Type: *H. californicus* (Ker Gawl.) Salisb. (= *Sisyrinchium californicum* (Ker Gawl.) Dryand.).

= *Souza* Vell., Fl. Flumin. 7: 273, t. 2 (1829). Type: *S. marchio* Vell. (= *Sisyrinchium marchio* Vell. (lectotype designated by Goldblatt *et al.* 1990).

= *Paneguia* Raf., Fl. Tellur. 4: 34 (1836). Type: *P. striata* (Sm.) Raf. (= *Sisyrinchium striatum* Raf.).

= *Pogadelpha* Raf., Fl. Tellur. 4: 29 (1836). Type: *P. graminifolia* (Lind.) Raf. (= *S. graminifolium* Lind.) (lectotype designated by Goldblatt *et al.* 1990).

= *Echthronema* Herb., Edwards's Bot. Reg. 29(Misc.): 85 (1843). Type: *E. tenuifolium* (Kunth) Herb. (= *Sisyrinchium tenuifolium* Kunth) (lectotype designated by Goldblatt et al. 1990).

= *Glumosia* Herb., Edwards's Bot. Reg. 29(Misc.): 85 (1843). Type: *G. palmifolium* (L.) Herb. (= *Sisyrinchium palmifolium* L.).

= *Oreolirion* E.P.Bicknell, Bull. Torrey Bot. Club 28: 571 (1901). Type: *O. arizonicum* (Rothr.) E.P. Bicknell (= *Sisyrinchium arizonicum* Rothr.).

Perennial or rarely annual herbs, erect or prostate, rhizome present (conspicuous or inconspicuous) or absent, roots fibrous, fleshy or tuberous. **Basal leaves** linear, lanceolate, ensiform or terete; caulinar leaves sometimes present, linear to lanceolate. **Floriferous stem** simple or branched, ancipitate (obviously or slightly winged) or terete, with or without bracts along the stem; terminal bract sometimes present. **Synflorescence** fasciculiform, spiciform, paniculiform, corimbiform, cymose or variation of these, with short or long axis or **Inflorescence** simple, rhipidium, enclosed by opposite bracts, the valves of the spathe, terminal or axillar, **Spathe** sessile to pedunculate. **Flowers** borne on slender, glabrous or pillose pedicels, radially symmetric, disk or cup shaped, rarely infundibuliform, yellow, white, lilac to dark bluish violet. **Tepals** free or united at the base, subequal, patent or reflex, glabrous or with trichomes or elaiophores. **Stamens** symmetrically arranged. **Filaments** connate to different lengths or nearly to the top in a cylindrical, carboy-shaped or conical staminal column, glabrous or with trichomes in different densities and positions, elaiophores sometimes present. **Anthers** versatile or not rimose. **Ovary** globose to obovoid. **Style** entire, hidden by the staminal column or inconspicuous or conspicuously trifurcated, with style branches alternate to the stamens. **Stigma** above or hidden by the anthers, or at the apices of the style branches. **Capsule** globose, subglobose, ovoid, obovoid, ellipsoid, pyriform or obloid. **Seeds** globose, often with a deep depression at the chalazal end.

PARTE 1 – Seção *Cephalanthum*

Key to *Sisyrinchium* sect. *Cephalanthum*

1. Inflorescence single, one terminal rhipidium, terminal bract absent

2. Plant erect, caespitose, leaves terete……………….….………………. **18. *S. setaceum***

2'. Plant prostrate, stoloniferous, leaves plane …...……………………… **15. *S. rambonis***

1'. Synflorescence fasciculiform, one to many rhipidia, terminal bract present

3. Spathes pilose

4. Floriferous stem ancipitate

5. Synflorescence with 1–6 rhipidia, subsessile to pedundulate, flowers white with vinaceous veins …………………………...………..……………. **5. *S. dasyspathum***

5'. Synflorescence with 9–20 rhipidia, sessile to subsessile, flowers purple with dark veins ……………………………..………………………….………. **20. *S. teleanthum***

4'. Floriferous stem terete ……….....……….. **14. *S. purpurellum*** subsp. ***trichospathum***

3'. Spathes glabrous

6. Leaves terete or filiform

7. Flowers yellow

8. Filaments connate in a staminal column, free for 0.1–0.4 mm at the apex, with oil-producing trichomes (elaiophore) at the base of the staminal column for 0.4–0.5 mm …..…………………………………………………………………..… **7. *S. fiebrigii***

8'. Filaments just basally connate for 0.5−0.7 mm, then free for 0.8−1.3 mm, without elaiophore, just with or without sparse trichomes at the base of the staminal column …...……………………………………………………………..… ***S. sectiandrum***

7'. Flowers white, purple, lilac or mauve

9. Flowers white

10. Perigon disk-shaped, staminal column cylindrical ……..…….. **16. *S. scariosum***

10'. Perigon cup-shaped, flaring distally, staminal column conical basally ……………..………………………………………………………… ***S. pampeanum***

9'. Flowers purple, lilac or mauve

11. Basal leaves and floriferous stem slightly incrassate; leaves with longitudinal whitish veins in fresh material ……………………...……………. **21. *S. elegantulum***

11'. Basal leaves and floriferous stem not incrassate; leaves without longitudinal whitish veins

12. Plant 35–81 cm tall; spathes with lower valve 8–15.6 mm long, pedicel 12–20 mm long, glabrous or with sparse trichomes ..………………….... **11. *S. pendulum***

12'. Plant 15–43 cm tall; spathes with lower valve 5–7.5 mm long, pedicel 6–13 mm long, with sparse trichomes …..…… **13. *S. purpurellum* subsp. *purpurellum***

6'. Leaves plane

13. Staminal column without elaiophores at the base

14. Staminal column covered all length with reflexed or incurved trichomes

15. Plants 40–103 cm tall, staminal column with abundant coarse reflexed yellow hairs ……………………………………………...…….. **8. *S. hasslerianum***

15'. Plants 18–40 cm tall, staminal column with reflexed or incurved yellow hairs in moderate density ………………………...…...…… **6. *S. fasciculatum***

14'. Staminal column mostly covered with reflexed trichomes, glabrous at the base …. ……………………………………………………………………. **9. *S. hoehnei***

13'. Staminal column with oil-producing trichomes (elaiophores) at the base

16. Spathes with lower valve greater or equal to 8 mm long

17. Flowers vinaceous …………..……………..……………….. **19. *S. soboliferum***

17'. Flowers yellow, cream or white

18. Flowers yellow

19. Terminal bract stiff, incurved at apex, staminal column with dense crown of reflexed trichomes below the anthers …..………..………… **10. *S. ostenianum***

19'. Terminal bract slender, straight, staminal column without crown of trichomes below the anthers ……..……………………..... **1. *S. albilapidense***

18'. Flowers cream to white

20. Flowers 7.5–10 mm diameter, style length 2–2.6 mm, elaiophore extension on the basis of the staminal column 0.5–0.7 mm …………..…. **12. *S. platycaule***

20'. Flowers (8.5–)13–15.5(–18) mm diameter, style length 3.3–4.6 mm, elaiophore extension on the basis of the staminal column 0.7–1.1 mm ..……… ……………………………………………………….... **17. *S. sellowianum***

16'. Spathes with lower valve up to 7 mm long

21. Synflorescence congested, with sessile to subsessile rhipidia, peduncle 0.2–2.6 mm long ……………………………………………………………. **2. *S. claritae***

21'. Synflorescence usually lax with subsessile to pedunculate rhipidia, peduncle 0.5–32.5 mm long

22. Basal leaves 0.8–2.5 mm width, distributed in central-east Brazil (Paraná, Mato Grosso do Sul, São Paulo, Rio de Janeiro, Minas Gerais, Bahia and Distrito Federal) .... **3. *S. commutatum* subsp. *commutatum***

22'. Basal leaves 0.3–1 mm width, distributed in northeast Argentina, south Brazil (Rio Grande do Sul) and Paraguay …………………………………….. ……………………………………………**4. *S. commutatum*** subsp. ***piliferum***

1. ***Sisyrinchium albilapidense*** Ravenna, Onira 5: 56 (2001). Type: Brazil, Santa Catarina, Parque das Pedras Brancas, 10 km SE de Lages, 17 January 1988, A. Krapovickas & C. Cristóbal 42042 (holotype: CTES!).

Illustrations: Fig. 1, 2 A−D.

Perennial herb, erect, 9–24 cm tall, roots slender and fibrous. Basal leaves erect, linear, 4.5–15 cm × 1–1.5 mm, glabrous, acute, and rigid. Floriferous stem simple, erect, narrowly winged, 6–20 cm × 1.1–1.4 mm, rigid, margin entire, with a linear terminal bract, 1.5–8 cm long, proximal margin membranaceous. Synflorescence fasciculiform, 1–3 rhipidia, congested at the base of the terminal bract. Rhipidium 3–5 flowers, subsessile to pedunculate, peduncle 1–18 mm long. Spathes bivalved, lower valve 11–14 × 1.6 mm, upper 12–14 × 1.6 mm, glabrous, acute to long apiculate, margin membranaceous for 1–1.2 mm. Pedicel longer than spathes, 14–18 mm long, glabrous. Perigon disk shaped, predominantly yellow to whitish, proximally yellow followed by a brown to vinaceous ring from which vinaceous veins initiate, 11–12 mm diameter (fresh flowers). Tepals subequal, 4.5–6 × 2–2.5 mm, oblanceolate, apiculate, with three large and two small vinaceous veins at both sides and sparse trichomes at the abaxial side. Filaments light yellow, sometimes distally vinaceous, connate in a staminal column, 2–2.4 mm long, cylindrical, with oil-producing trichomes (elaiophores) at the base for 0.5–0.7 mm, then with sparse trichomes. Anthers yellow, basifixed, 2–3 mm long. Ovary globose, 1–1 mm long and wide, glabrous. Style yellow, entire, 2.5–3 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 1.9–6 × 2.5–6 mm, brown, glabrous.

Distribution: *Sisyrinchium albilapidense* is endemic of Brazil, recorded so far just in Lages, Santa Catarina, in a locality named Pedras Brancas (Ravenna, 2001). The habitat is characterized by a mixture of grassland, forested areas and rock outcrops, with altitude around 900 m a.s.l. (Fig. 3), in the vegetation formation named Subtropical Mixed Forest (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from October to January.

Notes: The species is recognized by the narrow synflorescence with few rhipidia with a linear terminal bract and the rigid floriferous stem and leaves. It was just found in the type locality.

Examined material: BRAZIL, SANTA CATARINA, **Lages**, Mirante das Pedras Brancas, 945 m, 10 October 2014 (fl), *C.D. Inácio et al. 228* (ICN).

2. ***Sisyrinchium claritae*** Herter, Revista Sudamer. Bot. 5: 27 (1937). Type: Uruguay, Rocha, Santa Teresa, November 1931, Herter 87667 – H 1525 (holotype: RB!, isotypes: CTES!, MVM!, SI!, B 10 0249001, B 10 0249002, F, GH, MO, NY, S, US, photos!).

Illustrations: Fig. 2 E−H, 4.

Perennial herb, erect, 7.5–35.5 cm tall, roots slender and fibrous. Basal leaves erect, linear, 3.5–27.5 cm × 0.2–1.4 mm, glabrous, acute. Floriferous stem simple, erect, terete or narrowly winged, 5.5–33.2 cm × 0.3–1.3 mm, margin entire, with a linear or cylindrical terminal bract, 0.8–4.3 cm long, proximal margin membranaceous. Synflorescence fasciculiform, 1–7(–12) rhipidia, congested at the base of the terminal bract. Rhipidium 1–5 flowers, sessile to subsessile, peduncle 0.2–2.6 mm long. Spathes bivalved, lower valve 4.6–6.5 × 0.9–1.4 mm, upper 5.2–8 × 1.1–1.6 mm, glabrous, acute to long apiculate, margin membranaceous for 0.5–1.1 mm. Pedicel longer than spathes, 4.6–11.2 mm long, with yellow straight capitate trichomes. Perigon disk shaped, predominantly yellow, proximally yellow, followed by a brown to vinaceous large ring from which vinaceous veins initiate, 9.5–12.2 mm diameter (fresh flowers and liquid preserved flowers). Tepals subequal, 4.5–6.1 × 1.8–2.7 mm, oblanceolate, apiculate, with three vinaceous veins at both sides and surface vinaceous, with sparse trichomes at the abaxial side. Filaments light yellow, connate in a staminal column, 2–2.7 mm long, cylindrical, with oil-producing trichomes (elaiophores) at the base for (0.5–)0.8–1 mm, sparse trichomes at the middle and more abundant at the top. Anthers yellow, basifixed, 0.4–0.9 mm long. Ovary subglobose, 1.2–1.8 × 1–1.4 mm, puberulous, with light yellow straight capitate trichomes. Style yellow, entire, 2.9–3.7 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 1.3–3.3 × 1.3–2.9 mm, brown, pilose.

Distribution: *Sisyrinchium claritae* occurs in Argentina (Corrientes), Southern Brazil (Rio Grande do Sul) and Uruguay (Lavalleja, Rocha and Salto), according to herbaria data and Roitman *et al.* (2008). In Rio Grande do Sul, populations were found in the Encosta do Sudeste, Litoral and Serra do Sudeste (Fortes 1959). It inhabits grasslands and roadsides, also in humid areas, from sea level to 439 m a.s.l. (Fig. 3) comprehending the south-brazilian formation of Low Altitude Temperate Grassland, Subtropical/Temperate Coastal Scrub and Temperate Shrubland (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from October to December, occasionally in July in Corrientes, Argentina.

Notes: The species is recognized by its slender habit and sessile riphidia, differing from *S. commutatum*, which presents pedunculate riphidia. *Sisyrinchium claritae* was related to *S. ostenianum* by Johnston (1938), but can be easily distinguished by the dense and delicate globose synflorescence and the narrower, delicate leaves. Although *S. claritae* was reported to have lilac, sometimes yellow flowers by Ravenna (2002), label of type material refers "Fl. lut.", *i.e.*, yellow flowers. Color misinterpretation could be related to the characteristic lilac venation and color at the abaxial side of the tepals and the fact that Ravenna has analyzed only preserved material, since there is no collection of *S. claritae* made by him. Samples of *S. claritae* reported for G herbarium (Johnston 1938) are in fact at GH herbarium.

Examined material: BRAZIL, RIO GRANDE DO SUL, **Amaral Ferrador**, estrada secundária de Encruzilhada do Sul para Amaral Ferrador, 427 m, 03 December 2015 (fl, fr), *L. Eggers & O. Chauveau 950* (ICN); **Canguçu**, RS 265, aprox km 96, estrada Canguçu-São Lourenço, bem próximo a Canguçu, 432 m, 06 November 2015 (fl), *L. Eggers & O. Chauveau 942* (ICN); **Capão do Leão**, Cerro das Almas, 31 October 2013 (fl, fr), *T. Pastori & E. Pasini 102* (ICN); **Encruzilhada do Sul,** BR 471, direção BR 392, após saída de Encruzilhada do Sul. Após Passo Novo, antes da entrada para Coxilha do Vento, 316 m, 03 December 2015, (fr), *L. Eggers & O. Chauveau 956* (ICN); **Rio Grande**, Quinta pr. Rio Grande oppid., 12 July 1892 (fr), *C.A.M. Lindman 819* (GH, NY, US); **São Lourenço do Sul**, BR 116, km 474, 03 October 2009 (fl), *L. Eggers & T.T. Souza-Chies 484* (ICN).

Additional examined material: ARGENTINA, CORRIENTES, **Capital**, El Pericha, sables, 50 m, 4 November 1986, (fl, fr), *A. Charpin & U. Eslauche 20090* (SI); **Ituzaingó**, Rincón Ombú Chico, 3-5 July 1974 (fl, fr), *A. Krapovickas et al.25600* (CTES); **Maite Coseis**, Máximo A. Capivari, cerca de Parada Auina, 16 October 1949 (fl), *E.G. Nicora 4908* (SI). URUGUAY, SALTO, November 1902 (fl, fr), *M.B. Berro 2994* (MVFA).

3. ***Sisyrinchium commutatum*** Klatt **subsp.** ***commutatum***, Hamburger Garten - Blumenzeitung 16: 164 (1860). Type: Brazil, Minas Gerais, Caldas, 30 October 1864, Regnell 444 (lectotype: K! designated by Chukr & Capellari Jr., 2003; isolectotype: P 02065961!, P 02065963!, B, S 06-18378, S 06-18381, S 06-18384, photos!).

= *Sisyrinchium secundiflorum* Klatt, Linnaea 31: 91 (1861-1862a). Type: Brazil, Minas Gerais, Caldas, 30 October 1864, Regnell 444 (syntype: K!, P 02065961!, P 02065963!, B, S 06-18378, S 06-18381, S 06-18384, photos!), *nom. illeg.*

Illustrations: Klatt (1871: 71, as *S. secundiflorum*); Wanderley & Toledo (1986: 147); Chukr & Capellari Jr. (2003: 145); Vieira *et al.* (2003: 25); Takeuchi *et al.* (2008: 62). Fig. 5, 6 A−D.

Perennial herb, erect, 13–44 cm tall, roots slender and fibrous. Basal leaves erect, linear, 6.5–23.5 cm × 0.8–2.5 mm, glabrous, acute. Floriferous stem simple, erect, narrowly winged, 10–39.5 cm × 0.8–1.8 mm, margin entire, with a linear terminal bract, 1.5–8.5 cm long, proximal margin membranaceous. Synflorescence fasciculiform, 2–10 rhipidia, raised from the base of the terminal bract. Rhipidium 1–8 flowers, subsessile to pedunculate, peduncle 3–32.5 mm long, sometimes flexuose. Spathes bivalved, lower valve 5.1–5.9 × 0.7–1.7 mm, upper 5.3–6.8 × 0.9–1.8 mm, glabrous, acute to long apiculate, margin membranaceous for 0.6–1.4 mm. Pedicel longer than spathes, 5.8–11.1 mm long, with yellow straight capitate trichomes. Perigon disk shaped, predominantly yellow, proximally yellow to light green, followed by a brown to vinaceous ring from which vinaceous veins initiate, 8.5–11.5 mm diameter (liquid preserved flowers). Tepals subequal, 3.6–5.5 × 1.4–1.9 mm, oblanceolate, acute-apiculate, with three vinaceous veins at both sides and surface reddish with sparse trichomes at the abaxial side. Filaments light yellow, connate in a staminal column, 1.1–2 mm long, cylindrical, with oil-producing trichomes (elaiophores) at the base for 0.5–1 mm, then with sparse trichomes and a crown of trichomes below the anthers. Anthers yellow, basifixed, 0.6–1.1 mm long. Ovary subglobose, 1–1.6 × 0.8–1.3 mm, puberulous, with light yellow straight capitate trichomes. Style yellow, entire, 2.1–3 mm long, with stigmatic region projected above the anthers. Capsule subglobose, 1.7–4.4 × 1.9–3.9 mm, brown, pilose.

Distribution: *Sisyrinchium commutatum* subsp. *commutatum* occurs in Brazil (Paraná, São Paulo, Rio de Janeiro, Minas Gerais and Bahia), according to herbaria data, Wanderley & Toledo (1986), Vieira *et al.* (2003), Ravenna (2003) and Takeuchi *et al.* (2008). The species was also refered to Paraguay (Chukr & Capellari Jr., 2003), but Ravenna (2003a) stated that only *S. commutatum* subsp. *capillare* occurs there. In Southern Brazil, the species is broadly distributed in Paraná, in the Subtropical Seasonal Forest, Subtropical Mixed Forest, Tropical Forest and Subtropical Highland Grasslands (Iganci *et al.* 2011). It inhabits dry or humid grasslands, margin of water reservoirs, rocky outcrops or roadsides. Elevation records range from 200 to 1180 m a.s.l (Fig. 7).

Phenology: Flowers and fruits are reported from August to December, although there are collections with flowers from February to July in the Brazilian states of Bahia, Minas Gerais and São Paulo.

Notes: The species is recognized by the plane floriferous stem and leaves, pedunculate riphidium, yellow flowers with cylindrical staminal column with elaiophores in the base and a crown of trichomes below the anthers. In Flora Brasiliensis (Klatt 1871), it is presented as *S. secundiflorum*, that was described previously (Klatt 1861-1862a) based on the same syntypes of *S. commutatum*, the first being an illegitimate name. Although drawings and descriptions neglect some important information, *S. commutatum* subsp. *commutatum* is correctly reported at Wanderley & Toledo (1986), Vieira *et al.* (2003), Chukr & Capellari Jr. (2003), Takeuchi *et al.* (2008) and Ávila Jr. *et al.* (2015). However, species reported at Oliveira *et al.* (2016) as *S. commutatum* is certainly another taxon.

Selected examined material: BRAZIL, PARANÁ, **Adrianópolis,** Fazenda Mato Limpo, Berneck, 26 October 2005 (fl, fr), *O.S. Ribas & J.M. Silva 7060* (MBM); **Candói,** BR 277 aproximadamente km 383, 977 m, 31 October 2014 (fl), *C.D. Inácio et al. 251* (ICN); **Castro,** PR 151, direção Castro - Jaguariaíva, após Castro, 1037 m, 25 October 2008 (fl, fr), *L. Eggers & T.T. Souza-Chies 331* (ICN); **Curitiba,** Cidade Industrial, 19 October 2007 (fl, fr), *R. Rodrigues 93* (MBM); **Guaíra,** 7 Quedas, 17 November 1966 (fl, fr), *J.C. Lindeman & J.H. Haas 3279* (GH, NY, US); **Guaratuba,** Serra do Araçatuba, Morro dos Perdidos, 1000 m, 24 October 2001 (fl, fr), *E.R. Vieira, E.P. Santos & S. Slusarski 34* (MBM, UPCB); **Imbituva,** BR 373, direção Prudentópolis - Imbituva. ca. Km 225, 832 m, 20 November 2010 (fl, fr), *L. Eggers & T.T. Souza-Chies 621* (ICN); **Ipiranga,** Rio Ipiranga, 19 December

1970 (fl, fr), *G. Hatschbach 25865* (MBM); **Jaguariaíva,** Estrada secundária para o Parque Estadual do Cerrado, 851 m, 02 November 2014 (fl), *C.D. Inácio et al. 270* (ICN); **Palmeira,** BR 277, antes da cidade de Palmeira, 15 October 2007 (fl, fr), *L. Eggers & T.T. Souza-Chies 245* (ICN); **Piraí do Sul,** PR 090, km 162,2, 1180 m, 21 November 2010 (fl, fr), *L. Eggers & T.T. Souza-Chies 648* (ICN); **Piraquara,** Morro do Canal, 17 November 2006 (fl, fr), *A.R. Silva 89* (MBM); **Ponta Grossa,** beira da estrada, 02 November 1985 (fl, fr), *N.M. Kokitsu s.n.* (FUEL 1668); Parque Estadual de Vila Velha - estrada que leva as formações areníticas, 915 m, 01 November 2014 (fl, fr), *C.D. Inácio et al. 262* (ICN); **São José dos Pinhais,** ADEA - Reserva Ecológica do Cambuí, 17 October 1986 (fl, fr); *M. Scaramuzza Filho s.n.* (MBM 303288); **São Mateus do Sul,** Vargem Grande, 16 December 1969 (fl, fr), *G. Hatschbach 23253* (MBM); **Sengés,** PR 151, estrada Sengés – Reianópolis, 667 m, 26 October 2008 (fl, fr), *L. Eggers & T.T. Souza-Chies 336* (ICN); **Teixeira Soares**, PR 151, direção Irati, após Guarauna, antes de Teixeira Soares, 787 m, 29 October 2008 (fl, fr), *L. Eggers & T.T. Souza-Chies 366* (ICN); **Tibagi,** Canyon Guartelá, 08 October 1994 (fl, fr), *D.N. Pinheiro 29* (FUEL).

Additional examined material: BRASIL, BAHIA, **Jacobina,** Oeste de Jacobina. Serra do Tombador, estrada para Lagoa Grande, 23 December 1984 (fl, fr), *J.R. Pirani et al. 7484* (SPF); **Mirangaba,** Prox. a Caboré., 01 September 1981 (fr), *L.M.C. Gonçalves 171* (RB); MINAS GERAIS, **Alto Rio Doce,** 855 m, July 1944 (fl, fr), *J. Vidal I-226* (R); **Bom Jardim de Minas,** BR-494, estrada secundária junto à primeira ponte sobre o ribeirão Jacutinga, 02 October 2011 (fl, fr), *M. Sobral 14249* (RB); **Caldas,** Estrada entre Pocinhos e Andradas, 1140 m, 07 November 2014 (fl), *C.D. Inácio et al. 290* (ICN); **Camanducaia,** Estrada secundária entre Camanducaia e Monte Verde, 1379 m, 07 November 2014 (fr), *C.D. Inácio et al. 293* (ICN); **Cambuquira,** 16 October 1905 (fr), *C. Diogo 149* (R); **Carandaí,** Crespo, 14 December 1946 (fr), *Duarte 900* (RB); **Cristina,** Mata à saída da cidade, próxima à estrada para Carmo de Minas, 22 October 1989 (fl, fr), *R. Mello-Silva et al. 84* (SPF); **Itamonte,** Serra do Picú, 11 December 1886 (fr), *P. Schwacke 5326* (RB); **Lavras,** Serra dos Deuses. Material remetido pela Escola Superior de Lavras, 16 August 1944 (fr), *G. Black 2102B* (RB); **Nepomuceno,** 28 September 1983 (fl, fr), *M.L. Garlanes 966* (UEC); **Ouro Preto,** Cachoeira das Andorinhas, 23 May 1979 (fr), *L. Mautone et al. 729* (RB); **Poços de Caldas,** Rodovia Poços de Caldas - Campestre, Estrada de Minas Gerais, 01 December 1982 (fr), *H.F. Leitão Filho et al. 1846* (UEC); **São Roque de Minas,** São José do Barreiro, Divisa entre Fazenda Flora Mariana e o Parque, 18 March 1999 (fl, fr), *L. Freitas 623* (UEC). RIO

DE JANEIRO, **Itatiaia,** Parque Nacional do Itatiaia. Secondary forest near Rio Campo Belo, 850 m, 10 October 1977 (fl, fr), *P. J. M. Maas & G. Martinelli 3165* (NY); SÃO PAULO, **Atibaia,** Via D. Pedro I, Km 79, Perto de Atibaia, 800 m, 30 September 1976 (fl, fr), *P.H. Davis et al. 3122* (UEC); **Avaré,** Represa Jurumirim, 13 October 1982 (fl, fr), *G. Hatschbach 45640* (UPCB); **Campinas,** próximo ao Canal de Saneamento, 29 September 1938 (fl, fr), *H.P. Krug & O. Zagatto s.n.* (IAC 2204); **Capão Bonito,** SP 127 Km 199, Lagoa na margem direita da rodovia, 24 February 1997 (fr), *K. Matsumoto et al. 141* (UEC); **Guaratinguetá,** Fazenda Sete Lagoas, 30 October 1988 (fl, fr), *N.S. Chukr 2* (SPF); **Jundiaí,** Serra do Japi, 09 May 1984 (fl, fr), *K. Yamamoto et al. 16477* (UEC); **Pindamonhangaba,** Haras Paulista, 22 November 1938 (fr), *Germeck & Paclieri s.n.* (IAC 4445); **São Paulo,** Horto da Cantareira, 30 October 1933 (fl, fr), *W. Hoehne s.n.* (SPF 10526).

4. ***Sisyrinchium commutatum*** **subsp.** ***piliferum*** (Klatt) C.D.Inácio & L.Eggers **comb. nov.** ≡ *Sisyrinchium piliferum* Klatt, Abh. Naturf. Ges. Halle 15: 379 (1882). Type: Paraguay, Ibitimi, 6 September 1874, Balansa 553 (holotype: CTES!; isolectotypes: B!, G!).

= *Sisyrinchium commutatum* subsp. *capillare* (Baker) Ravenna, Onira 8: 51 (2003b). *Sisyrinchium capillare* Baker, Bull. Herb. Boissier 2, 3: 1105 (1903). Type: Paraguay, Curuguaty, September 1898-1899, Hassler 4588 (lectotype here designated: G 38432, photo!; isolectotypes: G 4664!, G 38435!, K!, G 38433, G 4697, GH 314949, GH 31492, MO, NY, P 634422, P 623021, S, UC photo!), *nom. illeg.*

Illustrations: Fig. 6 E−G, 8.

Perennial herb, erect, 12–33 cm, roots slender and fibrous. Basal leaves erect, linear, 6–23 cm × 0.3–1 mm, glabrous, acute. Floriferous stem simple, erect, narrowly winged, 6–24(–30) cm × 0.4–1 mm, margin entire, with a linear terminal bract, 0.8–6 cm long, proximal margin membranaceous. Synflorescence fasciculiform, 1–13 rhipidia, raised from the base of the terminal bract. Rhipidium 1–12 flowers, subsessile to pedunculate, peduncle 0.5–23 mm long, sometimes flexuose, margin papilose. Spathes bivalved, lower valve 4–6 × 1.5–2 mm, upper 4.5–7 × 1.5–2 mm, glabrous, acute, margin membranaceous for 0.5–1.3 mm. Pedicel longer than spathes, 5–12 mm long, with yellow straight capitate trichomes. Perigon disk shaped, predominantly yellow, proximally yellow to light green, followed by a brown to vinaceous ring from which vinaceous veins initiate, 8.8–12.2 mm diameter (fresh flowers and in liquid preserved flowers). Tepals subequal, 3.5–6.7 × 2–3.4 mm, oblanceolate, emarginate-apiculate, with three to five vinaceous veins and sparse trichomes at both sides. Filaments light yellow, connate in a staminal column, 1.4–2.9 mm long, cylindrical, with oil-producing trichomes (elaiophores) at the base for 0.5–1.2 mm, then with sparse trichomes and a crown of trichomes below the anthers. Anthers yellow, basifixed, 0.4–1 mm long. Ovary subglobose, 1–1.8 × 0.6–1.6 mm, puberulous, with light yellow straight capitate trichomes. Style yellow, entire, 2.5–3.9 mm long, with stigmatic region projected above the anthers. Capsule globose, 1.9–3 mm long and wide, brown, pilose.

Distribution: *Sisyrinchium commutatum* subsp. *piliferum* occurs in northeast Argentina (Corrientes, Entre Ríos, Misiones and Santa Fé), southern Brazil (Rio Grande do Sul) and Paraguay (Alto Paraguay, Caaguazú, Canindeyú, Central, Concepción, Cordillera, Guaíra, Itapúa, Misiones, Paraguarí, San Pedro), according to herbaria data, Klatt (1882) and Ravenna (2003a). In Rio Grande do Sul, it occurs in the Campanha, Campos de Cima da Serra, Litoral and Missões (Fortes 1959). It inhabits sandy, dry or damp grasslands and roadsides, from sea level to 150 m (Fig. 7), rarely above 500 m a.s.l., in the Temperate Savanna, Low Altitude Temperate Grasslands, Subtropical/Temperate Coastal Scrub and Subtropical Mixed Forest (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from August to December.

Notes: This subspecies differs from the typical subspecies by the slender leaves and stems and the generally longer staminal column. Also, geographic distribution segregate both taxa, *S. commutatum* subsp. *commutatum* occurring mainly in central-eastern Brazil, from Bahia to Paraná and *S. commutatum* subsp. *piliferum* inhabiting southern to central-western South America, mostly at Paraguay, northeast Argentina and Rio Grande do Sul.

Ravenna (2003b) reduced *S. capillare* to a subspecies of *S. commutatum*, but *S. capillare* is an illegitim name, since the epithet was already applied for the North American *S. capillare* E.P.Bicknell (1899). Another problem is that Ravenna should have used the epithet piliferum considering the first name published was *S. piliferum* (Klatt 1882).

Selected examined material: BRAZIL, RIO GRANDE DO SUL, **Barra do Quaraí**, Parque do Espinilho, 554 m, 05 November 2012 (fl, fr), *L. Eggers et al. 737* (ICN); Barra do Quaraí, propriedade do Sr. Angelo Dovigi, 77 m, 05 November 2012 (fl, fr), *L. Eggers et al.* 740 (ICN); **Barra do Ribeiro**, Perto de Guaíba, 14 November 1948 (fl, fr), *B. Rambo* 38007 (GH); **Eldorado do Sul**, BR 290, em frente à Estação Agronômica da UFRGS, 54 m, 25 October 2013 (fl), *C.D. Inácio et al.* 142 (ICN); **Itaqui**, RS 529, entrada secundária para Maçambará, a partir da BR 472. 6,5 km após Maçambará, trecho para Encruzilhada do Sul, 85 m, 07 November 2012 (fl, fr), *L. Eggers et al. 755* (ICN); **Mostardas,** BR 101, aprox. km 158, 20 m, 04 December 2015 (fl, fr), *L. Eggers & O. Chauveau 969* (ICN); **Muitos Capões** (Esmeralda), Estação Ecológica de Aracuri, 02 December 2002 (fl, fr), *J. Mauhs s.n.* (PACA 94195); **São Borja,** estrada secundária a partir da BR 287, entrada em Nhu-Porã - direção Bororé. Após 24,1 km, 81 m, 15 October 2014 (fl, fr), *T. Pastori et al. 131* (ICN); **São José do Norte,** BR 101, aprox. km 325, 3 m, 04 December 2015 (fl, fr), *L. Eggers & O. Chauveau 967* (ICN); **São Vicente do Sul,** Cerro da Glória, 150 m, 13 October 2014 (fl, fr), *T. Pastori et al. 120* (ICN); **Uruguaiana**, estrada secundária a partir da BR 472, em direção ao Rio Uruguay, logo após a cidade de João Arlegui, 79 m, 06 November 2012 (fl), *L. Eggers et al. 750* (ICN).

Additional examined material: ARGENTINA, BUENOS AIRES, **Buenos Aires**, 25 November 1940 (fl, fr), *Castellanos s.n.* (BA 34372); CHACO, **Colonia Benitez,** 18 September 1942 (fl, fr), *A.G. Schulz 3517* (SI); CORRIENTES, **Capital**, 3 km S de Laguna Brava, nacientes del Ayo. Pirayuí, Cañada Nambi-í, 24 November 1981 (fl, fr), *R. Carnevali 5235* (CTES); **Concepción**, Colonia Habana, 5 November 1980 (fl, fr), *T.M. Pedersen 12948* (SI); **Empedrado,** Ea. Cooperado INTA, 19 October 1982 (fl, fr), *J.G. Fernandez 877* (SI); **Esquina,** Estancia La Victoria. Reserva Zeni & Cia, 08 October 2008 (fl, fr), *H.A. Keller et al. 6306* (CTES); **Itatí**, 7,5 km E de Itatí, 25 October 1982 (fl, fr), *R. Carnevali 6237* (CTES); **Ituzaingó**, Isla Apipé Chico, 29 September 1978 (fl), *A. Schinini & R. Vanni 15394* (SI); **La Cruz**, Playa del Pueblo, 12 November 1986 (fl), *L.R. Parodi s.n.* (BAA 12614); **Mercedes**, "Ensayo de cargas". Potrero 8 E.E. INTA, 28 October 1980 (fl, fr), *J.G. Fernández* 740 (CTES); **Merirucuyá**, 10 km W de Merirucuyá, 29 October 1967 (fl, fr), *A. Krapovickas & C.L. Cristóbal* 13623 (SI); **Monte Caseros**, Estancia La Pototа, 19 October 1950 (fl, fr), *E.G. Nicora 5149* (SI); **San Luis del Palmar,** Cañada Grade, Ruta 8, 26 September 1973 (fl), *C. Quarín & S.G. Tressens 1437* (CTES); **Santo Tomé**, Estancia "Garruchos", 21 October 1954 (fl, fr), *T.M. Pedersen 2882* (CTES, Paratype); ENTRE

RÍOS, **Concordia,** Cala. Ayuí, 28 November 1988 (fl, fr), *N.M. Bacigalupo et al. 1024* (SI); **Federación**, Estancia Buena Esperanza, 24 October 1961 (fl), *T.M. Pedersen 6267* (SI). MISIONES, **Apóstoles,** 29 November 1943 (fr), *A. Burkart 14342* (SI); **Candelaria**, cruce de ruta prov. 103 y ruta prov. 4, 120 m, 26 September 1997 (fl), *F. Zuloaga & O. Morrone 6541* (SI); **Iguazú**, Eldorado - Zona de Schwelm, 28 October 1949 (fl, fr), *E. Schwindt 2255* (CTES); **San Ignacio**, Costa del arroyo Yabebiry, 150 m, 20 September 2000 (fl), *M.E.M. Romero et al. 2164* (SI); SANTA FÉ, **General Obligado**, Capital Reconquista. Potrero: cañada del cementerio, 20 September 1985 (fl), *G. Blanchoud 2152* (CTES). PARAGUAY, ALTO PARAGUAY, Primavera, 31 August 1957 (fl), *A.L. Woolston B287* (PACA); CAAGUAZÚ, **Coronel Ovideo,** km 119, 15 October 1951 (fl) *A. Burkart 18569* (SI); CANINDEYÚ, cerca de Salto del Guairá, Fazenda Sete Quedas, em praditos húmedos cerca de las riberas del rio Paraná, August-September 1980 (fl, fr), *J.F. Casas & J. Molero 4190* (NY); CENTRAL, Estansuela Aryuá, October 1970 (fl, fr), *A. Schinini 3259* (CTES); CONCEPCIÓN, September 1892 (fl, fr), *O. Kuntze s.n.* (NY s.n..); CORDILLERA, **Caacupé,** Barrerito, 21 October 1951 (fl), *Burkart et al. 18869* (SI); **Cordillera de Altos,** 28 September 1902 (fl), *K. Fiebrig 161* (SI); **Itacurubi,** October 1970 (fl, fr), *A. Schinini 3258* (SI); **San Bernardino,** 19 August 1916 (fl), *Osten & Rojas* 8928 (MVM); GUAIRÁ, **Hiaty,** 10 September 1928 (fl, fr), *P. Jörgensen 4260* (BA, NY, SI); MISIONES, **Villa Florida,** cerca de Villa Florida, a orillas del rio Tebicuary, em arenas de la ribera, August-September 1980 (fl, fr), *J.F. Casas & J. Molero 3688* (NY); PARAGUARÍ, **Caapucú,** 13 November 1956 (fl, fr), *T.M. Pedersen s.n.* (CTES 350033); **Ybitimi**, 6 September 1874 (fl, fr), *Balansa 553* (CTES, syntype); SAN PEDRO, Primavera, 10 August 1954 (fl, fr), *A.L. Woolston 287* (NY).

5. ***Sisyrinchium dasyspathum*** (Ravenna) Ravenna, Onira 7: 29 (2002). ≡ *Sisyrinchium hirsutum* subsp. *dasyspathum* Ravenna, Wrightia 7: 7 (1981). Type: Argentina, Misiones, Obera, 10 Km SO de Obera, ruta prov. 105, arroyo Salto, 10 November 1972, L.A. Mroginski 778 (lectotype here designated: CTES!).

Illustrations: Fig. 6 H−I, 9.

Perennial herb, erect, 9–15 cm tall, roots slender and fibrous. Basal leaves erect, linear, 5.5–14.5 cm × 1.9–3.5 mm, glabrous, acute, margin frequently ciliate. Floriferous stem simple, erect, narrowly to obviously winged, 4–11.5 cm × 0.8–2.7 mm, margin strigulose, with a linear terminal bract, 2.5–5.7 cm long, margin strigulose. Synflorescence fasciculiform, 1–6 rhipidia, raised from the base of the terminal bract. Rhipidium 2–9 flowers, subsessile to pedunculate, peduncle 3–32.5 mm long. Spathes bivalved, lower valve 8.1–10.1 × 1.4–1.8 mm, upper 10.3–11.5 × 2–2.5 mm, pilose, acute to long apiculate, margin membranaceous for 0.7–1 mm. Pedicel longer than spathes, 16–21.6 mm long, with translucent capitate trichomes. Perigon disk shaped, white with vinaceous veins, 11.5–14.5 mm diameter (liquid preserved flowers). Tepals subequal, 5.2–7 × 1.8–2.2 mm, oblanceolate, acute-apiculate, with three vinaceous veins and sparse trichomes at the abaxial side. Filaments light yellow, connate in a staminal column, 1.6–2.5 mm long, cylindrical, with oil-producing trichomes (elaiophores) at the base for 0.8–1 mm, then with sparse trichomes. Anthers yellow, basifixed, 0.5–0.8 mm long. Ovary globose to subglobose, 1.2–1.5 × 1.1–1.4 mm, puberulous, with light yellow straight capitate trichomes. Style yellow, entire, 2.9–3.2 mm long, with stigmatic region projected above the anthers. Capsule subglobose, 3–4.5 × 3.1–5 mm, brown, pilose.

Distribution: *Sisyrinchium dasyspathum* is distributed in Argentina (Corrientes, Misiones), southern Brazil (Rio Grande do Sul) and Paraguay (Itapúa, Paraguarí), according to herbaria data and Roitman *et al.* (2008). Ravenna (1981) mentioned a collection (Reitz & Klein 8414, US, photo!) for Santa Catarina (Brazil), however the sample belongs to *S. sellowianum*, a similar species depending on the developmental state of the synflorescence. In Rio Grande do Sul, it occurs on the physiographic region of Missões (Fortes 1959), in the Low Altitude Temperate Grasslands (Iganci *et al.* 2011). *Sisyrinchium dasyspathum* inhabits grasslands, sandy soils, rocky outcrops and border of paths, from 121 to 328 m a.s.l. (Fig. 10).

Phenology: Flowers and fruits are reported from September to October.

Notes: The species is recognized by the plane leaves and floriferous stem, and the pilose spathes, frequently pedunculated, with white flowers. Also, plants turn particularly dark after drying. Measurements here presented were based only in the collections made in Brazil, but Ravenna (2002, 2003) described that the species could reach 37 cm tall. A lectotype was here designated since holotype is unavailable, reported to be at Ravenna herbarium, and the isotype was not found in K herbarium.

Examined material: BRAZIL, RIO GRANDE DO SUL, **Cerro Largo,** Cerro Largo p. São Luiz, 01 September 1944 (fl), *E. Friderichs s.n.* (PACA 26735);, Cerro Largo p. São Luiz, 12 September 1946 (fl), *Irmão Augusto s.n.* (PACA 33823); **Entre-Ijuís,** estrada secundária (aproximadamente no km 513) para o Sítio Arqueológico São João (em frente ao sítio), 328 m, 29 October 2009 (fl, fr), *L. Eggers & T.T. Souza-Chies 537* (ICN); **Jaguari,** BR 287, aproximadamente km 345, 121 m, 30 October 2009 (fl, fr), *L. Eggers & T.T. Souza-Chies 557* (ICN).

Additional examined material: ARGENTINA, CORRIENTES, **Santo Tomé**, em bosque a orillas del rio Uruguay, 31 October 1970 (fl, fr), *A. Krapovickas & C.L. Cristóbal 16449* (CTES); MISIONES, **Aristíbulo del Valle,** Arroyo Acaraguá, October 1949 (fl, fr), *Grondona & Piccinuini 3163* (CTES); **Cainguás,** Predio UNLP: valle del arroyo Cuña Pirú, picada em selva, ruta 7, cerca del balneário, 22 September 1999 (fl), *F. Biganzoli et al. 580* (SI); **Candelaria,** Loreto, 220 m, 9 September 1946 (fl), *J.E. Montes 2109* (SI); **Iguazú**, puente viejo sobre rio Uruguay, 12 September 1985 (fl, fr), *M.E. Múlgura et al. 546* (SI); **Leandro N. Alem,** Villa Venecia, 14 September 1970 (fl, fr), A. *Krapovickas & C.L. Cristóbal 15959* (CTES); **Libertador General San Martín**, Ruta prov. 11, cerca de límite com Dpto. Cainguás, 01 September 2008 (fl), *H.A. Keller 5950* (CTES); **Loreto,** Ruinas de Loreto, 18 October 1969 (fl, fr), *G.C. Pfeiffer 118* (CTES); **Oberá,** 10km SO de Oberá, ruta prov. 105, ayo. Salto, 10 November 1972 (fr), *L.A. Mroginski 778* (CTES, Paratype); **San Ignacio**, Parque Prov. Teyú Cuaré, Peñón del Teyú Cuaré, 20 October 1996 (fl, fr), *O. Morrone et al. 1649* (SI). PARAGUAY, ITAPÚA, **Encarnación**, September 1915 (fl, fr), *E. Hassler 1374* (SI); PARAGUARÍ, **Ybytimí**, 8 October 1952 (fl, fr), *J.E. Montes 12943* (CTES).

6. ***Sisyrinchium fasciculatum*** Klatt, Linnaea 31: 97 (1861-1862a). ≡ *Bermudiana fasciculata* (Klatt) Kuntze, Revis. Gen. Pl. 2: 699 (1891). Type: Brasilia meridionalis, Sellow 3864 (lectotype: B100247598! designated by N.S. Chukr, 2003).

Illustrations: Klatt (1871: 71); Chukr & Capellari Jr. (2003: 145). Fig. 11, 12 A−B.

Perennial herb, erect, 18–40 cm tall, roots slender and fibrous. Basal leaves erect, linear, 10.5–27 cm × 1.5–3.3 mm, glabrous, acute. Floriferous stem simple, erect, ancipitate, narrowly winged, 17–38.5 cm × 0.6–1.6 mm, margin entire, with a linear terminal bract, 1–3.5 cm long, proximal margin narrowly membranaceous. Synflorescence fasciculiform, 4–12 rhipidia, congested at the base of the terminal bract. Rhipidium 1–5 flowers, sessile to subsessile, peduncle 0.7–2.6 mm long. Spathes bivalved, lower valve 6.2–8.2 × 1.3–1.7 mm, upper 7.6–9 × 1.4–2 mm, glabrous, acute to long apiculate, margin membranaceous for 0.3–0.5 mm. Pedicel longer than spathes, 10.5–17.9 mm long, with translucent straight capitate trichomes. Perigon disk shaped, yellow, 9–11.8 mm diameter (liquid preserved flowers). Tepals subequal, 4.5–6.5 × 1.9–3.5 mm, lanceolate, acute-apiculate, with green or yellow veins and sparse trichomes at the abaxial side. Filaments yellow, connate in a staminal column, 1.4–1.7(–2) mm long, cylindrical, full extension with reflexed trichomes, slightly denser at the base and top, below the anthers. Anthers yellow, basifixed, 0.9–1.5 mm long. Ovary globose to subglobose, 1.2–1.6 × 1.2–1.5 mm, pilose, with translucent straight capitate trichomes. Style yellow, inconspicuously trifurcate, 2.7–3.1 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 2–3.7 × 2.2–4.6 mm, brown, sparsely pilose.

Distribution: *Sisyrinchium fasciculatum* is distributed in northeast Argentina (Corrientes and Missiones), southern Brazil (Rio Grande do Sul) and Paraguay (Alto Paraná, Caaguazú, Canindeyú, Cordillera, Itapúa, Misiones), according to herbaria data, Ravenna (2003) and Roitman *et al.* (2008). In Rio Grande do Sul it occurs in the Planalto Médio (Fortes 1959), in the Subtropical Seasonal Forest (Iganci *et al.* 2011). The species occurs in grasslands, from 455 to 583 m a.s.l (Fig. 13).

Phenology: Flowers and fruits are reported in October, but there are records from August to November in Argentina and Paraguay.

Notes: *Sisyrinchium fasciculatum* is similar to *S. hasslerianum* and was considered a synonym of the last by Ravenna (2002, 2003). However, it is a distinct species, differing from *S. hasslerianum* mainly by the density of trichomes in the staminal column. *Sisyrinchium fasciculatum* presents reflexed trichomes all along the staminal column, but density is lower in the middle portion, while in *S. hasslerianum*, column is tomentose in all extension. This difference was also reported by Chukr and Capellari Jr. (2003), who described that *S. fasciculatum* is tomentose at the base of the staminal column while *S. hasslerianum* has the staminal column all covered by trichomes. On the other hand, Johnston's characterization of the staminal column of *S. fasciculatum* is not inequivocal, and he just specified that the species presents glanduliferous trichomes near the base (Johnston 1938). Trichomes of the staminal column of *S. fasciculatum*, *S. hasslerianum* and *S. hoehnei* are evidently distinct from the trichomes localized at the proximal end of the staminal column of many *Sisyrinchium* species which bear elaiophores. Original description of *S. fasciculatum* stated that the species presents staminal column "dense glanduloso-pubescente" (Klatt 1861-1862a). Although not chemically analyzed, we believe that trichomes of the staminal column of *S. fasciculatum* are morphologically similar to trichomes of *S. setaceum*, which are glanduliferous, albeit oil production is reduced compared with other species (Silvério *et al.* 2012). Chukr & Capellari Jr. (2003) described flowers of *S. fasciculatum* as lilac or purple, rarely yellow, however flowers are definitively yellow.

Chukr & Capellari Jr. (2003) designated a lectotype based on a collection of Sellow, probably number 3864, from "Brasilia Meridionalis", dated 1836. At the left upper side of the label, there is a number 112, scratched. This exsiccate is preserved at B herbarium and we agree with the designation of the lectotype.

Examined material: BRAZIL, RIO GRANDE DO SUL, **Júlio de Castilhos**, depois da estrada secundária para as barragens, estrada secundária de Júlio de Castilhos para Pinhal Grande / Estrela Velha, 455 m, 18 October 2013 (fl, fr), *C.D. Inácio et al. 128* (ICN); BR 158, km 276, na beira da estrada, 482 m, 17 October 2013 (fl, fr), *C.D. Inácio et al. 119* (ICN); **Lagoa Bonita do Sul**, estrada secundária para Lagoa Bonita do Sul, 583 m, 19 October 2013 (fl), *C.D. Inácio et al. 131* (ICN).

Additional examined material: ARGENTINA, CORRIENTES, **Bella Vista,** Ruta 27,10 km S de Bella Vista, Toropí, 13 October 1974 (fl, fr), *A. Schinini & C.L. Cristóbal 9830* (CTES); **Capital,** Ayo. Riachuelo y Ruta 12, 12 October 1967 (fl, fr), *A. Krapovickas & C.L. Cristóbal 13539* (CTES); **Ituzaingó,** Playadito, 24 September 1974 (fl, fr) A. *Krapovickas et al. 26369* (CTES); **Santo Tomé**, Arroio Chimiray, 23 September 1974 (fl, fr), *A. Krapovickas et al. 26245* (MBM); MENDOZA, **San Rafael,** Camino Cerro Victoria, 19 October 1969 (fl, fr), *G.C. Pfeiffer 48* (CTES); MISIONES, **Candelaria,** Camino a Cerro Azul, 2km E de ruta 12, 20 September 1969 (fl), *A. Krapovickas et al. 15450* (CTES); **Garupá**, September 1947 (fl, fr), *E. Granaliria & R. Spegazzini 1326* (CTES); **Posadas**, Ruta 12, saindo de Posadas direção Ituzaingó, Km 1328, em frente à estância Santa Lucia, 145 m, 16 October 2013 (fl, fr), *C.D. Inácio et al. 103* (ICN); **San Ignacio, S**an Ignacio, alrededores de la casa de Horacio Quiroga, 5 November 1993 (fl, fr), *A. Krapovickas & C.L. Cristóbal 44598* (CTES). PARAGUAY, ALTO PARANÁ, **Estancia Santa Elena,** Zona rio Pirá Pytá, 16 October 1990 (fr), *G.C. Marmori s.n.* (CTES 209491); CAAGUAZÚ, Ea. Caa Cora. Estribacio nes de la Sra. De San Joaquin, 290 m, 10 October 1995 (fl), *A. Schinini & G.C. Marmori 30081* (CTES); CANINDEYÚ, 5 August 1996 (fl, fr), *B. Jiménez & G. Marín 1309* (CTES); ITAPÚA, **Capitán Miranda,** 2km N del Hotel Tirol, 6 October 1993 (fl, fr), *A. Krapovickas & C.L. Cristóbal 44422* (CTES).

7. *Sisyrinchium fiebrigii* I.M. Johnst**.,** J. Arnold Arbor. 19: 384 (1938). Type: Paraguay, Cordillera de Altos, 8 October 1902, Fiebrig 220 (holotype: GH, photo!).

Illustrations: Fig. 12 C−D, 14.

Perennial herb, erect, 30–80 cm tall, roots slender and fibrous. Basal leaves erect, terete, 18–60 cm × 0.9–1 mm, glabrous, acute, and leaves with sheath 4.5–14 cm and leaf blade filiform, 0.4–2.7 mm, glabrous. Floriferous stem simple, erect, terete, 16–63 cm × 0.9–1.3 mm, with a cylindrical terminal bract, 2.8–9.5 cm long, proximal margin membranaceous. Synflorescence fasciculiform, 5–16 rhipidia, congested at the base of the terminal bract. Rhipidium 1–4 flowers, sessile to subsessile, peduncle to 4.9 mm long, sometimes subtended by inconspicuous sterile bract with cuspidate apex. Spathes bivalved, lower valve 6.5–8 × 1.2–1.5 mm, upper 7–10 × 1–2 mm, acute to long apiculate, margin papiraceous for 0.5 mm. Pedicel longer than spathes, 15 mm long, with translucent capitate trichomes, slightly pilose to glabrescent. Perigon disk shaped, yellow, proximally light green, followed by a vinaceous ring from which vinaceous veins initiate, 9.5–11.8 mm diameter (liquid preserved flowers), purpureous in the face abaxial. Tepals subequal, 4.5–5.5 × 2–2.5 mm, lanceolate, apiculate, with three vinaceous veins at both sides and sparse trichomes at the abaxial side. Filaments light green, connate in a staminal column, 1.2–1.5 mm long, cylindrical, free for 0.1–0.4 mm at the apex, with oil-producing trichomes (elaiophores) at the base for 0.4–0.5 mm, then with sparse trichomes. Anthers yellow, basifixed, 0.4–1 mm long. Ovary subglobose, 0.9–1 × 0.6–0.9 mm, pilose, with light yellow straight capitate trichomes. Style yellow, inconspicuously trifurcate, 2.5–3.1 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 2.5–3 × 2.8–5 mm, brown, sparse pilose.

Distribution: *Sisyrinchium fiebrigii* is distributed in southern Brazil (Paraná) and Paraguay (Caazapá, Canindeyú, Cordillera, Misiones, Paraguarí), according to herbaria data, Ravenna (2003) and Roitman *et al.* (2008). In Paraná, it occurs mainly in the Segundo Planalto (Maack 1969), in area of Subtropical Mixed Forest (Iganci *et al.* 2011). The species inhabits stony grasslands, roadsides and wet areas, from 899 to 1136 m a.s.l (Fig. 10).

Phenology: Flowers and fruits are reported in September and October.

Notes: The species is recognized by the yellow flowers with filaments connate almost to the top of the staminal column, free for just 0.1 to 0.4 mm, and with dense trichomes at the base (elaiophores). *Sisyrinchium sectiandrum* is a similar species, but it presents the staminal column with free filaments from half portion, with or without sparse trichomes at the base. *Sisyrinchium fiebrigii* was described without a clear reference to flower colour, just with a reference that flowers in dried material are purpureous. However, comments made by Jonhston (1938) in the original description, comparing *S. fiebrigii* with other species with yellow flowers, make flower colour clear. Abaxially, indeed, tepals are purpureous in exsiccates and living material.

Selected examined material: BRAZIL, PARANÁ, **Balsa Nova**, BR 277, direção Curitiba - Guarapuava, após São Luís do Purunã, 1048 m, 28 October 2008 (fr), *L. Eggers & T.T. Souza-Chies 362* (ICN); **Campo Largo,** São Luís do Purunã, 22 September 1976 (fl), *L.T. Dombrowski 6430* (MBM); **Jaguariaíva,** PR 151, após Piraí do Sul, 1136 m, 25 October 2008 (fr), *L. Eggers & T.T. Souza-Chies 334* (ICN); **Ponta Grossa,** BR 376, km 531, borda com pedras à margem do Rio Tibagi, 928 m, 27 October 2008 (fr), *L. Eggers & T.T. Souza-Chies 352* (ICN); **Tijucas do Sul**, estrada secundária da BR 376 para Tijucas do Sul, cerca de 2 km da BR, 899 m, 24 October 2008 (fl), *L. Eggers & T.T. Souza-Chies 325* (ICN).

Additional examined material: PARAGUAY, MISIONES, **Santiago**, Estancia La Soledad, 21 October 1959 (fl, fr), *T.M. Pedersen 5177* (CTES).

8. ***Sisyrinchium hasslerianum*** Baker, Bull. Herb. Boissier, sér. 2, 3: 1106 (1903). Type: Paraguay, Vaqueria Capibary, August 1898-1899, E. Hassler 4376 (lectotype here designated: G38468!, isolectotype G! MO!).

Illustrations: Chukr & Capellari Jr. (2003: 145). Fig. 12 E−F, 15.

Perennial herb, erect, 40–103 cm tall, roots slender and fibrous. Basal leaves erect, linear, 18.7–63 cm × 1.1–4.1 mm, glabrous, acute. Floriferous stem simple, erect, ancipitate, narrowly winged, 38–80 cm × 0.5–2.5 mm, margin entire, with a linear terminal bract, 2–13(–29) cm long, proximal margin narrowly membranaceous. Synflorescence fasciculiform, 4–19 rhipidia, congested at the base of the terminal bract. Rhipidium 2–6 flowers, subsessile to pedunculate, peduncle 0.8–11.8(–42.3) mm long. Spathes bivalved, lower valve 6.5–10.9 × 0.8–1.5 mm, upper 7.5–11.2 × 1.1–1.7 mm, glabrous, acute to long apiculate, margin membranaceous for 0.3–0.6 mm. Pedicel longer than spathes, 10.5–17.9 mm long, with light yellow straight capitate trichomes. Perigon disk shaped, yellow, 9.5–10.6 mm diameter (flowers in exsiccates). Tepals subequal, 4.5–5.7 × 1.5–2 mm, lanceolate, acute-apiculate, with yellow veins and sparse trichomes at the abaxial side. Filaments yellow, connate in a staminal column, 1.3–1.6 mm long, cylindrical, full extension with reflexed trichomes, covering all column. Anthers yellow, basifixed, 0.9–1.5 mm long. Ovary subglobose, 1–1.4 × 0.9–1.1 mm, pubescent, with light yellow straight capitate trichomes. Style yellow, inconspicuously trifurcate, 2.2–3.2 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 3.2–4.9 × 2.6–5.5 mm, brown, pilose.

Distribution: *Sisyrinchium hasslerianum* occurs in northeast Argentina (Chaco, Corrientes and Missiones), Brazil (Paraná, Santa Catarina, Rio Grande do Sul, Mato Grosso do Sul and São Paulo) and Paraguay (Canindeyú, Central, Concepción, Cordillera, Guaíra, Itapúa, Misiones, Paraguarí, San Pedro), according to herbaria data and Roitman *et al.* (2008). In Paraná, it occurs in the three plateaus (Primeiro, Segundo e Terceiro Planaltos, Maack 1969). In Santa Catarina, there is one record in the Planalto Arenito-Basáltico (Prates *et al.* 1989) and in Rio Grande do Sul, it occurs in the Campos de Cima da Serra and Missões (Fortes 1959). The species inhabits grasslands (mostly humid), margins of bogs, and occasionally in roadsides, from 74 to 1000 m a.s.l (Fig. 13). Vegetation correspond to Subtropical Mixed Forest and Low Altitude Temperate Grasslands (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from August to December, although there are occasional collections in January and June.

Notes: As mentioned for *S. fasciculatum*, these two species are very similar and can be distinguished by the density of trichomes at the staminal column. Although the protologue of the species does not present any comment about trichomes at the staminal column, this character was well described in Jonhston (1938), who stated that the entire length of the staminal tube is covered by abundant coarse reflexed yellow hairs. Trichomes of *S. hasslerianum* are visually different of trichomes of *S. fasciculatum.* They are correctly defined as coarse and we believe they do not secrete oil.

Selected examined material: BRAZIL, PARANÁ, **Guarapuava,** BR 277, direção Guarapuava - Laranjeiras do Sul, após Guarapuava, após PR 364, 978 m, 30 October 2008(fl), *L. Eggers & T.T. Souza-Chies 377* (ICN); **Tibagi,** Parque Estadual do Guartelá, 27 September 2008 (fl, fr), *M. Fritschet al. 396* (RB); RIO GRANDE DO SUL, **Esmeralda,** rio Frade, 03 October 2007 (fl), *T.B. Guimarães & C.R. Grippa 1285* (ICN); **Itaqui,** BR 472 entre Itaqui e São Borja, 74 m, 15 October 2014 (fl, fr), *T. Pastori et al. 139* (ICN); **Manoel Viana,** Estrada de Chão entre Manoel Viana e Encruzilhada RS 176, 171 m, 14 October 2014 (fl, fr), *T. Pastori et al. 130* (ICN); **São Borja,** BR 285, km 639, 112 m, 29 October 2009 (fr), *L. Eggers & T.T. Souza-Chies 543* (ICN); SANTA CATARINA, **Abelardo Luz,** 8-9 Km north of Abelardo Luz, 900-1000 m, 8 December 1964 (fl), *L.B. Smith & R.M. Klein 13883* (US).

Additional examined material: BRAZIL, MATO GROSSO DO SUL, **Amambaí,** Arredores da tribo Caiuá, 1979 (fr), *W.G. Garcia 14021* (UEC); SÃO PAULO, **Campos do Jordão,** no Parque Estadual, em São José dos Alpes, 05 October 1975 (fl,fr), *J. Mattos 16015* (HAS). ARGENTINA, CORRIENTES, **Concepción,** Arroyo Tajio, 58 km al NE de Chavarria camino a Concepción, 1 km al N de la Estancia Cerro Pyta, 23 October 1996 (fl, fr), *M.M. Arbo et al. 6803A* (CTES); **Ituzaingó,** 30km W de Ituzaingó, ruta nac. 12, 20 September 1970 (fl, fr), *A. Krapovickas & C.L. Cristóbal 16065* (CTES); **Mburucuyá,** Parque Nacional Mburucuyá. Potrero Maizal, 17 October 2006 (fl, fr), *M.M. Arbo et al. 9269* (CTES); **Mercedes,** 75 km N de Mercedes, Laguna Trin, Ea. Culantrillar, 17-24 October 1975 (fl), *A. Schinini et al. 11777* (SI, CTES); **San Martín,** Esteros del Cambá Trapo, 15 September 1999 (fl, fr), *A. Schinini et al. 35007* (CTES, SPF); **San Miguel,** Ruta 17, 24 km

S de ruta 12. Col San Antonio, (ex El Ciervo), 23 October 1979 (fr), *R. Carnevali 6327* (CTES); **San Roque,** Ea. Añá Cuá, 7 October 1969 (fl), *R. Carnevali 1661* (CTES); MISIONES, **Apóstoles,** Estrada Apóstoles para Três Capones, 139 m, 16 October 2013 (fl), *C.D. Inácio et al. 105* (ICN); **Cainguás,** Predio UNLP: valle del arroyo Cuña Pirú, 150 m, 23 September 1998 (fl), *F. Biganzoli et al. 341* (SI); **Candelaria,** Ruta Prov. 3, 10 km del desvío de la Ruta Nac. 12 a Cerro Corá, 21 October 1996 (fl), *O. Morrone et al. 1769* (SI); **Concepción,** Aldea aborigen Yraka Miri, 15 September 2008 (fl), *H.A. Keller et al. 6032* (CTES); **Oberá,** Campo Viera. Colonia Yazá, ca. De Escuela Provincial. El Yazá, 279 m, 6 October 2007 (fl), *H.A. Keller et al.i 4484* (CTES); **San Ignacio,** Cercanias de aldea aborigen Pindoty, 16 October 2009 (fl, fr), *H.A. Keller & J.J. Araujo 7577* (CTES). PARAGUAY, CENTRAL, **Villa Elisa,** 20 September 1962 (fl), *T.M. Pedersen 6517* (CTES, SI); CORDILLERA, **Altos**, January 1885-1895 (fr), *E. Hassler 1831* (NY); **Caacupé,** Barrerito, 21 October 1951 (fl), *A. Burkart 18865* (SI); MISIONES, **Santiago,** Estancia La Soledad, 26 September 1962 (fl), *T.M. Pedersen 6576* (CTES, SI); SAN PEDRO, Primavera, 2 September 1956,(fl, fr), *A.L. Woolston 723* (NY, SI).

9. ***Sisyrinchium hoehnei*** I.M. Johnst., J. Arnold Arbor. 19: 387 (1938). ≡ *Sisyrinchium fasciculatum* subsp. *hoehnei* (I.M. Johnst.) Ravenna, Onira 7: 39 (2002). Type: Brazil, Paraná, Curitiba, 18 October 1928, F.C. Hoehne, SBSP 23057 (holotype: GH, photo!, isotype: SPF!).

Illustrations: Fig. 12 G−H, 16.

Perennial herb, erect, 27–106 cm tall, roots slender and fibrous. Basal leaves erect, linear, 15.5–64 cm × 0.4–2.8 mm, glabrous, acute. Floriferous stem simple, erect, terete, 32–95 cm × 0.6–2.6 mm, with a linear terminal bract, 1.5–6.5 cm long, proximal margin narrowly membranaceous. Synflorescence fasciculiform, 4–31 rhipidia, congested at the base of the terminal bract. Rhipidium 1–4 flowers, sessile to subsessile, peduncle 0.2–4.5 mm long. Spathes bivalved, lower valve 3.8–6.8 × 0.8–1.7 mm, upper 4–10 × 0.7–1.9 mm, glabrous, acute to long apiculate, margin membranaceous for 0.3–0.8 mm. Pedicel longer than spathes, 7.5–14 mm long, with light yellow straight capitate trichomes. Perigon disk shaped, yellow, 7.3–8.5 mm diameter (liquid preserved flowers). Tepals subequal, 3.5–5.1 × 1.3–2.3 mm, lanceolate, acute-obtuse, with green coloured veins and sparse trichomes at the abaxial side.

Filaments yellow, connate in a staminal column, (1.1–)1.5–2.8 mm long, cylindrical, full extension with reflexed trichomes, except the base, glabrous for (0.2–)0.5–1.3 mm. Anthers yellow, basifixed, 0.8–2 mm long. Ovary subglobose, 0.6–1.5 × 0.5–1.3 mm, pubescent, with light yellow straight capitate trichomes. Style yellow, inconspicuously trifurcate, 2.6–4.2 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 1.8–3.5 × 1.3–4.5 mm, brown, pilose.

Distribution: *Sisyrinchium hoehnei* occurs in northeast Argentina (Corrientes and Missiones), Brazil (Paraná, Santa Catarina, Rio Grande do Sul and Mato Grosso do Sul) and Paraguay (Alto Paraná, Caaguazú, Misiones), according to records in herbaria and Roitman *et al.* (2008). In Paraná, there are records in the Primeiro e Segundo Planaltos (Maack 1969). In Santa Catarina, the species occurs in the Planalto Arenito-Basáltico e Planalto Paleozóico (Prates *et al.* 1989) and in the state of Rio Grande do Sul, there are records in the Depressão Central (Fortes 1959). The species inhabits wetlands and swamp borders, from 50 to 1297 m a.s.l. (Fig. 13), in the Subtropical Mixed Forest and Subtropical Seasonal Forest (Iganci *et al*. 2011).

Phenology: Flowers and fruits are reported from August to November.

Notes: *Sisyrinchium hoehnei* was considered synonymy of *S. hasslerianum* by Chukr & Capellari Jr. (2003) and a subspecies of *S. fasciculatum* by Ravenna (2002), who segregated the subspecies based on the taller habit, narrower leaves and slightly smaller flowers. We agree with Johnston (1938) that it is a distinct species, by the differences above mentioned and also by the staminal column which lacks trichomes at the very base, trait that is mentioned by Ravenna (2002), but not by Johnston (1938). This characteristic, although not evident, is easily noticeable with careful observation.

Selected examined material: BRAZIL, PARANÁ, **Balsa Nova,** PR 510, estrada Campo Largo - Balsa Nova, 879 m, 28 October 2008 (fr), *L. Eggers & T.T. Souza-Chies 355* (ICN); **Barigui,** 14 November 950 (fl, fr), *A. Mattos s.n.* (US 2440506); **Candói,** BR 277 aprox. km 383, 977 m, 31 October 2014 (fl), *C.D. Inácio et al. 253* (ICN); **Curitiba,** Rio Atuba, 30 October 1973 (fl), *G. Hatschbach 32781* (CTES, MBM, MO); **Guarapuava,** BR 277, direção Guarapuava - Laranjeiras do Sul, após Guarapuava. Posto Águia, 1037 m, 30 October 2008 (fr), *L. Eggers & T.T. Souza-Chies 373* (ICN); **Lapa,** Johanisdorf, 31 October

1972 (fl, fr), *G. Hatschbach 30597* (MBM, US); **Palmas,** PR 280 - Km 93, 1297 m, 30 October 2014 (fl), *C.D. Inácio et al. 245* (ICN); **Piraquara,** Fazenda Experimental de Agronomia, 14 October 1969 (fl), *N. Imaguire 2250* (MBM); **São José dos Pinhais,** Col. Roseira, 18 October 1980 (fl), *G. Hatschbach 43210* (MBM, MO, US); RIO GRANDE DO SUL, **São Leopoldo,** Barreto Viana, 24 October 1949 (fl, fr), *B. Rambo 44105* (CTES, GH, PACA); SANTA CATARINA, **Curitibanos,** Ponte alta do norte, 900 m, 24 October 1962 (fl), *R. Reitz & R. Klein 13392* (HBR); **Itaiópolis,** BR 116, Mafra - Lages, km 42, aprox 2 km de Papanduva, 797 m, 03 November 2008 (fr), *L. Eggers & T.T. Souza-Chies 400* (ICN).

Additional examined material: BRAZIL, MATO GROSSO DO SUL, **Bonito,** Fazenda Princesinha, 1 km da MS-270, entorno oeste do Parque Nacional da Serra da Bodoquena, 560 m, 09 September 2005 (fl, fr), *V.J. Pott et al. 8204* (UEC). ARGENTINA, CORRIENTES, **Galarza,** Proximo al puesto de guardaparques, 25 November 1999 (fr), *M.M. Arbo et al. 8510* (CTES); **Ituzaingó,** Ruta 41, ca. 20 km al S de Ruta 12, 31 August 2001 (fl), *M.M. Arbo et al. 8842* (CTES); **Soledad,** 28 October 1959 (fl, fr), *T.M. Pedersen s.n.* (CTES 350032). PARAGUAY, ALTO PARANÁ, Estancia Santa Elena, 19 October 1990 (fl, fr), *G.C. Marmori s.n.* (CTES 186173); CAAGUAZÚ, Cnia. Pindo, camino entre Itaguyry y Curuguati. Estribaciones de la Sra. De San Joaquin, 300 m, 11 October 1995 (fl, fr), *A. Schinini & G.C. Marmori 30195* (CTES); CANINDEYÚ, **Aguara Ñu,** 02 September 1996 (fl), *B. Jiménez 1453* (CTES).

10. ***Sisyrinchium ostenianum*** Beauverd, Bull. Soc. Bot. Genève, sér. 2, 14: 163 (1922 publ. 1923). Type: Uruguay, Durazno, Molles, 20 October 1901, C. Osten 4306 (holotype: G!, isotype: MVM!).

Illustrations: Beauverd (1922 publ. 1923: 164); Lombardo (1984: 394), Eggers (2008: 175). Fig. 17, 18 A−D.

Perennial herb, erect, 10–28 cm tall, roots slender and fibrous. Basal leaves erect, linear, 4.5–17 cm × 1–3.3 mm, glabrous, acute, conspicually terracotta coloured at the base. Floriferous stem simple, erect, terete to narrowly winged, 6.5–26 cm × 0.7–1.8 mm, margin entire, with a rigid linear, slightly curved terminal bract, 1.3–3.5 cm long, proximal margin conspicuously membranaceous. Synflorescence fasciculiform, 1–5(–8) rhipidia, congested at the base of the terminal bract. Rhipidium 1–21(–40) flowers, subsessile, peduncle 1–2 mm long. Spathes bivalved, lower valve 9–25 × 2–5 mm, upper 8–16 × 1.6–4 mm, glabrous, acute to long apiculate, margin membranaceous for 1–2.5(–3) mm. Pedicel longer than spathes, 10–23 mm long, with yellow straight capitate trichomes. Perigon disk shaped, yellow, light yellow to pale cream, proximally yellow to light green, followed by a brown to vinaceous ring from which vinaceous veins initiate, 10–18 mm diameter (liquid preserved flowers). Tepals subequal, 5–9 × 2–3.5 mm, oblanceolate, emarginate-apiculate, with three vinaceous veins at both sides and sparse trichomes at the abaxial side. Filaments light yellow, connate in a staminal column, 2–3.2 mm long, cylindrical, with oil-producing trichomes (elaiophores) at the base for 0.5–1.1 mm, then with sparse trichomes and a dense crown of reflexed trichomes below the anthers. Anthers yellow, basifixed, 0.7–1(–1.3) mm long. Ovary globose, 1.2–2 mm long and wide, pubescent, with light yellow straight capitate trichomes. Style yellow, entire, 3.7–4.8 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 3–4 × (2.3–)3.2–3.9 mm, khaki to brown, pilose.

Distribution: *Sisyrinchium ostenianum* is distributed in Argentina (Corrientes), southern Brazil (Rio Grande do Sul) and Uruguay (Canelones, Cerro Largo, Durazno, Montevideo, São José and Tacuarembó), according to herbaria data. In Rio Grande do Sul, it occurs in the Campanha, Depressão Central, Encosta do Sudeste and Litoral (Fortes 1959). It inhabits grasslands in sandy soils or rocky outcrops, sometimes in roadsides, from 32 to 431 m a.s.l. (Fig. 19), in the Low Altitude Temperate Grasslands, Temperate Shrubland and Subtropical/Temperate Coastal Scrub (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from September to December.

Notes: Ravenna (2002) considered *S. ostenianum* a synonym of *S. sellowianum* due to habit, inflorescence and shape of spathes, decision followed by Roitman *et al.* (2008). However, *S. ostenianum* is easily recognized by the reddish leaf sheaths in the base of the plant in fresh material, the firm leaves and bracts and the typical recurved end of the terminal bract, characters which *S. sellowianum* does not present. The flower colour is also different between the species (light yellow vs. white, respectively). Beauverd (1923) did not describe the androecium, which was made later by Johnston (1938) and is in agreement with the present description.

Selected examined material: BRAZIL, RIO GRANDE DO SUL, **Arroio dos Ratos,** estrada secundária a partir da BR 290, em direção a Minas do Faxinal, 128 m, 24 October 2014 (fl), *L. Eggers & O. Chauveau 919* (ICN); **Caçapava do Sul,** estrada secundária a BR 153 em direção ao piquete Guarda Velha, 19 November 2008 (fl), *L. Eggers & T.T. Souza-Chies 434* (ICN); **Capão do Leão,** estrada secundária para florestamento, 192 m, 03 December 2015 (fl, fr), *L. Eggers & O. Chauveau 961*(ICN); **Eldorado do Sul,** BR 290, em frente a estação agronômica da UFRGS, 54 m, 25 October 2013(fl), *C.D. Inácio et al. 141* (ICN); **Lavras do Sul,** Estrada secundária para Ibaré (a direita fica a Serra do Tabuleiro), 431 m, 14 November 2013 (fl), *C.D. Inácio et al. 187* (ICN); **Manoel Viana,** RST 377, 28 September 2008 (fl), *W. Heberle s.n.* (ICN 159211); **Osório,** Estrada do Mar em frente à Fazenda Maribo, 50 m, 13 November 2008 (fl, fr), *L. Eggers & T.T. Souza-Chies 422* (ICN); **Pedro Osório,** estrada saída de Pedro Osório para Capão do Leão, 32 m, 03 October 2009 (fl, fr), *L. Eggers & T.T. Souza-Chies 475* (ICN); **Quaraí,** 16 October 2004 (fl), *L. Eggers & T.T. Souza-Chies 55* (ICN); **Quintão,** 08 November 1901 (fr), *G.A. Malme s.n.* (R 28126); **Rio Grande,** Campus Carreiros, 03 November 2010 (fl), *U.S. Jacobi s.n.* (HURG 4499); **Viamão,** Parque Estadual de Itapuã, estrada para Praia da Pedreira, 152 m, 10 November 2005 (fl), *L. Eggers & T.T. Souza-Chies 138* (ICN).

Additional examined material: ARGENTINA, CORRIENTES, **Monte Caseros,** Al sur de Cambai, 25 December 1957 (fl), *E.G. Nicora 5933* (SI). URUGUAY, CANELONES, **Puerto Jackson,** Rio Santa Lucia, 31 October 1948 (fl, fr), *Rosengurtt B-5214* (MVFA); CERRO LARGO, **Tupambaé**, Ruta 7, após a cidade de Tupambaé, aproximadamente Km 322, 302 m, 12 November 2013 (fl), *C.D. Inácio et al. 180* (ICN); MONTEVIDEO, Campos de Montevideo, November 1927 (fl), *A. Lombardo 1630* (MVJB); SÃO JOSÉ, Rio São José - Picada de la cuera del tigre. Rincon del tio Penco Perez. Cerca de Raigón, 24 November 1935 (fl, fr), *Rosengurtt 2171B* (GH); TACUAREMBÓ, Arenal, Granja Municipal, 18 October 1952 (fl), *Rosengurtt B-6228* (MVFA).

11. ***Sisyrinchium pendulum*** Ravenna, Onira 7: 23 (2002). Type: Brazil, Paraná, Piraquara, estrada Taquarí – Rio Divisa, 13 November 1949, G. Hatschbach 1620 (holotype: MBM!, isotype: PACA!).

Illustrations: Fig. 18 E−F, 20.

Perennial herb, erect, 35–81 cm tall, roots slender and fibrous. Basal leaves erect, terete, 13.5–28 cm × 0.4–0.8 mm, glabrous, acute. Floriferous stem simple, erect, terete, 14.5–77 cm × 0.7–1.6 mm, with a cylindrical terminal bract, 2–11 cm long, margin entire. Synflorescence fasciculiform, 1–7 rhipidia, congested at the base of the terminal bract. Rhipidium 1–4(–6) flowers, subsessile, peduncle 0.8–1.5 mm long. Spathes bivalved, lower valve 8–15.6 × 1.2–2.2 mm, upper 9–14.9 × 1.5–2.5(–3.2) mm, glabrous, acute to long apiculate, margin membranaceous for 0.4–1.2 mm. Pedicel longer than spathes, 12–20 mm long, glabrous or with sparse light yellow capitate trichomes. Perigon disk shaped, vinaceous, proximally yellow to light green, with darker marked veins, 9–14 mm diameter (flowers in exsiccates). Tepals subequal, 5–7.5 × 1.5–2.5 mm, oblanceolate, emarginate-apiculate, with three to five dark veins at both sides and sparse trichomes at the abaxial side. Filaments light yellow to vinaceous, connate in a staminal column, 2.2–3 mm long, cylindrical, free for 0.5 mm at the apex, with oil-producing trichomes (elaiophores) at the base for 0.6–0.8 mm, then with sparse trichomes. Anthers yellow, basifixed, 0.5–0.7 mm long. Ovary globose, 0.8–1.4 mm long and wide, pilose, with light yellow straight capitate trichomes. Style yellow, entire, 2.8–3.7 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 3.5–4.5 × 3–5.5 mm, brown, pilose.

Distribution: *Sisyrinchium pendulum* is endemic of southern Brazil (Paraná, Santa Catarina and Rio Grande do Sul), according herbaria data and Roitman *et al.* (2008). In Paraná, it occurs in the Primeiro and Segundo Planaltos (Maack 1969), in the state of Santa Catarina, in the Planalto Paleozóico (Prates *et al.* 1989) and in Rio Grande do Sul, it is distributed in the Campos de Cima da Serra (Fortes 1959). The species inhabits mainly wet grasslands and peatlands, from 860 to 1300 m a.s.l. (Fig. 19) and occurs predominantly in the Subtropical Highland Grasslands of Southern Brazil (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from October to February.

Notes: Almost all samples of *Sisyrinchium* with terete terminal bract and purple to vinaceous flowers were identified, in herbaria, as *S. luzula* (pers. obs.; Johnston, 1938). Protologue of *S. luzula* (Klatt 1861-1862a) truly presented the species with “floribus roseis”. However, “fl. auri” is written in the label of the collection of *Blanchet 3313* (lectotype: BM 553820, B, photos!) and we do not believe that flower colour may change in *S. luzula*, like in other species such as *S. micranthum* Cav. In our analysis, purple flowered specimens from southern Brazil belong to *S. pendulum*, *S. purpurellum* (in accordance with Ravenna 2002) and a third, not described, species.

Sisyrinchium pendulum shows vinaceous flowers as *S. purpurellum*, but plants, spathes and flowers are larger and pedicels are glabrous or with sparse trichomes (*vs.* hirsute. Plants generally become dark after drying. Ravenna (2002) described the species with declinate to pendulous flowers, but this character is not always obvious. Notwithstanding, habitat of both species differ considerably, since *S. pendulum* grows in humid areas, while *S. purpurellum* inhabits dry grasslands.

Selected examined material: BRAZIL, PARANÁ, **Balsa Nova,** São Luís do Purunã, Rod. BR-277, 28 October 1996 (fl, fr), *O.S. Ribas & M.F. da Luz 1533* (MBM, Paratype); **Carambeí,** Estrada para o Rio São João, Alto Carambeí, 02 November 2013 (fl), *E.D. Lozano & M.E. Engels 1721* (ICN); **General Carneiro,** Faxinal do Souza, 07 December 1971 (fl, fr), *G. Hatschbach et al. 28362* (HB, HBR, MBM, MO, Paratype); **Piraquara,** Próximo ao reservatório Piraquara II, estrada para o Morro do Canal, 30 October 2013 (fl, fr), *E.D. Lozano 1617* (ICN); **Ponta Grossa,** Cachoeira da Mariquinha, 04 October 2007 (fl, fr), *J.M. Silva et al. 6081* (MBM); **Quatro Barras,** Estrada da Graciosa, Rio Taquari, 16 October 2013 (fl), *E.D. Lozano et al. 1577* (MBM); RIO GRANDE DO SUL, **São Francisco de Paula,** CPCN Pró-Mata, 05 January 2004 (fl, fr), *L. Eggers & T.T. Souza-Chies 41* (ICN); SANTA CATARINA, **São Joaquim,** 50 km antes de São Joaquim, 1350 m, 22 October 1961 (fl, fr), *G.F.J. Pabst et al. 6185* (HB, R).

12. ***Sisyrinchium platycaule*** Baker, Handb. Irid.: 132 (1892). Type: Paraguay, Balansa 555 (lectotype: P! designated by Ravenna, 1981; isolectotype: K!).

Illustrations: Fig. 21, 22 A−C.

Perennial herb, erect, 4–26 cm tall, roots slender and fibrous. Basal leaves erect, linear, 2.7–16.5 cm × 1.5–5.5 mm, glabrous, acute, apex margin papillose. Floriferous stem simple, erect, narrowly to obviously winged, 2.5–20 cm × 1–4.2 mm, margin entire to papillose, with a linear terminal bract, 1.2–9.5 cm long, proximal margin ciliate, distal margin papillose. Synflorescence fasciculiform, 1–3 rhipidia, congested at the base of the terminal bract. Rhipidium 1–6 flowers, sessile to subsessile, peduncle 1–4 mm, sometimes pedunculate, peduncle 10–45 mm long. Spathes bivalved, lower valve (8–)12.5–22(–30) × 1.4–2.1(–2.7) mm, upper 10–22 × 1.7–2.5 mm, papillose, acute to long apiculate, glabrous, margin membranaceous and ciliate for 0.2–0.7 mm. Pedicel longer than spathes, 10–18 mm long, with light yellow straight capitate trichomes. Perigon disk shaped, cream to white, proximally yellow to light green, followed by a vinaceous ring from which vinaceous veins initiate, 7.5–10 mm diameter (liquid preserved flowers and flowers in exsiccates). Tepals subequal, 3.5–5 × 1.1–2.5 mm, proximally connected 0.2–0.3 mm, oblanceolate, acute-apiculate, with three vinaceous veins at both sides and sparse trichomes at the abaxial side. Filaments light yellow, distally vinaceous, connate in a staminal column, 1.6–2.3 mm long, cylindrical, with oil-producing trichomes (elaiophores) at the base for 0.4–0.6 mm, then with sparse trichomes. Anthers yellow, basifixed, 0.4–0.6 mm long. Ovary subglobose, 1–1.8 x 0.9–1.2 mm, pubescent, with light yellow straight capitate trichomes. Style yellow, inconspicuously trifurcate, 2–2.6 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 3.5–4.7 × 3.5–5 mm, brown, pilose.

Distribution: *Sisyrinchium platycaule* is distributed in Argentina (Buenos Aires, Chaco, Corrientes and Missiones), Brazil (Paraná, Santa Catarina, Rio Grande do Sul and Rio de Janeiro) and Paraguay (Alto Paraná, Caaguazú, Central, Cordillera, Guaía, Paraguarí and Presidente Hayes), according to herbaria data and Roitman *et al.* (2008). In the state of Paraná, there are records of collections from the Segundo Planalto (Maack 1969). In Santa Catarina, the species occurs in the Planalto Arenito-Basáltico and Baixada Litorânea (Prates *et al.* 1989) and in Rio Grande do Sul, there are records in the Campos de Cima da Serra, Depressão Central and Encosta Inferior do Nordeste (Fortes 1959). The species grows in grasslands, anthropic areas and lawns of public parks (Ravenna 1981), from 76 to 809 m a.s.l. (Fig. 23), in the Subtropical Mixed Forest, Tropical Mixed Forest and Temperate Shrubland (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from September to December.

Notes: *Sisyrinchium platycaule* is similar to *S. sellowianum*, but differs from it by having smaller flowers, less rhipidia and flaccid, dark green leaves. This species was considered synonymy of *S. sellowianum* by Johnston (1938), but it was legitimated again by Ravenna (1981), with a record for Misiones, Argentina. In the protologue, type was designated without herbarium citation (Baker 1892). Nevertheless, an inadvertent lectotypification (Prado *et al.* 2015) was performed by Ravenna (1981), which mentioned P herbarium as depository of Balansa's sample. *Sisyrinchium platycaule* is a new record for Brazil, since all collections were misidentified as *S. sellowianum*, which may have resulted in the omission of the species from the Catalogue of Vascular Plants of Southern South America (Roitman *et al.* 2008).

Examined material: BRAZIL, PARANÁ, **Ponta Grossa,** Parque Estadual de Vila Velha - gramado próximo aos quiosques, 807 m, 01 November 2014 (fr), *C.D. Inácio et al. 261* (ICN); **Sengés,** PR 151, estrada Sengés – Reianópolis, 667 m, 26 October 2008 (fl, fr), *L. Eggers & T.T. Souza-Chies 337* (ICN); RIO GRANDE DO SUL, **Bom Jesus,** estrada de Bom Jesus para São Joaquim, beira rio Pelotas, lado RS, 750 m, 10 November 2011 (fr), *L. Eggers & T.T. Souza-Chies 686* (ICN); **Santa Cruz do Sul,** Linha Travessa, 06 December 2004 (fl), *L. Eggers & T.T. Souza-Chies 86* (ICN); **Viamão,** Bairro Tarumã região de entorno do Lago Tarumã, 76 m, 04 October 2008 (fl, fr), *P.J. Silva-Filho 1007* (ICN); SANTA CATARINA: **Chapecó,** SC 480, cerca de 20 km após cruzar a ponte sobre o rio Uruguay, 688 m, 05 December 2013 (fr), *L. Eggers & O. Chauveau 886* (ICN); **Descanso,** 25 October 1975 (fl, fr), *E. Santos et al. 3684* (R); **Florianópolis,** Campus da UFSC, Ilha de Santa Catarina, 17 September 2010 (fl, fr), *G. Hassemer 322* (FLOR).

Additional examined material: BRASIL, RIO DE JANEIRO, **Rio de Janeiro,** Jardim Botânico, 07 November 1946 (fr), *Apparicio Duarte 423* (RB). ARGENTINA, CHACO, **Bermejo,** Arroyo Cangüi Chico, 22 September 1967 (fl, fr), *A. Krapovickas & C.L. Cristóbal 13173* (CTES, MBM, SI); CORRIENTES, **Ituzaingó,** Puerto Valle 6 November 1962 (fr), *W. Partridge s.n.* (BA 60541); MISIONES, **Cainguás,** Predio de la Universidad Nac. de La Plata, camino Dos Huellas, 24 September 1997 (fl), *F. Zuloaga & O. Morrone 6497* (SI); **General Manuel Belgrano,** Ruta Provincial 228, arroyo Juanita, 280 m, 01 December 2004 (fl), *F. Zuloaga & M. Belgrano 8329* (SI); **Guaraní,** Predio Guaraní. Ruta 15 y Tramo I, 15 October 2002 (fl, fr), *S.G. Tressens 6745* (NY); **San Ignacio,** Sto. Pipó, 6 September 1950 (fl); *Diem 1556* (SI); **San Javier,** Cerro del Monje, 6 km NE de San Javier, 271 m, 7 September 1993 (fl, fr), *M.M. Arbo et al. 5950* (CTES). PARAGUAY, ALTO PARANÁ, Pratensis circa Escuela Tecnica Forestal, Km 12 Pto Presid. Stroessner, 04 December 1978 (fr), *Bernandi 18888* (NY); CAAGUAZÚ, 15 km al NE de Talavera, 16 October 1961 (fl), *A. Burkart 18918* (SI); CENTRAL, **Aryuá,** December 1966 (fr), *A.*

Schinini 1502 (CTES); CORDILLERA, Cordillera Sapucai, 19 October 1894 (fl, fr), s.col. (BA 17164); PRESIDENTE HAYES, Chacoí, 5 December 1989 (fl, fr), *A. Schinini 26759* (BA, CTES).

13. ***Sisyrinchium purpurellum*** Ravenna subsp. ***purpurellum***, Onira 7: 24 (2002). Type: Brazil, Paraná, Palmas, Santo Agostinho, 5 December 1989, G. Hatschbach & V. Nicolack 53689 (holotype: MBM!, isotype: FUEL!, ICN!, SI!).

Illustrations: Fig. 18 G−H, 24.

Perennial herb, erect, 15–43 cm tall, roots slender and fibrous. Basal leaves erect, terete, 5–35 cm × 0.3–0.9 mm, glabrous, acute. Floriferous stem simple, erect, terete, 5–33 cm × 0.4–0.9 mm, with a cylindrical terminal bract, 1–9.5 cm long, proximal margin membranaceous. Synflorescence fasciculiform, 2–7(–10) rhipidia, congested at the base of the terminal bract. Rhipidium 1–4(–5) flowers, sessile to subsessile, peduncle 0.5–3 mm long. Spathes bivalved, lower valve 5–7.5 × 1–2 mm, upper 6–8.2 × 1.2–2.2 mm, glabrous, acute to long apiculate, margin membranaceous for 0.5–1(–2) mm. Pedicel longer than spathes, 6–13 mm long, with sparse light yellow straight capitate trichomes. Perigon disk shaped, lilac to mauve, proximally yellow to light green, followed by a vinaceous ring from which vinaceous veins initiate, 8.5–14.4 mm diameter (liquid preserved flowers). Tepals subequal, 4–6.5 × 2–2.8 mm, proximally connected 0.2–0.5 mm, oblanceolate, acute-apiculate, with three to five vinaceous veins at both sides and sparse trichomes at the abaxial side. Filaments entirely light yellow to distally vinaceous, connate in a staminal column, 1.8–2.8 mm long, cylindrical, free for 0.5 mm at the apex, with oil-producing trichomes (elaiophores) at the base for 0.5–0.6 mm, then with sparse trichomes. Anthers yellow, basifixed, 0.4–0.8 mm long. Ovary globose, 0.7–1 mm long and wide, pubescent, with light yellow straight capitate trichomes. Style yellow, inconspicuously trifurcate, 2.4–3.4 mm long, with stigmatic region projected above the anthers. Capsule globose 2 × 3.1 mm, brown, pilose.

Distribution: *Sisyrinchium purpurellum* is endemic of southern Brazil (Paraná, Santa Catarina and Rio Grande do Sul). The species occurs mainly in the Primeiro and Segundo Planaltos of Paraná (Maack 1969), in the Planalto Arenito-Basáltico and Planalto Paleozóico of Santa Catarina (Prates *et al.* 1989) and in the physiographic regions of Alto Uruguai and

Campos de Cima da Serra, in Rio Grande do Sul (Fortes 1959). The species occurs in grasslands, rocky outcrops, roadsides, 534 to 1481 m a.s.l. (Fig. 25), in the vegetation formation of Subtropical Mixed Forest, Subtropical Highland Grasslands (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from August to December.

Notes: The species is similar to *S. scariosum*, but differs from it by the lilac, vinaceous flowers (*vs.* white) and the staminal column with free filaments at the apex (*vs.* entire staminal column). Nevertheless, as explained for *S. pendulum*, most of the samples of this species were identificated as *S. luzula* in herbaria, because of the flower colour.

Sisyrinchium purpurellum was cited in the Catalogue of Vascular Plants of Southern South America (Roitman *et al.* 2008) as a native perenial herb from Paraná, according to the original description of Ravenna (2002). The collector number of the holotype, presented in the protologue, does not agree with the label of the voucher specimen, the correct one being 53689 (with handwritting identification of Ravenna as "typus" in the exsiccate) instead of 53686, which is a paratype (rather than isotype). Among the paratypes cited by Ravenna (2002), it is possible to observe two morphotypes (in dried material). We recognized as *S. purpurellum* all the samples with similar characterization of the holotype, isotypes and almost all paratypes. The paratype *Hatschbach 27582* (NY!) belongs to a differente morphotype and is segregated of this description.

Selected examined material: BRAZIL, PARANÁ, **Balsa Nova,** Ponte dos Arcos, 04 August 2005 (fl), *C. Kozera 2344* (MBM); **Castro,** PR 151, Km 280, 1055 m, 20 November 2010 (fl, fr), *L. Eggers & T.T. Souza-Chies 625* (ICN); **Curitiba,** Rio Atuba, 30 October 1973 (fl, fr), *G. Hatschbach 32757* (MBM, Paratype); **General Carneiro,** PR 280 - Km 71, 1358 m, 30 October 2014 (fl), *C.D. Inácio et al. 244* (ICN); **Ipiranga,** 15 October 1966 (fl), *J.C. Lindeman & .J.H.Haas 2781* (MBM, NY); **Jaguariaíva,** Rod. PR-151, ca. 2 km S do Rio Cajuru, 15 October 1997 (fl, fr), *G. Hatschbach et al. 67091* (CTES, MBM, Paratype); **Lapa,** Reserva Florestal Passa Dois, 21 October 1990 (fl, fr), *I.F. Barbola s.n.* (UPCB 18786); **Palmas,** Santo Agostinho, 05 December 1989 (fl, fr), *G. Hatschbach & V. Nicolack 53686* (FLOR, HUCS, Paratype); BR 280, direção Palmas - União da Vitória, após Palmas, 1051 m, 01 November 2008 (fl, fr), *L. Eggers & T.T. Souza-Chies 387* (ICN); **Palmeira,**

Rio dos Papagaios, 1000 m, 14 October 1966 (fl, fr), *J.C. Lindeman & J.H. Haas 2676* (MBM, NY, Paratype); **Ponta Grossa,** Parque Estadual de Vila Velha - Rio Monjolo, 05 October 1989 (fl); *A.C. Cervi & G. Hatschbach 2804* (MBM, UPCB); **São José dos Pinhais,** Aeroporto Afonso Pena, 10 October 2009 (fl), *A.C.L. Miranda et al. 278* (MBM); **Sengés,** Serra do Mocambo, 3 km O, 19 September 1975 (fl), *G. Hatschbach 37115* (MBM); RIO GRANDE DO SUL, **Erechim,** Quatro Irmãos, 780 m,16 November 1995 (fl, fr), *A. Butzke s.n.* (HUCS 11266); **São José dos Ausentes,** Estrada entre São José dos Ausentes e Silveira, 1193 m, 11 October 2014 (fl), *C.D. Inácio et al. 238* (ICN); SANTA CATARINA, **Água Doce,** BR 153, próximo a entrada para Herciliópolis, 1228 m, 09 October 2014 (fl), *C.D. Inácio et al. 217* (ICN); **Campo Alegre,** Morro do Iquererim, 1400 m, 18 October 1957 (fl), *R. Reitz & R. Klein 5234* (GH, HBR, US); **Campo Erê,** 8 km a oeste de Campo Erê, 900-1000 m, 07 December 1964 (fl, fr), *L.B. Smith & R. Klein 13790* (R, US); **Campos Novos (erroneously cited as Campos Belos),** Rod. BR-470, próximo a divisa com Herval do Oeste, 17 September 1994 (fl), *G. Hatschbach & J.M. Silva 61101* (MBM).

14. ***Sisyrinchium purpurellum*** subsp. ***trichospathum*** Ravenna, Onira 7: 25 (2002). Type: Brazil, Paraná, Ponta Grossa, Parque Vila Velha, 19 September 1965, G. Hatschbach 12828 (holotype: MBM!).

Illustrations: Fig. 18 I, 26.

Perennial herb, erect, 15–27(–73) cm tall, roots slender and fibrous. Basal leaves with sheath 2–7 cm and leaf blade filiform, 0.8–2.3(–4.5) mm, glabrous. Floriferous stem simple, erect, terete, 9–28(–55) cm × 0.5–1(–1.3) mm, with a cylindrical terminal bract, 1.5–4.5 cm long, proximal margin membranaceous. Synflorescence fasciculiform, 1–5 rhipidia, congested at the base of the terminal bract. Rhipidium 1–3 flowers, sessile to subsessile, peduncle 0.5–2.5 mm long, sometimes subtended by a sterile bract with cuspidate apex. Spathes bivalved, lower valve 6.5–8 × 0.8–1.9 mm, upper 7.5–10 × 1.2–2 mm, pilose, acute to long apiculate, margin membranaceous for 0.2–0.7 mm. Pedicel longer than spathes, 7–13 mm long, with sparse light yellow straight capitate trichomes. Perigon disk shaped, lilac to mauve, proximally yellow to light green, followed by a vinaceous ring from which vinaceous veins initiate, 10.5–15.5 mm diameter (liquid preserved flowers). Tepals subequal, 4.8–7.5 × 1.8–2.6 mm, oblanceolate, emarginate-apiculate, with three vinaceous veins at both sides and sparse trichomes at the abaxial side. Filaments light yellow, connate in a staminal column, 2.9–3.4 mm long, cylindrical, free for 0.5 mm at the apex, with oil-producing trichomes (elaiophores) at the base for 0.6–0.8 mm, then with sparse trichomes. Anthers yellow, basifixed, 0.4–0.6 mm long. Ovary globose, 0.9–1.6 mm long and wide, pubescent, with light yellow straight capitate trichomes. Style yellow, inconspicuously trifurcate, 3.2–3.6 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 2.8–4 × 3.3–5 mm, brown, pilose.

Distribution: *Sisyrinchium purpurellum* subsp. *trichospathum* is endemic of southern Brazil (Paraná). According to herbaria data and Roitman *et al.* (2008), area of occurrence of this subspecies is more restricted than the area of the typical subspecies, with observed records only from the Paraná municipalities of Ponta Grossa and Palmeira, in the Segundo Planalto (Maack 1969). It inhabits grass-dominated vegetation, with or without shrubs, from 794 to 856 m a.s.l. Most of the samples are from a State conservation unit (Parque Estadual de Vila Velha) or surrounding areas, in the Subtropical Mixed Forest (Iganci *et al*. 2011).

Phenology: Flowers and fruits are reported from September to November, with one record in July.

Notes: The subspecies differs from the typical subspecies by the presence of conspicuously pilose spathes.

Examined material: BRAZIL, PARANÁ, **Palmeira,** Rod. BR-277, descida para o Rio Capivara, 05 July 1997 (fl, fr), *O.S. Ribas & L.B.S. Pereira 1881* (MBM); Próximo ao Rio dos Papagaios, 25 October 1976 (fr), *L.T. Dombrowski 6577* (MBM); **Ponta Grossa,** Furnas, 15 October 1971 (fl), *E. Santos et al. 2983* (R); Próximo a Vila Velha, 11 October 1976 (fl, fr), *L.T. Dombrowski 6319* (MBM); Parque Estadual de Vila Velha, 17 November 1964 (fl, fr), *E. Santos & J.C. Sacco 2117* (PEL, R); Parque Estadual de Vila Velha - Estrada para a igreja, 856 m, 01 November 2014 (fl), *C.D. Inácio et al. 260* (ICN); BR 376, em frente ao Parque de Vila Velha, 794 m, 27 October 2008 (fr), *L. Eggers & T.T. Souza-Chies 350* (ICN).

15. ***Sisyrinchium rambonis*** R.C. Foster, Contr. Gray Herb. 171: 28 (1950). Type: Brasil. Rio Grande do Sul. Cambara, 26 January 1948, Rambo 36606 (holotype: GH, photo!, isotype: PACA!).

Illustrations: Fig. 22 D−F, 27.

Perennial herb, prostate, stoloniferous, 3–8 cm tall, roots slender. Basal leaves erect, linear, 2.5–5.5 cm × 0.3–0.8 mm, glabrous, acute. Floriferous stem simple, erect, narrowly winged, 2–5.5 cm × 0.2–0.6 mm, margin entire, terminal bract absent. Inflorescence single, one terminal rhipidium. Rhipidium 1–3 flowers. Spathes bivalved, lower valve 4–12 × 0.6–1 mm, upper valve 4–6 × (0.5–)0.7–1 mm, glabrous, acute, margin membranaceous for 0.1–0.4 mm. Pedicel longer than spathes, 5.5–12 mm long, glabrous. Perigon disk shaped, yellow, 4–7.5 mm diameter (liquid preserved flowers). Tepals subequal, 2–3.7 × 1–2 mm, oblanceolate, apiculate, with a discrete yellow central vein at both sides and sparse trichomes at the abaxial side. Filaments light yellow, connate in a staminal column, 0.6–1.4 mm long, cylindrical, with a short whorl of trichomes at the base. Anthers yellow, basifixed, 0.7–1 mm long. Ovary globose to subglobose, 2.1–2.6(–3.5) x 2.5–3(–4) mm, slightly puberulent. Style yellow, inconspicuously trifurcated, 1.8–2.1 mm long, stigmatic region projected above the anthers. Capsule globose to subglobose, 2.3–2.6 × 2.6–3 mm, brown, glabrous.

Distribution: *Sisyrinchium rambonis* is endemic of Brazil (Paraná, Santa Catarina, Rio Grande do Sul and Minas Gerais), according to herbaria data and Roitman *et al.* (2008). In Paraná, the species occurs mainly in the Primeiro e Segundo Planaltos (Maack 1969), in Santa Catarina, it is distributed in the Planalto Arenito-Basáltico and Planalto Paleozóico (Prates *et al.* 1989) and in Rio Grande do Sul, it is found in the Campos de Cima da Serra (Fortes 1959). Plants usually inhabit wetlands, floodplains and humid areas, in the Subtropical Mixed Forest and Subtropical Highland Grasslands (Iganci *et al.* 2008). *Sisyrinchium rambonis* is reported to occur from sea level to 500 m a.s.l. in the Catalogue of Vascular Plants of Southern South America (Roitman *et al.* 2008), which is a mistake, since the species is distributed in areas of high altitude, from 800 to 1447 m a.s.l. (Fig. 28).

Phenology: Flowers and fruits are reported from November to February, although there is one record in September in the state of Minas Gerais.

Notes: *Sisyrinchium rambonis* is easily recognized by the stoloniferous habit displayed as continuous masses of plants or as cushions particularly in humid areas, or borders of accumulated water, and the small, less than 1 cm yellow flowers. Plants in herbaria were sometimes misdentified as *S. minus* or *S. minutiflorum*, from which they differ by the habit (stoloniferous *vs.* erect), bracts of the floriferous stem (absent *vs.* present) and flower colour (yellow *vs.* lilac).

In the original description, Foster (1950) has reported G herbarium as the depository of the holotype and the paratype, as well as samples of other species described in the same publication. However, there are no Rambo's or Dusén's collections of *S. rambonis* in the Herbarium G. Foster must have made a mistake, holotype and paratypes are in the Herbarium GH.

Selected examined material: BRAZIL, PARANÁ, **Araucaria,** Rodovia do Xisto, Rio Iguaçu, 11 January 1965 (fl, fr), *G. Hatschbach 12083* (HBR, MBM); **Balsa Nova,** Barra do Rio dos Papagaios, 27 December 1968 (fl, fr), *G. Hatschbach 20666* (CTES, MBM, MO, NY); **Curitiba,** Boqueirão, 28 January 1975 (fl, fr), *L.F. Ferreira 185* (MBM); **Curitiba,** 29 November 1903 (fr), *P. Dusén 2340* (GH, R, SI); **General Carneiro,** Fazenda Santa Candida, Lagoa do chalé, 15 January 2011 (f, fr), *C. Bona & R. Dalla Costa 357* (UPCB); **Palmas,** Ponte Serrada, 5 December 1971 (fl, fr), *G. Hatschbach et al. 28258* (MBM); **Ponta Grossa,** próximo a Desvio Ribas, 22 February 1910 (fl, fr), *P. Dusén 9450* (NY, US); **São José dos Pinhais,** Estrada Curitiba - Rio Negro, Rio da Várzea, 23 January 1949 (fl, fr), *G. Hatschbach 1188* (MBM, US); **Tijucas do Sul,** Represa de Vossoroca, 26 January 1975 (fl, fr), *R. Kummrow 859* (MBM, NY); RIO GRANDE DO SUL, **Cambará do Sul,** na Fortaleza, 12 January 1994 (fr), *N. Silveira 10446* (HAS); **Cruz Alta,** 18 January 1906 (fr), *G.A. Malme s.n.* (R 48143); **Gramado,** 26 December 1949 (fl, fr), *B. Rambo SJ 45021* (GH); **Jaquirana,** RS 110, direção Bom Jesus para Várzea do Cedro após entrada de Jaquirana, 927 m, 11 November 2013 (fl), *L. Eggers & T.T. Souza-Chies 571* (ICN); **São Francisco de Paula,** RS 020 aprox. Km 105, 1 December 2011 (fl), *L. Eggers & T.T. Souza-Chies 291* (ICN); **Vacaria,** 29 February 1980 (fr), *L. Arzivenco s.n.* (ICN 44351); SANTA CATARINA, **Abelardo Luz,** 8-9 km ao norte de Abelardo Luz, 900-1000 m, 8 December 1964 (fr), *L. B. Smith & R. M. Klein 13871* (R, US); **Bom Jardim da Serra,** gerador de energia eólica, 1447 m, 16 December 2008 (fr), *L. Eggers & T.T. Souza-Chies 103* (ICN); **Caçador,** 33 km a oeste de Caçador, 900-1000 m, 23 December 1956 (fl, fr), *L.B. Smith &*

R. Reitz 9113 (GH, US); **Curitibanos,** 6 Km Oeste de Lebon Regis, 700 m, 8 February 1957 (fl, fr), *L.B. Smith & R. Klein 11038* (GH, R, US); **Lages,** 800-900 m, 2 December 1956 (fl, fr), *L.B. Smith & R. Klein 8043* (GH, US); **Matos Costa,** 1200 m, 9 December 1962 (fl, fr), *R.M. Klein 3604* (HBR); **Porto União,** Serra da Taquara Verde, 34-36 km ao sul de Porto União, 1300 m, 5 February 1957 (fr), *L.B. Smith & R. Klein 10841* (GH, US); **São Joaquim,** 18 km ao sudoeste de São Joaquim, 1100-1200 m, 6 January 1965 (fl, fr), *L.B. Smith & R. Reitz 14356* (GH, HBR, R, US); **Xanxerê,** 5 km east of Faxinal dos Guedes, 700-900 m, 3 January 1957 (fr), *L.B. Smith & R. Reitz 9797* (R).

Additional examined material: BRASIL, MINAS GERAIS, **Poços de Caldas,** 17 September 1961 (fl), *A.G. Andrade & M. Emmerich 1245* (R); **Tiradentes,** 7 November 1956 (fr), *A.P. Duarte 4085* (RB).

16. ***Sisyrinchium scariosum*** I.M. Johnst**.** J. Arnold Arbor. 19: 386 (1938). Type: Uruguay, Maldonado, Sierra Animas, 11 October 1932, Osten 22693 (holotype: GH, photo!; isotype: MVM!).

Illustrations: Lombardo (1984: 394); Eggers (2008: 175). Fig. 29, 30 A−B.

Perennial herb, erect, 14–63 cm tall, roots slender and fibrous. Basal leaves erect, terete, 12–32 cm × 0.5–0.9 mm, glabrous, acute. Floriferous stem simple, erect, terete, 9.5–57 cm × 0.7–1 mm, with a cylindrical terminal bract, 1.5–7.8 cm long, proximal margin membranaceous. Synflorescence fasciculiform, 3–13 rhipidia, congested at the base of the terminal bract. Rhipidium 2–4 flowers, subsessile, peduncle 0.3–1.8 mm long. Spathes bivalved, lower valve 6–8.5 × 1–1.7 mm, upper 7.5–9.8 × 1.2–1.7 mm, glabrous, acute to long apiculate, margin membranaceous for 0.5–1 mm. Pedicel longer than spathes, 7.2–11.2 mm long, with light yellow straight capitate trichomes. Perigon disk shaped, mostly white, proximally inconspicuously yellow to light green, followed by a vinaceous to purple ring from which the veins initiate, 12.8–19.7 mm diameter (fresh flowers and liquid preserved flowers). Tepals subequal, 6.1–8.1 × 2.8–3.8 mm, proximally connected 0.2–0.3 mm, oblanceolate to elliptic, emarginate-apiculate, with three vinaceous to purple veins at both sides and sparse trichomes at the abaxial side. Filaments yellow, distally vinaceous, connate in a staminal column, (2.5–)2.7–3 mm long, cylindrical, with oil-producing trichomes (elaiophores) at the base for 0.6–1 mm, then with sparse trichomes. Anthers yellow, basifixed, 0.3–0.8 mm long. Ovary globose, 1–1.5 mm long and wide, pubescent, with light yellow straight capitate trichomes. Style yellow, inconspicuously trifurcate, 3.5–4.1 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 2–4 × 2.5–5 mm, brown, pilose.

Distribution: *Sisyrinchium scariosum* occurs in Argentina (Corrientes, Entre Ríos and Misiones), southern Brazil (Rio Grande do Sul) and Uruguay (Canelones, Cerro Largo, Durazno, Florida, Lavalleja, Maldonado, Montevideo, Paysandú, Rio Negro, Rocha, Soriano and Tacuarembó). In the Catalogue of Vascular Plants of Southern South America (Roitman *et al.* 2008), *S. scariosum* was reported to occur in Paraná probably because one collection from that state was indicated in the original description of Johnston (1938). However, this sample, paratype *Dusén 2247* (MBM!, MO!, NY!, US!), does not belong to this species. For the state of Rio Grande do Sul there are collections in the physiographic regions of Campanha, Campos de Cima da Serra, Depressão Central, Encosta do Sudeste, Missões and Serra do Sudeste (Fortes 1959). The species inhabits stony or shruby grasslands, from 59 to 450 m a.s.l., sometimes up to 1100 m a.s.l. (Fig. 28), in the Low Altitude Temperate Grasslands, Subtropical Seasonal Forest, Temperate Shrubland, Subtropical Highland Grasslands and Subtropical Mixed Forest (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported mainly from September to January. There are occasional records in February, March (for Uruguay), May (Brazil) and August (Argentina).

Notes: *Sisyrinchium scariosum* is strongly characterized by the spathes with conspicuous scarious margins which become ragged. It is similar to *S. purpurellum*, but differs by the flower colour (white *vs.* lilac) and filament connection (completely united *vs.* free apex).

Selected examined material: BRAZIL, RIO GRANDE DO SUL, **Arroio dos Ratos,** Estrada secundária em direção à fazenda Faxinal a partir da BR 290 (à esquerda em direção à Arroio dos Ratos, antes da entrada da cidade), 154 m, 25 October 2013 (fl, fr), *C.D. Inácio et al. 135* (ICN); **Bagé,** Estrada de chão a partir da BR 153 para Palmas, 349 m, 27 November 2014 (fl, fr), *T. Pastori & O. Chauveau 180* (ICN); **Caçapava do Sul,** estrada secundária à BR 153, em direção ao piquete Guarda Velha, 142 m, 19 November 2008 (fr), *L. Eggers & T.T. Souza-Chies 435* (ICN); **Cambará do Sul,** Lajeado das Margaridas, 894 m, 16 January

2016 (fl, fr), *L. Eggers & O. Chauveau 974* (ICN); **Capão do Leão,** estrada saída de Pedro Osório para Capão do Leão, 72 m, 03 October 2009 (fl), *L. Eggers & T.T. Souza-Chies 478* (ICN); **Dom Pedrito,** estrada de Dom Pedrito para fronteira com Uruguay- Ponche Verde, 180 m, 21 December 2012 (fl, fr), *L. Eggers et al. 786* (ICN); **Encruzilhada do Sul,** Cerro Partido, Propriedade de Aldroaldo, 12 October 2014 (fl), *T. Pastori & C. Forgiarini 114* (ICN); **Guaíba,** Fazenda São Maximiano, 59 m, 20 November 2004 (fl), *L. Eggers & T.T. Souza-Chies 83* (ICN); **Pinheiro Machado,** Distrito de Torrinhas, 392 m, 11 November 2014 (fl), *T. Pastori et al. 166* (ICN); **Porto Alegre,** Morro São Pedro, 130-160 m, 20 October 2005 (fl); *R. Setubal 576* (HUCS); Parque Natural Morro do Osso, 87 m, 26 November 2014 (fl, fr), *C.D. Inácio & L. Tacuatiá 297* (ICN); **Quaraí,** Cerro do Jarau, 151 m, 22 November 2012 (fl, fr), *L. Eggers et al. 793* (ICN); **Rosário do Sul,** BR 290 - Coxilha do Batovi, aproximadamente Km 454, 148 m, 24 November 2013 (fl, fr), *C.D. Inácio et al. 190* (ICN); **Santana do Livramento,** próximo ao aeroporto, 19 October 1984 (fr), *J. Mattos & N. Silveira* 28508 (HAS); **São José dos Ausentes,** Fazenda Ilgo Burigo, 1100 m, 07 October 2002 (fl), *E. Boldo 6* (HUCS, MBM, US); **São Leopoldo,** in summo monte Sapucaia, 1934 (fl, fr), *B. Rambo 33994* (PACA); **São Lourenço do Sul,** BR 116, Km 474, 25 October 2007 (fr), *L. Eggers & T.T. Souza-Chies 277* (ICN); **São Vicente do Sul,** Estrada de chão para o Cerro da Glória, 104 m, 13 October 2014 (fl), *T. Pastori et al. 121* (ICN); **Unistalda,** BR 287, Km 430, 355 m, 30 October 2009 (fr), *L. Eggers & T.T. Souza-Chies 556* (ICN); **Viamão,** Parque Estadual de Itapuã - Trilha da Pedra da Visão, 152 m, 27 November 2014 (fl, fr), *C.D. Inácio et al. 298* (ICN).

Additional examined material: ARGENTINA, CORRIENTES, **Mercedes,** Estancia "Itá Caabó", 15 October 1961 (fl), *T.M. Pedersen 6140* (CTES); ENTRE RÍOS, **Federación,** Sta. Ana, medanos no Uruguay, 24 September 1961 (fl), *A. Burkart 22506* (SI); MISIONES, **Apóstoles,** San José, 23 August 1978 (fl), *A.L. Cabrera et al. 29389* (SI); **Concepción** Estancia de Elsa Prates sobre el rio Uruguay, 160 m, 28 January 2004 (fl), *F. Biganzoli et al. 1652* (SI); **Posadas,** Ruta 12, saindo de Posadas direção Ituzaingó, Km 1328, em frente à estância Santa Lucia, 145 m, 15 October 2013 (fl), *C.D. Inácio et al. 102* (ICN). URUGUAY, CANELONES, Cuchilla Alta, 16 October 1949 (fl), *Rosengurtt B-5657* (MVFA); CERRO LARGO, **Cerro de las Cuentas,** 23 February 1938 (fl, fr), *Rosengurtt 2555b* (GH, Paratype); **Rio Negro y Palleros,** December 1937 (fl, fr), *Rosengurtt 2366b* (GH, Paratype); DURAZNO, **Establecimiento El Rincón,** 21 October 2009 (fl), *C. Brussa & P. Boggiano s.n.* (MVJB 28234); FLORIDA, Ruta 7, após a cidade de Rebolecho, aprox.

km 173.5, 201 m, 12 November 2013 (fl, fr), *C.D. Inácio et al. 178* (ICN); LAVALLEJA, **Minas,** Estrada de chão (a esquerda antes do bairro "La Coronilla" (em direção a Minas) para o cerro Verdún desde a Ruta 8, 222 m, 11 November 2013 (fl, fr), *L. Eggers et al. 852* (ICN); MALDONADO, **Cerro Pan de Azucar,** 19 November 1939 (fl, fr), *Rosengurtt 2717b* (GH); **Punta Ballena,** October 1937 (fl), *A. Lombardo s.n.* (MVJB 12988); Cerro de Las Animas, 15 October 1939 (fr), *Legrand 1575* (MVM); PAYSANDÚ, Estrada secundária a partir da ruta 3, para Gruta del Padre Pio. Campo da Gruta do Padre Pio, 37 m, 09 November 2013 (fl), *C.D. Inácio et al. 157* (ICN); RIO NEGRO, Ruta 3, próximo ao km 265, 62 m, 10 November 2013 (fl), *C.D. Inácio et al. 170* (ICN); ROCHA, **Aº La Pantanosa,** 05 February 1938 (fl, fr), *Rosengurtt 2452b* (GH, Paratype); SORIANO, **Juan Jackson,** Sta. Elena, 10 October 1942 (fl), *Gallinal et al. 5078* (MVFA, NY); TACUAREMBÓ, Valle Edén, 7-8 December 1963 (fl, fr), *Arrilaga et al. 1829* (MVFA).

17. ***Sisyrinchium sellowianum*** Klatt. Linnaea 31: 375 (1861-1862b). ≡ *Bermudiana sellowiana* (Klatt) Kuntze, Revis. Gen. Pl. 2: 700 (1891). Type: Brasilia meridionalis, Montevideo, Sellow 1484 (lectotype here designated: B!, isolectotype: K!).

Illustrations: Klatt (1871), Eggers (2008: 175). Fig. 22 G−I, 31.

Perennial herb, erect, 6–42 cm tall, roots slender and fibrous. Basal leaves erect, linear to ensiform, 3.5–40 cm × 1.2–7 mm, glabrous, occasionally margin papillose, acute. Floriferous stem simple, erect, narrowly to obviously winged, 3–31, cm × 0.8–3.5 mm, margin entire to papillose, with a linear terminal bract 2–16 cm long, margin entire to papillose. Synflorescence fasciculiform, 1–14 rhipidia, congested between the base of the terminal bract and an opposite bract, 14–48 mm long, attenuate. Rhipidium 1–4(–5) flowers, sessile to subsessile, peduncle 1–4 mm long. Spathes bivalved, lower valve 11–19.5 × 1.2–2.2 mm, upper 12–19 × 1.6–2.3 mm, glabrous, acute to long apiculate, margin membranaceous for 0.5–1 mm. Pedicel longer than spathes, 15–25 mm long, with light yellow straight capitate trichomes. Perigon disk shaped, mostly white, proximally yellow to light green, followed by a vinaceous to purple ring from which the veins initiate, (8.5–)13–15.5(–18) mm diameter (liquid preserved flowers). Tepals subequal, 4–7.5(–9) × 2–4 mm, oblanceolate, emarginate-apiculate, with five vinaceous to purple veins at both sides and sparse trichomes at the abaxial side. Filaments light yellow, connate in a staminal column, 1.5–2.7 mm long, cylindrical, with oil-producing trichomes (elaiophores) for 0.7–1.1 mm, then with sparse trichomes. Anthers yellow, basifixed, 0.9–1.4 mm long. Ovary globose, 1.2–2 mm long and wide, pubescent, with light yellow straight capitate trichomes. Style yellow, entire, 3.3–4.6 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 2.3–3.3 × 3.3–3.5 mm, tawny to brown, pilose.

Distribution: *Sisyrinchium sellowianum* occurs in northeast Argentina (Misiones) and southern Brazil (Paraná, Santa Catarina and Rio Grande do Sul), according to herbaria data. Ravenna (2002) mentioned that *S. sellowianum* occurs in Uruguay, mainly because the author considered the species as a synonym of *S. ostenianum*, decision also followed by Roitman *et al.* (2008), which cited as vouchers the samples of *F.M. Rodriguez 448* (BA!, actually *S. soboliferum*), *E. Hassler 1374* (SI!, correctly identified as *S. dasyspathum*) and *C. Osten 4306* (MVM!, actually *S. ostenianum*). *Sisyrinchium sellowianum* was also refered to occur in Paraguay (Johnston 1938), but the sample *Fiebrig 5434* (SI!, G, US photo!) belongs indeed to *S. platycaule*, species that Johnston considered synonymy of *S. sellowianum*. In Paraná there are records in the Terceiro Planalto (Maack 1969) and in Rio Grande do Sul and Santa Catarina, it is largely distributed. The species inhabits grasslands, sometimes rocky or humid areas, pastures, and is commonly found in roadsides, from 53 to 1728 m a.s.l. (Fig. 23), in the Low Altitude Temperate Grasslands, Subtropical Seasonal Forest, Temperate Shrubland, Subtropical Highland Grasslands and Subtropical Mixed Forest (Iganci *et al.* 2008).

Phenology: Flowers and fruits are reported from September to February.

Notes: The species is recognized by white flowers with vinaceous veins, generally in dense fasciculiform synflorescence, plane leaves and floriferous stem. *Sisyrinchium scariosum* has similar flowers, but the leaves and floriferous stem are terete.

The species was described based on the syntypes *Sellow 1484* and *Sellow 3922*. Sample *3922* was not found and the lectotype was here designated as *Sellow 1484* (B, photo!), plant that was collected in an expedition of Sellow to Porto Alegre after Rio Grande, as mentioned by Johnston (1938).

Selected examined material: BRAZIL, PARANÁ, **Candói,** BR 277 aproximadamente km 383, 977 m, 31 October 2014 (fl), *C.D. Inácio et al. 252* (ICN); **General Carneiro,** PR 280 - Km 71, 1358 m, 30 October 2014 (fl), *C.D. Inácio et al. 242* (ICN); **Guarapuava,** BR 277 direção Guarapuava - Laranjeiras do Sul após Guarapuava. Posto Águia, 30 October 2008 (fl), *L. Eggers & T.T. Souza-Chies 372* (ICN); **Palmas,** PR 280 - Km 93, 1297 m, 30 October 2014 (fl), *C.D. Inácio et al. 246* (ICN); **Pinhão,** PR 170 10 km após cidade de Pinhão em direção à Guarapuava, 805 m, 14 October 2007 (fl), *L. Eggers & T.T. Souza-Chies 241* (ICN); RIO GRANDE DO SUL, **Arroio dos Ratos,** Estrada secundária em direção à fazenda Faxinal a partir da BR 290 (à esquerda em direção à Arroio dos Ratos, antes da entrada da cidade), 162 m, 25 October 2013 (fl), *C.D. Inácio et al. 134* (ICN); **Bom Jesus,** Fazenda Casa Branca, 950 m, 23 September 2001 (fl, fr), *R. Wasum 1250* (HUCS, MO, MBM, US); **Cambará do Sul,** campo em estrada interna à Fazenda Camarinhas, Parador Casa da Montanha, 972 m, 17 January 2016 (fl, fr), *L. Eggers & O. Chauveau 979* (ICN); **Campestre da Serra,** BR 116, aproximadamente Km 59, 806 m, 06 December 2013 (fl, fr), *L. Eggers & O. Chauveau 892* (ICN); **Canoas,** 28 October 2009 (fl), *C. Mondin 3436* (MPUC); **Caxias do Sul,** RS 453, Km 165, 1036 m, 09 November 2009 (fl), *L. Eggers & T.T. Souza-Chies 561* (ICN); **Ciríaco,** BR 285, Km 246, 767 m, 06 December 2013 (fl, fr), *L. Eggers & O. Chauveau 889* (ICN); **Cristal,** estrada Cristal - Amaral Ferrador (RS 354), 54 m, 03 November 2011 (fl), *L. Eggers & T.T. Souza-Chies 67* (ICN); **Encruzilhada do Sul,** Fazenda Xafri, 16 November 2006 (fl, fr), *L. Eggers & T.T. Souza-Chies 181* (ICN); **Erechim,** Barragem Corsan, Estrada Lateral, 19 October 1995 (fl, fr), *A. Butzke et al. s.n.* (HUCS 33109, US 3321133); **Muitos Capões (Esmeralda),** Estação Ecológica Aracuri, 08 November 1981 (fl, fr), *S. Franco & E. Miotto s.n.* (ICN 64852); **Espumoso,** *s.loc.*, *s.d.* (fl, fr), *M. Sobral 5241* (ICN); **Farroupilha,** Parque Santa Rita, 13 November 1978 (fl, fr), *O. Bueno 1130* (HAS); **Fontoura Xavier,** BR 386, aproximadamente km 258 antes do Parque das Tuias, 676 m, 04 December 2013 (fl, fr), *L. Eggers & O. Chauveau 881* (ICN); **Guaíba,** Fazenda São Maximiano, 15 November 2003 (fl), *L. Eggers & T.T. Souza-Chies 19* (ICN); **Jaquirana,** RS 110 direção Bom Jesus para Várzea do Cedro após entrada de Jaquirana, 911 m, 10 November 2009 (fl), *L. Eggers & T.T. Souza-Chies 575* (ICN); **Júlio de Castilhos,** Estrada secundária de Júlio de Castilhos para Pinhal Grande. Estrada para barragem Kotzian, 307 m, 18 October 2013 (fl), *C.D. Inácio et al. 121* (ICN); **Lagoa Vermelha,** 7 November 1962 (fl), *Rosengurtt & Del Puerto 9072* (MVFA); **Lajes,** a 10 km de Vacaria, na rodovia para Lajes, 2 January 1980 (fl), *J. Mattos & N. Mattos 19678* (HAS); **Montenegro,** 28 October 1977 (fl, fr), *S. Miotto s.n.* (HAS 9703); **Osório,** Estrada do Mar em frente à Fazenda

Maribo, 53 m, 13 November 2008 (fl), *L. Eggers & T.T. Souza-Chies 424* (ICN); **Paraíso do Sul,** estrada secundária a partir da RS287, para Contenda (lado oposto a Três Vendas) - cerca de 5,4 km da RST 287, 80 m, 20 October 2011 (fl), *L. Eggers & T.T. Souza-Chies 668* (ICN); **Passo Fundo,** Campus I da Universidade de Passo Fundo, 01 December 2004 (fl, fr), *B. Severo s.n.* (ICN 183136); **Porto Alegre,** Morro Santana, 297 m, 09 November 2010 (fl), *L. Eggers & T.T. Souza-Chies 588* (ICN); **Salto do Jacuí,** localidade próxima à PCH (Pequena Central Hidrelétrica) Kotzian, 290 m, 20 October 2012 (fl), *L. Eggers et al. 724* (ICN); **Santo Ângelo,** Granja Piratiní, 1412 m, 19 November 1973 (fr), *K. Hagelund 7809* (ICN); **São Francisco de Paula,** RS 476 aproximadamente Km 5, 355 m, 09 November 2009 (fl, fr), *L. Eggers & T.T. Souza-Chies 568* (ICN); **São Jose dos Ausentes,** Lajeadinho, 17 November 2008 (fl), *J.M. Silva et al. 7291* (MBM); **São Leopoldo,** São Leopoldo para Esteio, 14 November 1955 (fl, fr), *B. Rambo 57114* (PACA); **São Luiz Gonzaga,** BR-285, São Borja, 112 m, 14 November 1975 (fr); *M.L. Porto et al. 1754* (CTES, ICN); **São Miguel das Missões,** BR 285 (aprox. Km 532) antes da entrada para São Lourenço das Missões, 1006 m, 29 October 2009 (fl, fr), *L. Eggers & T.T. Souza-Chies 540* (ICN); **São Sepé,** 06 November 1990 (fl, fr), *O. Bueno 5944* (HAS); **Sarandi,** próximo km 140, na rodovia para Carazinho, 11 November 1983 (fr), *J. Mattos et al. 24514* (HAS); **Soledade,** BR 386, direção Porto Alegre, após Soledade. Km 251, 652 m, 09 November 2012 (fl), *L. Eggers et al. 769* (ICN); **Torres,** Morro do Farol, 12 November 1972 (fl), *J.C. Lindeman s.n.* (ICN 020814); **Unistalda,** BR 287 km 430, 905 m, 30 October 2009 (fl), *L. Eggers & T.T. Souza-Chies 554* (ICN); **Vacaria,** perto de Estação Experimental, na rodovia Vacaria-Bom Jesus, 2 November 1977 (fl, fr), *J. Mattos & N. Mattos 17595* (HAS); **Viamão,** P.E. de Itapuã estrada para Praia de Fora, 363 m, 10 November 2005 (fl); *L. Eggers & T.T. Souza-Chies 131* (ICN); **Viamão,** Parque Saint'Hilaire, 28 October 1956 (fr), *J. Mattos 3860* (HAS); SANTA CATARINA, **Abelardo Luz,** 12 km ao norte de Abelardo Luz, 900-1000 m, 23 October 1964 (fl, fr), *L.B. Smith & R. Reitz 12838* (US); **Água Doce,** BR 153, próximo a entrada para Herciliópolis, 1228 m, 09 October 2014 (fl), *C.D. Inácio et al. 220* (ICN); **Campos Novos,** 1000 m, 29 October 1963 (fl, fr), *R. Klein 4194* (HBR); **Correia Pinto,** BR 116 cerca de 30 km após Lages em direção à Vacaria, 914 m, 16 October 2007 (fl), *L. Eggers & T.T. Souza-Chies 253* (ICN); **Herciópolis,** Estrada de Água Doce para Herciópolis, 933 m, 14 October 2007 (fl, fr), *L. Eggers & T.T. Souza-Chies 238* (ICN); **Imbituba,** Praia de Imbituba, 20-30 m, 22 November 1994 (fl, fr), *G. Hatschbach & O.S. Ribas 61228* (MBM); **Joaçaba,** campo do Rio Irani, a 15km a leste da Ponte Serrada, 700-900 m, 3 January 1957 (fl), *L.B. Smith & R. Reitz 9846-A* (US); **Lages,** Fazenda Paraíso Serrano, 1217 m, 12 December 2004 (fl, fr); *L.*

Eggers & T.T. Souza-Chies 87 (ICN); **Macieira,** SC 451, a 18 km da BR 153, em direção a Água Doce, próximo a Restaurante e Lancheria O Carreteiro, 1319 m, 09 October 2014 (fl), *C.D. Inácio et al. 215* (ICN); **Ponte Serrada,** Campo de Palmas, 05 December 1971 (fl, fr), *G. Hatschbach et al. 28274* (HBR, MBM); **São Joaquim,** SC 430, Km 56,8, 1217 m, 23 November 2010 (fl, fr), *L. Eggers & T.T. Souza-Chies 660* (ICN).

Additional examined material: ARGENTINA, MISIONES, **Cainguás,** Salto Golondrina, 400 m, 16 November 2011 (fl), *F.O. Zuloaga & N.B. Deginani 13329* (SI); **Guarani,** camino al Salto Golondrina, 15 km de ruta 14, 410 m, 24 November 2004 (fl); *F.O. Zuloaga & M.J. Belgrano 8156* (SI); **Leandro N. Alem,** 14 September 1970 (fl, fr), *A. Krapovickas & C.L. Cristóbal s.n.* (CTES 59349); **25 de Mayo,** Salto Las Golondrinas, 375 m, 18 November 2005 (fr), *F.O. Zuloaga et al. 8727* (CTES).

18. *Sisyrinchium setaceum* Klatt, Linnaea 31: 85 (1861-1862a). ≡ *Bermudiana setacea* (Klatt) Kuntze, Revis. Gen. Pl. 2: 700 (1891). Type: Brasil. Brasilia meridionalis, Montevideo, Sellow 2282 (lectotype here designated: B!).

= *Sisyrinchium humidum* Ravenna, Onira 6 (7): 55. 2002. Holotype: Brasil. Paraná. Clevelandia (Herb. Rav., *n.v.*) *syn. nov.*

Illustrations: Klatt (1871), Eggers (2008: 175). Fig. 30 C−F, 32.

Perennial herb, erect, cespitose, 7–18(–25) cm tall, roots slender and fibrous. Basal leaves erect, terete, (3–)5.5–17 cm × 0.1–0.4 mm, glabrous, acute. Floriferous stem simple, erect, terete, 4.5–16(–25) cm × 0.2–0.4 mm, terminal bract absent. Inflorescence single, one terminal rhipidium. Rhipidium 1–10 flowers. Spathes bivalved, lower valve 4.5–8 × 0.8–1.15 mm, upper valve 3.5–5.8(–7) × 0.7–1.10 mm, glabrous, acute to aristate, lower valve awn 0.8–11.5(–17) mm long, margin membranaceous for 0.3–0.5 mm. Pedicel longer than spathes, 10–11 mm long, with light yellow capitate trichomes, slightly pilose to glabrescent. Perigon disk shaped, yellow, 5.5–6.5 mm diameter (liquid preserved flowers). Tepals subequal, 2.5–3 × 1.1–1.4 mm, oblanceolate, apiculate, with discrete yellow to green veins at both sides and sparse trichomes at the abaxial side. Filaments light yellow, connate in a staminal column, 0.9–1.4 mm long, cylindrical, full extension with long trichomes, slightly denser at the base. Anthers yellow, basifixed, 0.7–1 mm long. Ovary globose, 0.6–1 x 0.8–1.2 mm, slightly pilose. Style entire, 1.8–2.1 mm long, stigmatic region hidden by the anthers. Capsule globose to subglobose, 2.3–2.6 × 2.6–3 mm, brown, sparsely pilose.

Distribution: *Sisyrichium setaceum* occurs in Argentina (Catamarca, Chaco, Córdoba, Corrientes, Misiones, Santiago del Estero and Tucumán) and southern Brazil (Paraná, Santa Catarina and Rio Grande do Sul), according to herbaria data and Roitman *et al.* (2008). In Paraná, there are records in the Terceiro Planalto (Maack 1969) and in Rio Grande do Sul and Santa Catarina, the species is largely distributed. It inhabits grasslands, usually in small tussocks scattered in rocky areas and wet soils, from 149 to 1720 m a.s.l. (Fig. 33), in the Subtropical Highland Grasslands, Subtropical Mixed Forest, Subtropical Seasonal Forest and Temperate Shrubland (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from August to March, although there are few records in April (Argentina) and July (Argentina and Brazil – Rio Grande do Sul and Santa Catarina).

Notes: The species is recognized by the greyish green slender leaves in small tussocks, the small yellow flowers with long trichomes distributed throughout the staminal column. Although in the original description (Klatt 1861-1862a) and in Flora Brasiliensis (Klatt 1871) flowers were described as pink, *S. setaceum* actually presents yellow flowers. The incorrect observation might be due to the fact that the description was based on dried material, 25 years after the collection of Sellow. Besides that, abaxial side of tepals is slightly reddish at flower bud, which could also misled Klatt's observation. Trichomes observed on the staminal column of *S. setaceum* are oil trichomes, even though they present a lower amount of secretion, compared to the amount of oil accumulation detected in other species of *Sisyrinchium* (Silvério *et al.* 2012).

Sisyrinchium humidum is a synonym based on the analyses of all four paratypes cited in the original description. Holotype is not available for examination since it was deposited in Ravenna's herbarium. Duplicates of *J.C. Lindeman & J.H. Haas 2795* (MBM!, US!, NY!) and *J.R. Mattos 9317* (HAS!) present trichomes at the base of the staminal column, contrary to comments made by Ravenna, which mentioned that *S. humidum* is readily distinguished from *S. setaceum* by the lack of dense stipitate glands in the lower part of the staminal column (although this characteristic is not indicated at the protologue). The paratype *E. Tameirão-Neto 2973* (BHCB!) does not have flowers and *G. Hatschbach et al. 71815* (MBM! FUEL!) belongs to *S. elegantulum* Ravenna. Most all traits cited in the original description of *S. humidum* ressemble the characters of *S. setaceum*, with exception of outer tepals and anther size. Concerning tepals, a misinterpretation should have occurred since the size of the outer tepals alone corresponds to size of the flower diameter, and anthers could have been undervalued on dried material.

Sisyrinchium setaceum was considered an ambiguous name by Ravenna (2002a) by the uncertainty of the collection site mentioned by Sellow ("Brasilia meridionalis" and "Montevideo"). However, *Sellow 2282* is a syntype collected in Rio Grande do Sul (Urban 1893), which is kept in B herbarium. Analysis of this material, here designated as lectotype of *S. setaceum*, elucidate and confirm the species name. This taxon is also well described in Johnston (1938).

Selected examined material: BRAZIL, PARANÁ, **Candói,** Colônia São Judas Tadeu, 19 September 2001 (fl, fr), *G. Hatschbach et al. 72413* (MBM); **Cantagalo,** BR-373, 27 November 1987 (fl, fr), *A.C. Cervi 2518* (MBM, NY, UPCB); **Coronel Domingos Soares,** Abarracamento, 1038 m, 23 September 2013 (fl, fr), *J.T. Motta et al. 4058* (MBM, RB); **Guarapuava,** Rodovia Guarapavuna-Lagoa Seca, Km 382, 26 October 2006 (fl, fr), *E. Barbosa & E.M. Cunha 1747* (ICN, MBM, RB); **Mangueirinha,** Reserva Indígena de Mangueirinha, 16 September 2009 (fl, fr), *J.M. Silva et al. 7344* (MBM, RB); **Palmas,** Santo Agostinho, 5 December1989 (fl, fr), *G. Hatschbach & V. Nicolack 53687* (MBM); **Turvo,** arredores de Turvo, 1032 m, 18 October 2009 (fl, fr), *M.G. Caxambu & E.L. Siqueira 2835* (MBM); RIO GRANDE DO SUL, **Amaral Ferrador,** estrada secundária de Encruzilhada do Sul para Amaral Ferrador, 427 m, 3 December 2015 (fl, fr), *L. Eggers & O. Chauveau 951* (ICN); **Bagé,** Casa de Pedra, 3 November 2010 (fl, fr), *P.J.S. Silva Filho 1378* (ICN); **Bom Jesus,** entre Bom Jesus e Rio Pelotas e Rio Pelotas a Ausentes, 14 October 2004 (fl, fr), *I. Boldrini et al. 1417* (ICN); **Caçapava do Sul,** Serra do Sudeste, Minas do Camaquã, Guaritas e margem da BR 153, 150 m, 1 October 1992 (fl, fr), *C. Schlindwein 1698* (MPUC); **Cambará do Sul,** Parque Nacional de Aparados da Serra. Ao longo da Trilha do Cotovelo, 8 November 2006 (fl), *J. Lovo et al. 197* (SPF); **Cambará do Sul,** Lajeado das Margaridas, 894 m, 16 January 2016 (fl, fr), *L. Eggers & O. Chauveau 975* (ICN); **Canela,** Lage de Pedra, 18 September 1971 (fl), *J.C. Lindeman s.n.* (HAS 3184); **Caxias do Sul,** distrito de

Vila Seca, 780 m, November 2010 (fl, fr), *P.J.S. Silva Filho 1375* (ICN); **Derrubadas (Tenente Portela),** Parque Estadual do Turvo, 2 July 1986 (fr), *M. Bassan & J. Pilla 382* (HAS); **Dois Irmãos,** 1 November 1989 (fr), *N. Silveira 9298* (HAS); **Encruzilhada do Sul,** terraço na beira S do Rio Camaquã, areia com vegetação baixa, 10 October 1972 (fl, fr), *J.C. Lindeman s.n.* (HAS 653); **Erechim,** Patronato São José, 780 m, 22 December1994 (fr), *A. Butzke et al. s.n.* (US 3332221); **Esmeralda,** Pinhal da Serra/rio Tigre, 21 October 2007 (fl, fr), *C.R. Grippa & T.B. Guimarães 190* (ICN); **Farroupilha,** Est. Exp. Fruticultura, 4 October 1957 (fr), *O.R. Camargo 213* (HAS); **Gramado,** 20 September 1960 (fl), *A.L. Cabrera & A.R. Schultz 2353* (LP); **Jaquirana,** 800 m, 2 November 2004 (fl, fr), *F. Marchett 93* (US); **Montenegro,** Linha Pinhal, 450 m, 26 October 1949 (fl, fr), *A. Sehnem 3953* (FLOR, HBR, MBM, PACA, PEL); **Morro Reuter,** 17 October 1971 (fl, fr), *R. Wasum 166* (PACA); **Palmitinho,** 1 October 1979 (fl, fr), *J.L. Waechter 1361* (HAS, ICN); **Passo Fundo,** Campus I da Universidade de Passo Fundo, 1 December 2004 (fl, fr), *B. Severo s.n.* (ICN 183142); **Pelotas,** IPEAS, 14 October 1964 (fl, fr), *J.C. Sacco 2296* (PEL); **Porto Alegre,** Reserva Biológica do Lami, 1 October 1975 (fr), *L. Aguiar s.n.* (HAS 3249); **Santo Augusto,** Estação Experimental, 13 November 1979 (fr), *J. N. Mattos 19533* (HAS); **São Francisco de Assis,** para Alegrete, 14 November 1975 (fl, fr), *M.L. Porto et al. 1801* (ICN); **São Francisco de Paula,** Represa do salto, 800 m, 26 September 2009 (fl, fr), *R. Wasum 4544* (ICN); **Tupandi (Kappesberg p. Montenegro),** 10 October 1945 (fl, fr), *Friderichs s.n.* (PACA 32919); **Vacaria,** 8 November 1962 (fl, fr), *Rosengurtt & Del Puerto 2125* (MVFA); **Viamão,** Estiva - km 48 estrada para Cidreira, 22 September 1972 (fl, fr), *B.E. Irgang & L. Baptista s.n.* (ICN 10221, CTES 224592); **Viamão,** Parque Estadual de Itapuã, estrada para Praia de Fora, 10 September 2005 (fl, fr), *L. Eggers & T.T. Souza-Chies 134* (ICN); SANTA CATARINA, **Bom Jardim da Serra,** SC 438, após aprox. 10 km de Bom Jardim da Serra, gerador de energia eólica, 12 October 2007 (fl, fr), *L. Eggers & T.T. Souza-Chies 225* (ICN); **Chapecó,** SC 480, cerca de 20 km após cruzar a ponte sobre o rio Uruguai, 688 m, 5 December 2013 (fl, fr), *L. Eggers & O. Chauveau 885* (ICN); **Lages,** beira do Rio Pelotinhas, 1031 m, 13 December 2004 (fl, fr), *L. Eggers & T.T. Souza-Chies 96* (ICN); **Praia Grande,** Rod. SC-450, Serra do Faxinal, 800 m, 3 November 1994 (fl, fr), *G. Hatschbach & O.S. Ribas 61276* (MBM); **São Joaquim,** SC 430 – 438, 1499 m, 10 October 2014 (fl), *C.D. Inácio et al. 235* (ICN); **São Lourenço (do Oeste),** 16 km a oeste de São Lourenço, 900-1000 m, 6 December 1964 (fr), *L.B. Smith & R.M. Klein 13660* (GH, HBR, NY, US); **Urubici,** Rod. SC 430, 10 km de Vaca Gorda, 7 December 2000 (fl, fr), *G. Hatschbach et al. 71611* (MBM); **Urupema,** Morro das Antenas, 1720 m, 6 November 2013 (fl, fr), *A.C. Cervi et al. 10125* (MBM); **Xanxerê,** Rio Xanxerê, Xanxerê e arreadores, 700 m, 14 November 1964 (fl, fr), *L.B. Smith & R.M. Klein 13268* (FLOR, GH, HBR, NY, US).

Additional examined material: ARGENTINA, CHACO, **1° de Mayo,** Colonia Benitez, 16 November 1961 (fl, fr), *T.M. Pedersen 6397* (CTES); CORRIENTES, **Mercedes,** Estancia "Itá Caabó", 18 October 1961 (fl), *T.M. Pedersen 6190* (CTES); **Santo Tomé,** 19 km SE de Gobernador Virasoro, camino a Colonia Garabí, 9 October 1980 (fl, fr), *A. Schinini & O. Ahumada 20863* (CTES); MISIONES, **Apóstoles,** campos bajos del Chirimay, 29 November 1943 (fl), *A. Burkart 14335* (SI); **Cainguás,** Salto Las Golondrinas, 375 m, 18 November 2005 (fl), *F.O. Zuloaga et al. 8729* (SI); **Candelaria,** Ruta Provincinal 3, a 3 km al E de Cerro Corá, 28 December 1979 (fl), *Medán et al. 77* (BAA); **General Manuel Belgrano,** Campinas de América, camino de tierra al norte de Ruta Provincinal 17, 3 May 2007 (fr), *H.A. Keller & M. Franco 4109* (CTES); **Guarani,** camino al Salto Golondrina, 15 km de ruta 14, 410 m, 24 November 2004 (fl), *F.O. Zuloaga & M.J. Belgrano 8160* (SI); **Oberá,** Ruta Provicinal 103, de San Martín a Martires, 200 m, 26 September 1997 (fl), *F. Zuloaga & O. Morrone 6525* (SI); **San Ignacio,** desvio a Colonia Alberdi, 5 km ruta 14, 10 December 1997 (fl, fr), *M.E.M. Romero et al. 1721* (CTES, SI); **San Pedro,** de Tobuna al 24, 31 July 1937 (fl, fr), *Pérez-Moreau s.n.* (BA 21250).

19. ***Sisyrinchium soboliferum*** Ravenna, Wrightia 7: 5 (1981). Type: Argentina, Ad Parque Nacional Iguazu Argentinae, 6 December 1969, Ravenna 1045 (lectotype here designated: NY photo!, isolectotype: K!).

Illustrations: Fig. 30 G−I, 34.

Perennial herb, erect, 22–75 cm tall, roots slender and fibrous. Basal leaves erect, linear, 3.5–40 cm × 1.2–7 mm, glabrous, acute. Floriferous stem simple, erect, obviously winged, 17–62 cm × 2–5.8 mm, margin entire, with a linear terminal bract 2–20 cm long, distal margin occasionally papillose. Synflorescence fasciculiform, (1–)3–12 rhipidia, congested at the base of the terminal bract. Rhipidium 1–6 flowers, subsessile to pedunculate, peduncle 0.5–32 mm long. Spathes bivalved, lower valve 8–14 × 1.2–2 mm, upper 9.5–12.5(–18) × 1.2–2.4 mm, glabrous, acute to long apiculate, margin membranaceous for 0.4–1 mm. Pedicel longer than spathes, 15–25 mm long, with light yellow straight capitate trichomes.

Perigon disk shaped, light vinaceous, proximally yellow to light green, with dark veins, 9–16.8(–20) mm diameter (liquid preserved flowers). Tepals subequal, 4–8.5(–10) × 2–4 mm, oblanceolate, emarginate-apiculate, with five vinaceous veins at both sides and sparse trichomes at the abaxial side. Filaments light yellow, connate in a staminal column, 2.1–2.6 mm long, cylindrical, with oil-producing trichomes (elaiophores) for 1–1.2 mm, then with sparse trichomes. Anthers yellow, basifixed, 0.8–1.1 mm long. Ovary globose, 1–1.6 mm long and wide, pubescent, with light yellow straight capitate trichomes. Style yellow, entire, 3.1–4.5 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 2.8–4 × 3.7–4.7 mm, brown, pilose.

Distribution: *Sisyrinchium soboliferum* occurs in Argentina (Corrientes, Formosa and Misiones), southern Brazil (Paraná, Santa Catarina and Rio Grande do Sul) and Paraguay (Cordillera and Paraguarí), according to herbaria data, Ravenna (2003) and Roitman *et al.* (2008). In Paraná, there are records in the Terceiro Planalto (Maack 1969). In Santa Catarina, the species is distributed in the Planalto Paleozóico and Serra do Mar (Prates *et al.* 1989), and in Rio Grande do Sul, it occurs in the Encosta do Sudeste and Encosta Inferior do Nordeste (Fortes 1959). *Sisyrinchium soboliferum* inhabits wet environments, margins of bogs and roadsides, from 233 to 1020 m a.s.l. (Fig. 35), in the Subtropical Mixed Forest and Subtropical Seasonal Forest (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from October to January, although there are collections from Argentina from August to February, and only one record in April.

Notes: The species is recognized by light vinaceous flowers, glabrous spathes and plane leaves and floriferous stem. *Sisyrinchium soboliferum* is similar to *S. dasyspathum* which, however, presents white flowers and pilose spathes. Plants of *S. soboliferum* usually turn dark after drying.

A lectotype was here designated since type material of Ravenna's herbarium is not accessible.

Selected examined material: BRAZIL, PARANÁ, **Guarapuava,** Guará, 3 December 1969 (fl, fr), *G. Hatschbach & P. Ravenna 23084* (CTES, HUCS, MO, SPF, UPCB, Paratype); **Três Barras do Paraná,** "Canyon" do Rio Guarani (margem direita), 4 October 1997 (fl, fr), *I. Isernhagen & M. Borgo 131* (CTES, MBM, UPCB); **Vitorino,** BR 280, Francisco Beltrão - Pato Branco, próx. ao trevo para São Lourenço do Oeste, 750 m, 31 October 2008 (fl, fr), *L. Eggers & T.T. Souza-Chies 381* (ICN); RIO GRANDE DO SUL, **Mariana Pimentel,** estrada secundária entre Mariana Pimentel e Dr Maurício Cardoso, após uma rótula. Acostamento da estrada, 233 m, 09 April 2014 (sem), *O. Chauveau & T. Pastori 899* (ICN); **Nova Petrópolis,** RS 235, Cachoeira Panelão, 09 January 2013 (fl), *L. Eggers & O. Chauveau 815* (ICN); SANTA CATARINA, **Major Vieira,** cerca de 4 km após Major Vieira em direção a Canoinhas, 814 m, 17 November 2010 (fl, fr), *L. Eggers & T.T. Souza-Chies 603* (ICN); **São Bento do Sul,** BR 280, direção Jaraguá - São Bento, cerca de 15 km antes de São Bento, 488 m, 23 October 2008 (fl), *L. Eggers & T.T. Souza-Chies 317* (ICN).

Additional examined material: ARGENTINA, FORMOSA, **Pilcomayo,** Laguna Naick Neck, Colonia El Paraíso, 5 km W de Palma Sola, 60 m, 18 September 1996 (fl, fr), *A. Schinini et al. 31348* (CTES); MISIONES, **Eldorado,** Ex Ruta 12, A° Piray Guazú, 5 January 1972 (fl, fr), *C. Quarín 297* (CTES); **Guaraní,** Arroyo El Paraíso y Ruta 2, 23 September 1993 (fl), *M. Rodriguez et al. 764* (CTES); **Iguazú,** Depto Iguazú, pasarela Rota 12, sobre Rio Uruguay, 14 October 1949 (fl, fr), *V. R. Perrone s.n.* (BA 54167); **Iguazú,** Parque Nacional, 15 November 1976 (fl), *Guaglianone et al. 19* (SI); **San Ignacio,** 23 March 1947 (fl, fr), *J.E. Montes s.n.* (BA 53209). PARAGUAY, CORDILLERA, **San Bernardino**, Costa del Lago Ipacaray, 14 October 1973 (fr), *C. Quarín et al. 1532* (CTES).

20. ***Sisyrinchium teleanthum*** Ravenna, Onira 5: 13 (2000). Type: Brazil, Paraná, Tijucas do Sul, Rincão, 15 October 1961, G. Hatschbach 8509 (lectotype here designated: US!).

Illustrations: Fig. 36, 37 A−B.

Perennial herb, erect, 107 cm tall. Rhizome short, with slender and fibrous roots. Basal leaves absent in the collect. Floriferous stem simple, erect, obviously winged, 74–105 cm × 4–6 mm, margin entire, with a linear terminal bract 1.7–2.7 cm long, proximal margin membranaceous. Synflorescence fasciculiform, 9–20 rhipidia, congested at the base of the terminal bract. Rhipidium 1–3 flowers, sessile to subsessile, peduncle 1.3 mm long. Spathes bivalved, lower valve 5–7 × 1.2–1.8 mm, upper 9.5–10.5 × 2 mm, pilose, acute to long apiculate, margin membranaceous for 0.5 mm. Pedicel longer than spathes, 9–12 mm long, with light yellow capitate trichomes. Perigon disk shaped, purple, with dark veins. Tepals subequal, 4–4.5 × 1.5–2 mm, oblanceolate, apiculate, with five vinaceous veins at both sides and sparse trichomes at the abaxial side. Filaments light yellow, connate in a staminal column, 1.8–2.5 mm long, cylindrical, with oil-producing trichomes (elaiophores) for 0.6–0.8 mm, then with sparse trichomes. Anthers yellow, basifixed, 0.4–0.5 mm long. Ovary globose, 0.7–1 × 0.6–1 mm, pilose. Style yellow, entire, 3.2 mm long, with stigmatic region projected above the anthers. Capsule globose to subglobose, 2.2–2.5 × 2.8–3 mm, brown, pilose.

Distribution: *Sisyrinchium teleanthum* occurs only in Paraná, at Tijucas do Sul municipality, southern Brazil (Fig. 35). According the label of this single collection, it was found in a swampy area. Other expeditions to the region did not succeed to find other samples of the species.

Phenology: According to the collection, flowers and fruits occur in October.

Notes: The species is recognized by presenting purple flowers, pilose spathes, terminal bract to 2.7 cm, plane leaves and floriferous stem and tall plants (up to 100 cm).

Since the holotype of *S. teleanthum* was not found in the MBM herbarium and the isotype kept in Ravenna's herbarium is not accessible, a duplicate of *Hatschbach 8509* (US!) was designated as lectotype.

RELATED SPECIES (Unplaced in Inácio *et al.* 2017, accepted)

21. ***Sisyrinchium elegantulum*** Ravenna, Onira 10: 67 (2006). Type: Brazil, Rio Grande do Sul, São José dos Ausentes, Mirante Serra da Rocinha, 1225 m, 11 October 2014 (fl), C.D. Inácio et al. 239 (neotype here designated: ICN!).

Illustrations: Fig. 37 D−G, 38.

Perennial herb, erect, 12–65(–78) cm tall, roots slender and fibrous. Basal leaves erect, linear, 5–50 cm × 0.4–1.5 mm, glabrous, acute, incrassate, with whitish veins (in fresh material). Floriferous stem simple, erect, terete to slightly quadrangular, incrassate, (4–)7–65 cm × 0.4–1.8 mm, with whitish veins, with a cylindrical to slightly quadrangular terminal bract, 1.5–14 cm long, proximal margin ciliate. Synflorescence fasciculiform, 1–4(–6) rhipidia, congested between the base of the terminal bract and an opposite bract, 11–29 mm long, attenuate to aristate, awn 4–14.7 mm long, margin ciliate. Rhipidium 1–2(–3) flowers, subsessile, peduncle 1–4.5 mm long, sometimes subtended by a sterile bract with ciliate keel. Spathes bivalved, lower valve 8–13(–15) × 1–3 mm, upper 9–13 × 1.5–3.5 mm, glabrous, acute to long apiculate, margin membranaceous. Pedicel longer than spathes, 10–20 mm long, with light yellow capitate trichomes. Perigon disk shaped, predominantly purple, proximally yellow to light green, with dark veins 10–12 mm diameter (flowers in exsicates). Tepals subequal, 4–8 × 2–4(–5) mm, oblanceolate, emarginate-apiculate, with five to seven dark-purple veins and sparse trichomes at the abaxial side. Filaments yellow, connate in a staminal column, 2–3 mm long, cylindrical, with oil-producing trichomes (elaiophores) at the base for 0.8–1 mm, then with sparse trichomes. Anthers yellow, basifixed, 0.5–0.7(–1) mm long. Ovary globose, 1–1.5 mm long and wide, pubescent. Style yellow, inconspicuously trifurcate, with stigmatic region projected above the anthers. Capsule globose to subglobose 2–5 × 1.5–5.5 mm, brown, pilose.

Distribution: *Sisyrinchium elegantulum* is endemic of southern Brazil (Santa Catarina and Rio Grande do Sul). In the state of Santa Catarina, it occurs in the Planalto Paleozóico and Arenito-Basáltico (Prates *et al.* 1989) and in Rio Grande do Sul in the Campos de Cima da Serra and Encosta Superior do Nordeste (Fortes 1959). This species inhabits grasslands, sometimes with turfous soil, from 700 to 2000 m a.s.l., in the Subtropical Highland Grasslands (Iganci *et al.* 2011),

Phenology: Flowers and fruits are reported from October to December.

Notes: *Sisyrinchium elegantulum* differs from other species of purple or vinaceous flowers (such as *S. purpurellum* and *S. pendulum*) by having slightly incrassate leaves and stems. Samples of Santa Catarina present verrucous surface in the leaves and floriferous stem. A neotype is here designated based on a sample from the same place of the original collection since the type material (*Ravenna 601*) cited by Ravenna (2006) was not found in R herbarium and duplicates were not encountered.

Select examined material: BRAZIL, RIO GRANDE DO SUL, **Cambará do Sul,** Itaimbezinho, 10 December 1980 (fl, fr), *J. Goergem s.n.* (ICN 50052); **São Francisco de Paula,** estrada secundária para Canyon Josafá, cerca de 5 km da Rota do Sol, 946 m, 10 November 2011 (fl, fr), *L. Eggers & T.T. Souza-Chies 678* (ICN); **São José dos Ausentes,** Mirante Serra da Rocinha, 1225 m, 11 October 2014 (fl), *C.D. Inácio et al. 239* (ICN); SANTA CATARINA, **Bom Retiro,** Campo dos Padres, 1650 m, 17-19 November 1956 (fl, fr), *L.B. Smith, R. Reitz & R. Klein 7754* (GH, NY, R, US); **São Joaquim,** 1701 m, 15 December 2004 (fl), *L. Eggers & T.T. Souza-Chies 99* (ICN); **Urubici,** Alto do Morro da Igreja, 1700 m, 8 December 2000 (fl, fr), *G. Hatschbach, A.C. Cervi & E. Barbosa 71815* (FUEL, MBM).

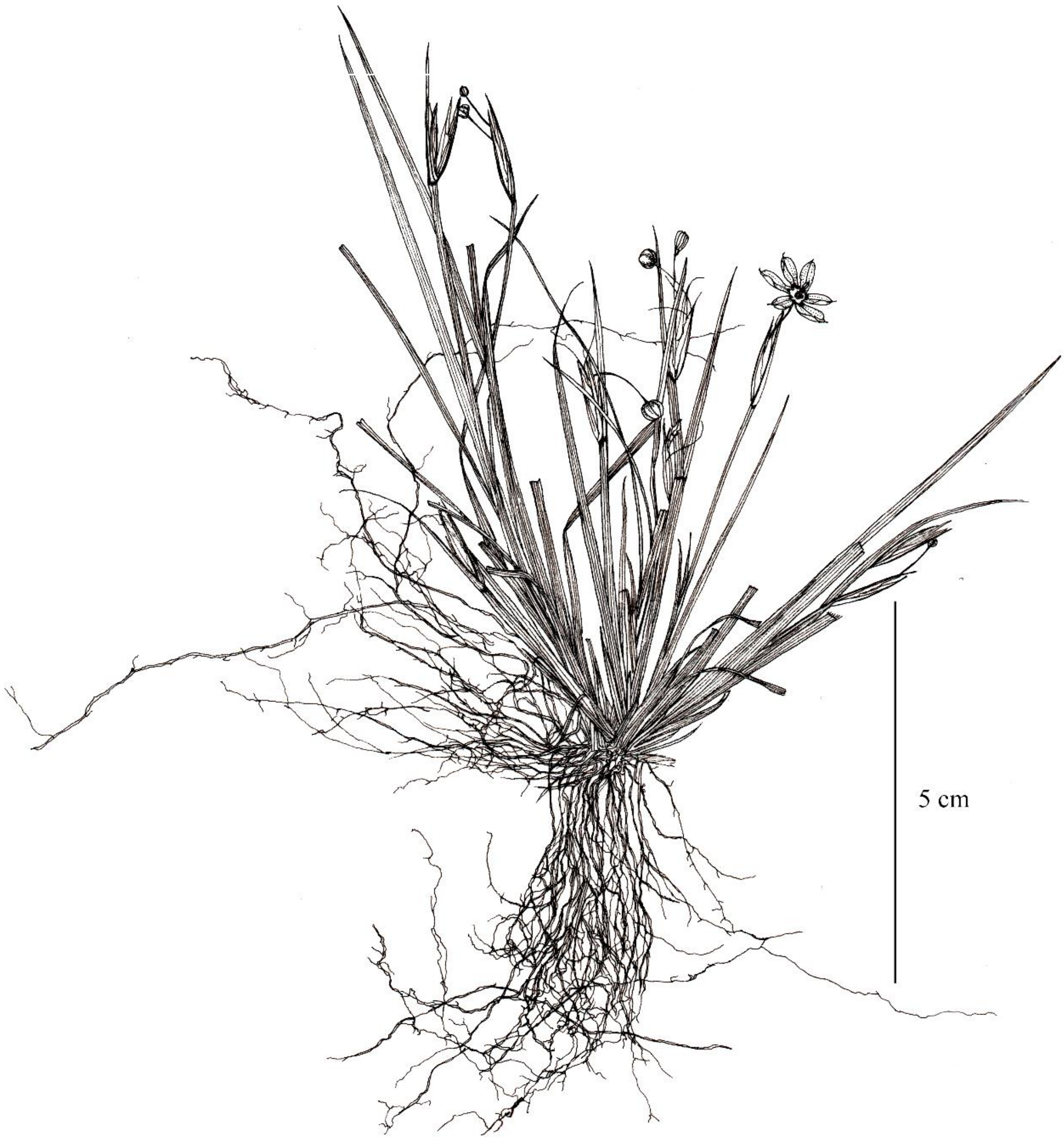

FIGURE 1. Habit of *Sisyrinchium albilapidense*. From *C.D. Inácio et al. 228* (ICN), illustration by Anelise Scherer.

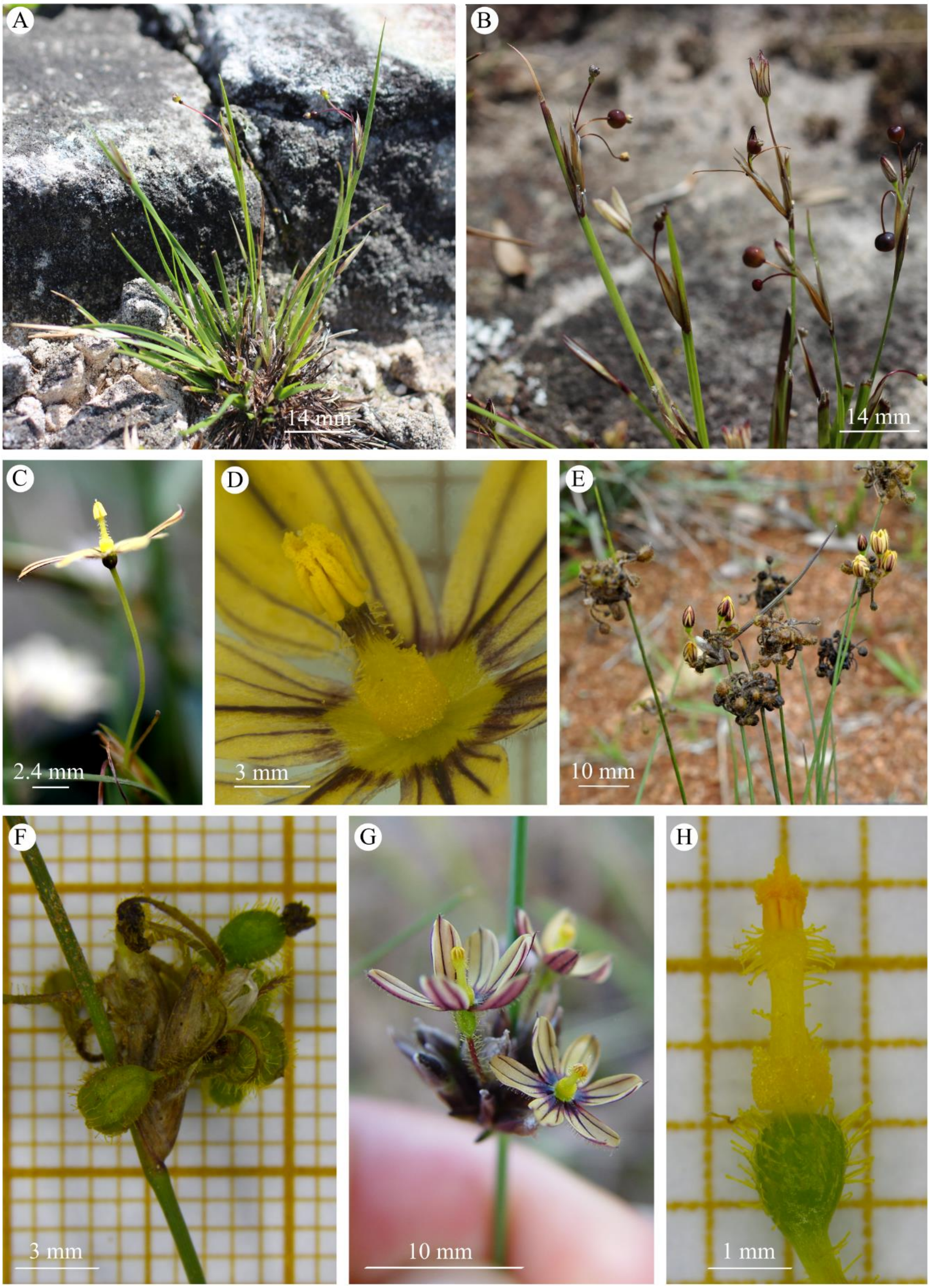

FIGURE 2. *Sisyrinchium albilapidense*: A. Habit. B. Floriferous stem. C. Flower in lateral view. D. Staminal column with elaiophores. *S. claritae*: E. Floriferous stem terete. F. Synflorescence. G. Flowers. H. Staminal column with elaiophores and trichomes. A–C: *C.D. Inácio et al. 228* (ICN). E, F, H: *L. Eggers & O. Chauveau 950* (ICN). G: *L. Eggers & T.T. Souza-Chies 484* (ICN).

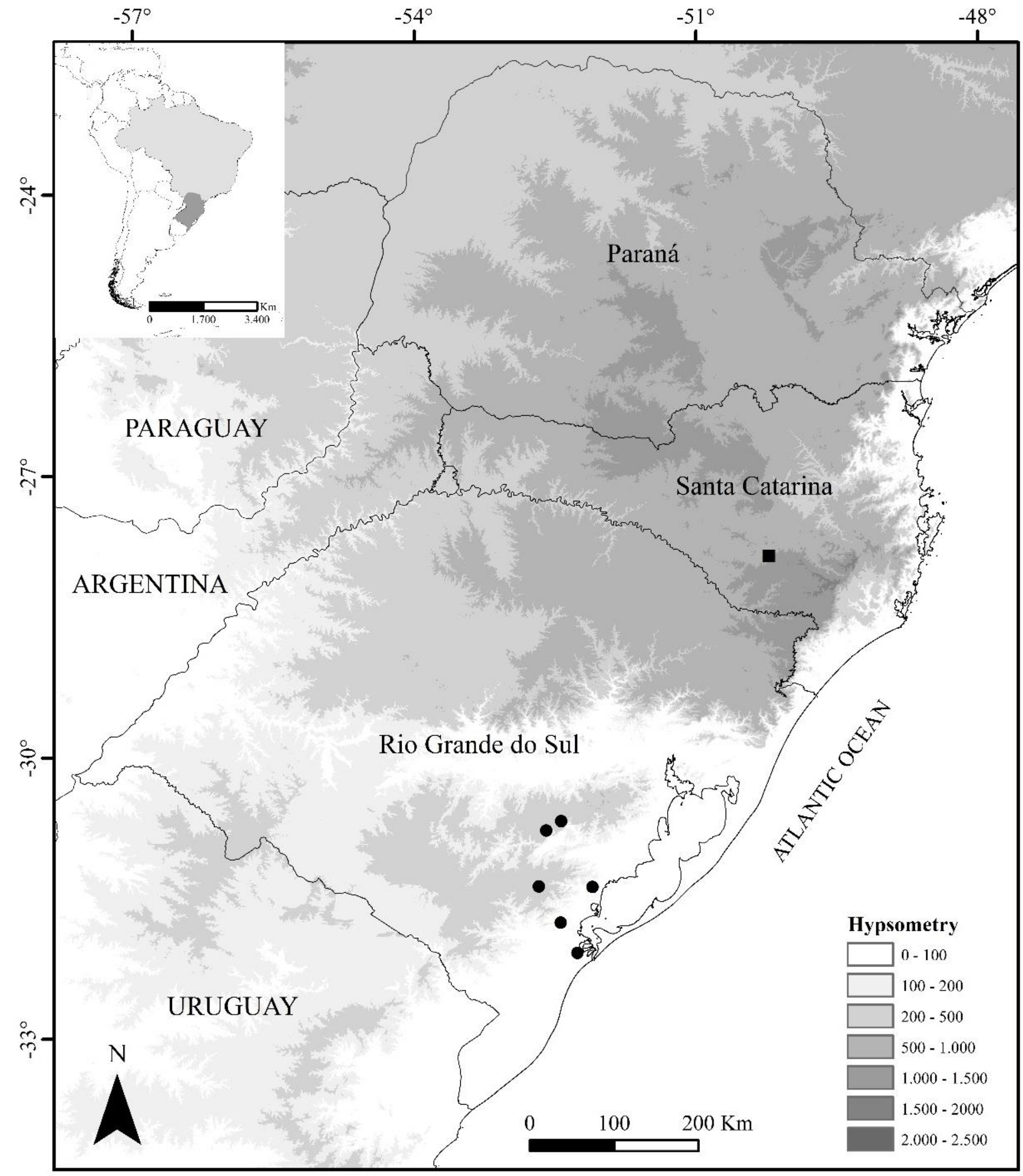

FIGURE 3: Distribution map of *Sisyrinchium albilapidense* (square) and *S. claritae* (circle) in Southern Brazil.

FIGURE 4. Habit of *Sisyrinchium claritae*. From *L.Eggers & O. Chauveau 942* (ICN), illustration by Anelise Scherer.

FIGURE 5. Habit of *Sisyrinchium commutatum* subsp. *commutatum*. From *C.D.Inácio et al. 251* (ICN), illustration by Anelise Scherer.

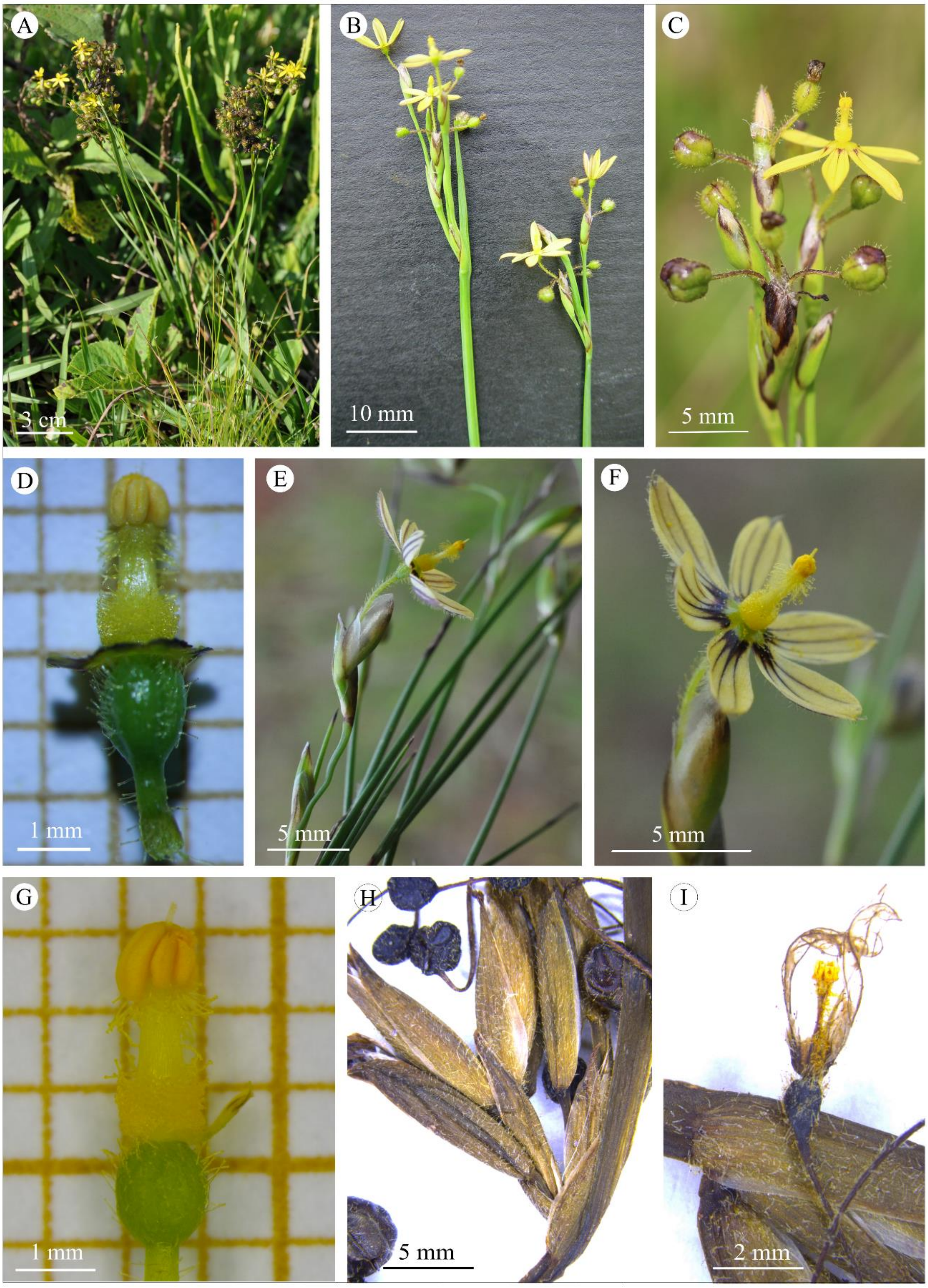

FIGURE 6. *Sisyrinchium commutatum* subsp. *commutatum*: A. Habit. B. Synflorescence. C. Flower and fruits. D. Staminal column with elaiophores. *S. commutatum* subsp. *piliferum*: E. Floriferous stem. F. Flower. G. Staminal column with elaiophores and crown of trichomes bellow the anthers. *S. dasysphatum*: H. Pilose spathes. I. Flower from exsiccate with staminal column. A–B: *L. Eggers & T.T. Souza-Chies 616 and 331* (ICN). C–D: *C.D. Inácio et al. 251* (ICN). E–G: *C.D. Inácio et al. 107* (ICN). H-I: *L. Eggers & T.T. Souza-Chies 557* (ICN).

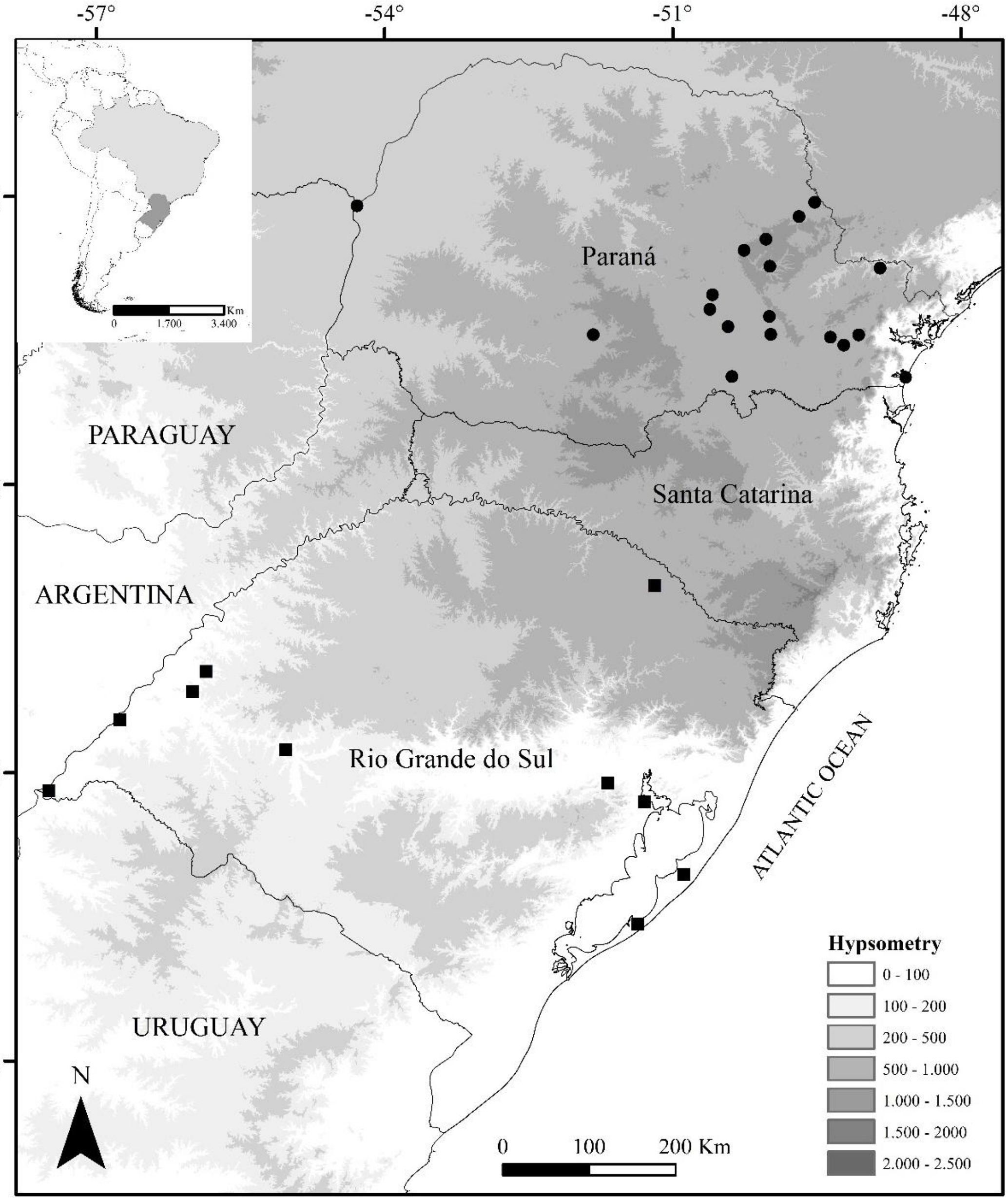

FIGURE 7: Distribution map of *Sisyrinchium commutatum* subsp. *commutatum* (circle) and *S. commutatum* subsp. *piliferum* (square) in Southern Brazil.

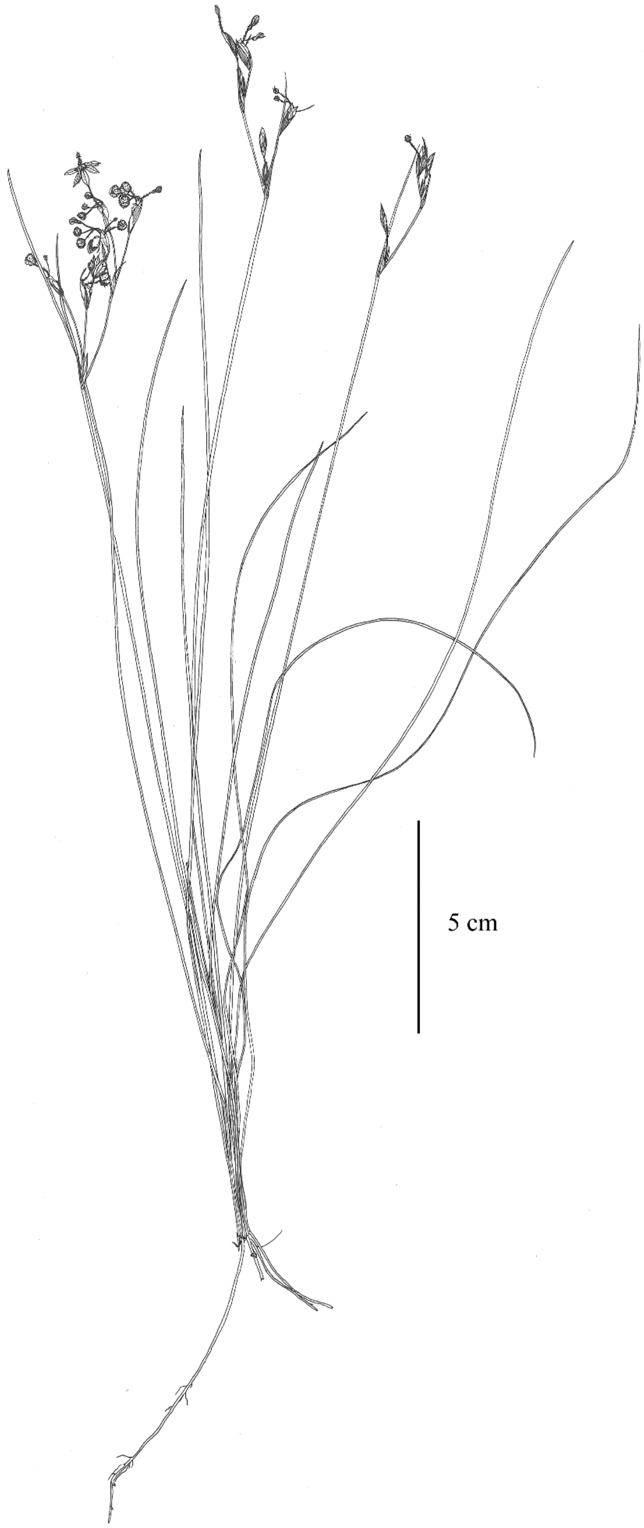

FIGURE 8. Habit of *Sisyrinchium commutatum* subsp. *piliferum*. From *L.Eggers & O. Chauveau 969* (ICN), illustration by Anelise Scherer.

FIGURE 9. Habit of *Sisyrinchium dasyspathum*. From *L.Eggers & T.T. Souza-Chies 557* (ICN), illustration by Anelise Scherer.

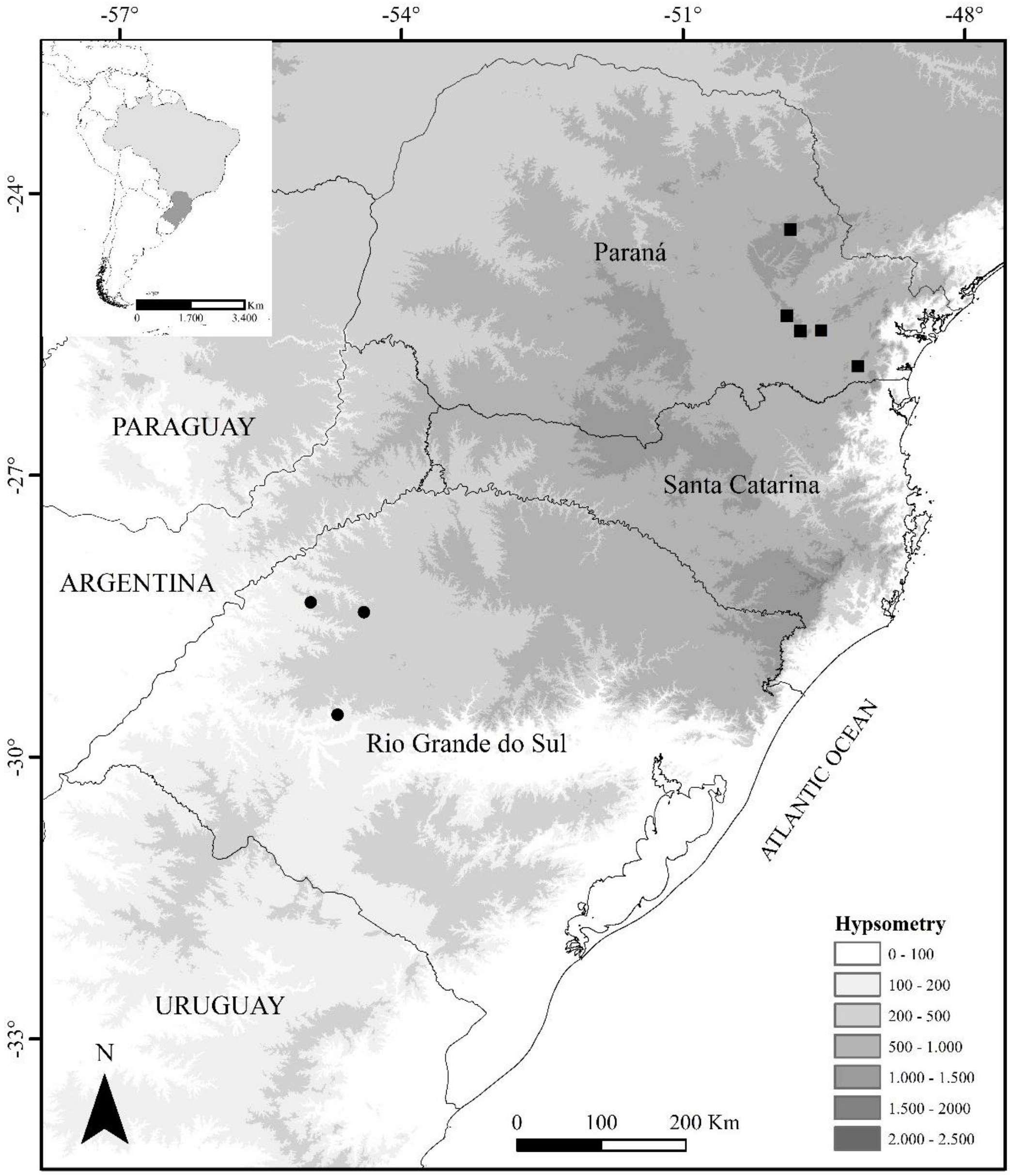

FIGURE 10: Distribution map of *Sisyrinchium dasyspathum* (circle) and *S. fiebrigii* (square) in Southern Brazil.

FIGURE 11. Habit of *Sisyrinchium fasciculatum*. From *C.D. Inácio et al. 128* (ICN), illustration by Anelise Scherer.

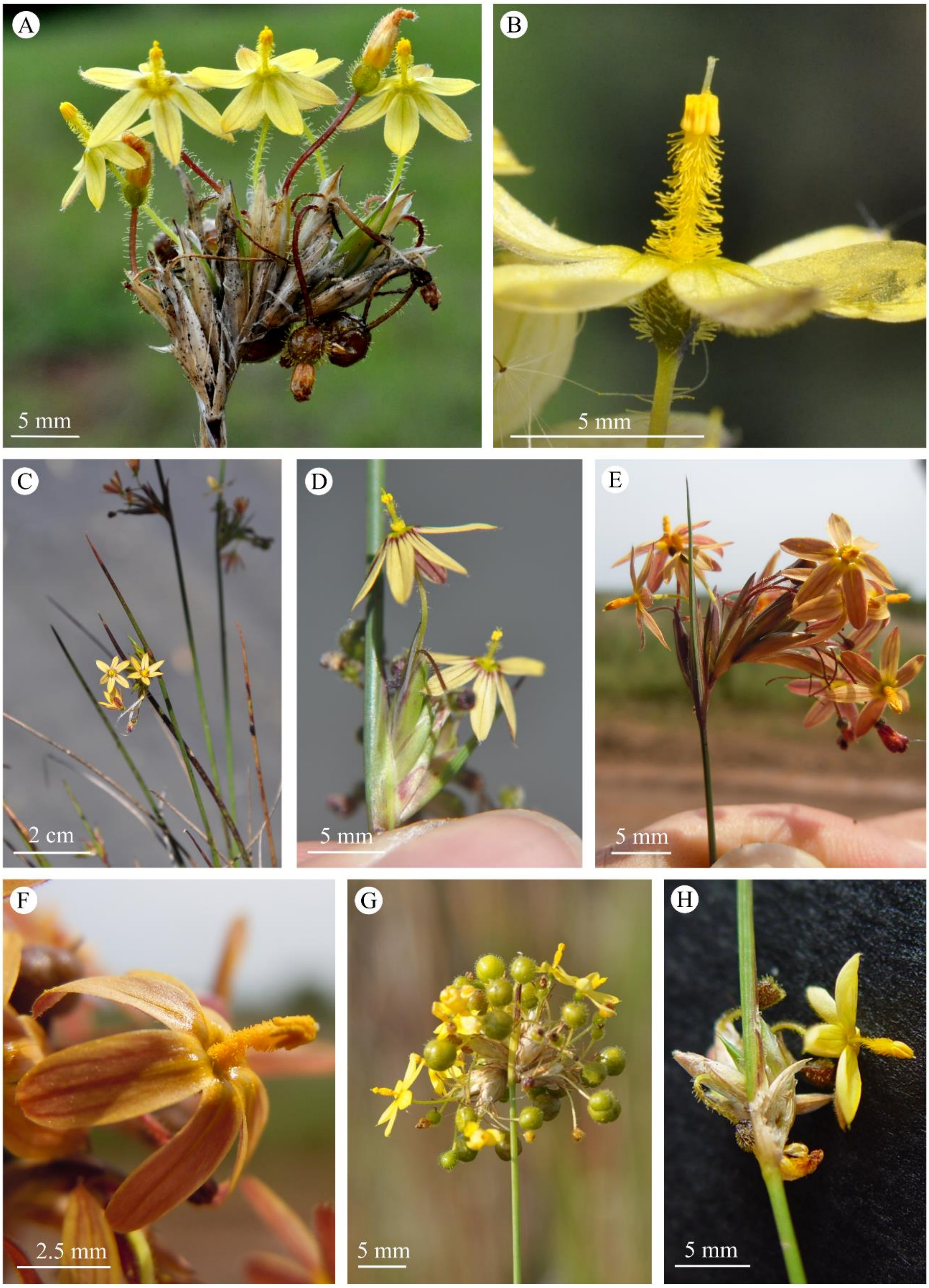

FIGURE 12. *Sisyrinchium fasciculatum*: A. Synflorescence. B. Flowers. *S. fiebrigii*: C. Floriferous stem. D. Synflorescence and flowers. *S. hasslerianum*: E. Synflorescence. F. Flowers. *S. hoehnei*: G. Synflorescence. H. Flower. A−B: *C.D. Inácio et al. 103 and 131* (ICN). C−D: *L. Eggers & T.T. Souza-Chies 352* (ICN). E−F: *T. Pastori et al. 136* (ICN). G−H: *L. Eggers & T.T. Souza-Chies 375* and *615* (ICN).

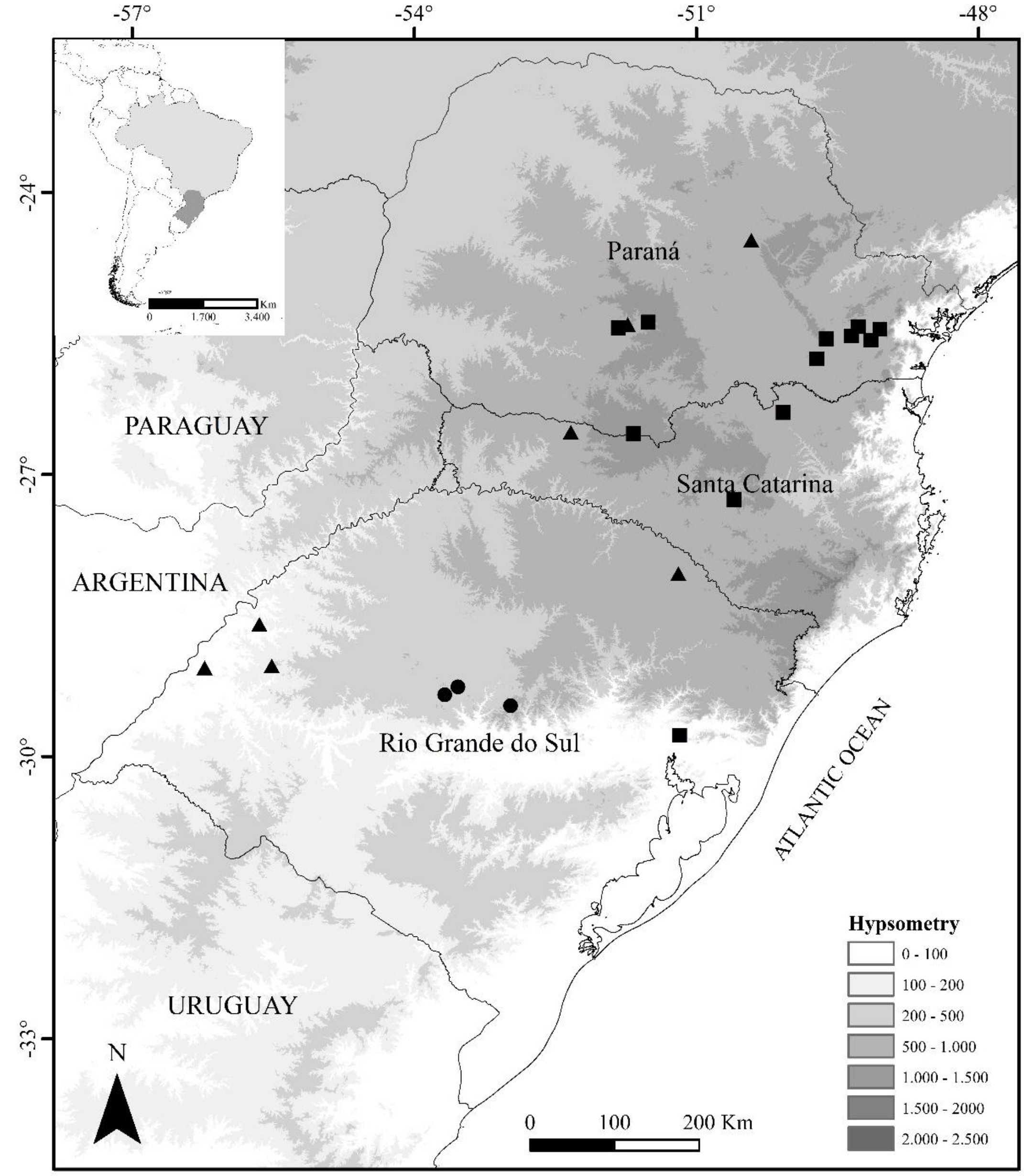

FIGURE 13: Distribution map of *Sisyrinchium fasciculatum* (circle), *S. hasslerianum* (triangle) and *S. hoehnei* (square) in Southern Brazil.

FIGURE 14. Habit of *Sisyrinchium fiebrigii*. From *L.Eggers & T.T. Souza-Chies 352* (ICN), illustration by Anelise Scherer.

FIGURE 15. Habit of *Sisyrinchium hasslerianum*. From *T. Pastori et al. 156* (ICN), illustration by Anelise Scherer.

FIGURE 16. Habit of *Sisyrinchium hoehnei* I.M. Johnst. From *C.D. Inácio et al. 245* (ICN), illustration by Anelise Scherer.

FIGURE 17. Habit of *Sisyrinchium ostenianum*. From *C.D. Inácio et al. 141* (ICN), illustration by Anelise Scherer.

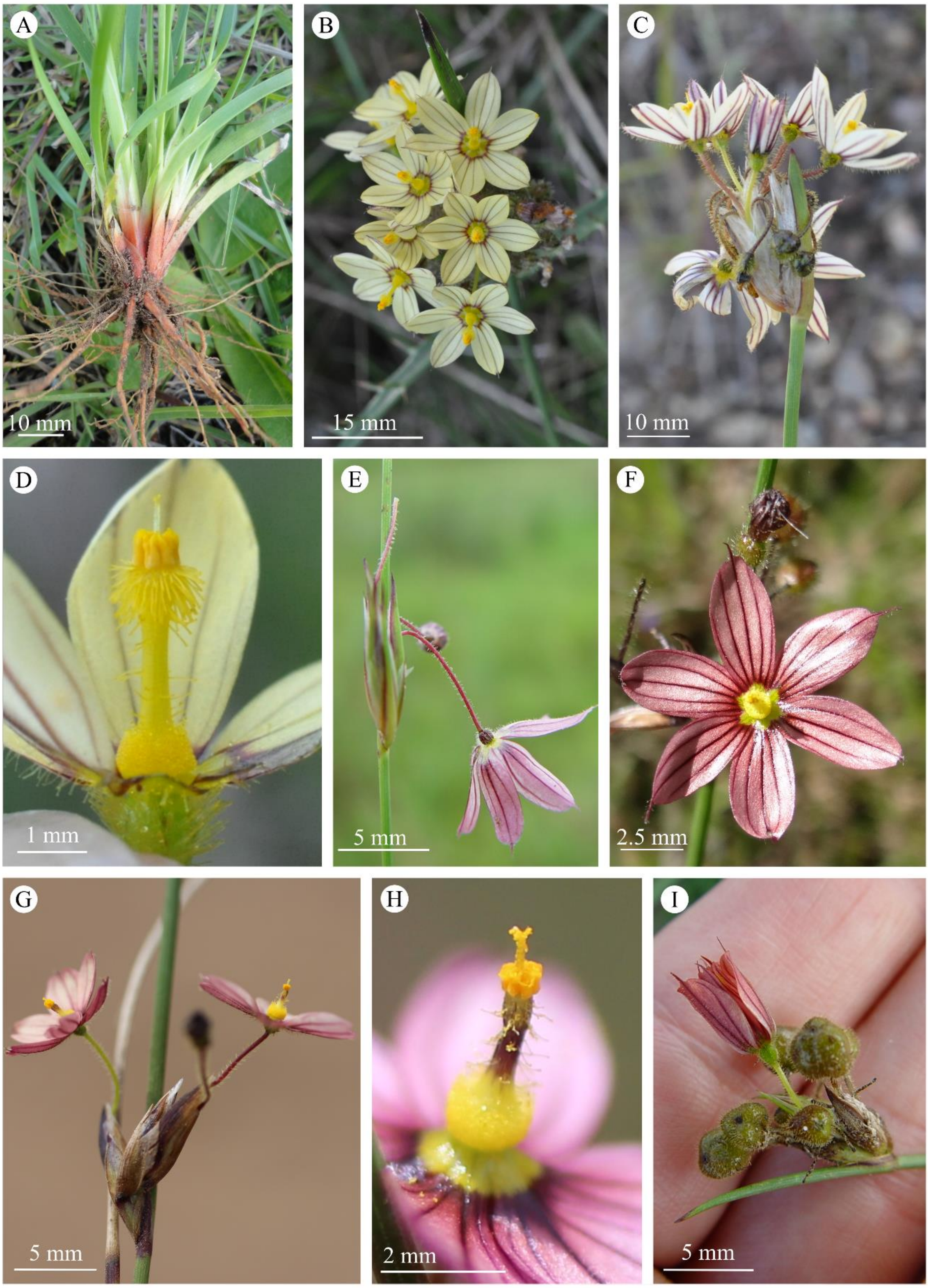

FIGURE 18. *Sisyrinchium ostenianum*: A. Base of plant with roots and reddish leaf sheaths B. Synflorescence. C. Recurved terminal bract and flowers. D. Staminal column with elaiophores and crown of trichomes bellow the anthers. *S. pendulum*: E. Floriferous stem and pendulous flower. F. Flower. *S. purpurellum* subsp. *purpurellum*: G. Synflorescence. H. Flower. *S. purpurellum* subsp. *trichospathum*: I. Synflorescence. A, C: *C.D. Inácio et al. 141*, 180 (ICN). B, D: *L. Eggers & O. Chauveau 919* (ICN). E: *L. Eggers & T.T. Souza-Chies 578* (ICN). F: *E.D. Lozano 1617* (ICN). G–H: *C.D. Inácio et al. 238 and 217* (ICN). I: *L. Eggers & T.T. Souza-Chies 350* (ICN).

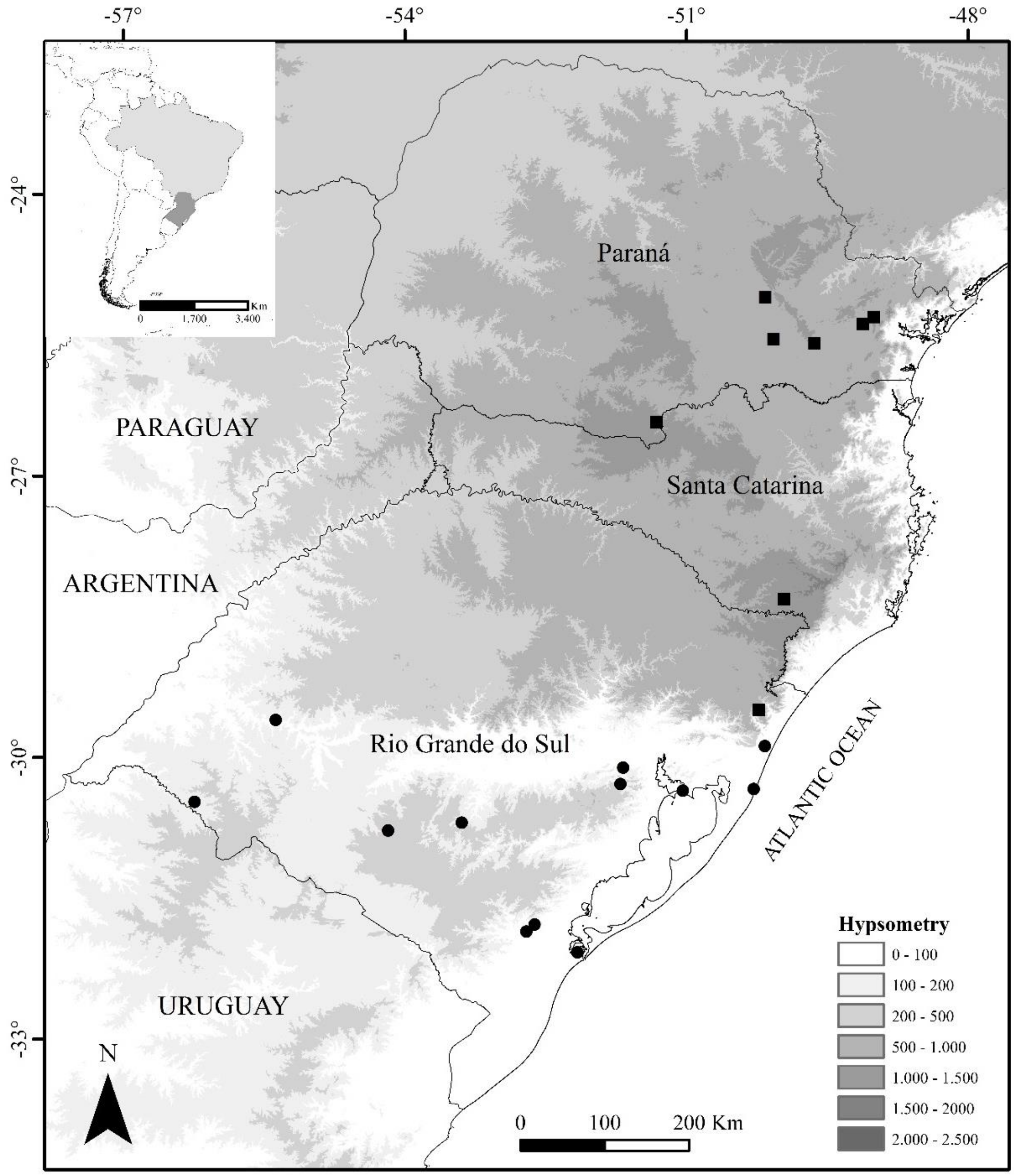

FIGURE 19: Distribution map of *Sisyrinchium ostenianum* (circle) and *S. pendulum* (square) in Southern Brazil.

FIGURE 20. Habit of *Sisyrinchium pendulum*. From *G. Hatschabach et al. 28362* (MO), illustration by Anelise Scherer.

FIGURE 21. Habit of *Sisyrinchium platycaule*. From *P.J. Silva-Filho 1007* (ICN), illustration by Anelise Scherer.

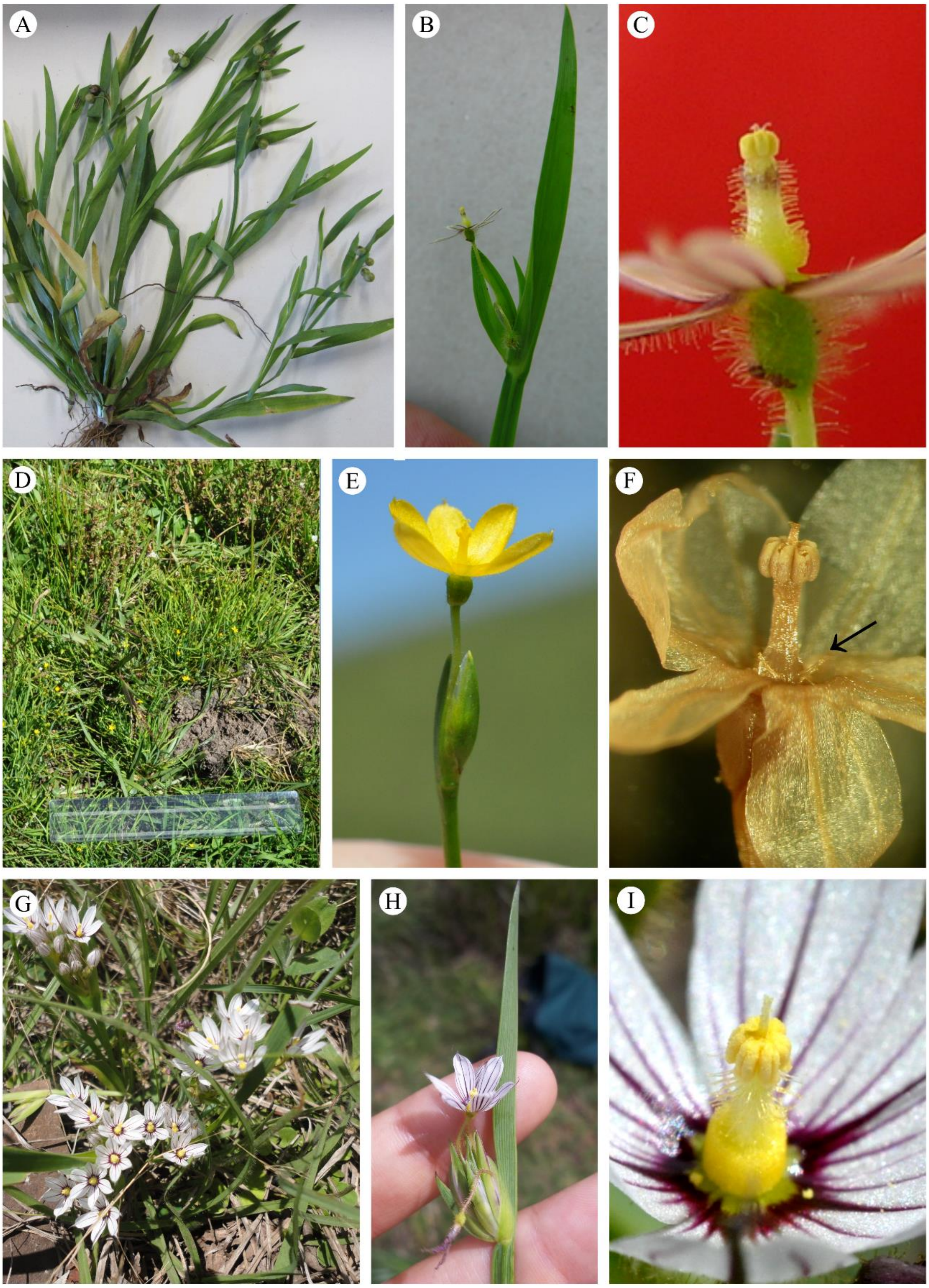

FIGURE 22. *Sisyrinchium platycaule*: A. Habit. B. Synflorescence and terminal bract. C. Flowers. *S. rambonis*: D. Habitat. E. Inflorescence and flower. F. Flower with sparse trichomes in the base (arrow). *S. sellowianum*: G. Habit. H. Synflorescence. I. Flower. A: photo Eduardo D. Lozano. B−C: *L. Eggers & T.T. Souza-Chies 86* (ICN). D, E: *L. Eggers & O. Chauveau 978*. F: *L. Eggers & T.T. Souza-Chies 48* (ICN). G, I: *C.D. Inácio et al. 121* (ICN). H: photo Ana Paula R. Schmitz.

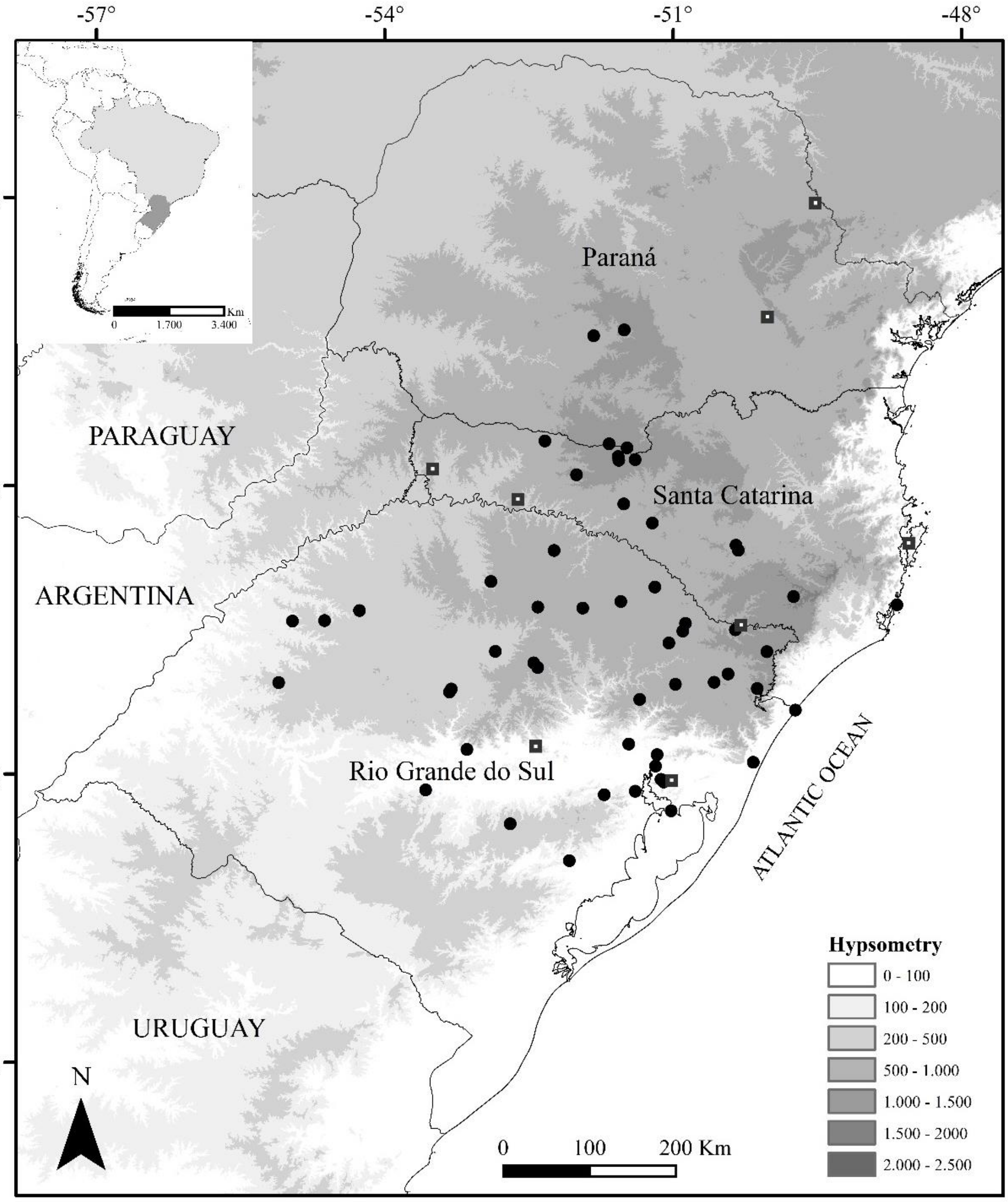

FIGURE 23: Distribution map of *Sisyrinchium platycaule* (square) and *S. sellowianum* (circle) in Southern Brazil.

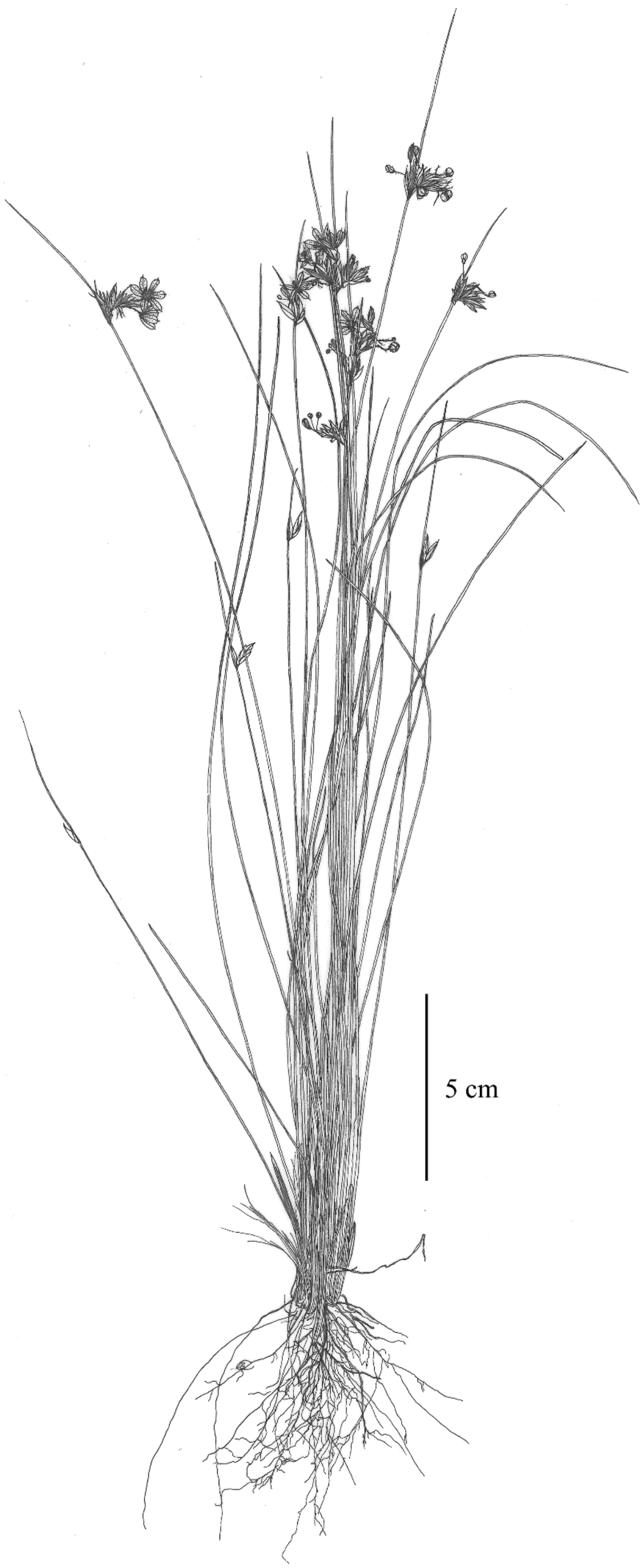

FIGURE 24. Habit of *Sisyrinchium purpurellum* subsp. *purpurellum*. From *G. Hatschbach & V. Nicolack 53689* (FUEL), illustration by Anelise Scherer.

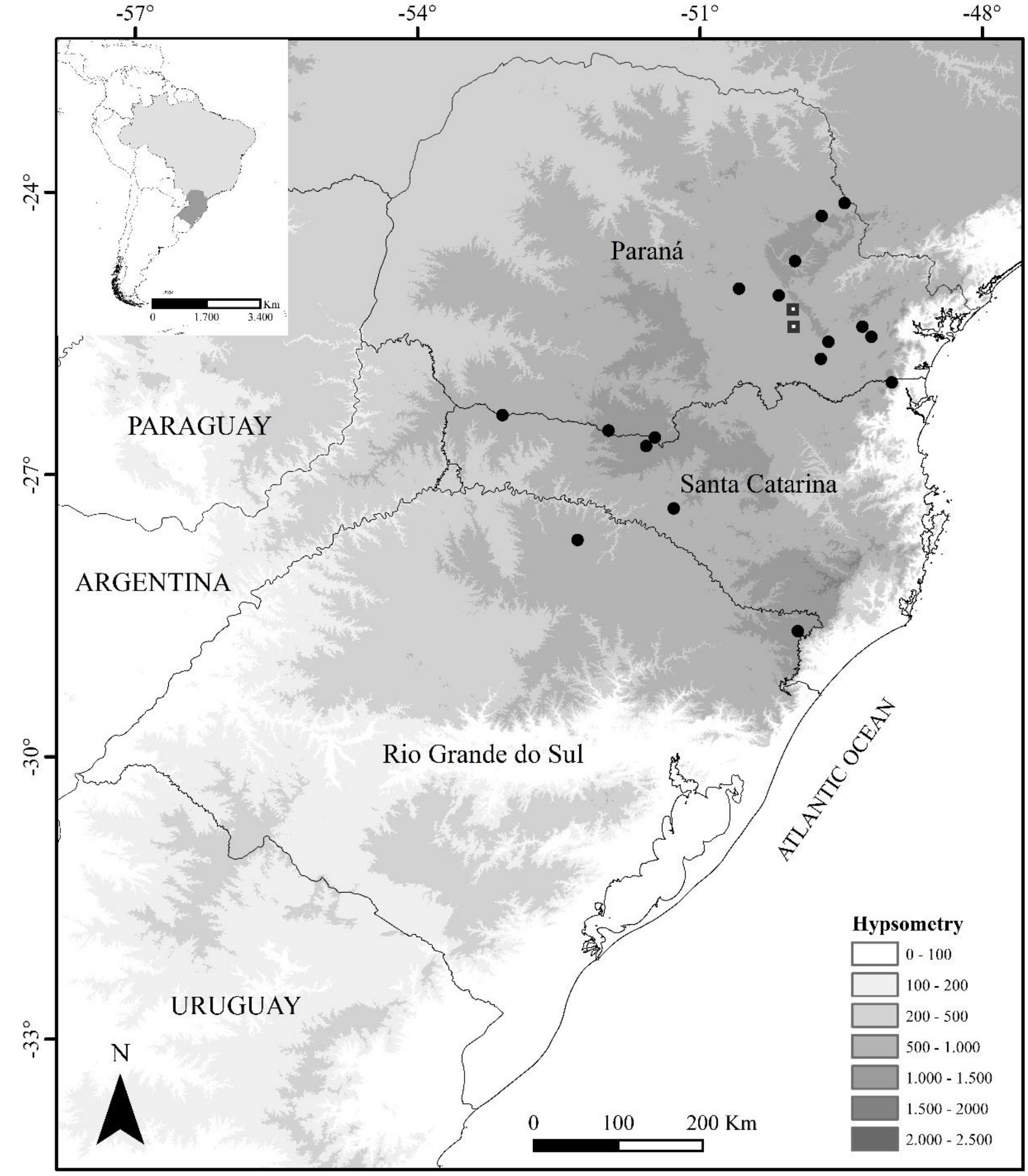

FIGURE 25: Distribution map of *Sisyrinchium purpurellum* subsp. *purpurellum* (circle) and *S. purpurellum* subsp. *trichospathum* (square) in Southern Brazil.

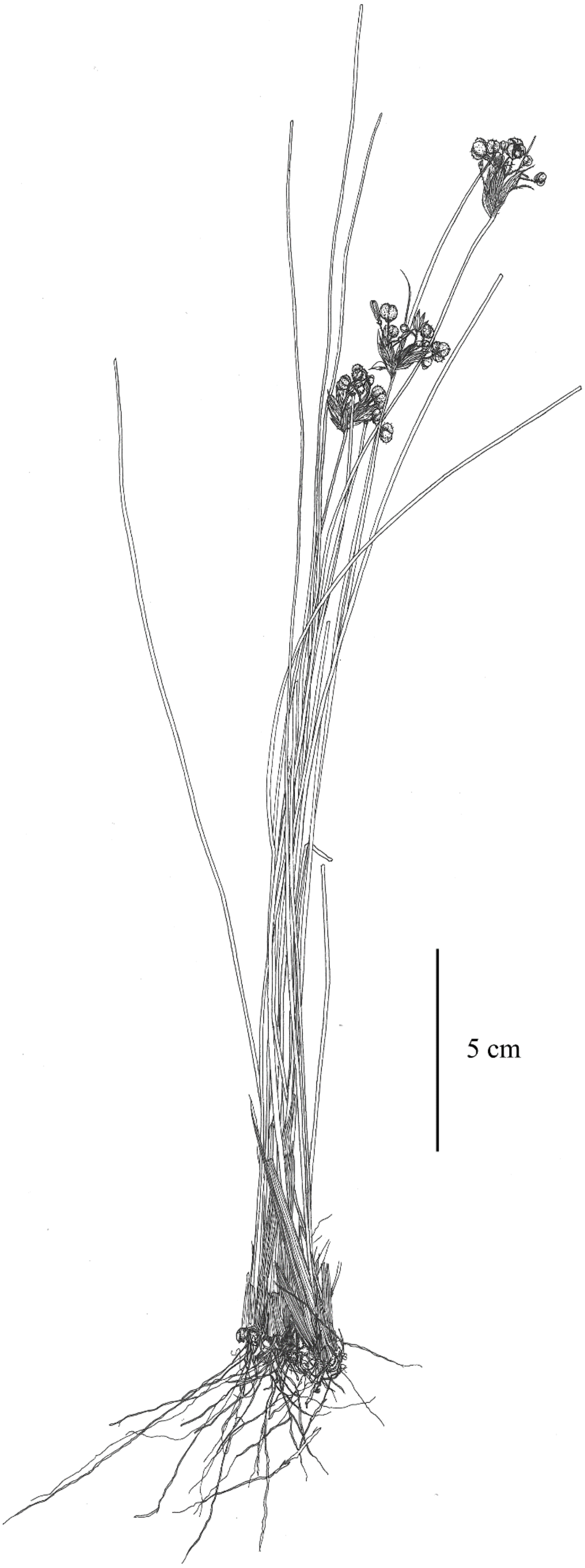

FIGURE 26. Habit of *Sisyrinchium purpurellum* subsp. *trichospathum*. From *E. Santos & J.C. Sacco 2117* (PEL), illustration by Anelise Scherer.

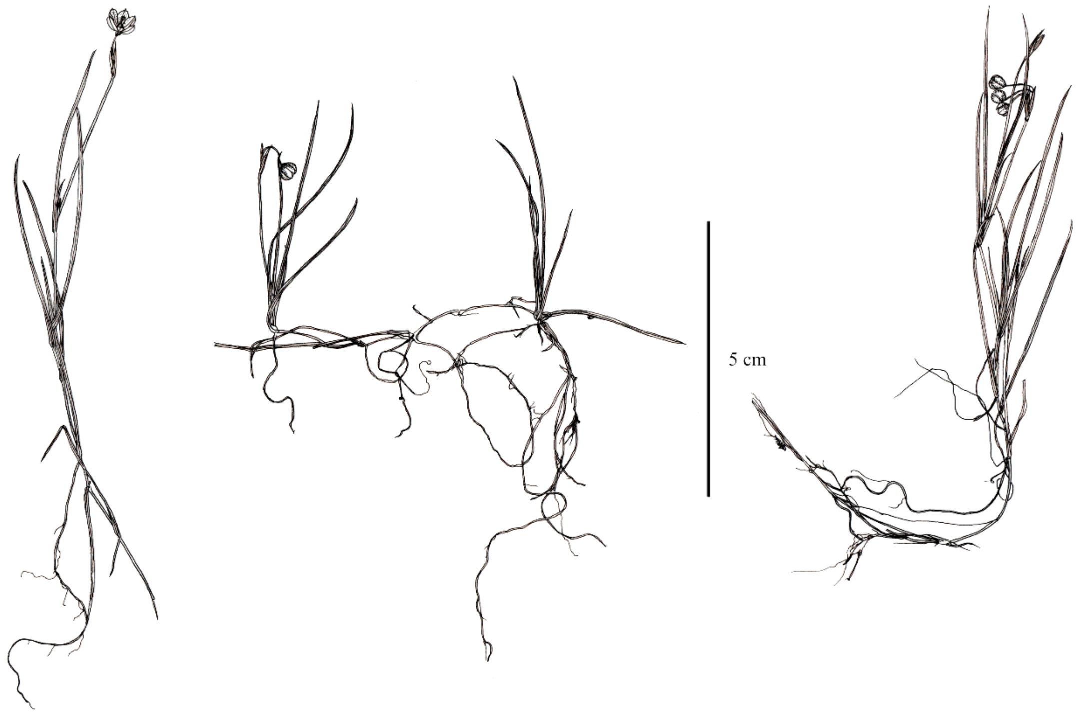

FIGURE 27. Habit of *Sisyrinchium rambonis*. From L. *Eggers & T.T. Souza-Chies 48* (ICN), illustration by Anelise Scherer.

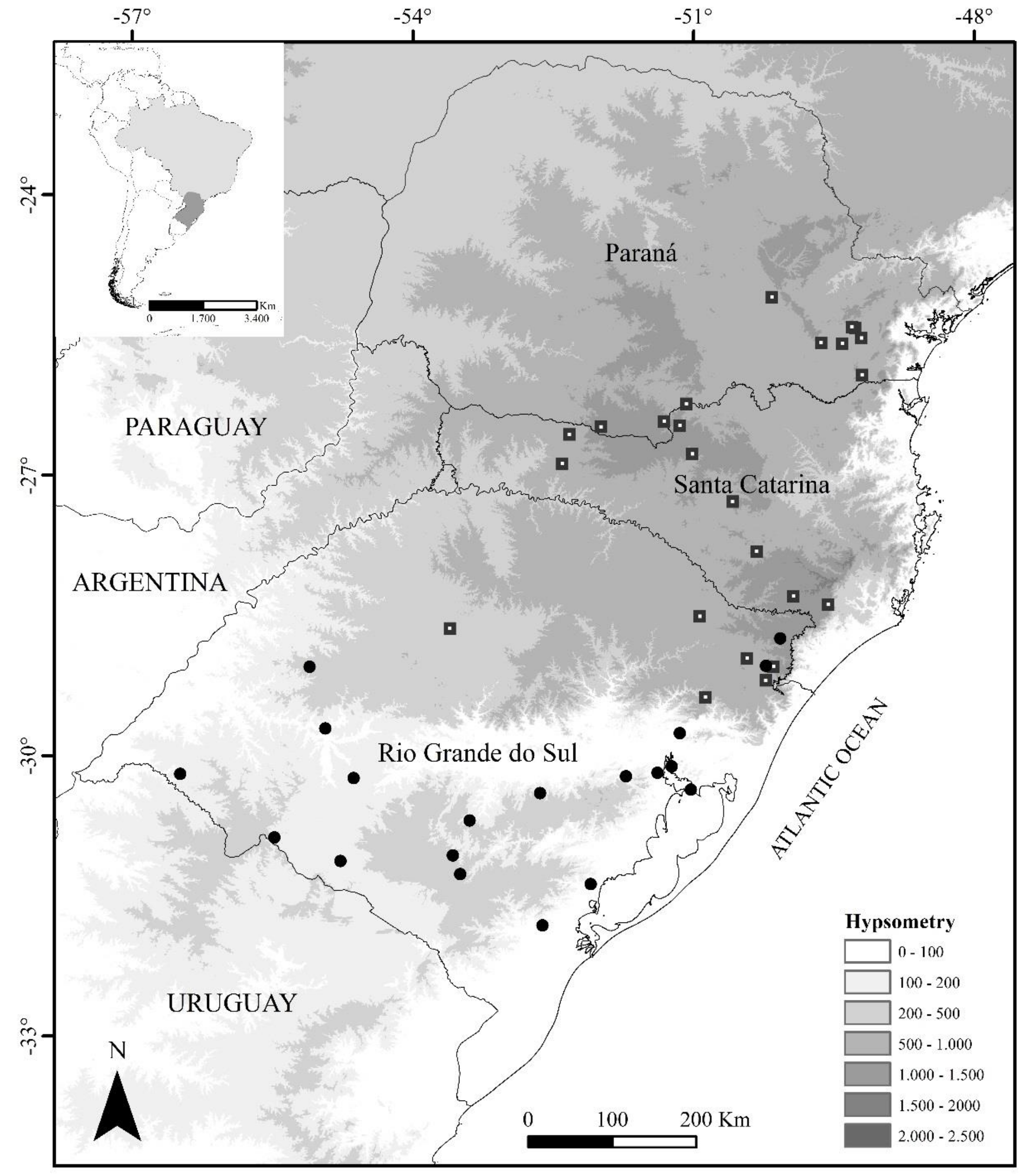

FIGURE 28: Distribution map of *Sisyrinchium rambonis* (square) and *S. scariosum* (circle) in Southern Brazil.

FIGURE 29. Habit of *Sisyrinchium scariosum*. From *C.D. Inácio et al. 135* (ICN), illustration by Anelise Scherer.

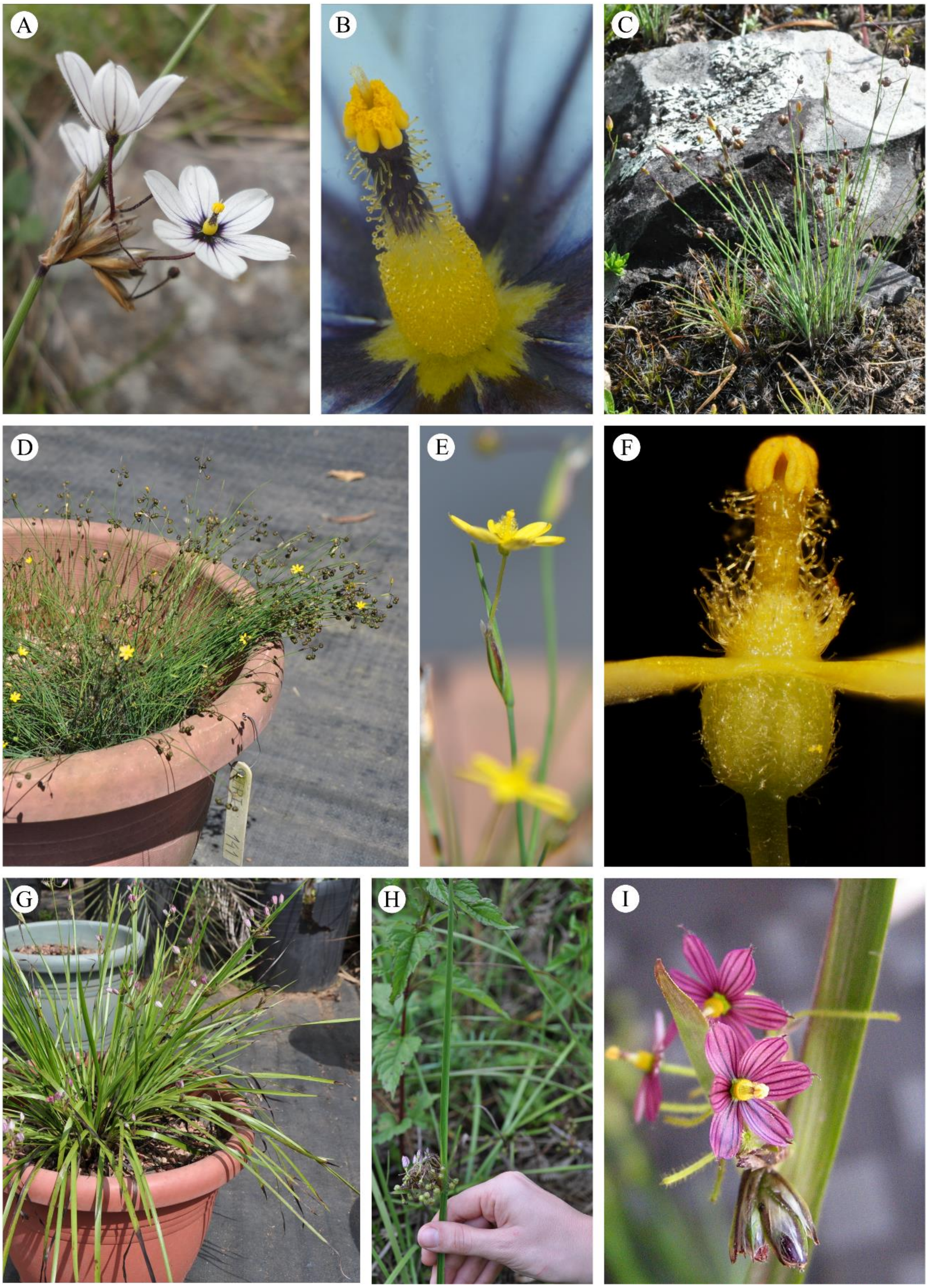

FIGURE 30. *Sisyrinchium scariosum* I.M. Johnst.: A. Synflorescence. B. Staminal column with elaiophores. *S. setaceum* Klatt: C. Habitat. D. Plant (cultivated). E. Floriferous stem and flowers. F. Staminal column. *S. soboliferum* Ravenna: G. Plant (cultivated). H. Floriferous stem, synflorescence and terminal bract. I. Flowers. A−B: *C.D. Inácio et al. 170* (ICN). C−F: *L. Eggers & T.T. Souza-Chies 690* (ICN). G−I: *L. Eggers & T.T. Souza-Chies 603 and 317* (ICN).

FIGURE 31. Habit of *Sisyrinchium sellowianum*. From *C.D. Inácio et al. 246* (ICN), illustration by Anelise Scherer.

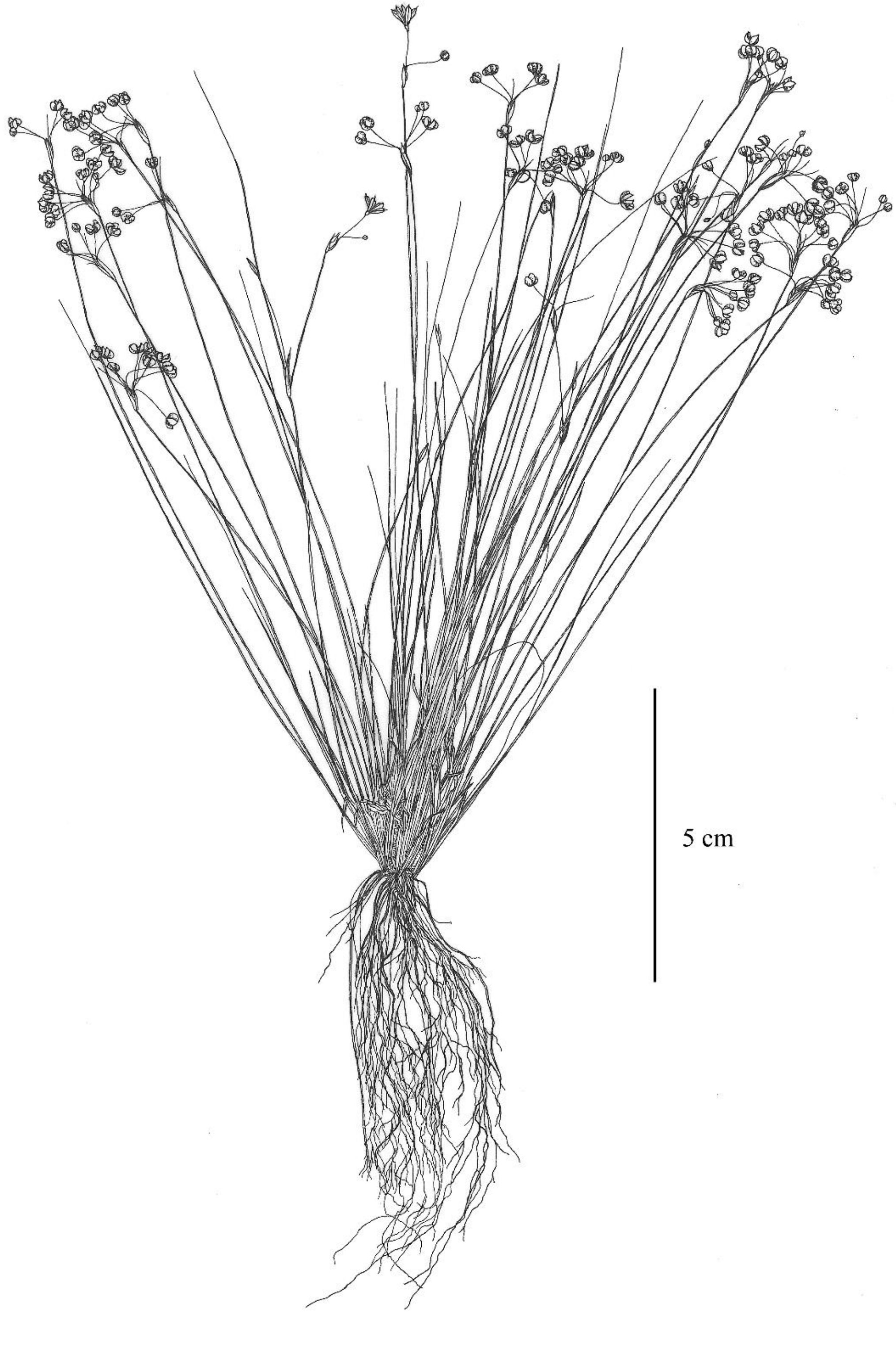

FIGURE 32. Habit of *Sisyrinchium setaceum*. From *L. Eggers & O. Chauveau 885* (ICN), illustration by Anelise Scherer.

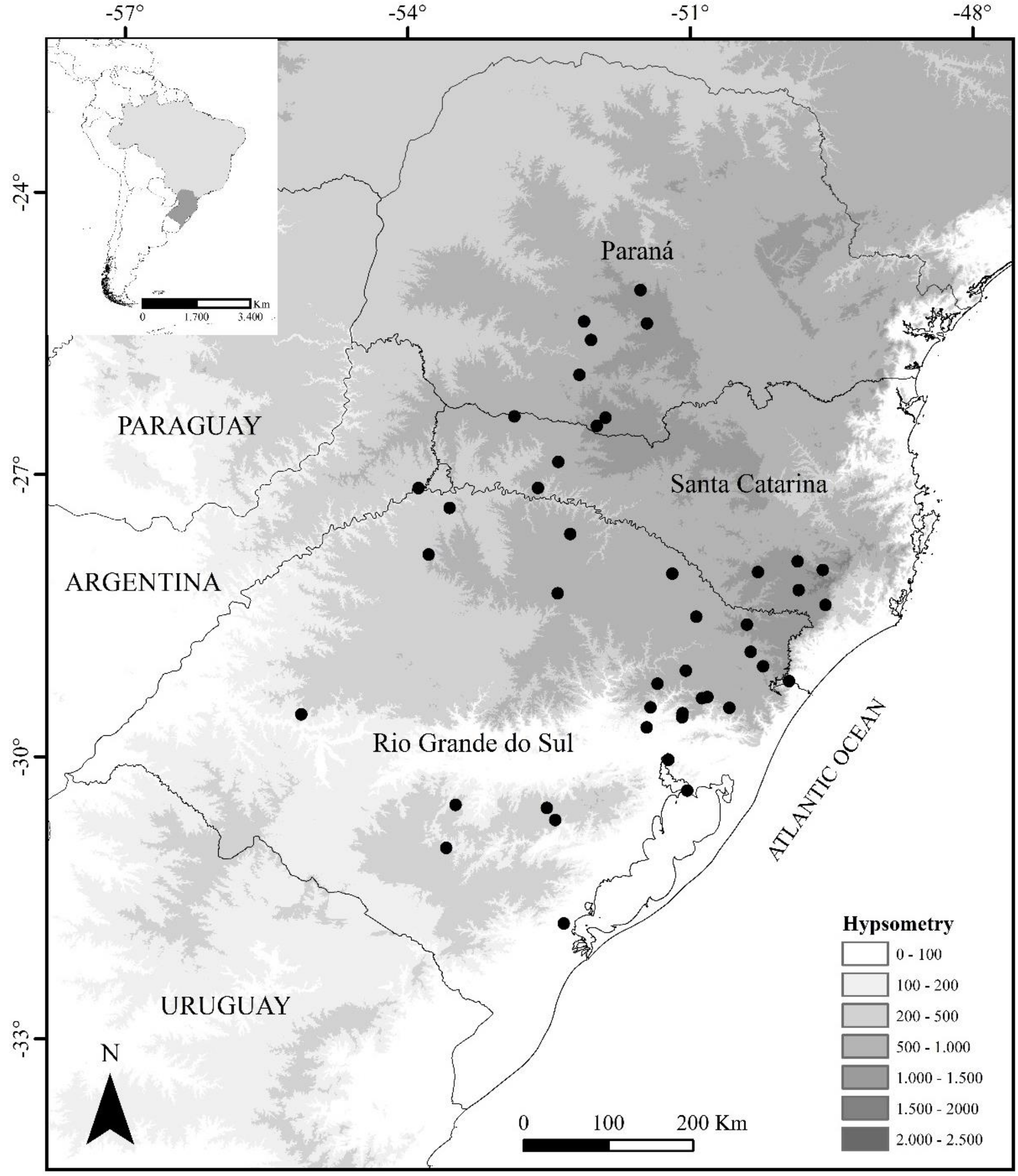

FIGURE 33: Distribution map of *Sisyrinchium setaceum* (circle) in Southern Brazil.

FIGURE 34. Habit of *Sisyrinchium soboliferum*. From *L. Eggers & T.T. Souza-Chies 603* (ICN), illustration by Anelise Scherer.

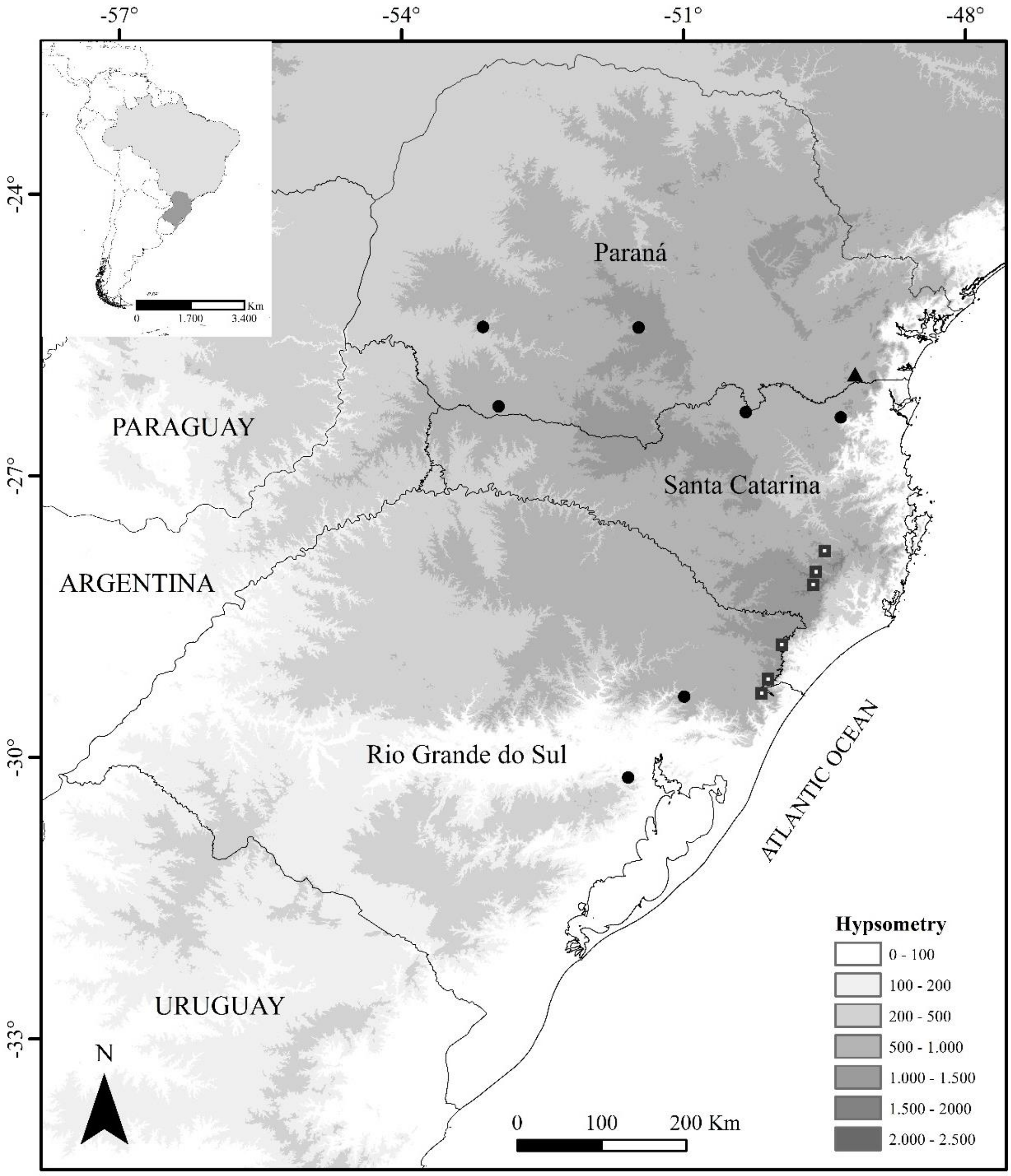

FIGURE 35: Distribution map of *Sisyrinchium soboliferum* (circle), *S. teleanthum* (triangle) and *S. elegantulum* (square) in Southern Brazil.

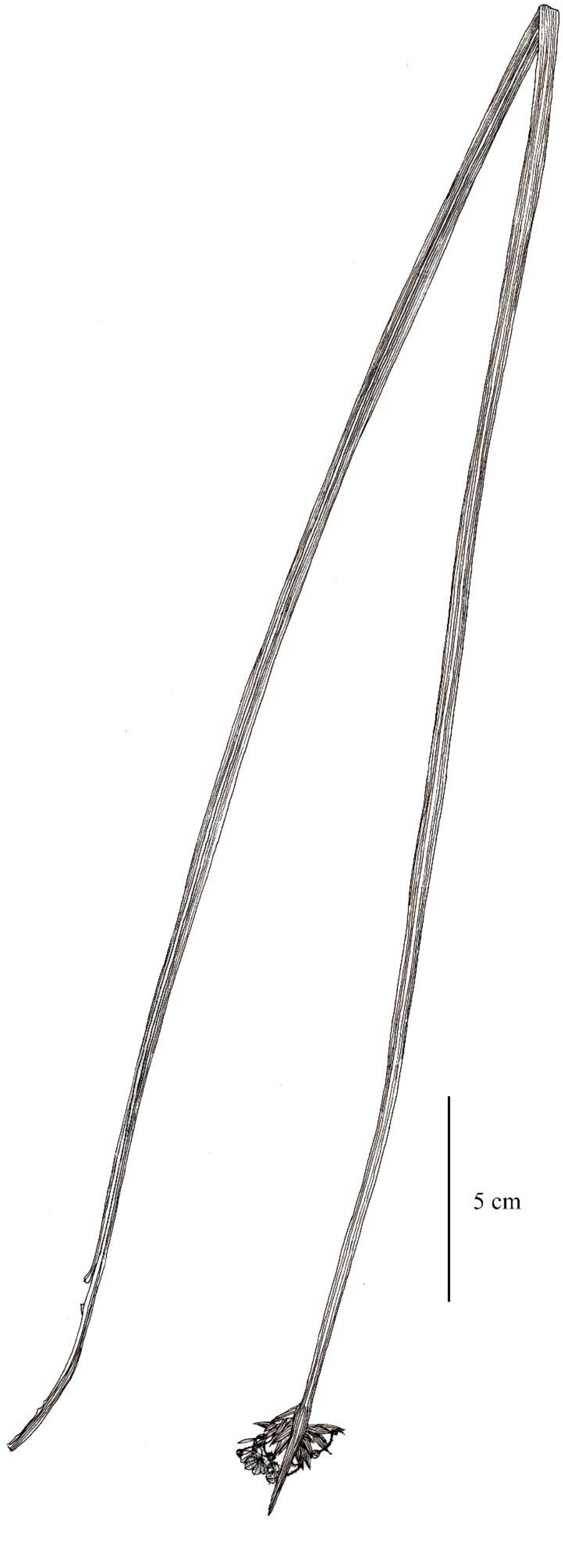

FIGURE 36. Habit of *Sisyrinchium teleanthum*. *From G. Hatschbach 8509* (US), illustration by Anelise Scherer.

FIGURE 37. *Sisyrinchium teleanthum*: A. Exsiccate (lectotype). B. Pilose spathes. C. Flower in exsiccate, staminal column with elaiophores (arrow). *S. elegantulum*: D. Incrassate leaves with whitish veins. E. Synflorescence. F. Flowers. G. Staminal column with elaiophores. A−C: *Hatschbach 8509* (US). D, E, G: *C.D. Inácio et al. 239* (ICN). F: photo Leonardo Nogueira da Silva.

FIGURE 38. Habit of *Sisyrinchium elegantulum*. From *L.B. Smith et al. 7754* (R), illustration by Anelise Scherer.

PARTE 2 – Seção *Viperella*

– *Sisyrinchium palmifolium* e espécies relacionadas

Key to section *Viperella* – *S. palmifolium* and related species

1 – Synflorescence between two conspicuous bracts (terminal and opposite bracts).

2 – Flowers aprox. 15 mm diameter, tepals 7.5−9.7 mm long …......…. **9.** ***S. flabellatum***

2' – Flowers more than 19.3 mm diameter, tepals more than 10 mm long

3 – Flowering stem 21−53.5 cm long .... **8.** ***S. densiflorum***

3' – Flowering stem inconspicuous to 16 cm long

4 – Leaves glabrous with thickened margin. Capsule rugulose in dry material …………………………………………………..………….……... **11.** ***S. nidulare***

4' – Leaves papillose with thickened and ciliate margin. Capsule distinctly verrucose …....…………………………………...…...……………...….... ***S. diversicarpum***

1' – Synflorescence with a conspicuous or inconspicuous terminal bract, opposite bract absent.

5 – Synflorescence spiciform

6 – Synflorescence congested

7 – Leaves 0.5−1.3 mm wide .... **4.** ***S. caeteanum***

7' – Leaves 1.5−14 mm wide

8 – Plants up to 23 cm tall, with erect to slightly arcuate floriferous stem and lower valves of the spathes 13.9−19.7 mm long …..…..…. **7.** ***S. decumbens***

8' – Plants from 22 to 105 cm tall, with erect floriferous stem and lower valves of the spathes 18−35.9 mm long

9 – Leaves glabrous, 3−14 mm wide .... **10.** ***S. marginatum***

9' – Leaves papillose, 1.5−6.1 mm wide .... **17.** ***S. wettsteinii***

6' – Synflorescence elongated

10 – Ovaries and fruits included in the spathes. Flowers with tepals connate for 2.3 to 6 mm at the base, perigon infundibuliform .... **2.** ***S. brasiliense***

10' – Ovaries and fruits exserted of the spathes. Flowers with tepals connate for 0.2 to 0.4 mm at the base, perigon disk shaped .... **1.** ***S. angustius***

5' – Synflorescence fasciculiform, paniculiform, cymose or other types

11 – Synflorescence fasciculiform ………………..…………….... **12.** ***S. oxyspathum***

11' – Synflorescence paniculiform, cymose (monochasial) or other types

12 – Synflorescence cymose, laterally oriented

13 – Valves of the spathes notably enlarged at the base, with length:width relation of 4–6(8):1

14 – Leaves with thickened margin and papillose surface … **6. *S. congestum***

14’ – Leaves with attenuate margin and glabrous surface .... **5. *S. coalitum***

13’ – Valves of the spathes elongate, not notably enlarged at the base, with length:width relation of 6−8:1 .... **16. *S. rectilineum***

12’ – Synflorescence paniculiform, corimbiform or any variation of them

15 – Synflorescence many-branched, (20−)31−221 riphidia, plants 112−250 cm tall

16 – Spathes 13.8−20.3(−25) mm long, synflorescence without sterile bracts covering most of the branches and ramifications………………... ……………………………………………..………**14. *S. paludosum***

16’ – Spathes 9−13.2 mm long, synflorescence witht sterile bracts covering most of the branches and ramifications ……………..... **3. *S. bromelioides***

15’ – Synflorescence few-branched, 1−29(−33) riphidia, plants 12−123.5(−135.6) cm tall

17 – Leaves plane, synflorescence paniculiform or corimbiform with straight axis and peduncles .... **13. *S. palmifolium***

17’ – Leaves plicate, synflorescence paniculiform with flexuose axis and peduncles ………..……………………….……..……..... **15. *S. plicatulum***

1. *Sisyrinchium angustius* (Ravenna) C.D.Inácio & L.Eggers **comb. & stat. nov.** ≡ *Sisyrinchium bromelioides* subsp. *angustius* Ravenna, Onira 7: 28 (2002b). Type: Argentina, Corrientes, Santo Tomé, 3 km SW de Gobernador Virasoro, Estancia Vuelta del Ombú, 10 December 1984, S.G. Tressens *et al.* 2689 (holotype: CTES!).

Illustrations: Fig. 1, 2A.

Perennial herb, caespitose, 56.5–90 cm tall. Rhizome short, compact, roots thickened. Basal leaves linear, 30−62 × 0.3–0.57 cm, glabrous, acute, margin attenuate. Floriferous stem simple, erect, winged, 45–67.5 × 0.2−0.5 cm, with terminal bract 4.4−5.2 cm long. Synflorescence spiciform, elongated, 5−23 rhipidia. Rhipidium 2−11 flowers, sessile to pedunculate, peduncle 1.8−11 mm. Spathes bivalved, lower valve 13.8−19.4 × 1.1−2.3 mm, upper 15.5−17 × 1−1.9 mm, acute to acuminate, margin membranaceous. Pedicel equal or longer than spathes, 13−16.2 mm long, glabrous. Perigon disk shaped, yellow, 16.9−19 mm diameter (liquid preserved flowers). Tepals subequal, 8−10.5 × 3−4.5 mm, connate 0.2−0.4 mm at the base, patent, oblanceolate, acute to acuminate, glabrous. Filaments yellow, basally connate for 0.6−0.9 mm, then 2−2.6 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 3.5−4.8 mm long. Ovary globose to subglobose, 1−1.6 mm x 1.2−1.5 mm. Style yellow, 1.3−1.7 mm long, glabrous, style branches 2.1−2.7 mm long, alternate to the stamens, ascending to patent. Capsule globose to subglobose, 3.8−5.7 × 3.4−5 mm, brown, glabrous.

Distribution: *Sisyrinchium angustius* occurs in Argentina (Corrientes and Misiones) and southern Brazil (Rio Grande do Sul), according to herbaria data. In Rio Grande do Sul it is distributed in the physiographic region of Missões (Fortes 1959), in humid areas, from 70 to 1224 m a.s.l. (Fig. 3), in the Subtropical Seasonal Forest and Low Altitude Temperate Grasslands (Iganci *et al.* 2011). The species was also reported for Paraná as *S. bromelioides* subsp. *angustius* Ravenna (2002b, Roitman *et al.* 2008) based in the collection of *Hatschbach 22645* (MBM!). However, carefull analysis of this exsiccate cited as a paratype revealed it does not belong to this taxon.

Phenology: Flowers and fruits are reported from October to December.

Notes: *Sisyrinchium angustius* was first described as *S. bromelioides* subsp. *angustius* Ravenna (2002b), differing from the typical subspecies by the smaller size, leaves 30−58 × 0.4−0.6 cm, floriferous stem 80−90 × 0.3−0.4 cm. Also, synflorescence is described as “more slender and less branched” (Ravenna 2002b) and may be more precisely characterized as spiciform or racemose than paniculiform, the typical *S. bromelioides* synflorescence. This feature, in addition with other characters as smooth, regular surface of leaves (*vs.* papillose), longer spathes (lower valve 13.8−19.4 mm, upper 15.5−17 mm *vs.* lower valve 9−12.9 mm, upper 9−13.2 mm) and less number of rhipidia per synflorescence (5−23 rhipidia *vs.* up to hundreds rhipidia), distinguish accurently this taxon from *S. bromelioides*. We here propose the new status and combination for *S. bromelioides* subsp. *angustius* to *S. angustius,* considering that both taxa are remarkably different and related to distinct geographic regions, *S. angustius* to the western Rio Grande do Sul (RS, Brazil) and Argentina and Paraguay, while *S. bromelioides* has been registered only in the eastern side of South America (eastern RS, Brazil).

Examined material: BRAZIL, RIO GRANDE DO SUL, **Cerro Largo p. São Luiz,** 20 November 1952 (fr), *B. Rambo 53147* (PACA); **Santo Ângelo,** Granja Piratiní, 1224 m, 13 November 1973 (fr), *K. Hagelund 7825* (ICN); **São Borja,** BR 285, Km 639, 1006 m, 29 October 2009 (fl, fr), *L. Eggers & T.T. Souza-Chies 544* (ICN).

Additional examined material: ARGENTINA, CORRIENTES, Yapeyú, 11 November 1936 (fr), *A. Burkart 8015* (SI); MISIONES, **Cainguás,** Salto Golondrina, 10 October 1975 (fr), *E.M. Zardini et al. 945* (SI); *ibidem*, 400 m, 16 November 2011 (fr), *F.O. Zuloaga 13348* (SI); Misiones, **Guarani,** Salto Golondrina, 382 m, 24 November 2004 (fr), *F.O. Zuloaga & M.J. Belgrano 8174* (SI).

2. ***Sisyrinchium brasiliense*** (Ravenna) Ravenna, Onira 5: 17 (2000). ≡ *Phaiophleps brasiliensis* Ravenna, Bonplandia 2: 274 (1968). Type: Brasilia, s.d., Sello 3850 (lectotype designated by Inácio 2017: K!).

= *Sisyrinchium spicatum* Seub. ex Klatt, Linnaea 31: 377 (1861-1862b), *nom. illeg*. *Orthrosanthus spicatus* (Seub. ex Klatt) Baker, J. Linn. Soc., Bot. 16: 113 (1877), *nom. illeg*. Type: Brasilia, s.d., Sello 3850 (lectotype here designated: K!).

Illustrations: Fig. 2 B−C, 4.

Perennial herb, caespitose 33–81 cm tall. Rhizome short, sometimes covered with fibers of older leaves, roots thickened. Basal leaves linear, 12.5−48 × 0.21–0.47 cm, glabrous, acute, margin thickened. Floriferous stem simple, erect, winged, 28−70.2 × 0.21−0.37 cm, with terminal bract 2.5−4 cm long. Synflorescence spiciform, elongated, 6−16 rhipidia. Rhipidium 1−2 flowers, sessile or subsessile. Spathes bivalved, lower valve 12−16.2 × 1.4−3.8 mm, upper 11.2−15.9 × 1.2−3.6 mm, acute, margin membranaceous. Pedicel shorter than spathes, 6.2−11.2 mm long, glabrous. Perigon infundibuliform, yellow, (33−)35−40 mm diameter (liquid preserved flowers), partially included in the spathes. Tepals subequal, 7.7−13 × 2.5−5 mm, connate 2.3−6 mm at the base, patent, oblanceolate, acute to acuminate, glabrous. Filaments yellow, basally connate for 2.1−3.7 mm, then 2.1−3.7 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 3−4.1 mm long. Ovary obovoid, 3.3−4.5 × 0.6−2.3 mm. Style yellow, 1.7−2.7 mm long, glabrous, style branches 2.8−5 mm long, alternate to the stamens, ascending to patent. Capsule obovoid, 4.4−7 × 2.8−5.2 mm, brown, glabrous, partially included in the spathes.

Distribution: *Sisyrinchium brasiliense* is endemic of southern Brazil, recorded so far just in Paraná state, according to herbaria data and Ravenna (1968). In Paraná it occurs in the Primeiro, Segundo and Terceiro Planalto (Maack 1968). The species inhabits dry or damp grasslands, and roadsides, from 800 to 1239 m a.s.l. (Fig. 3), in the Subtropical Highland Grasslands and Subtropical Mixed Forest (Iganci *et al.* 2011). The species was reported to Argentina (Ravenna 2002b; Roitman *et al.* 2008) based in *T.M. Pedersen 9241* (CTES!), which however belongs to *S. avenaceum* Klatt.

Phenology: Flowers and fruits are reported from August to November.

Notes: The species is mostly recognized by the ovaries and fruits slightly exserted from the spathes, accompanied by apices of contiguous membranaceous bracteoles, features that can be easily noticed. Flowers also present a distinct infundibuliform perigon, but since the proximal part is in general included in the spathes, this character is not evident. *Sisyrinchium brasiliense* was first described as *Sisyrinchium spicatum* Seub. ex Klatt (Klatt 1861-1862b) and referred in Flora Brasiliensis (Klatt 1871) for "Brasilia meridionalis". However, this name is illegitimate by homonymy (*S. spicatum* Cav. 1793, synonym of *S. striatum* Sm., from Chile and Argentina). Baker (1877) proposed a new combination (*Orthrosanthus spicatus* Baker) which is also illegitimate, since there is no valid combination based on an illegitimate name. Thus, *Phaiophleps brasiliensis* Ravenna is the first correct published name for this taxon (Ravenna 1968). Another problem with this species is that Ravenna (1968) cited a photo of Sellow 2850 as a phototype (although the correct collection number is 3850). Since the phototype is not considered an original material, it cannot be designated as a lectotype. A syntype (Sellow 3850) was found in K herbarium and it is here designated as lectotype.

Examined material: BRAZIL, PARANÁ, **Guarapuava,** BR 277, direção Guarapuava - Laranjeiras do Sul, após Guarapuava, após PR 364, 978 m, 30 October 2008 (fr), *L. Eggers & T.T. Souza-Chies 379* (ICN); Rio Campo Real, 26 September 1968 (fl), *G. Hatschbach & O. Guimarães 19873* (HBR, MBM); **Jaguariaíva,** Fazenda Rondon, 20 August 2010 (fl), *E.*

Barbosa et al. 2689 (MBM 382673, MBM 362861, RB); **Lapa,** 4 September 1959 (fl), *R. Braga s.n.* (US 2440493); **Palmas,** PR 280, aprox. Km 113, 1239 m, 30 October 2014 (fl, fr), *C.D. Inácio et al. 249* (ICN); **Palmeira,** Rodovia do Café, Rio Tibagi, 27 September 1973 (fl), *G. Hatschbach 32596* (CTES, MBM, RB); 25 October 1976 (fl, fr), *L.T. Dombrowski 6644* (MBM); **Piraí do Sul,** PR 090, Km 162, Serra do Pirahy, 1110 m, 21 November 2010 (fl, fr), *A.M. Aita & L. Eggers 12* (ICN); **Ponta Grossa,** Parque Vila Velha, Rio Monjolo, 5 October 1989 (fl), *A.C. Cervi & G. Hatschbach 2801* (MBM); Rodovia do Café, Fazenda Rivadavia, 800 m, 23 September 1962 (fl), *G. Hatschbach 9822* (HBR, MBM, US Paratype); Rodovia do Café, 16 September 1966 (fl), *J. Lindeman & H. Haas 2476* (MBM, RB); **Sengés,** Estrada Santo Antônio – Itararé, 8 October 1971 (fl, fr), *G. Hatschbach 27186* (MBM).

3. ***Sisyrinchium bromelioides*** R.C.Foster, Rhodora 64: 311 (1962). Type: Brazil, São Leopoldo, November 1941, Leite 2032 (holotype: GH, photo!, isotype: NY!).

Illustrations: Fig. 2 D−F, 5.

Perennial herb, caespitose, robust, up to 250 cm tall. Rhizome compact, roots thickened. Basal leaves linear, 103−183 × (0.5–)1.2–2.3 cm, papillose, acute, margin attenuate. Floriferous stem simple, erect, winged, 220 × 0.4−1.1 cm, with terminal bract 6.7−10 cm long. Synflorescence paniculiform, up to hundreds rhipidia, widely branched with sterile bracts covering most of the branches and ramifications. Rhipidium 1−4 flowers, pedunculate, peduncle 3.3−85.3 mm long. Spathes bivalved, lower valve 9−12.9 × 1.2−2.3 mm, upper 9−13.2 × 1.4−2.7 mm, acute to acuminate, margin membranaceous. Pedicel longer than spathes, 10.5−14.2 mm long, glabrous. Perigon disk shaped, yellow, 16−18.3 mm diameter (liquid preserved flowers). Tepals subequal, 9−10 × 3.5−4.2 mm, connate 0.4−0.7 mm at the base, patent, oblanceolate, acute to acuminate, glabrous. Filaments yellow, basally connate for 0.9−1 mm, then 2−2.5(−3.5) mm free, ascending to patent, glabrous. Anthers yellow, versatile, 3.8−4.7 mm long. Ovary globose, 1.2−1.6 mm long and wide. Style yellow, 1.2−1.5 mm long, glabrous, style branches 2.8−3.1 mm long, alternate to the stamens, ascending to patent. Capsule globose to subglobose, 3.6−5.8 × 3.5−5.6 mm, brown, glabrous.

Distribution: *Sisyrinchium bromelioides* is endemic of southern Brazil, recorded so far just in Rio Grande do Sul state, according to herbaria data. The species was also mentioned to occur in Paraná state (Roitman *et al.* 2008), but no register was found to confirm the citation. In Rio Grande do Sul, there are records in the Depressão Central, Encosta Superior do Nordeste and Encosta do Sudeste (Fortes 1959). *Sisyrinchium bromelioides* typically occurs in bogs and damp places, in altitude around 152 m a.s.l. (Fig. 6), usually exhibiting extensive populations, in the Subtropical Seasonal Forest, Subtropical Mixed Forest and Subtropical/Temperate Coastal Scrub (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from October to January.

Notes: The species is recognized by the paniculiform synflorescence which resembles a bromeliad inflorescence (as mentioned by Foster 1962), with numerous spathes and sterile bracts covering most of the branches. Foster (1962) considered it as probably the tallest species of *Sisyrinchium*, with plants to 2.5 m tall, assertion confirmed by our data. The second tallest and similar species of *S. bromelioides* is *S. macrocephalum* subsp. *giganteum* Ravenna (further presented with a new status and combination). Both are similar species that occur associated to wet places and swamps. We considered them as distinct taxa, mainly based on the size and aspect of inflorescences and measurements of spathes. However, additional studies would be necessary for a more precise differentiation.

Examined material: BRAZIL, RIO GRANDE DO SUL, **Arroio dos Ratos,** Estrada secundária em direção à fazenda Faxinal a partir da BR 290, 152 m, 25 October 2013 (fl), *C.D. Inácio et al. 140* (ICN); **Montenegro,** Kappesberg, s.d. (fl, fr), *B. Rambo 35746* (PACA); **São Leopoldo,** 17 December 1948 (fl, fr), *B. Rambo 38856* (GH, PACA, SI Paratype); *ibidem*, s.d. (fl), *C. Orth s.n.* (PACA 33941); *ibidem*, 1941 (fl), *E. Friderichs s.n.* (PACA 25880); *ibidem*, s.d. (fl), *E. Henz s.n.* (PACA 35322); **Vila Oliva,** próximo a Caxias, 2 January 1946 (fl), *B. Rambo 33939* (GH, PACA Paratype).

4. ***Sisyrinchium caeteanum*** Ravenna, Onira 1: 31 (1988). Type: Brazil, Santa Catarina, Bom Jardim da Serra, gerador de energia eólica, 1452 m, 11 November 2011, L.Eggers & T.T. Souza-Chies 691 (neotype here designated: ICN!).

Illustrations: Fig. 2 G–I, 7.

Perennial herb, caespitose, delicate, 12.5–36 cm tall. Rhizome short, roots thickened. Basal leaves linear, 8.2−36 × 0.05–0.13 cm, glabrous, acute, margin thickened. Floriferous stem simple, erect, winged, 9–29.6 × 0.05−0.13 cm, with terminal bract 1.3–4.8 cm long. Synflorescence spiciform, congested, 1−3 rhipidia. Rhipidium 1−6 flowers, sessile to subsessile, peduncle 0.9−2.8 mm long. Spathes bivalved, lower valve 10−15.8 × 1−2.2 mm, upper 11.6−17.8(−22.7) × 1.3−2.7 mm, acute to acuminate, margin membranaceous. Pedicel mostly equal or slightly shorter than spathes, 11.1−17.5 mm long, glabrous. Perigon disk shaped, yellow, 11.5−17.8 mm diameter (liquid preserved flowers). Tepals subequal, 6−9 × 2−3.9 mm, connate 0.4−0.7 mm at the base, patent, oblanceolate, acute to acuminate-apiculate, glabrous. Filaments yellow, basally connate for 0.5−1.5 mm, then 0.9−2.3 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 2.5−3.5 mm long. Ovary obovoid, 1.5−1.9 mm x 0.9−1.4 mm. Style yellow, 1.5−2.9 mm long, glabrous, style branches 1.4−2.1 mm long, alternate to the stamens, ascending to patent. Capsule ellipsoid, 2.8−4.5 × 1.9−4.1 mm, brown, glabrous.

Distribution: *Sisyrinchium caeteanum* is endemic of Brazil, and is reported to occur in Minas Gerais and Santa Catarina, according to the original description and herbaria data. In Santa Catarina, it occurs in the Planalto Paleozóico and Planalto Arenito-Basáltico (Prates *et al.* 1989), in grasslands and occasionally in bogs, from 1207 to 1447 m a.s.l. (Fig. 8), in the Subtropical Highland Grasslands (Iganci *et al.* 2011). For Minas Gerais (MG), the species was mentioned for the Serra de Altamira (distant 95 km of Serra do Cipó), between rocks in the summit of the Serra.

Phenology: Flowers and fruits are reported from October to January.

Notes: The species is recognized by the small habit, thin leaves and floriferous stems (up to 1.3 mm wide) and the persistent fibrous leaf remains at the base of the plant. Ravenna (1988) described this species based on only one collection from the municipality currently known as Nova União, MG. We did not find any other sample of this collection for examination. However, the plants from Santa Catarina correspond to *S. caeteanum* description, with slight adjustments in some measurements. Also, both samples are from stony and high altitude grasslands, which may ressemble in environmental characterization. We here propose a neotype for *S. caeteanum*, since type is reported to be in the Ravenna herbarium, inaccessible for analysis.

Examined material: BRAZIL, SANTA CATARINA, **Bom Jardim da Serra,** 1412 m, 28 November 2011 (fl), *A.M. Aita et al. 118* (ICN); SC 438, 1438 m, 12 October 2007 (fl, fr), *L. Eggers & T.T. Souza-Chies 224* (ICN); gerador de energia eólica, 1447 m, 11 November 2011 (fr), *L. Eggers & T.T. Souza-Chies 691* (ICN); Rod. SC-438, 5 km oeste do alto da serra do Rio do Rastro, 1250 m, 10 December 2000 (fl), *G. Hatschbach et al. 71793* (FUEL, MBM, SI); **São Joaquim,** Serra do Oratório, 17 January 1957 (fl, fr), *L.B. Smith et al. 10247* (GH, R, US); 1207 m, 15 December 2004 (fl, fr), *L. Eggers & T.T. Souza-Chies 98* (ICN); Santa Barbara, 1400 m, 3 January 1965 (fl), *L.B. Smith & R. Reitz 14208* (R, US); Fazenda Laranja, Bom Jardim, 1400 m, 10 December 1958 (fl), *R. Reitz & R. Klein 7718* (HBR, US).

5. ***Sisyrinchium coalitum*** Ravenna, Onira 5: 14 (2000). Type: Brazil, Santa Catarina, mun. Curitibanos, Marombas, banhado, 29 October 1962, Reitz & Klein 13900 (holotype: HBR!).

Illustrations: Fig. 9, 10 A–B.

Perennial herb, caespitose, robust, 123.5–157.5 cm tall. Rhizome short, compact, roots thickened. Basal leaves linear, 69−82.5 × 0.5–0.63 cm, glabrous, acute, margin attenuate. Floriferous stem simple, erect, winged, 119–149 × 0.45−0.61 cm, with terminal bract 4.5–8.5 cm long. Synflorescence cymose, monochasial, laterally oriented, 15−18 rhipidia. Rhipidium 4−6 flowers, subsessile to pedunculate, peduncle 2.5−6 mm long. Spathes bivalved, lower valve 11.9−12.3 × 3.3−3.7 mm, upper 12.8−13 × 2.1−2.5 mm, acute to acuminate, margin membranaceous, membranaceous bracteoles exsert from the valves. Pedicel equal or slightly longer than spathes, 12.5−14.7 mm long, glabrous. Perigon disk shaped, yellow, 17.9−22.7 mm diameter (liquid preserved flowers). Tepals subequal, 11.6−14 × 3.6−5.7 mm, connate 0.8−2 mm at the base, patent, oblanceolate, acute to acuminate, glabrous. Filaments yellow, basally connate for 1.4−2.1 mm, then 3−3.7 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 3.8−5 mm long. Ovary obovoid 2.9−3.7(−4.5) mm x 1.3−2 mm. Style yellow, 2−2.8 mm long, glabrous, style branches

3.1−4.6 mm long, alternate to the stamens, ascending to patent. Capsule ellipsoid, 6−6.1 × 3.5−4.7 mm, dark brown, glabrous.

Distribution: *Sisyrinchium coalitum* is endemic of southern Brazil, in Santa Catarina state, according to herbaria data and Roitman *et al.* (2008). The distribution area belongs to the Planalto Arenito-Basáltico (Prates *et al.* 1989) and the species inhabits bogs, from 900 to 1000 m a.s.l. (Fig. 11), in the Subtropical Mixed Forest (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported in October.

Notes: *Sisyrinchium coalitum* is mostly recognized by the membranaceous bracteoles exserted from the valves of the spathes, resembling *S. brasiliense*. *Sisyrinchium congestum* is the most similar taxon morphologically, both distributed in Santa Catarina in high altitude grasslands. To differentiate these species, vegetative characters are very important and leaf surface (glabrous *vs.* papillose in *S. congestum*) and leaf margin (attenuate *vs.* thickened in *S. congestum*) must be observed. However, since few specimens could be examined here, we recommend more collections and analyses to better circumscribe this species.

Examined material: BRAZIL, SANTA CATARINA, **Ponte Alta do Norte,** BR 116, Km 181,5, 17 October 2010 (fl, fr), *A.M. Aita & L. Eggers 2* (ICN).

6. *Sisyrinchium congestum* Klatt, Linnaea 31: 98 (1861-1862b). ≡ *Sisyrinchium palmifolium* var. *congestum* (Klatt) Baker, J. Linn. Soc., Bot. 16: 120 (1877). ≡ *Bermudiana congesta* (Klatt) Kuntze, Revis. Gen. Pl. 2: 699 (1891). Type: Brasilia meridionalis, s.d., Sellow 2967 (holotype: B!).

Illustrations: Fig. 10 C, 12.

Perennial herb, caespitose, 31–87 cm tall. Rhizome short, compact, roots fibrous. Basal leaves linear, 19.8−64.5 × 0.34–0.69 cm, papillose, acute, margin thickened. Floriferous stem simple, erect, winged, 27–82 × 0.31−0.57 cm, with terminal bract 3–6.1(−10.5) cm long. Synflorescence cymose, monochasial, laterally oriented, 4−16 rhipidia. Rhipidium 1−3 flowers, sessile to pedunculate, peduncle 2−13.7 mm long. Spathes bivalved, lower valve

15−21.8 × 2.5−4.8 mm, upper 17−22 × 2.1−4.6 mm, acute to acuminate, margin membranaceous, mostly pappillose. Pedicel shorter or slightly longer than spathes, 12.8−20 mm long, glabrous. Perigon disk shaped, yellow, 15.5−24.3 mm diameter (liquid preserved flowers). Tepals subequal, 9−13.5 × 4.5−8.5 mm, connate 0.5−1.1 mm at the base, patent, oblanceolate, acute to acuminate, glabrous. Filaments yellow, basally connate for 1.3−2.2 mm, then 1.4−3.6 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 3.3−5.3 mm long. Ovary obovoid, 2.5−3.3 x 1.7−2.6 mm. Style yellow, 2−3.6 mm long, glabrous, style branches 3−4.2 mm long, alternate to the stamens, ascending to patent. Capsule obovoid to ellipsoid, 4.8−8.5 × 4.2−6.9 mm, brown, glabrous.

Distribution: *Sisyrinchium congestum* is endemic of southern Brazil, in Santa Catarina state, according to herbaria data. It occurs in the Planalto Paleozóico (Prates *et al.* 1989), in highland grasslands, sometimes in humid and peaty soils, from 1600 to 1821 m a.s.l. (Fig. 11), in the Subtropical Highland Grasslands (Iganci *et al.* 2011). Roitman *et al.* (2008) mentioned that *S. congestum* occurs in Paraná and Rio Grande do Sul, but we did not find any sample from these states.

Phenology: Flowers and fruits are reported from October to November.

Notes: *Sisyrinchium congestum* is recognized by the papillose leaves with thickened margins and the congested synflorescence. After its description, this species was reported for Santa Catarina and “Brasilia meridionalis” in Flora Brasiliensis (Klatt 1871). Johnston (1938) did not associate any material to the original description of *S. congestum* and treated it as an unrecognized or excluded species in his work on *Sisyrinchium* species from Uruguay, Paraguay and Brazil.

Sisyrinchium congestum, among other taxa, was cited as synonym of *S. palmifolium* by Chukr & Capellari Jr. (2003), who did not find features to segregate this and other species. *Sisyrinchium palmifolium* and allies are very difficult to distinguish. Synflorescences vary along plants development and, until now, little importance has been given to vegetative characters. Leaf anatomical sections revealed important traits related to the presence of sclerenchyma in the margins of leaves (Aita, 2013), which made us observe this character more carefully.

Ravenna (1981) reported *S. eserrulatum* I.M. Johnst. as a synonym of *S. congestum*, assertion we do not confirm. Synflorescence of both species are obviously distinct and overall measurements are different. No material from Southern Brazil was retrieved for *S. eserrulatum*, only the type specimen is recorded for Panambi (Neu Württemberg) and preserved in GH herbarium (Johnston 1938). This species is not treated here since it is a dubious taxon, which will be discussed in the revision of sect. *Trichoparcus* C.D.Inácio, Chauveau & L.Eggers.

As for *S. coalitum*, more expeditions and collections on high altitude grasslands are necessary to better characterize this species.

Examined material: BRAZIL, SANTA CATARINA, **Bom Retiro,** Morro da Bela Vista, Campo dos Padres, 1700-1821 m, 16 November 1958 (fl, fr), *L.B. Smith et al. 7675* (GH, R, US); **Rio Fortuna,** Campo dos Padres, 13 November 2011 (fl, fr), *A.L. Gasper 2982* (RB); **Urubici,** Morro da Igreja, topo do morro, 770 m, 5 November 2013 (fl), *A.C. Cervi et al. 10085* (MBM, RB); Morro da Igreja, 23 November 2010 (fl, fr), *A.M. Aita & L. Eggers 15* (ICN); *ibidem*, 14 November 2008 (fl, fr), *J.M. Silva et al. 7090* (MBM); Morro da Igreja, Cavalgada, 1600 m, 11 November 2001 (fl, fr), *G. Hatschbach et al. 72627* (MBM); Morro da Igreja, próximo ao alto, 1650 m, 18 October 2004 (fl), *G. Hatschbach et al. 78190* (FURB, MBM, RB).

7. ***Sisyrinchium decumbens*** Ravenna, Onira 6: 53 (2002a). Type: Brazil, Rio Grande do Sul, mun. Cambará do Sul, Fortaleza, 24 November 1994, G. Hatschbach & O.S. Ribas 61329 (lectotype here designated: MBM!).

= *Sisyrinchium antemeridianum* Aita & L.Eggers, Phytotaxa 88: 10 (2013). Type: Brazil, Rio Grande do Sul, São Francisco de Paula, 25 November 2005, L. Eggers & T.T. Souza-Chies 151 (holotype ICN!) *syn. nov.*

Illustrations: Aita *et al.* (2013: 12, as *S. antemeridianum*). Fig. 10 D–F, 13.

Perennial herb, caespitose, 12–23 cm tall. Rhizome short, roots thickened. Basal leaves linear-ensiform, erect to slightly curved, 5−16 × 0.1–0.3 cm, glabrous, acute, margin thickened. Floriferous stem simple, erect to slightly arcuate, narrowly winged, 7.7–24.5 × 0.1−0.2 cm, with terminal bract 1.3−4.3 cm long. Synflorescence spiciform, congested, 1−3(−4) rhipidia. Rhipidium 1−4(−8) flowers opening, sessile to pedunculate, peduncle 6.5−35.5 mm long. Spathes bivalved, lower valve 13.9−19.7 × 1.8−3.6 mm, upper 17−19.6 × 2.8−4.2 mm, acute, margin membranaceous. Pedicel usually longer than spathes, (9.8−)13.8−22(−24) mm long, glabrous. Perigon disk shaped, yellow, 17.5−19.8 mm diameter (liquid preserved flowers). Tepals subequal, 9.3−12 × 2.8−5 mm, connate 0.5−0.7 mm at the base, patent, oblanceolate, acute to acuminate, glabrous. Filaments yellow, basally connate for 2 mm, then 1.5−2 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 3−3.5 mm long. Ovary globose to subglobose, 2−3 x 1.5−2 mm. Style yellow, 2−2.2 mm long, glabrous, style branches 3−4.2 mm long, alternate to the stamens, ascending to patent. Capsule globose to subglobose, 3−5 × 2.5−4.3 mm, dark brown, glabrous.

Distribution: *Sisyrinchium decumbens* is endemic of southern Brazil, in Rio Grande do Sul and Santa Catarina states, according to herbaria data, Roitmann *et al.* (2008) and Aita *et al.* (2013). The species inhabits grasslands, ravines and path margins, from 780 to 1250 m a.s.l. (Fig. 11), in the Subtropical Highland Grasslands (Iganci *et al.* 2011). *Sisyrinchium decumbens* plants are encountered as spread individuals and in extremely big populations, extended as lawns.

Phenology: Flowers and fruits are reported from September to March.

Notes: The species is recognized by the small habit and the floriferous stem erect to slightly curved, narrowly winged, with 1 to 2 mm wide. *Sisyrinchium antemeridianum* Aita & L.Eggers (Aita *et al.* 2013) is here synonymized based on a paratype of *S. decumbens* found in MBM herbarium after publication. We designate the MBM specimen as lectotype here, since the holotype (Ravenna 2002b) is in Ravenna herbarium, not accessible for analysis.

Examined material: BRAZIL, RIO GRANDE DO SUL, **Bom Jesus,** terreno em rua de acesso ao Hotel Recanto das Camélias, 10 November 2009 (fl, fr), *L. Eggers & T.T. Souza-Chies 570* (ICN); **Cambará do Sul,** Parque Nacional de Aparados da Serra, ao longo da trilha do Cotovelo, 8 November 2006 (fl), *J. Lovo et al. 195* (ICN, SPF); RS 020, Km 134, 30 November 2006 (fl, fr), *L. Eggers & T.T. Souza-Chies 204* (ICN); **São Francisco de Paula,** Centro de Pesquisas e Conservação da Natureza Pró-Mata (CPCN Pró-Mata), 6

January 2004 (fl, fr), *L. Eggers & T.T. Souza-Chies 47* (ICN); RS 020, antes da entrada para o Veraneio Hampel, 30 November 2006 (fl, fr), *L. Eggers & T.T. Souza-Chies 200* (ICN); **São José dos Ausentes,** Silveira, 1250 m, 22 November 1997 (fl), *R. Wasum et al. s.n.* (HUCS 12170, US 3362227); SANTA CATARINA, **Bom Jardim da Serra,** Chapada Seca, distante 16 km de São Joaquim, 12 October 2007 (fl), *A.M. Aita & E. Pasini 131* (ICN).

8. ***Sisyrinchium densiflorum*** Ravenna, Onira 3: 37 (1991). Type: Brazil, Paraná, edge second upland plain, ca 45 km W of Curitiba along main road to Ponta Grossa, 15 September 1966, J.C. Lindeman & J.H. de Hass 2446 (lectotype here designated: MBM! Isolectotypes: CTES!, NY! RB!, UB photo!).

Illustrations: Fig. 14, 15 A–C.

Perennial herb, caespitose, remarkably equitante, 46.5–77.8 cm tall. Rhizome compact, roots thickened. Basal leaves linear, 20−77.8 × 0.48–0.92 cm, glabrous, acute, margin thickened. Floriferous stem simple, erect, winged, 21–53.5 × 0.39−0.64 cm, with a terminal bract 10–40.5 cm long and an opposite bract 4.5−11.1 cm long. Synflorescence spiciform, congested, (8−)14−24(−32) rhipidia. Rhipidium 1−6 flowers, dense at the base of the terminal bract, subsessile to pedunculate, peduncle 3.4−45.3 mm long. Spathes bivalved, lower valve 12.2−24.7 × 1.9−4.9 mm, upper 12.7−22.7 × 1.7−3.8 mm, acute to acuminate, margin membranaceous. Pedicel mostly shorter or equal than spathes, 7.6−24.3(−36) mm long, glabrous. Perigon disk shaped, yellow, 19.3−22.9 mm diameter (liquid preserved flowers). Tepals subequal, 10−13.5 × 4−7 mm, connate 0.8−1.2 mm at the base, patent, oblanceolate, acute to acuminate, glabrous. Filaments yellow, basally connate for 0.8−1.3 mm, then 1.2−1.5 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 3.5−5.5 mm long. Ovary globose to subglobose, 2−2.5 x 1.7−2.4 mm. Style yellow, 1.6−1.9 mm long, glabrous, style branches 3.4−3.9 mm long, alternate to the stamens, ascending to patent. Capsule globose to subglobose, 3.4−8.2 × 4.1−7.9 mm, brown, glabrous.

Distribution: *Sisyrinchium densiflorum* is endemic of southern Brazil, in Paraná and Santa Catarina states, according to herbaria data. In the state of Paraná, the species occurs in the Primeiro and Segundo Planalto (Maack 1959) and in Santa Catarina there is one record in the Serra do Mar (Prates *et al.* 1989). *Sisyrinchium densiflorum* inhabits grasslands in sandy soils or with rocky outcrops of sandstone, from 800 to 1140 m a.s.l. (Fig. 16), in the Subtropical Mixed Forest (Iganci *et al.* 2011). In the Catalogue of Vascular Plants of Southern South America (Roitman *et al.* 2008), *S. densiflorum* was reported to occur only in Paraná, but one record was found in Santa Catarina, near to the border of these states.

Phenology: Flowers and fruits are reported from October to December.

Notes: The species is recognized by the conspicuous equitant habit, the dense fasciculiform synflorescence which bears a terminal and an opposite bract and usually numerous rhipidia (14−24), spathes from 12.2 to 24.7 mm long. and floriferous stems from 21 to 53.5 cm long. *Sisyrinchium nidulare* (Hand.-Mazz.) I.M.Johnst. is the most similar taxon, but it differs by presenting a small number of rhipidia (1−6), spathes usually larger (20.7 to 30.3 mm long) and floriferous stem up to 16 cm.

A plant cited as paratype in the protologue is here designated as lectotype since holotype is unavailable, reported to be at Ravenna herbarium. However, other paratypes as *Kummrow 2041* (CTES!, MO!, MBM!) and *Hatschbach 28349* (HB!, MBM! US!) does not belong to *S. densiflorum.*

Selected examined material: BRAZIL, PARANÁ, **Balsa Nova,** São Luís do Purunã, 1 September 1984 (fl, fr), *G. Hatschbach 48123* (FUEL, HAS, MBM, MO, RB); **Campo Largo,** Viaduto da Santa, Rodovia do Café, September 1971 (fl, fr), *L.T. Dombrowski 3819* (MBM); **Palmeira,** BR 376, km 531, borda com pedras à margem do Rio Tibagi, 928 m, 27 October 2008 (fr), *L. Eggers & T.T. Souza-Chies 353* (ICN); **Ponta Grossa,** Cachoeira da Mariquinha, 10 May 2010 (fl), *A.C. Cervi et al. 9464* (MBM, RB); Parque Estadual de Vila Velha - Estrada para a igreja, 856 m, 1 November 2014 (fr), *C.D. Inácio et al. 257* (ICN); **Tibagi,** Guartelá, Rio Iapó, 18 September 1996 (fl, fr), *S.R. Ziller 1517* (MBM); SANTA CATARINA, **Campo Alegre,** SC 301 - Km 117, em frente ao Parque Dona Francisca, 8 October 2014 (fl, fr), *C.D. Inácio et al. 208* (ICN).

9. *Sisyrinchium flabellatum* Aita & L.Eggers, Phytotaxa 88: 13 (2013). Type: Brazil. Rio Grande do Sul: Jaquirana, 893 m, 22 October 2010, L. Eggers & T.T. Souza-Chies 584 (holotype: ICN!).

Illustrations: Aita *et al.* (2013: 14). Fig. 10 G–H, 17.

Perennial herb, caespitose, remarkably equitante, 23–33.2 cm tall, typically with entangled dry leaves at base. Rhizome short, roots thickened. Basal leaves linear-ensiform, glaucous (but flushed purple proximally), 9.6−31.5 × 0.3–0.8 cm, slightly verrucose, acute, margin attenuate. Floriferous stem simple, erect, broadly winged, 7.7–21 × 0.4−0.7 cm, with a terminal bract 5.4−11.5 cm long, and an opposite bract 2.5−5.2 cm long. Synflorescence fasciculiform, 4−9 rhipidia, lax at the base of the terminal bract. Rhipidium 1−4(−8), usually pedunculate, peduncle 5−11(−71.4) mm long. Spathes bivalved, lower valve 14.5−16.5 × 2−3 mm, upper 12.8−19 × 1.2−3.5 mm, acute, margin membranaceous. Pedicel usually longer than spathes, 14−31.4 mm long, glabrous. Perigon disk shaped, yellow, *ca.* 15 mm diameter (flower image from nature). Tepals subequal, 7.5−9.7 × 2.5−3.1 mm, barely connate at the base (not measured), patent to reflex, elliptic to oblanceolate, acute to acuminate, glabrous. Filaments yellow, basally connate for less than 1 mm, then 1.5−2 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 4−5 mm long. Ovary globose to oblate, 2−3 x 1.2−2 mm. Style yellow, 0.7−1(−1.9) mm long, glabrous, style branches 3.6−4.5 mm long, alternate to the stamens, ascending to patent. Capsule globose to oblate, 4.8−6.6 × 4.7−7.2 mm, dark brown, glabrous.

Distribution: *Sisyrinchium flabellatum* is endemic of southern Brazil, recorded so far just in Rio Grande do Sul state, according to herbaria data and Aita *et al.* (2013). The species inhabits grasslands with rocky outcrops, in altitude around 900 m a.s.l. (Fig. 8), in the physiografic region of Campos de Cima da Serra (Fortes 1959) or Subtropical Highland Grasslands (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from October to January.

Notes: This species and *S. densiflorum* present the most conspicuous equitant habit, which can be observed in nature and in preserved exsiccates. These species can be differentiated by the inflorescence (lax at the base of the terminal bract *vs.* dense, in *S. densiflorum*) and the size of the bracts (terminal 5.4−11.5 cm long, and opposite 2.5−5.2 cm long *vs.* terminal

10–40.5 cm long and opposite 4.5−11.1 cm long, in *S. densiflorum*). Geographical distribution of both species do not overlap, and until now *S. flabellatum* is just reported to the highlands of Rio Grande do Sul, while *S. densiflorum* occurs mainly in the plateaus of Paraná and nearby localities.

Examined material: BRAZIL, RIO GRANDE DO SUL, **Cambará do Sul,** Cambará do Sul em direção a São Francisco de Paula, February 1948 (fr), *B. Rambo 36615* (GH, PACA Paratype); **Jaquirana,** 7 km de Cambará, material cultivado em coleção viva no Jardim Botânico de Porto Alegre - FZB-RS (vaso 11000133), s.d. (fl, fr), *L. Eggers 693* (ICN).

10. ***Sisyrinchium marginatum*** Klatt, Linnaea 31: 83 (1861-1862a). Type: Brasilia meridionalis, s.d., Sello 9817 (neotype here designated: K, photo!).

Illustrations: Eggers (2008: 175, as *S. palmifolium*). Fig. 15 D–F, 18.

Perennial herb, caespitose, 22–105 cm tall. Rhizome short, roots thickened. Basal leaves linear, 12.5−61.5(–105) × 0.3–1.4 cm, glabrous, acute, margin attenuate. Floriferous stem simple, erect, broadly winged, 9–84.5 × 0.3−1.1 cm, with terminal bract 3.5–15.6 cm long. Synflorescence spiciform, congested, 1−3(–6) rhipidia. Rhipidium 1−7 flowers, sessile to pedunculate, peduncle 2.5−13.4 mm long. Spathes bivalved, lower valve 23−35.9 × 3.5−5.6 mm, upper 21.9−35 × 2−4.3 mm, acute to acuminate, margin slightly membranaceous. Pedicel equal to spathes, 23.3−34.8 mm long, glabrous. Perigon disk shaped, yellow, 16−25(–28.5) mm diameter (fresh flowers and liquid preserved flowers). Tepals subequal, 8.6−16 × 3.5−6.5 mm, connate 0.4−0.8(–1) mm at the base, patent, oblanceolate, acute to acuminate-apiculate, glabrous. Filaments yellow, basally connate for 0.5−0.7(–1) mm, then 1.1−2.2 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 4.2−7.5 mm long. Ovary obovoid, 1.8−3.8 x 1.5−2.7 mm. Style yellow, 0.9−1.5 mm long, glabrous, style branches 1.7−3.6(–4.8) mm long, alternate to the stamens, ascending to patent. Capsule subglobose to obovoid, 5.6−9.8(–14.9) × 4.3−10.2 mm, brown, glabrous.

Distribution: *Sisyrinchium marginatum* occurs in Argentina (Misiones), southern Brazil (Paraná, Rio Grande do Sul and Santa Catarina), Paraguay (Caaguazú and San Pedro) and

Uruguay (Cerro Largo and Rocha), according to herbaria data. In Paraná, it occurs in the three plateaus (Primeiro, Segundo e Terceiro Planaltos, Maack 1968), in Santa Catarina, it is recorded in the Baixada Litorânea and Planalto Arenito-Basáltico (Prates *et al.* 1989) and in Rio Grande do Sul, it occurs in the Alto Uruguai, Campos de Cima da Serra, Depressão Central, Encosta Superior do Nordeste, Planalto Médio and Serra do Sudeste (Fortes 1959). The species inhabits grasslands, occasionally in rocky soils, forest borders, roadsides, sand dunes and wet ravines, from 10 to 1217 m a.s.l. (Fig. 19), in the Subtropical Mixed Forest, Subtropical Seasonal Forest and Temperate Savanna (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from August to March.

Notes: The species is recognized by the congest synflorescence generally with one to three (up to six) riphidia and leaves bright green and glabrous. *Sisyrinchium marginatum* was considered synonym of *S. palmifolium* by Baker (1892) and of *S. macrocephalum* by Johnston (1938), who, at that time, still considered *S. palmifolium* a doubtful species. *Sisyrinchium marginatum* is also presented in Flora Brasiliensis (Klatt 1871) with three samples: one from Minas Gerais, one from Porto Alegre and the other from "Brasiliae meridionalis". The sample from Minas Gerais is a collection of Martius, which Johnston (1938) identified as *S. nidulare*. This material is refered as a photograph of the collection of the Berliner Herbarium and, in FMNH Collection Database, this photo is treated as an image of the type of *S. marginatum*. However, it is not a type and our analysis of the photograph resulted in the identification of this species as *S. minense* Ravenna, a taxon from Minas Gerais and Bahia. The syntypes cited in the original description of Klatt (1861-1862a) were reported as "Brasilia meridionalis, leg Sellow, Herb. Reg. Berol. nº 68 et 103", which we did not succeed to find and we assume were lost in the Second World War. Since none of the syntypes were recuperated, a collection from Sellow was chosen by us to be here designated as neotype. The other collections cited in Flora Brasiliensis (Klatt 1871) were not recovered as well.

For a long time, different synonyms, such as *S. marginatum,* are indicated for *S. palmifolium* based on the failure to find efficient characters to distinct taxa. The synflorescence of these group of species was usually considerated the same, in distinct development stages, being the congest synflorescences with few rhipidia related to immature or young synflorescences. Analyzing synflorescence stages and growing samples in a live collection enabled us to better comprehend synflorescence development of the species. In *S. marginatum*, the spiciform synflorescence is composed by up to six rhipidia, and peduncles do not extend up to 1.5 cm, appearing congest, never turning lax or expanded. *Sisyrinchium wettsteinii* also present a congest synflorescence and the smooth and glabrous leaf surface of *S. marginatum* (*vs.* conspicuously papillose leaf surface in *S. wettsteinii*) helps to distinguish the species. However, exsiccates of *S. marginatum* may still be confused with some specimens of *S. palmifolium* with young synflorescences and further studies are necessary in searching characters to better circumscribe and identify both taxa.

Selected examined material: BRAZIL, PARANÁ, **Almirante Tamandaré,** 12 November 1942 (fl), *C. Stellfeld 199* (MBM); **General Carneiro,** BR 153, ca. 31 km após General Carneiro em direção a Palmas, 18 November 2010 (fl, fr), *L. Eggers & T.T. Souza-Chies 605* (ICN); **Guarapuava,** BR 277 direção Guarapuava - Irati cerca de 10 km antes de Guarapuava, 30 October 2008 (fl, fr), *L. Eggers & T.T. Souza-Chies 370* (ICN); **Laranjeiras do Sul,** Rincão Grande, 12 October 1974 (fl), *G. Hatschbach 35216* (MBM, SI); **Palmas,** BR 280 Palmas - União da Vitória, 1 November 2008 (fl, fr), *L. Eggers & T.T. Souza-Chies 392* (ICN); RIO GRANDE DO SUL, **Áurea,** 8 September 1995 (fl), *A. Butzke et al. s.n.* (US 3325533); **Bagé,** estrada de chão em direção a São Gabriel, 2 December 2005 (fl, fr), *L.Y.S. Aona & M.C. Machado 967* (UEC); **Barros Cassal,** 13 November 1975 (fl, fr), *M.L. Porto et al. 1688* (CTES, ICN); **Caçapava do Sul,** 1 October 1988 (fl), *R. Wasum & M. Rossato s.n.* (HUCS 4593, MBM 125471, MO 5697919, US 3118647); **Cambará do Sul,** RS 020, Km 151, 2 November 2005 (fl), *L. Eggers & T.T. Souza-Chies 125* (ICN); **Caxias do Sul,** Ana Rech – Faxinal, 780 m, 10 December 1999 (fr), *L. Scur 279* (HUCS, MBM, US); **Farroupilha,** São José, 750 m, 11 December 1999 (fl), *L. Scur 315* (HUCS, US); **Garibaldi,** 750 m, 25 October 2005 (fl), *E. Pasini 23* (HUCS); **Lavras do Sul,** RS 357, em direção a Lavras do Sul, após bifurcação para São Gabriel, 396 m, 20 November 2012 (fr), *L. Eggers et al. 780* (ICN); **Maquiné,** Caminho para Lagoa do Palmital, 10 m, 8 October 2011 (fl, fr), *M. Verdi & J. Durigon 6040* (FUEL, FURB, HUCS); **Montenegro,** Linha Pinhal, 8 November 1949 (fl), *A. Sehnem 4007* (FLOR, HBR, MBM, PACA); **Osório,** próximo à Lagoa do Peixoto-margem norte, 4 m, 21 November 2015 (fl, fr), *J. Gaio et al. 513* (HUCS); **Passo Fundo,** Campos da Est. Exp. de Passo Fundo, 1949 (fl), *s.col.* (PEL); **Porto Alegre,** Morro Santana, 13 January 2012 (fr), *L. Eggers 706* (ICN); **Santa Maria,** Jardim Botânico, UFSM, 10 November 1999 (fl, fr), *R. Záchia 3499* (FLOR); **São José do Norte,** Lagoa do Peixe, December 1991 (fl), *L.F. Neves s.n.* (HURG 2228); **São Leopoldo,** p. Portão, 23

September 1949 (fl), *B. Rambo 43547* (GH, PACA); **Torres,** 15 October 1971 (fl, fr), *G. Hatschbach & C. Koczicki 27223* (HB, MBM, NY, UPCB, US); **Trindade do Sul,** estrada entre Trindade do Sul e Rodeio Bonito, 615 m, 18 August 2012 (fl, fr), *L. Eggers & O. Chauveau 717* (ICN); **Turuçu,** BR 116, Km 474, após São Lourenço (direção Pelotas), 56 m, 5 November 2015 (fl, fr), *L. Eggers & O. Chauveau 939* (ICN); **Vacaria,** micro-região 331, propriedade do sr. Alcides Zamboni, 14 October 1972 (fl), *E. Santos et al. 3056* (R); **Viamão,** Parque Estadual de Itapuã - Trilha da Pedra da Visão, 152 m, 31 October 2013 (fl, fr), *C.D. Inácio & A.P. Schmitz 143* (ICN); SANTA CATARINA, **Campo Belo do Sul,** Canoas / Fazenda Gateados, 845 m, 15 December 2008 (fr), *M. Verdi 1275* (FURB); **Capão Alto,** Fazenda Pessegueirinho, 762 m, 11 December 2008 (fr), *M. Verdi et al. 212* (FURB, RB); **Imbituba,** Praia do Rosa Sul, 14 January 2013 (fl, fr), *L. Eggers & O. Chauveau 816* (ICN); **Irineópolis,** SC 280, Porto União - Canoinhas aprox. Km 39, 1051 m, 2 November 2008 (fl, fr), *L. Eggers & T.T. Souza-Chies 396* (ICN); **Lages,** Rod. BR-116, 15-20 km S de Lages, 22 October 2004 (fl), *G. Hatschbach et al. 78331* (FURB, MBM); **Laguna,** 16 October 1971 (fl), *G. Hatschbach & C. Koczicki 27234* (MBM, US); **São Joaquim,** SC 430, Km 56,8, 1217 m, 23 November 2010 (fr), *A.M. Aita & L. Eggers 18* (ICN); **Sombrio,** 10 m, 9 October 1945 (fl, fr), *R. Reitz 1289* (GH).

Additional examined material: ARGENTINA, MISIONES, **San Ignacio,** 15 km E de ruta 12, próximo a arroyo Las Dunas, 19 November 2000 (fl), *H. Keller 385* (CTES). PARAGUAY, CAAGUAZÚ, in regione fluminis Yhú. Florula caaguazuensis, *s.d.* (fl), *E. Hassler 9554* (NY); SAN PEDRO, Primavera, 20 October 1958 (fl), *A.L. Woolston 1032* (NY). URUGUAY, ROCHA, **Santa Teresa,** Parque Nacional de Santa Teresa, 20 March 1938 (fl, fr), *Rosengurtt B-2640* (BA, GH, MVFA).

11. ***Sisyrinchium nidulare*** (Hand.-Mazz.) I.M.Johnst., J. Arnold Arbor. 19: 383 (1938). ≡ *Sisyrinchium palmifolium* var. *nidulare* Hand.-Mazz., Denkschr. Kaiserl. Akad. Wiss., Wien. Math.-Naturwiss. Kl. 79: 216 (1908). Type: Brazil, São Paulo, in graminosis prope São Paulo (Villa Marianna) ca. 800 m.s.m., August 1901, Wettstein & Schiffner (holotype: W, photo!).

Illustrations: Fig. 15 G–I, 20.

Perennial herb, caespitose, 16–51 cm tall. Rhizome short, roots thickened. Basal leaves linear, (11.5−)16−51 × 0.2–0.8 cm, glabrous, acute, margin thickened. Floriferous stem simple, erect, winged, 0.5–16 × 0.2−0.45 cm, with a terminal bract 5–21(−28) cm long, and an opposite bract 4−9.5(−12) cm long. Synflorescence spiciform, congested, 1−6 rhipidia. Rhipidium 2−4 flowers, subsessile to pedunculate, peduncle 3−15(−20) mm long. Spathes bivalved, lower valve 20.7−30.3 × 3.1−5.1 mm, upper 23.8−29.2 × 3.1−4.4 mm, acute to acuminate, margin membranaceous. Pedicel shorter, equal or longer than spathes, 16−31 mm long, glabrous. Perigon disk shaped, yellow, 24−33 mm diameter (liquid preserved flowers). Tepals subequal, 15−19 × 6−7.3 mm, connate 1.2−1.5(1.8) mm at the base, patent, oblanceolate, acute to acuminate, glabrous. Filaments yellow, basally connate for 1−1.5 mm, then 1−2.5 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 5.5−6.8(−7.6) mm long. Ovary obovoid, 3−3.9 x 1.5−2.5 mm. Style yellow, 1.5−2.2 mm long, glabrous, style branches 3.5−4 mm long, alternate to the stamens, ascending to patent. Capsule subglobose, 5−9 × 4−7 mm, black, glabrous, rugulose in dry material.

Distribution: *Sisyrinchium nidulare* is endemic of Brazil. Although cited to occur just in the state of Paraná in the Catálogo de las Plantas Vasculares del Cono Sur (Roitman *et al.* 2008), it is distributed in Paraná, Santa Catarina, Minas Gerais and São Paulo, according to herbaria data. In Paraná, it occurs in the three plateaus (Primeiro, Segundo e Terceiro Planaltos, Maack 1968) and in Santa Catarina, in the Serra do Mar (Prates *et al.* 1989). The species inhabits grasslands or roadsides, sometimes in sandy soils with rocky outcrops, from 10 to 1217 m a.s.l. (Fig. 16), in the Subtropical Mixed Forest, Subtropical Seasonal Forest and Temperate Savanna (Iganci *et al.* 2011). The collection *R.M. Harley & S.J. Mayo 27402* (ICN!, NY!, RB! SPF!) recorded in the state of Bahia (Oliveira *et al.* 2016) actually corresponds to *S. minense* Ravenna. Until now, no records are confirmed for the state of Bahia.

Phenology: Flowers and fruits are reported from July to November, with one record in June in the state of Minas Gerais.

Notes: The species is recognized by the spiciform synflorescence with terminal and opposite bracts and 1 to 6 riphidia, the spathes from 20.7−30.3 mm long and the floriferous stem which can be inconspicuous (about 0.5 cm) to 16 cm long. *Sisyrinchium densiflorum* is the most similar taxon, but it differs by presenting 14 to 24 rhipidia, the spathes usually shorter (12.2 to 24.7 mm long) and the floriferous stem from 21 to 53.5 cm long.

Sisyrinchium nidulare was considered synonym of *S. palmifolium* by Chukr & Capellari Jr. (2003). However, it differs from *S. palmifolium* by the size of the flowers (24–33 mm diameter *vs.* 18.1–26 mm diameter, respectively) and the shorter floriferous stem (0.5–16 cm long *vs.* 13.7–90.5 cm long). Although some overlap occur on these characters, the co-occurrence of both superpositions is rare. *Sisyrinchium nidulare* is also similar to *S. minense* Ravenna, and can be differentiate from it by the attenuate leaf margins and smaller flowers (from 10 to 15 mm diameter, as described by Ravenna 1988). Also, carefull examination of protologue and exsiccates revealed distinct traits for *S. minense* such as the terminal bract from 6.4 to 9 cm long and the opposite bract from 3.4 to 5 cm, with a larger proximal part and a conspicuous membranaceous margin. Our studies evidenced that, until now, *S. minense* occurs only in the states of Minas Gerais and Bahia.

Selected examined material: BRAZIL, PARANÁ, **Adrianópolis,** Furnas, 22 August 2000 (fl), *J.M. Silva et al. 3205* (FUEL, FURB, HUCS, MBM); **Balsa Nova,** próximo ao portal de São Luiz do Purunã, 1049 m, 29 August 2015 (fl), *C.D. Inácio & E.D. Lozano 301* (ICN); **Candói,** BR 277, aprox. Km 383, 977 m, 31 October 2014 (fr), *C.D. Inácio et al. 255* (ICN); **Curitiba,** 5 October 1908 (fl, fr), *P. Dusén 6815* (GH, MO, NY); **Guarapuava,** BR 277, direção Guarapuava - Laranjeiras do Sul após Guarapuava, 30 October 2008 (fr), *L. Eggers & T.T. Souza-Chies 378* (ICN); **Inácio Martins,** Rio Bananas, 20 September 2001 (fl), *G. Hatschbach et al. 72451* (MBM, UPCB); **Lapa,** Rio Passo Dois, 14 November 1988 (fl), *G. Hatschbach & J. Cordeiro 52527* (MBM, US); **Laranjeiras do Sul,** Rincão Grande, 12 October 1974 (fl), *G. Hatschbach 35214* (MBM); **Palmeira,** estrada do Recanto dos Papagaios, 979 m, 29 August 2015 (fl), *C.D. Inácio & E.D. Lozano 305* (ICN); **Pinhais,** 29 October 1908 (fl, fr), *P. Dusén 7107* (GH, MO, US); **Pinhão,** PR 170, 10 km após cidade de Pinhão em direção à Guarapuava, 971 m, 14 October 2007 (fl), *L. Eggers & T.T. Souza-Chies 240* (ICN); **Piraquara,** Fazenda Experimental de Agronomia, *s.d.* (fl), *N. Imaguire 2224* (MBM 161984, 210335); **Porto Amazonas,** Papagaios Velhos, 19 August 1981 (fl), *R. Kummrow 1540* (MBM, US); **São José dos Pinhais,** Aeroporto Afonso Pena, 12 September 2009 (fl), *A.C.L. Miranda et al. 167* (MBM); **Tibagi,** Riacho do pedregulho, 7 August 1993 (fl), *R.S. Moro & B. Perkach 919* (FUEL); **Ventania,** Morro do Chapéu, 18 km estrada Ventania-Ibaiti, 3 December 2006 (fl, fr), *D.A. Estevan et al. 1084* (FUEL);

SANTA CATARINA, **Campo Alegre,** Morro Iquererim, 1300 - 1500 m, 8 November 1956 (fl, fr), *L.B. Smith & R. Klein 7411* (R, US); **Garuva,** Serra do Quiriri, 1300 m, 16 October 2004 (fl), *J.M. Silva et al. 4133* (MBM).

Additional examined material: BRAZIL, MINAS GERAIS, **Camanducaia,** Monte Verde, Campo de altitude impactado, 23 October 2002 (fl), *L.D. Meireles 1247* (UEC); **Carrancas** Serra de Bicas, subida para o afloramento no Alto da Serra, 1300 m, 12 November 1998 (fl), *A.O. Simões et al. 470* (UEC); **Poços de Caldas,** Campo de Santa Rosália, 17 November 1980 (fl, fr), *G.J. Shepherd 439* (FUEL, UEC); **Santana do Riacho,** Rodovia Belo Horizonte - Conceição do Mato Dentro, 2 June 1991 (fl), *R. Simão-Bianchini & S. Bianchini s.n.* (SPF 80306); SÃO PAULO, **Campos do Jordão,** Reserva do Instituto Florestal, São José dos Alpes, 1900 m, 29 September 1976 (fl), *P.H. Davis et al. 3015* (UEC); **Itararé,** Estação Ecológica de Itapeva, 12 November 1994 (fl), *V.C. Souza et al. 7029* (UEC); **Penha,** 6 September 1946 (fr), *A.A. Netto s.n.* (ICN 161316, SPF 363); **São Paulo,** próximo campo Congonhas, 20 August 1951 (fl, fr), *W. Hoehne s.n.* (ICN 161328, SPF 13471).

12. ***Sisyrinchium oxyspathum*** Ravenna, Onira 5: 55 (2001). Type: Paraguay, Caaguazú, 8 km S of Ihú, 13 December 1982, A. Schinini 23025 (holotype: CTES!).

Illustrations: Fig. 21, 22 A.

Perennial herb, caespitose, up to 104 cm tall. Rhizome short, roots thickened. Basal leaves linear, 62–73 × 0.28–0.5 cm wide, glabrous to sparsely papillose, acute, margin thickened. Floriferous stem simple, erect, winged, 99 × 0.26−0.3 cm wide, with terminal bract 3–3.5 cm long. Synflorescence fasciculiform, 10−12 rhipidia. Rhipidium 1−3 flowers, sessile to pedunculate, peduncle to 5 mm long. Spathes bivalved, lower valve 17−17.7 × 2−2.2 mm, upper 20.1−20.4 × 2.1−2.5 mm, acute to acuminate, margin membranaceous. Pedicel longer than spathes, 24.9−28.3 mm long, glabrous. Perigon disk shaped, yellow. Tepals subequal, 10 x 3.5–4.5 mm, oblanceolate, apiculate, glabrous. Filaments yellow, basally connate for 0.7−1 mm, then 2.2−2.5 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 2.9−3.1 mm long. Ovary obovoid, 1.5−1.7 x 1.2−1.3 mm. Style yellow, 1.1−1.3 mm long, glabrous, style branches 1.8−2.2 mm long, alternate to the stamens, ascending to patent. Capsule globose to subglobose, 4−7.8 × 3.9−8.2 mm, brown, glabrous.

Distribution: *Sisyrinchium oxyspathum* occurs in southern Brazil (Paraná) and Paraguay (Caaguazú), according to herbaria data. In Paraná, it was registered in a bog, in the Terceiro Planalto (Maack 1968), in the Subtropical Seasonal Forest (Iganci *et al.* 2011), on the border of Brazil and Paraguay (Fig. 19). Better characterization of the typical habitat of *S. oxyspathum* is needed since the type specimen was collected in sandy soils, among *Butia* sp. (Arecaceae), in Cerrado vegetation and the other one in a humid area.

Phenology: Flowers and fruits are reported from December to February.

Notes: The species is recognized by the tall habit, congested synflorescence and floriferous stem narrowly winged (0.26−0.3 cm wide). *Sisyrinchium oxyspathum* is a new record for Brazil, since other collections were only reported for Paraguay (Ravenna, 2003; Roitman *et al.* 2008).

Examined material: BRAZIL, PARANÁ, **Foz do Iguaçu,** Três Lagoas, 2 February 1981 (fr), *José s.n.* (MBM 85455).

Additional examined material: PARAGUAY, **Guaíra**, Colonia Independencia, 25 December 1986 (fl, fr), *A. Schinini & E. Bordas s.n.* (CTES 224614).

13. ***Sisyrinchium palmifolium*** L., Mant. Pl. 1: 122 (1767). ≡ *Paneguia palmifolia* (L.) Raf., Fl. Tellur. 4: 34 (1836). ≡ *Glumosia palmifolia* (L.) Herb., Edwards's Bot. Reg. 29(Misc.): 85 (1843). ≡ *Bermudiana palmifolia* (L.) Kuntze, Revis. Gen. Pl. 2: 700 (1891). ≡ *Eleutherine palmifolia* (L.) Merr., Philipp. J. Sci., C 7: 233 (1912). Type: Brazil, s.d., Arduino 21 (holotype: LINN, photo!).

Illustrations: Heaton & Mathew (1998: plate 339). Fig. 22 B–E, 23.

Perennial herb, caespitose, 19–98 cm tall. Rhizome compact, roots thickened. Basal leaves linear, 16.6−80 × 0.52–1.4 cm, glabrous, acute, margin attenuate. Floriferous stem simple, erect, broadly winged, 13.7–90.5 × 0.39−0.79 cm, with terminal bract 3.2–13.5 cm long. Synflorescence paniculiform, corimbiform or variation of them, 4−29(–33) rhipidia. Rhipidium 1−8 flowers, subsessile to pedunculate, peduncle 2.5−32.2 mm long. Spathes bivalved, lower valve 14.9−21.9 × 2−3.3 mm, upper 15.7−24.7 × 2−3.1 mm, acute to acuminate, margin membranaceous. Pedicel mostly longer than spathes, 11.9−30.2 mm long, glabrous. Perigon disk shaped, yellow, 18.1−26 mm diameter (fresh flowers and liquid preserved flowers). Tepals subequal, 10.5−14.5 × 3.8−6 mm, connate 0.2−0.4 mm at the base, patent, oblanceolate, obtuse to apiculate, glabrous. Filaments yellow, basally connate for 0.8−1.1 mm, then 1.8−2.6 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 4.5−5 mm long. Ovary globose to subglobose, 1.2−1.9 x 1.5−1.9 mm. Style yellow, 1.4−1.6 mm long, glabrous, style branches 3−3.5 mm long, alternate to the stamens, ascending to patent. Capsule globose to subglobose, 2.4−7.5 × 2.4−7.7 mm, dark brown, glabrous.

Distribution: *Sisyrinchium palmifolium* occurs in Argentina (Buenos Aires, Catamarca, Córdoba, Corrientes, Entre Ríos, Misiones, Santa Fé and Tucumán), southern Brazil (Santa Catarina and Rio Grande do Sul), Paraguay (Guairá) and Uruguay (Cerro Largo, Colonia, Florida, Lavalleja, Maldonado, Montevideo, Rocha, Salto, San José and Tacuarembó), according to herbaria data. In Santa Catarina, it is recorded in the Planalto Arenito-Basáltico (Prates *et al.* 1989) and in Rio Grande do Sul, it is broadly distributed (Fortes 1959). The species inhabits grasslands, roadsides, rocky outcrops and peatlands, from 101 to 1400 m a.s.l. (Fig. 24), in the Low Altitude Temperate Grasslands, Subtropical Mixed Forest, Subtropical Seasonal Forest and Tropical Forest (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from August to April.

Notes: The species is recognized mostly by the corimbiform synflorescence with straight axis and peduncles (although variations can be observed in synflorescence type). *Sisyrinchium plicatulum* is the most similar taxon, but it differs by the paniculiform synflorescence with flexuous axis and peduncles, and the slightly plicate leaves.

Sisyrinchium palmifolium and *S. vaginatum* Spreng. are perhaps the most common names of *Sisyrinchium* species of Brazil in herbaria of South America. One of the reasons is that *S. palmifolium* and allied species have morphologies which can be mistaken and most of exsiccates are identified as *S. palmifolium*. Also, precedent synonymizations (*e.g.* Chukr & Capellari Jr. 2003) contributed to include different taxa in this name.

The species has an ancient history of taxonomic problems. It was described as a bulbous plant, based on mixed material from *S. palmifolium* (a rhizomatous plant) and a species of *Eleutherine* (a bulbous plant) (Linnaeus 1767). In 1833, *S. macrocephalum* Graham was described with plants raised from seeds received from Buenos Aires (Argentina) and no type was designated. After the microfiches of the Linnean Herbarium became available, Ravenna confirmed that *S. palmifolium* was the correct name (Ravenna 1984) to be used and presented a complete description, synonyms and a new combination of *S. macrocephalum* subsp. *fuscoviride* (Ravenna 1981).

Sisyrinchium palmifolium was reported as *S. macrocephalum* in Flora Brasiliensis (Klatt 1871) and Johnston (1938), which presented it with great morphological variation in size of plants and synflorescences. The most important description and complete manuscript about *S. palmifolium* was produced by Heaton & Mathew (1998), which discussed taxonomy, distribution, cultivation and exhibited a colour plate and dissection drawings of the species. Although this bibliography enabled the correct use of the name in the beginning of the 21st century, synonymizations proposed by Chukr & Capellari Jr. (2003) and lack of information and availability of Ravenna’s work contributed to maintain this species a difficult taxon to identify. Truly, further morphological analyses along the whole development of plants of this and related species are recommended, as well as other approaches that would help to clarify the circumscription of *S. palmifolium.*

Selected examined material: BRAZIL, RIO GRANDE DO SUL, **Aceguá,** BR 153, direção à Bagé, após Aceguá, 145 m, 13 November 2013 (fl), *C.D. Inácio et al. 185* (ICN); **Bagé,** estrada entre Bagé e Pelotas, 28 October 1955 (fl), *A.R. Schultz 1222* (ICN); **Bom Jesus,** estrada Ausentes – Silveira, 18 December 1969 (fr), *B.E. Irgang & A. Ferreira s.n.* (ICN 7444); **Canguçu,** Rincão dos Piegas, 8 November 1973 (fl, fr), *E.C. dos Santos et al. s.n.* (PEL 8828); **Caxias do Sul,** Ana Rech, 780 m, 12 February 2000 (fl, fr), *A. Kegler 665* (HUCS, US); **Dois Irmãos,** Santa Maria do Herval, 27 January 1983 (fl, fr), *O. Bueno & A.*

Krapovickas 3640 (CTES); **Guaíba,** Parque Ecológico Riocell, 29 September 1989 (fl, fr), *J. Larocca s.n.* (PACA 90582); **Marcelino Ramos,** Rio Uruguay, 550 m, 27 November 1993 (fr), *A. Butzke et al. s.n.* (US 3320560); **Mariana Pimentel,** estrada secundária entre Mariana Pimentel e Dr. Maurício Cardoso, após uma rótula, acostamento da estrada, 302 m, 9 April 2014 (fr), *O. Chauveau & T. Pastori 897* (ICN); **Montenegro,** Morro do Cabrito, 13 November 1986 (fr), *I. Fernandes 230* (ICN); **Pinheiro Machado,** Arroio Lajeado, 9 November 2009 (fl, fr), *E. Barbosa et al. 2495* (MBM); **Porto Alegre,** Morro Santana, 295 m, 2 April 2014 (fl), *C.D. Inácio et al. 204* (ICN); **São Francisco de Paula,** RS 020, após Rio do Pinto, 20 October 2006 (fl), *L. Eggers & T.T. Souza-Chies 167* (ICN); **Torres,** February 1939 (fl), *J. Vidal s.n.* (R 36711); **Tramandaí,** Horto Florestal, *s.d.* (fl), *E. Schweizer 2203* (ICN); **Viamão,** Parque Estadual de Itapuã - Trilha da Pedra da Visão, 145 m, 31 October 2013 (fl, fr), *C.D. Inácio et al. 132* (ICN); SANTA CATARINA, **São Joaquim,** Rio Capivaras, Bom Jardim, 700-800 m, 14 December 1967 (fl), *A. Lourteig 2165* (HBR, LP, R, SI, US).

Additional examined material: ARGENTINA, BUENOS AIRES, **Buenos Aires,** 8 November 1927 (fr), *Castellanos s.n.* (BA 10386); CATAMARCA, Gracián, 4 January 1940 (fl, fr), *Castellanos s.n.* (BA 33520); CÓRDOBA, **Ascochimpa,** 16 December 1955 (fl, fr), *C.E. Calderón s.n.* (BAA 815); CÓRDOBA, **Calamuchita,** Loteo Rolandi, a 10 km W de Santa Rosa de Calamuchita, 670 m, 5 January 2010 (fl), *L. Zavala 36* (SI); **Punilla,** Cascadas de Otaen, December 2002 (fl), *Roitman & Tourn s.n.* (BAA 24891); **Totoral,** Camino entre Ascochinga y La Cumbre, 1295 m, 16 January 2009 (fl), *S. Donadio et al. 223* (SI); CORRIENTES, **Mercedes,** Paso Lucero, Ruta 23 y Rio Corriente, 18 November 1977 (fl, fr), *A. Schinini & C. Quarín 14503* (CTES, MBM); ENTRE RÍOS, **Colón,** Parque Nac. El Palmar, em camino a A. Palmar, 23 January 1982 (fl, fr), *L. Cusato 1089* (BAA); **Concordia,** Ayuí, 3 February 1931 (fl), *Castellanos s.n.* (BA 31/1003); MISIONES, **Guaraní,** Colonia Nuerva, Ruta prov. 15, ca. de aula satélite, September 2007 (fl), *H.A. Keller & M. Franco 4467* (CTES); **Itaimbé,** 4 October 1934 (fl, fr), *Rodriguez 353* (BA); **San Ignacio,** Santo Pipó, Ruta 12, September 2010 (fl, fr), *H.A. Keller & N.G. Paredes 9178* (CTES); **San Pedro,** Ruta provincial 21, a 10 km de ruta 14 a Moconá, borda do Arroio, 24 September 1999 (fl, fr), *F. Biganzoli et al. 652* (MBM, SI); **Santa Ana,** 4 September 1912 (fl, fr), *Rodriguez 540* (BA); SAN LUIS, Alto Rodeo x Pisada Gigante, 26 November 1926 (fl, fr), *Castellanos s.n.* (BA 26/2061); SANTA FÉ, **Reconquista,** 21 November 1905 (fl, fr), *S. Venturi 345* (BA); TUCUMÁN, vivero de Villa Nougues, 1200 m, September 1921 (fl, fr), *S. Venturi 1370* (BA). PARAGUAY, GUAIRÁ, **Iturbe,** 6 September 1952 (fl), *J.E. Montes 12852* (CTES). URUGUAY, CERRO LARGO, Cerro de las Cuentas, 23 February 1938 (fl), *Rosengurtt s.n.* (BA 32025); COLONIA, **Puerto Platero,** Arroio de Pintos, Artilleros, 19 November 1943 (fl, fr), *H.H. Bartlett 20758* (GH, US); FLORIDA, Ruta 7, após a cidade de Rebolecho, aprox. Km 173,5, 201 m, 12 November 2013 (fl), *C.D. Inácio et al. 179* (ICN); LAVALLEJA, **Cerro Grande,** no lado sul da estrada entre Salus e Minas, 27 November 1943 (fl), *H.H. Bartlett 20884* (GH); **Minas,** Cerro Verdum, April 1900 (fr), *M.B. Berro 1822* (MVFA); MALDONADO, **Piriápolis,** Cerro San Antonio (Ladera opuesta al mar), 6 December 1997 (fl, fr), *V.S. Neffa 404* (CTES); MONTEVIDEO, Parque Lecoq, 30 September 1956 (fl, fr), *Arrillaga 358* (MVFA); ROCHA, November 1952 (fl, fr), *J.W. Teague s.n.* (MVM 18264); SALTO, Area a inundar por Represa Salto Grande entre A. Espinillar y Río Arapey, 22-26 November 1977 (fl, fr), *Del Puerto 14416* (MVFA); SAN JOSÉ, Sierra Mahoma, 12 October 1970 (fl, fr), *A. Krapovickas & C.L. Cristóbal 16278* (CTES, MBM); SORIANO, 5 January 1899 (fl, fr), *M.B. Berro 2263* (MVFA); TACUAREMBÓ, Tamboras, 24 November 1901 (fl), *M.B. Berro 2262* (MVFA).

14. ***Sisyrinchium paludosum*** (Ravenna) C.D.Inácio & L.Eggers nom. & stat. nov. ≡ *Sisyrinchium macrocephalum* subsp. *giganteum* Ravenna, Wrightia 7: 6 (1981). Type: Brazil, in palude pr. Posto Agropecuário mun. Guarapuava civit. Paraná, 3 December 1969, Ravenna 1010 & Hatschbach 23079 (lectotype here designated: MBM! isolectotype: US!).

Blocking name: *Sisyrinchium giganteum* Ten., Cat. Orto Bot. Napoli. 96. 1845.

Illustrations: Fig. 22 F–G, 25.

Perennial herb, caespitose, robust, 112–227.5 cm tall. Rhizome compact, roots thickened. Basal leaves linear, 49−161 × 0.78–1.64 cm, glabrous to papillose, acute, margin attenuate. Floriferous stem simple, erect, broadly winged, 100.5–211.5 × 0.52−1.21 cm, with terminal bract 4.5–22 cm long. Synflorescence paniculiform, (20−)31–135 rhipidia. Rhipidium 1−5 flowers, pedunculate, peduncle 2.1−100 mm long. Spathes bivalved, lower valve 13.8−20.3(−25) × 1.8−4.6(−5.1) mm, upper 14.4−20.5 × 2.1−4.6(−5.1) mm, acute to acuminate, margin membranaceous. Pedicel longer than spathes, 14.1−23 mm long, glabrous. Perigon disk shaped, yellow, 15−20.9 mm diameter (liquid preserved flowers). Tepals subequal, 7.9−11.5 × 3−4.5 mm, connate 0.2−0.6 mm at the base, patent, oblanceolate, attenuate, glabrous. Filaments yellow, basally connate for (0.3−)0.5−0.7 mm, then 3−3.4(−3.7) mm free, ascending to patent, glabrous. Anthers yellow, versatile, 3−5.1 mm long. Ovary obovoid, 1.6−2.4 x 1.3−1.6 mm. Style yellow, 1.1−2(−2.4) mm long, glabrous, style branches 3.5−4.5 mm long, alternate to the stamens, ascending to patent. Capsule globose to subglobose, 3.8−7.4 × 2.9−6.2 mm, dark brown, glabrous.

Distribution: *Sisyrinchium paludosum* is endemic of southern Brazil (Paraná, Santa Catarina and Rio Grande do Sul), according to herbaria data. In Paraná, it occurs in the Primeiro and Terceiro Planaltos (Maack 1968), in Santa Catarina, it is recorded in the Planalto Paleozóico and Planalto Arenito-Basáltico (Prates *et al.* 1989) and in Rio Grande do Sul, it is distributed in the physiographic regions of Alto Uruguai, Campos de Cima da Serra, Encosta do Sudeste, Encosta Superior do Nordeste and Planalto Médio (Fortes 1959). The species inhabits bogs and water reservoirs, from 678 to 1348 m a.s.l. (Fig. 6), in the Subtropical Mixed Forest, Subtropical Seasonal Forest and Subtropical Highland Grasslands (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from October to February.

Notes: *Sisyrinchium paludosum* is the second tallest species of *Sisyrinchium* in Brazil, following *S. bromelioides.* Both species occur in humid areas, in big populations. They can be distinguished by the largest synflorescence with numerous spathes and sterile bracts covering the branches which are typical of *S. bromelioides.* Also, lower and upper valves of the spathes are longer in *S. paludosum* [13.8−20.3(−25) mm long and 14.4−20.5 mm long *vs.* 9−12.9 mm long and 9−13.2 mm long, in *S. bromelioides*, respectively].

Sisyrinchium macrocephalum subsp. *giganteum* was considered a synonym of *S. palmifolium* subsp. *palmifolium* by Roitman *et al.* (2008), however we assume it is a different species. The name of the subspecies was not possible to be used as epithet since *S. giganteum* Ten. (1845) already exists and is considered a synonym of *S. palmifolium*, information that still needs to be confirmed since protologue did not designate a type for the species and we could not review the collections of Michele Tenore at the Herbarium of Napoli (NAP), until now. A lectotype was designated since holotype is unavailable, reported to be at Ravenna herbarium.

Examined material: BRAZIL, PARANÁ, **Colombo,** Guaraituba, 9 October 1949 (fl), *G. Hatschbach 1516* (MBM, US); **Mariópolis,** BR 280 direção Pato Branco - Palmas após Mariópolis, 1348 m, 31 October 2008 (fl, fr), *L. Eggers & T.T. Souza-Chies 382* (ICN); **Palmas,** Estrada Palmas - Ponte Serrada, 5 December 1971 (fl, fr), *G. Hatschbach et al. 28256* (MBM); RIO GRANDE DO SUL, **Bom Jesus,** estrada de Bom Jesus para São Joaquim, cerca de 10 km de Bom Jesus, 1068 m, 10 November 2011 (fl, fr), *L. Eggers & T.T. Souza-Chies 680* (ICN); **Giruá,** Fazenda Santa Ana, 17 November 1974 (fr), *A.G. Ferreira 679* (ICN); **Muitos Capões,** Lajeado Bonito / PCH Lajeado Bonito, 678 m, 10 February 2012 (fl, fr), *M. Verdi & B.O. Boeni 6160* (FURB); **Passo Fundo,** a 3 km de Passo Fundo, 28 January 1964 (fr), *E. Pereira & G. Pabst 8683* (ICN, LP, MBM, PEL, RB); **Pelotas,** Rodovia para Porto Alegre, 5 November 1985 (fl), *N. Mattos & M. H. Bassan 144* (HAS); **São Francisco de Paula,** RS 476, cerca de 1 km da RS 453, 872 m, 9 November 2009 (fl, fr), *L. Eggers & T.T. Souza-Chies 567* (ICN); SANTA CATARINA, **Água Doce,** Campos de Palmas, 28,5 km southeast of Horizonte (Paraná), 1000 - 1200 m, 3 December 1964 (fl, fr), *L.B. Smith & R. Klein 13468* (FLOR, GH, HBR, MO, NY, R, SI Paratype); [Paraná] **Calmon,** 15 March 1910 (fl, fr), *P. Dusén 9268* (GH); **Campo Belo do Sul,** BR 116 Lages - Vacaria cerca de 35 km da divisa com RS, 914 m, 4 November 2008 (fl), *L. Eggers & T.T. Souza-Chies 410* (ICN); **Catanduvas,** Leste de Catanduvas, 700 - 800 m, 7 e 8 November 1964 (fl), *L.B. Smith & R. Klein 13001* (GH, HBR, NY, R, US Paratype); **Curitibanos,** bog, 5 km west of Curitibanos on the road to Campos Novos, 850 m, 9 February 1957 (fl, fr), *L.B. Smith & R. Klein 11117* (GH, R, US Paratype); **Lages,** Campo, bog, and forest, along the Estrada de Rodagem Federal, south of Lajes, 900 m, 3 December 1956 (fl, fr), *L.B. Smith & R. Klein 8195* (GH, R, US Paratype); Morro do Pinheiro Seco, 1100 m, 3 February 1963 (fl), *R. Reitz 6641* (HBR Paratype); **Matos Costa,** 1300 m, 27 October 1962 (fl, fr), *R. Reitz & R. Klein 13743* (HBR Paratype); **São Joaquim,** Rod. SC 438, 8 km O de Cruzeiro, 1300 m, 9 December 2000 (fl), *G. Hatschbach et al. 71724* (MBM, SI, SPF).

15. *Sisyrinchium plicatulum* Ravenna, Wrightia 7: 3 (1981). Type: Brazil, Santa Catarina, mun. Campo Alegre, lower fazenda of Ernesto Scheide, 900 m, 9 Novembre 1956, L.B. Smith & R. Klein 5584 (lectotype here designated: HBR!).

Illustrations: Fig. 26, 27 A–B.

Perennial herb, caespitose, 50–136 cm tall. Rhizome short, roots thickened. Basal leaves linear, 38.5−98 × 0.59–1.66 cm, glabrous, acute, margin attenuate, slightly plicate with 4−6 protruding veins. Floriferous stem simple, erect, broadly winged, 43–123.5 × 0.48−1.48 cm, with terminal bract 8–23.8 cm long. Synflorescence paniculiform, 7−23(–31) rhipidia. Rhipidium 1−5 flowers, pedunculate, peduncle 7.5−53 mm long, conspicuously flexuose. Spathes bivalved, lower valve 11.9−19.8 × 1.5−3.3 mm, upper 12.1−21.9 × 2.4−3.6 mm, acuminate, margin slightly membranaceous in the lower valve and broadly membranaceous in the upper valve. Pedicel mostly longer than spathes, 9−24.3 mm long, glabrous. Perigon disk shaped, yellow, 22.8−25.5 mm diameter (liquid preserved flowers). Tepals subequal, 15−18.5 × 4.8−5.6 mm, connate 0.6 mm at the base, patent, oblanceolate, acute to acuminate, glabrous. Filaments yellow, basally connate for 0.5−0.7 mm, then 2.1−2.5 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 4−5.7 mm long. Ovary obovoid, 2.5−3 x 1.8−2.5 mm. Style yellow, 1.7−2 mm long, glabrous, style branches 4.2−5 mm long, alternate to the stamens, ascending to patent. Capsule globose to subglobose, 2.1−9.3 × 2.4−8.2 mm, black, glabrous.

Distribution: *Sisyrinchium plicatulum* occurs in Brazil (Paraná, Santa Catarina, Rio Grande do Sul and São Paulo), according to herbaria data. In Paraná, it occurs in the Primeiro Planalto (Maack 1968), in Santa Catarina, it is recorded for the Baixada Litorânea and Serra do Mar (Prates *et al.* 1989) and in Rio Grande do Sul, it occurs in the Campos de Cima da Serra and Encosta Superior do Nordeste (Fortes 1959). The species inhabits wet soils, margins of water reservoirs and roadsides, from 600 to 1350 m a.s.l. (Fig. 24), in the Subtropical Mixed Forest and Tropical Forest (Iganci *et al.* 2011). The species was also reported for the Brazilian states of Rio de Janeiro and Minas Gerais and for Paraguay (Ravenna 2002b), records which we can not confirm until now.

Phenology: Flowers and fruits are reported from October to January.

Notes: The species is recognized by the slightly plicate leaves with 4 to 6 protruding venations and the characteristic synflorescence with flexuouse peduncles. The synflorescence is evidently lax in the species, but Ravenna (1981, 2002b, 2003) identified specimens with congested synflorescence as *S. plicatulum*, claiming they were not well developed at the time of collection. We do not agree with those determinations, since all plants were already with flowers and fruits and still not lax. Because of that, we consider that the collection *L.B. Smith & R. Reitz 12914* (GH!, HBR!, NY!, R!, US!) is not a paratype. Chukr & Capellari Jr. (2003) considered *S. plicatulum* to be synonym of *S. palmifolium*, which is indeed the most similar species. However, carefull examination of vegetative part is essential for a correct identification. A lectotype was designated since holotype is unavailable, reported to be at Ravenna herbarium.

Selected examined material: BRAZIL, PARANÁ, **Araucária,** 13 November 1972 (fl, fr), *L.T. Dombrowski et al. 4277* (MBM); **Bocaiúva do Sul,** Rio Putunã, 31 October 1969 (fl), *G. Hatschbach 22760* (MBM); **Piraquara,** Mananciais da Serra, 1021 m, 18 November 2006 (fl, fr), *M.G. Caxambú 1296* (MBM); **Quatro Barras,** Rio Taquari, 850 m, 12 November 1970 (fl, fr), *G. Hatschbach 25368* (MBM); **São José dos Pinhais,** Guaricana, 17 November 1999 (fl, fr), *J. Cordeiro 1628* (MBM); RIO GRANDE DO SUL, **Cambará do Sul,** Canyon Fortaleza, 19 November 2008 (fl), *J.M. Silva et al. 7383* (MBM); **Caxias do Sul,** Ana Rech-Faxinal, 700 m, 28 October 1988 (fl), *R. Wasum et al. s.n.* (MO 5697917); SANTA CATARINA, **Araranguá -** Jacinto Machado, 27 October 1944 (fr), *R. Reitz c55* (GH, RB); **Blumenau,** Área Virgem do Parque Nacional da Serra do Itajaí, 660 m, 23 November 2009 (fl, fr), *A. Stival-Santos et al. 1352* (FURB, MBM); **Bom Jardim da Serra,** Mantiqueira, 16 November 2008 (fl), *J.M. Silva et al. 7249* (MBM); **Campo Alegre,** Estrada secundária para Campos do Quiriri, 880 m, 8 October 2014 (fl), *C.D. Inácio et al. 210* (ICN); Lower fazenda of Ernesto Scheide, 900 m, 9 November 1956 (fl), *L.B. Smith & R. Klein 7491A* (GH, HBR, NY, R, RB Paratype); **Joinvile,** Estrada Dona Francisca, 600 m, 6 November 1957 (fl), *L.B. Smith & R. Klein 5584* (HBR, US Paratype); **São Bento do Sul,** Arredores do Centro de Estudos e Pesquisas Ambientais - CEPA Rugendas - Rio Natal, 18 November 2006 (fl, fr), *F.S. Meyer 227* (MBM).

Additional examined material: BRAZIL, SÃO PAULO, **Cotia,** Morro Grande, Reserva, beira da estrada, 6 November 2000 (fl, fr), *L.C. Bernacci 2913* (IAC); **Cubatão,** Paranapiacaba, 8 January 1967 (fl, fr), *T.M. Pedersen 7984* (CTES).

16. *Sisyrinchium rectilineum* Ravenna, Onira 6: 53 (2002a). Type: Brazil, Paraná, Saltinho, 25 October 1971, G. Hatschbach 27581 (holotype: MBM!).

Illustrations: Fig. 27 C–D, 28.

Perennial herb, caespitose, 53–113 cm tall. Rhizome short, thickened, roots fibrous. Basal leaves linear, 22−81 × 0.21–0.55 cm, glabrous to papillose, acute, margin attenuate or thickened. Floriferous stem simple, erect, winged, 47–107 × (0.13−)0.2−0.44 cm, with terminal bract 2.7–15.6 cm long. Synflorescence cymose, monochasial, laterally oriented, conspicuously recurved, 5−33 rhipidia. Rhipidium 1−4 flowers, subsessile to pedunculate, peduncle 1.7−19.6 mm long. Spathes bivalved, lower valve 7.1−23.2 × 1.2−2.9(−3.5) mm, upper 8.2−20.3 × 1−2.6 mm, acute to acuminate, margin slightly membranaceous. Pedicel longer than spathes, 8.6−22.6(−27.4) mm long, glabrous. Perigon disk shaped, yellow, 18.8−31.3 mm diameter (liquid preserved flowers). Tepals subequal, 9.5−17 × 4−7.9 mm, connate 0.3−0.7 mm at the base, patent, oblanceolate, acute to acuminate, glabrous. Filaments yellow, basally connate for (0.5−)1−1.4(–1.7) mm, then 1.5−2.5 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 2.8−7 mm long. Ovary obovoid, 1.5−4 x 1.3−2.5 mm. Style yellow, 1.5−2 mm long, glabrous, style branches 2.1−3.2 mm long, alternate to the stamens, ascending to patent. Capsule globose to subglobose, 3.4−6.5(–8.2) × 3.6−5.9(−7.2) mm, brown, glabrous.

Distribution: *Sisyrinchium rectilineum* is endemic of Brazil (Paraná, Rio Grande do Sul, Santa Catarina, Minas Gerais and São Paulo), according to herbaria data and Roitman *et al.* (2008). In Paraná, it occurs in the three plateaus (Primeiro, Segundo e Terceiro Planaltos, Maack 1968), in Santa Catarina, it is distributed in Serra do Mar, Planalto Paleozóico and Planalto Arenito-Basáltico (Prates *et al.* 1989) and in Rio Grande do Sul it occurs in the Campos de Cima da Serra and Encosta Superior do Nordeste (Fortes 1959). *Sisyrinchium rectilineum* inhabits grasslands, roadsides and margins of water reservoirs, from 700 to 1172 m a.s.l. (Fig. 29), in the Subtropical Highland Grasslands and Subtropical Mixed Forest (Iganci *et al.* 2011).

Phenology: Flowers and fruits are reported from September to February.

Notes: The species is mostly recognized by the tall plants with a cymose, monochasial synflorescence with recurved axis. Plants of *S. rectilineum* were first considered by us to present attenuate margins and smooth and glabrous leaf surfaces. However, we included here materials slightly papillose and/or with thickened leaf margins which could not be segregated from *S. rectilineum.*

Sisyrinchium rectilineum with thickened margins and papillose leaves can be mistaken with *S. wettsteinii*, although this species presents dense papillose leaves and straight spiciform synflorescences with fewer rhipidia (2 to 5 *vs.* 5 to 33). Some paratypes designated by Ravenna (2002a), we consider to be *S. wettsteinii*, such as *G. Hatschbach 22282* (MBM!), *G. Hatschbach 23185* (MBM!), *G. Hatschbach 32790* (MBM!), G. *Hatschbach 48795* (CTES!, MBM!, US!), *G. Hatschbach et al. 71613* (MBM!), *A. Lourteig 2137* (HBR!, P, US!) and *S.M. Silva & R.M. Britez 816* (MBM!, UEC!, UPCB!). The paratype *A. Lourteig 2165* (HBR!, LP!, P, R!, SI!, US!) is actually *S. palmifolium* and the paratype *G. Hatschbach 22645* (MBM!) was also indicated by Ravenna (2002b), as paratype of *S. bromelioides* subsp. *angustius*, and belongs to *S. angustius.* Further studies are necessary to better characterize this taxon and/or to understand its morphological variation.

Selected examined material: BRAZIL, PARANÁ, **Castro,** PR 151 direção Castro - Jaguariaíva após Castro, 1037 m, 25 October 2008 (fl), *L. Eggers & T.T. Souza-Chies 332* (ICN); **Clevelândia,** BR 280, aprox. Km 153 (23 km da cidade de Palmas), 988 m, 19 November 2010 (fl, fr), *A.M. Aita & L. Eggers 6* (ICN); **Colombo,** 3 September 1997 (fl, fr), *W. Maschio & A. Souza 157* (MBM); **Curitiba,** Tarumã, 18 October 1971 (fl, fr), *G. Hatschbach 27658* (MBM Paratype); **General Carneiro,** Fazenda Lageado Grande, Lagoa próxima à sede, 3 November 2005 (fl), *C. Bona et al. 330* (UPCB); **Palmeira,** Rod. BR-277, próximo do Rio Capivara, 27 December 1984 (fl), *G. Hatschbach 48822* (MBM, UPCB); **Quatro Barras,** Margem do rio Canguiri, 1 November 2009 (fl), *R. Ristow & A.C.L. Miranda 309* (MBM); **União da Vitória,** Rio Santa Maria, 10 February 1966 (fl, fr), *G. Hatschbach et al. 13843* (MBM, NY, RB, US); RIO GRANDE DO SUL, **Cambará do Sul,** RS 020, aprox. Km 155,3, cerca de 24 km de Tainhas, em direção à Cambará, 960 m, 17 January 2016 (fl), *L. Eggers & O. Chauveau 981* (ICN); **Caxias do Sul, p**róximo ao Hotel Samuara, 30 January 1994 (fl), *T.M. Pedersen 15384* (MBM); **São José dos Ausentes,** 927 m, 31 October 2012 (fl, fr), *L.P. Felix et al. 14096* (ICN); SANTA CATARINA, **Caçador,** West of Caçador on the road to Taquara Verde (25 km), 900 m, 23 December 1956 (fl, fr), *L.B. Smith & R. Reitz 9100* (GH, NY, R, US); **Grão Pará,** Serra do Corvo Branco, 19 November 2004 (fl, fr), *G. Hatschbach et al. 78227* (FUEL); **Major Vieira,** cerca de 4 km após Major Vieira em direção à Canoinhas, 1172 m, 17 November 2010 (fl, fr), *A.M. Aita & L. Eggers 3* (ICN); **Ponte Serrada-Fachinal dos Guedes,** 700 - 900 m, 13 October 1964 (fl, fr), *L.B. Smith & R. Reitz 12481* (FLOR, GH, HBR, R, SI, US); **São Joaquim,** Serra do Oratório, 1400 m, 14 December 1967 (fl, fr), *A. Lourteig 2125* (HBR Paratype); **Três Barras,** estrada secundária entre Três Barras e Canoinhas, logo após Três Barras, 1017 m, 18 November 2010 (fl, fr), *A.M. Aita & L. Eggers 4* (ICN).

Additional examined material: BRAZIL, MINAS GERAIS, **Poços de Caldas,** 30 September 1999 (fl), *E. Tameirão Neto 2970* (SPF); SÃO PAULO, **Campos do Jordão,** 5 February 1937 (fl), *P.C. Porto 3308* (RB).

17. ***Sisyrinchium wettsteinii*** Hand.-Mazz., Denkschr. Kaiserl. Akad. Wiss., Wien. Math.-Naturwiss. Kl. 79: 216 (1908). Type: Brazil, São Paulo, Inter Pilar et Alto da Serra prope Santos, 750-800 m a.s.l., 1902, M. Wacket s.n. (lectotype here designated: WU 65712!, isolectotype: WU 65714!).

Illustrations: Fig. 27 E–G, 30.

Perennial herb, caespitose, 33–100 cm tall. Rhizome short, roots thickened. Basal leaves linear, 12.5−86.5 × 0.15–0.61 cm, papillose, acute, margin thickened. Floriferous stem simple, erect, winged, 30–92 × 0.2−0.53 cm, with terminal bract 3.5–10.5(−19) cm long. Synflorescence spiciform, congested, 2−5 rhipidia. Rhipidium 1−5 flowers, subsessile to pedunculate, peduncle 1.5−12.3 mm long. Spathes bivalved, lower valve 18−28.2 × 2−4.4 mm, upper 17.4−26.1 × 1.7−3.4 mm, acute to acuminate, margin slightly membranaceous. Pedicel mostly longer than spathes, 9.8−28.4 mm long, glabrous. Perigon disk shaped, yellow. Tepals subequal, 11.5−13.5 mm long., connate 0.4−1 mm at the base, patent, oblanceolate, acute to acuminate, glabrous. Filaments yellow, basally connate for 1−2.5 mm, then 0.5−1.5 mm free, ascending to patent, glabrous. Anthers yellow, versatile, 3.7−7.1(−8.4) mm long. Ovary obovoid, 2−4 x 1−2 mm. Style yellow, 1−2.5 mm long, glabrous, style branches 2.5−4.8 mm long, alternate to the stamens, ascending to patent. Capsule globose to subglobose, 3.8−6.2 × 3−6.2 mm, brown, glabrous.

Distribution: *Sisyrinchium wettsteinii* is endemic of Brazil (Paraná, Rio Grande do Sul, Santa Catarina, Minas Gerais, Rio de Janeiro and São Paulo), according to herbaria data and Roitman *et al.* (2008). In Paraná, it occurs in the Primeiro, Segundo and Terceiro Planatos (Maack 1968), in Santa Catarina, it is distributed in Serra do Mar, Planalto Paleozóico and Planalto Arenito-Basáltico (Prates *et al.* 1989) and in Rio Grande do Sul it occurs in the Campos de Cima da Serra physiographic region (Fortes 1959). The species inhabits grasslands, humid soils and, sometimes, margins of water reservoirs, from 700 to 2500 m a.s.l. (Fig. 29), in the Subtropical Highland Forest and Subtropical Mixed Forest (Iganci *et al.* 2011). The species was also cited by Brade (1956) for the Parque Nacional de Itatiaia (Rio de Janeiro).

Phenology: Flowers and fruits are reported from September to December, and there are records from January to May in states of Southeastern region.

Notes: This species was considered synonym of *S. palmifolium* (Chukr & Capellari Jr. 2003), but it can be segregated from this species by the papillose surface of leaves and the straight spiciform, congested synflorescence with few rhipidia (3 to 5 *vs.* 4 to 33 in *S. palmifolium*). The papillae of *S. wettsteinii* were described and illustrated in the protologue (Handel-Mazzetti 1908) and can be easily examined in exsiccates. They are usually much denser than what is observed in the leaf surface of *S. bromelioides*, *S. congestum* and *S. rectilineum* (when present).

Sisyrinchium wettsteinii was originally described for the highlands of the Southeast region of Brazil (São Paulo and Rio de Janeiro) with three syntypes (*M. Wacket s.n.*; *Wettstein et Schiffner s.n*. and *Wrawa s.n*.). The species was usually neglected in Ravenna's publications, which never had determinated one sample as *S. wettsteinii*. However, some exsiccates of *S. wettsteinii* from Herbarium MBM were named *S. turbinatum* Ravenna (*nom. nud.*) by him, which might indicate these plants were considered distinct. Also, epithet can be related to the conical shape of the papillae.

Selected examined material: BRAZIL, PARANÁ, **Almirante Tamandaré,** Tranqueira. Estrada Curitiba - Rio Branco, 30 September 1964 (fl), *Y. Saito 190* (MBM); **Araucária,** December 1989 (fl, fr), *L.T. Dombrowski 14207* (MBM); **Colombo,** Rio Palmital, 1 November 1973 (fl, fr), *G. Hatschbach 32790* (MBM Paratype); **Curitiba,** UFPR - Centro Politécnico, 6 October 1983 (fl), *A.C. Cervi & A. Bida 2167* (UPCB); **General Carneiro,** Cabeceiras do Rio Iratim, 18 October 1966 (fl, fr), *G. Hatschbach 14988* (MBM, UPCB, US); **Guarapuava,** Três Capões, 9 December 1969 (fl, fr), *G. Hatschbach 23185* (MBM, MO); **Jaguariaíva,** Rod. BR 151, 2 km S do Rio Cajuru, 15 October 1997 (fl, fr), *G. Hatschbach & E. Barbosa 67086* (CTES, HUCS); **Palmas,** PR 280 - Km 93, 1297 m, 30 October 2014 (fl), *C.D. Inácio et al. 248* (ICN); **Piraí do Sul,** Fazenda das Almas, 19 September 1993 (fl), *G. Hatschbach 59429* (CTES); **Piraquara,** Fazenda Experimental de Agronomia, 14 October 1969 (fl, fr), *N. Imaguire 2256* (MBM); **Ponta Grossa,** Turma 23 [Desvio Ribas], 24 October 1914 (fl, fr), *G. Jönsson 1204*[a] (NY); **São Mateus do Sul,** cerca 10 km S de São Mateus do Sul, 760 m, 1 October 1969 (fl), *G. Hatschbach 22282* (MBM); **Sengés,** Serra do Mocambo, 8 October 1971 (fl), *G. Hatschbach 27156* (CTES, HB, LP, NY, US); RIO GRANDE DO SUL, Aparados da Serra, 1300 m, 24 October 1961 (fl), *G.F.J. Pabst & E. Pereira 6300* (HB, LP, PEL, R); SANTA CATARINA, **Bom Retiro,** 950 m, 26 October 1957 (fl, fr), *R. Reitz & R. Klein 5487* (GH, US); **Campo Alegre,** Morro do Iquererim, 1300 - 1500 m, 8 September 1956 (fl), *L.B. Smith & R. Klein 7421* (GH, R, US); **Chapecó,** Fazenda Campo São Vicente, 24 km west of Campo Erê, 900-1000 m, 26-28 December 1956 (fr), *L.B. Smith et al. 9528* (R, US); **Irani,** Campo de Irani, 700 m, 13 October 1964 (fl), *L.B. Smith & R. Reitz 12468* (FLOR, GH, R); **Major Vieira,** Rio da Serra, 1009 m, 27 October 2010 (fr), *A. Korte & A. Kniess 4823* (RB); **São Joaquim,** Serra do Oratório, 1400 m, 14 December 1967 (fr), *A. Lourteig 2137* (HBR, US).

Additional examined material: BRAZIL, MINAS GERAIS, **Engenheiro Passos,** Parque Nacional de Itatiaia, trilha em frente ao abrigo Rebouças, 22 January 2003 (fr), *V.F. Mansano et al. 217* (RB); **Itamonte,** Serra Fina, Casa Alpina – Antena, 13 March 2007 (fl), *L.D. Meireles et al. 2789* (UEC); **Passa Quatro,** Serra Fina, Pedra da Mina (Alta), 15 May 2005 (fl, fr), *L.D. Meireles et al. 1662* (UEC); RIO DE JANEIRO, **Itatiaia,** Parque Nacional de Itatiaia, Estrada para o Pico das Agulhas Negras, 1 October 1997 (fl), *S.J. Silva Neto et al. 1176* (RB); **Resende,** Serra do Itatiaia, 1953 (fl, fr), *S. Vianna 1124* (R); SÃO PAULO, **Silveiras,** Silveiras, Co. Serra da Bocaina, B. Vista, 2100 m, 25 March 1951 (fr), *S. Vianna 2568* (NY, R).

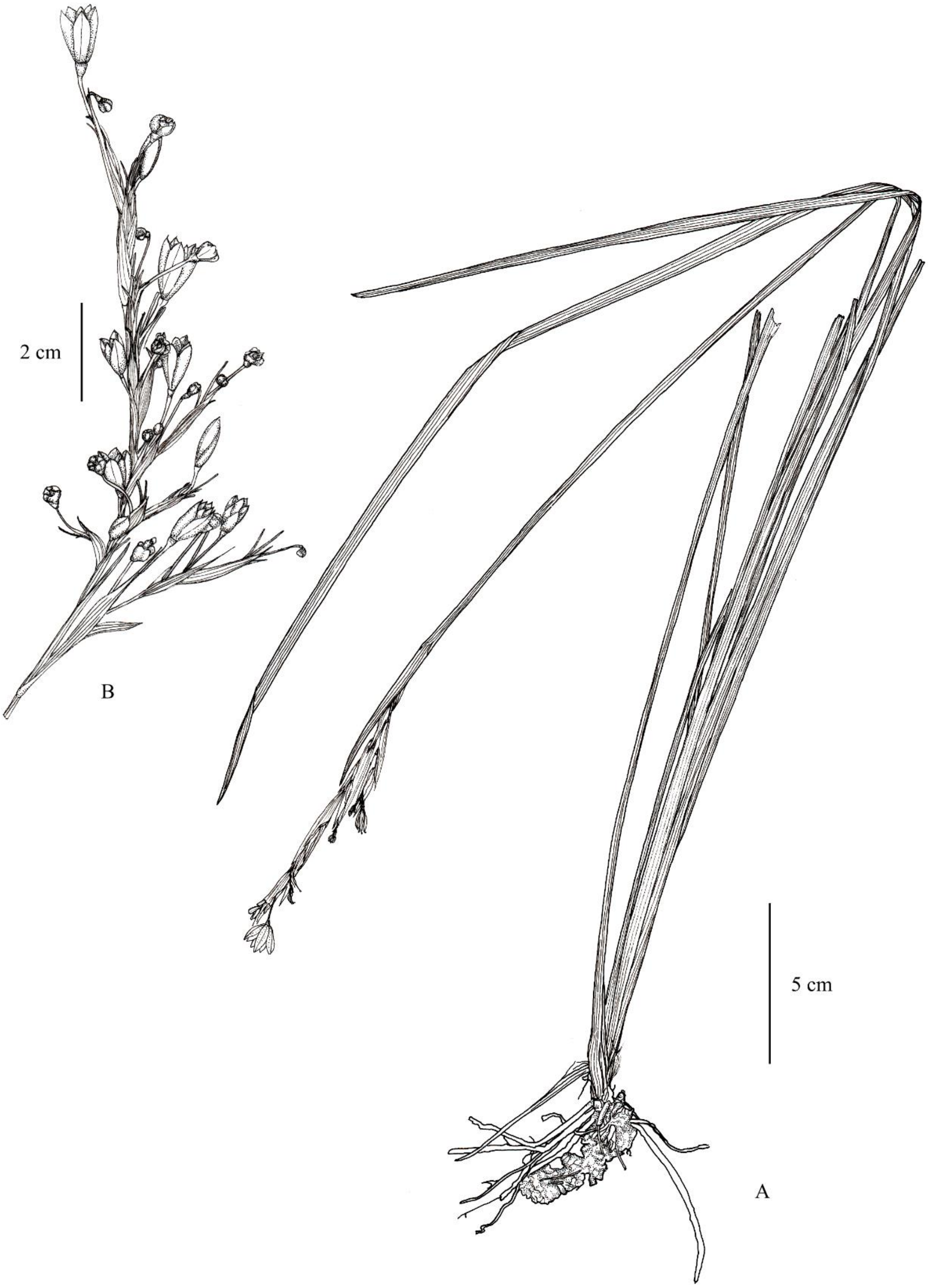

FIGURE 1. *Sisyrinchium angustius*. A. Habit. B. Synflorescence. From *L. Eggers & T.T. Souza-Chies 544* (ICN), **r**eproduced from Aita (2013).

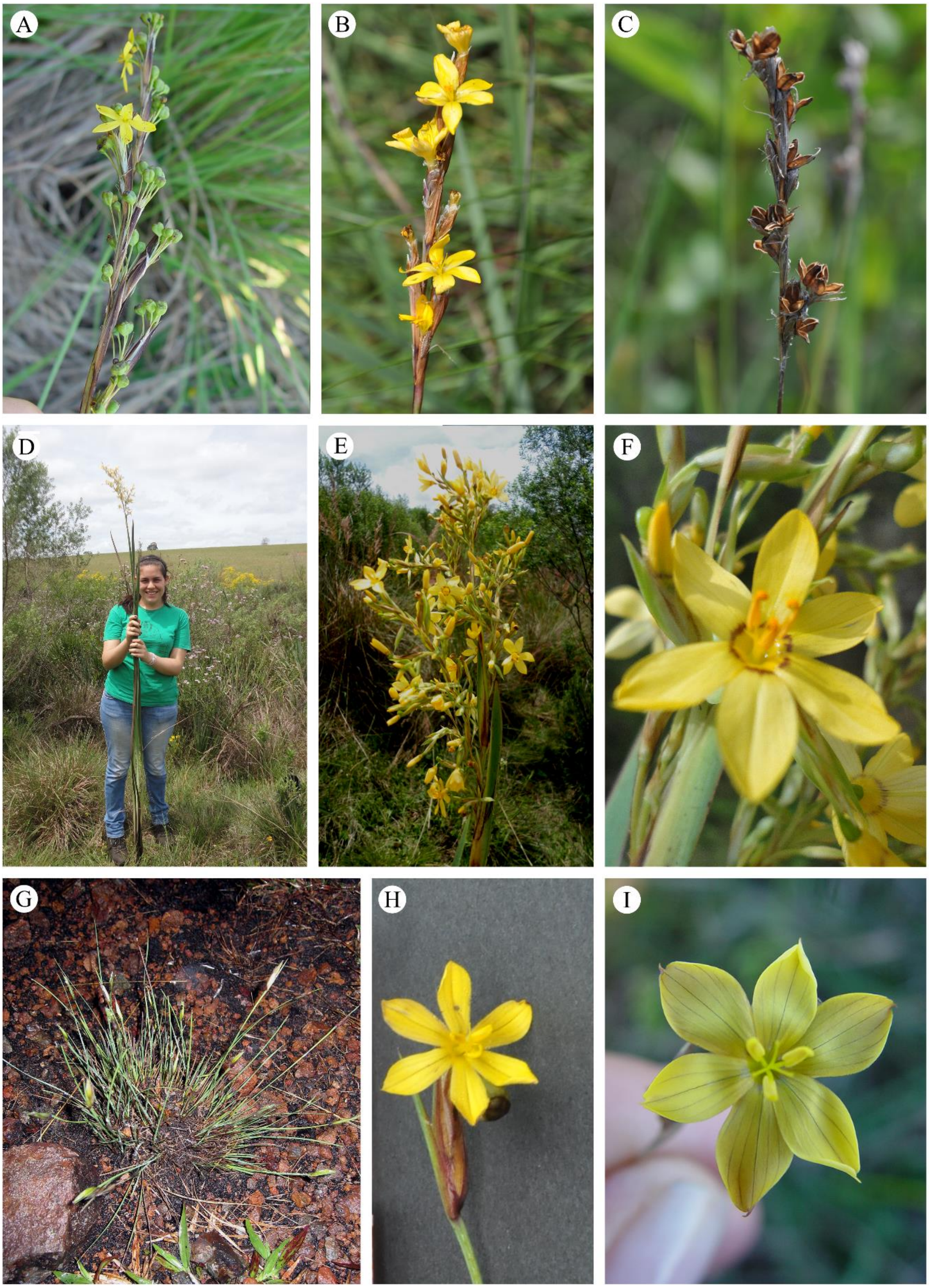

FIGURE 2. *Sisyrinchium angustius*: A. Synflorescence. *Sisyrinchium brasiliense*: B. Synflorescence. C. Synflorescence with fruits. *S. bromelioides*: D. Collected sample. E. Synflorescence. F. Flower. *S. caeteanum*: G. Habit. H. Synflorescence. I. Flower. A: *L. Eggers & T.T. Souza-Chies 544* (ICN). B−C: *A.M. Aita & L. Eggers 12* (ICN). D−F: *C.D. Inácio et al. 140* (ICN). G−H: *L. Eggers & T.T. Souza-Chies 224 and 691* (ICN).

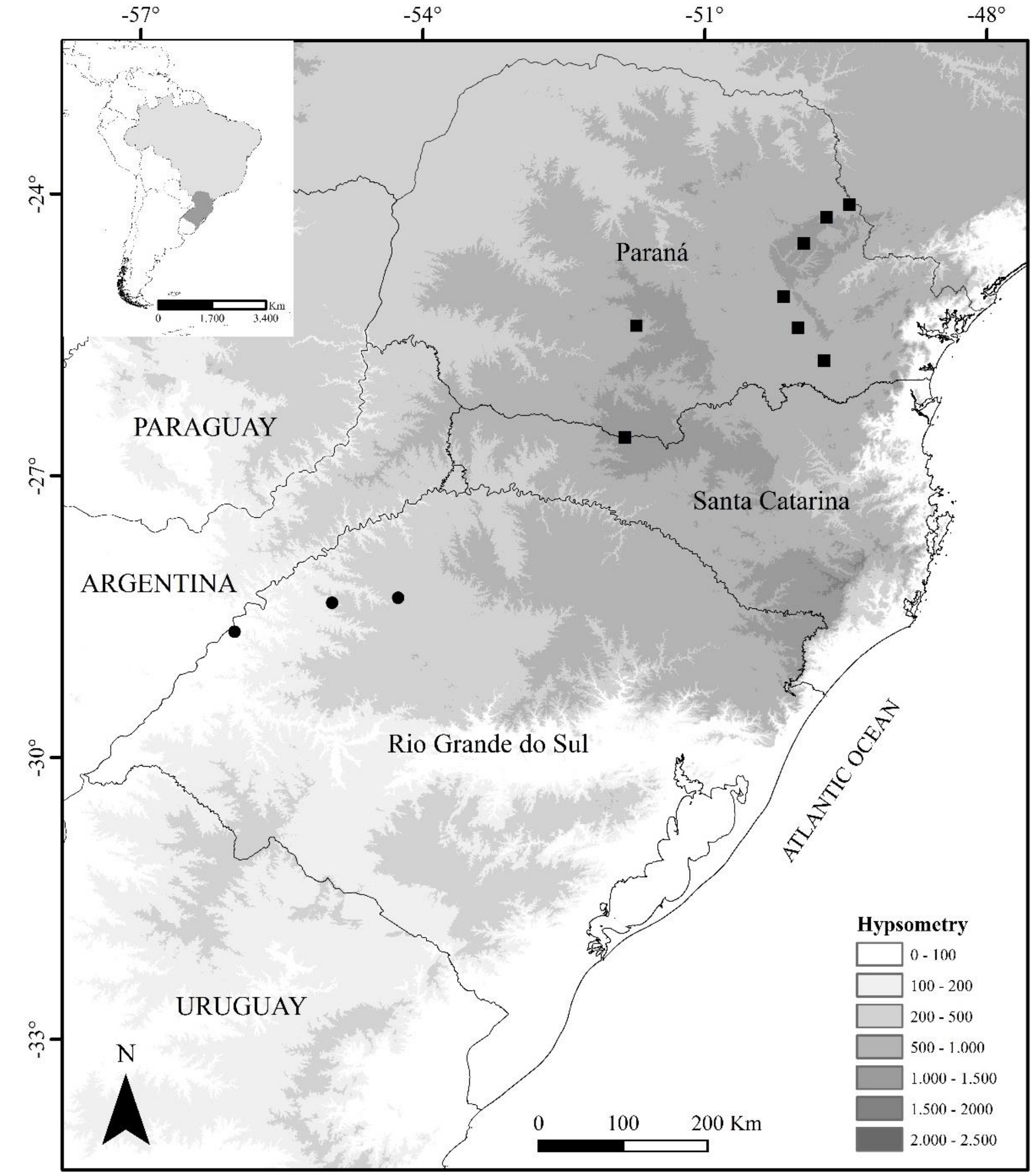

FIGURE 3: Distribution map of *Sisyrinchium angustius* (circle) and *S. brasiliense* (square) in Southern Brazil.

FIGURE 4. *Sisyrinchium brasiliense*. A. Habit. B. Synflorescence with dehiscent fruits. From *A.M. Aita & L. Eggers 12* (ICN), **r**eproduced from Aita (2013).

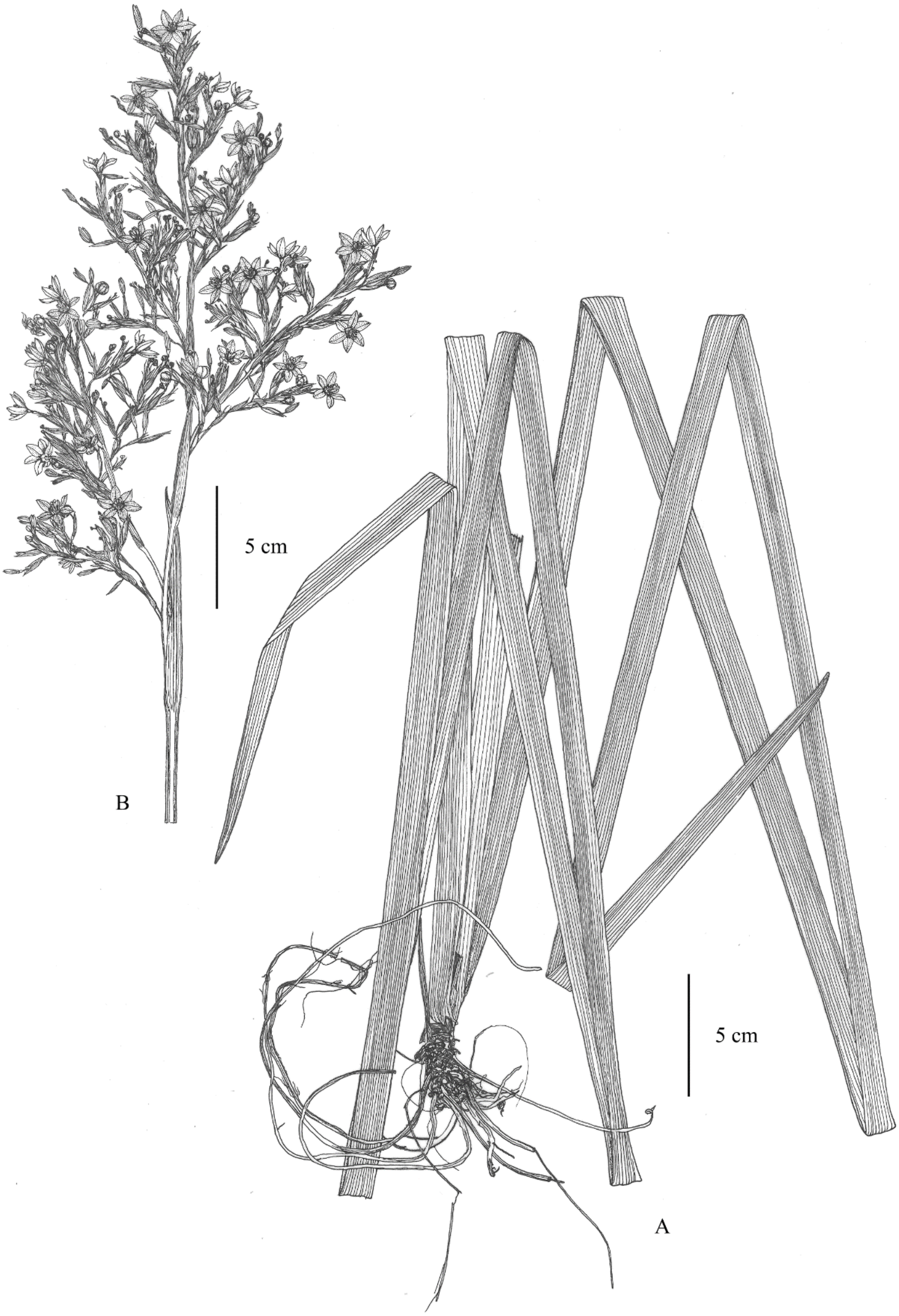

FIGURE 5. *Sisyrinchium bromelioides*. A. Habit. B. Synflorescence. From *C.D. Inácio et al. 140* (ICN), illustration by Anelise Scherer.

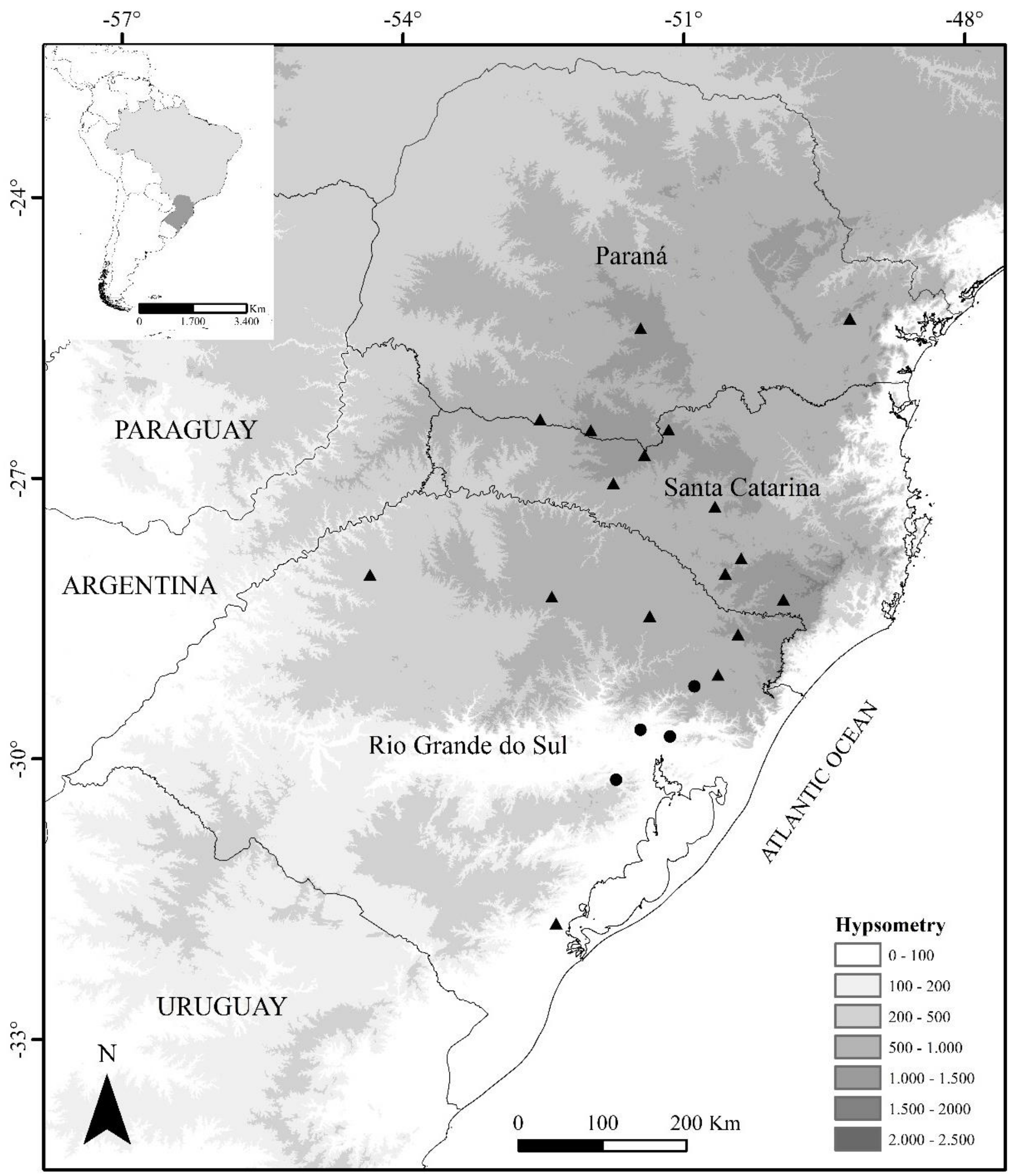

FIGURE 6: Distribution map of *Sisyrinchium bromelioides* (circle) and *S. paludosum* (triangle) in Southern Brazil.

FIGURE 7. *Sisyrinchium caeteanum*. A. Habit. B. Synflorescence. From *A.M. Aita & L. Eggers 124* (ICN), **r**eproduced from Aita (2013).

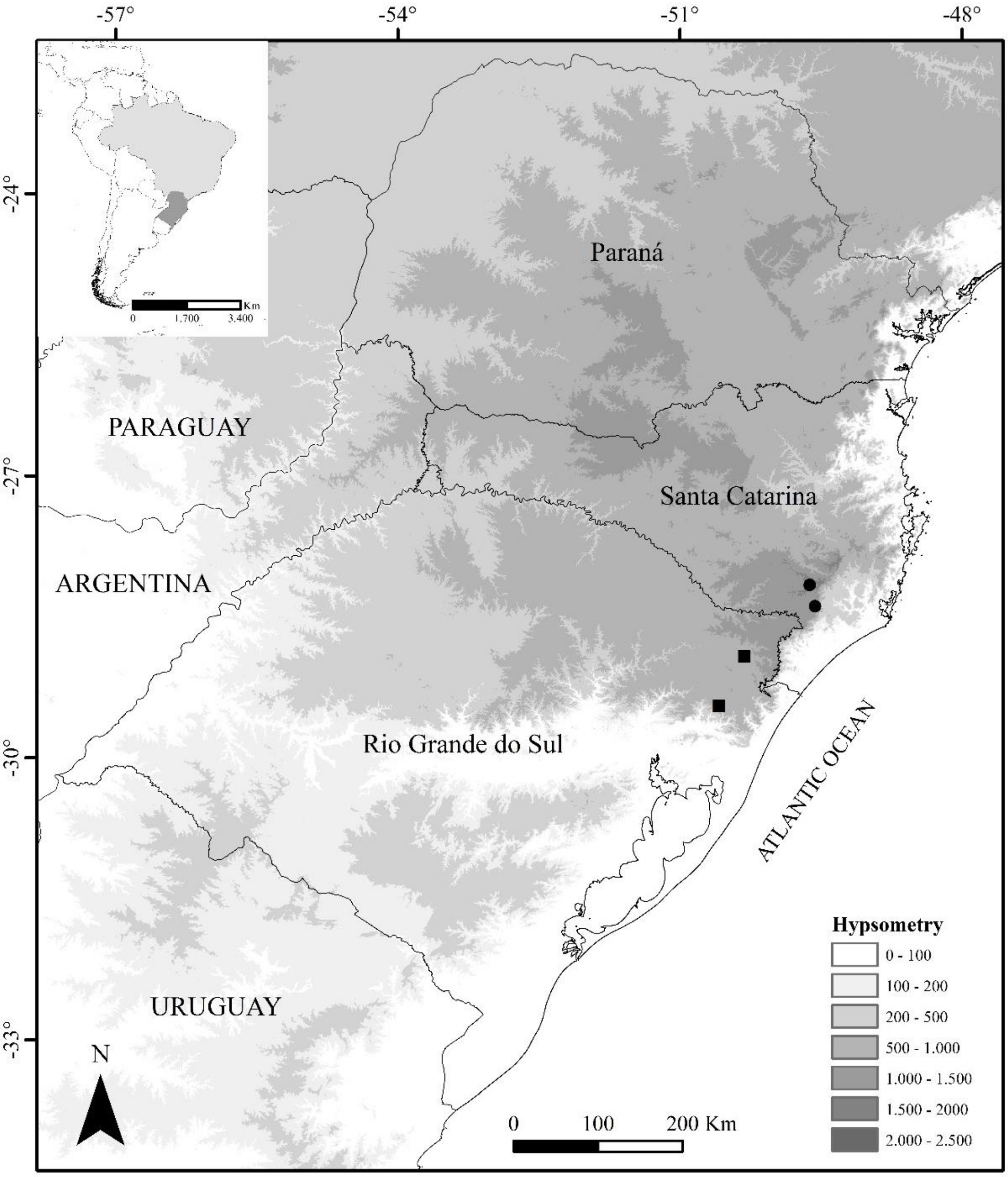

FIGURE 8: Distribution map of *Sisyrinchium caeteanum* (circle) and *S. flabellatum* (square) in Southern Brazil.

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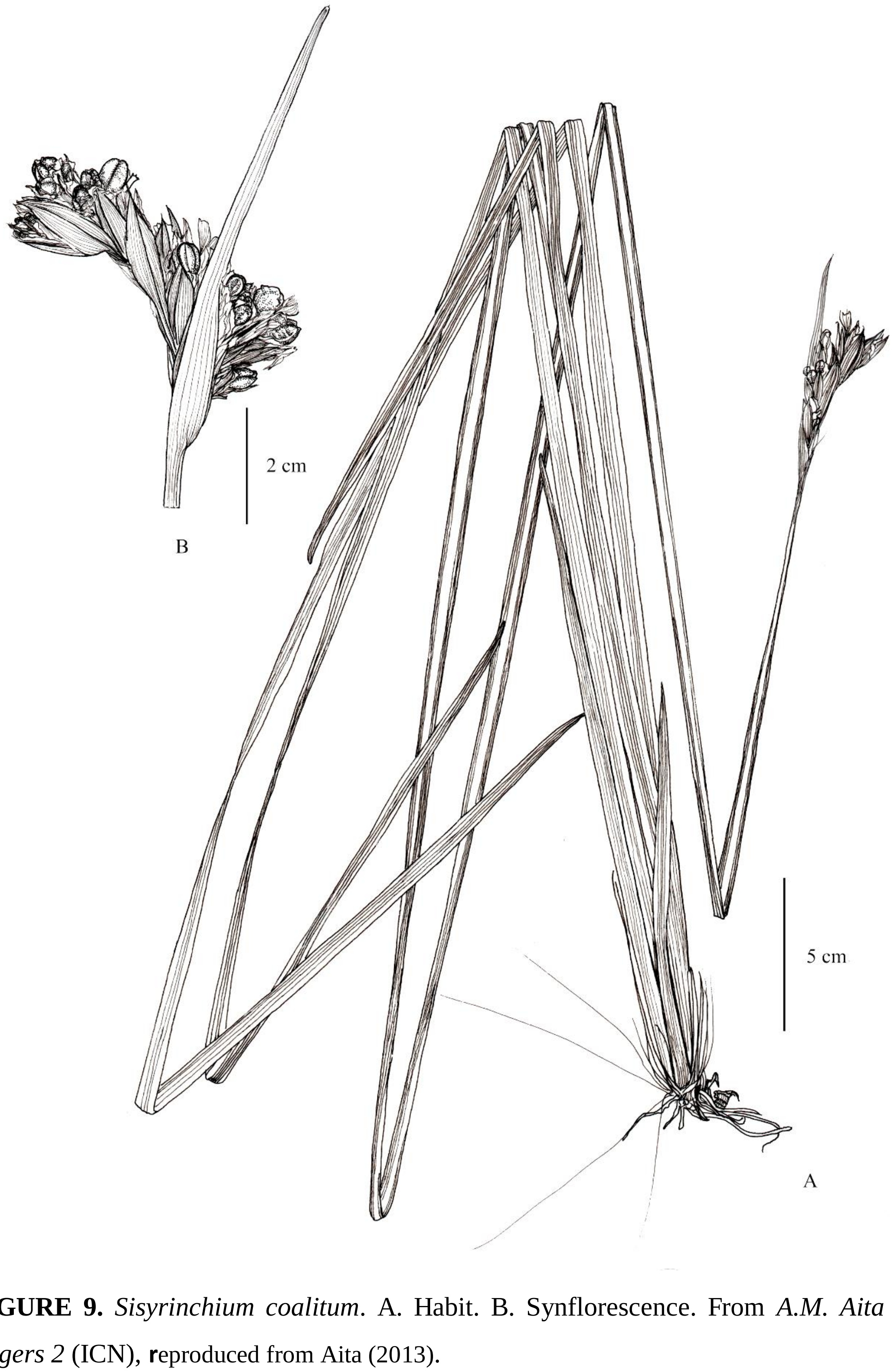

FIGURE 9. *Sisyrinchium coalitum*. A. Habit. B. Synflorescence. From *A.M. Aita & L. Eggers 2* (ICN), reproduced from Aita (2013).

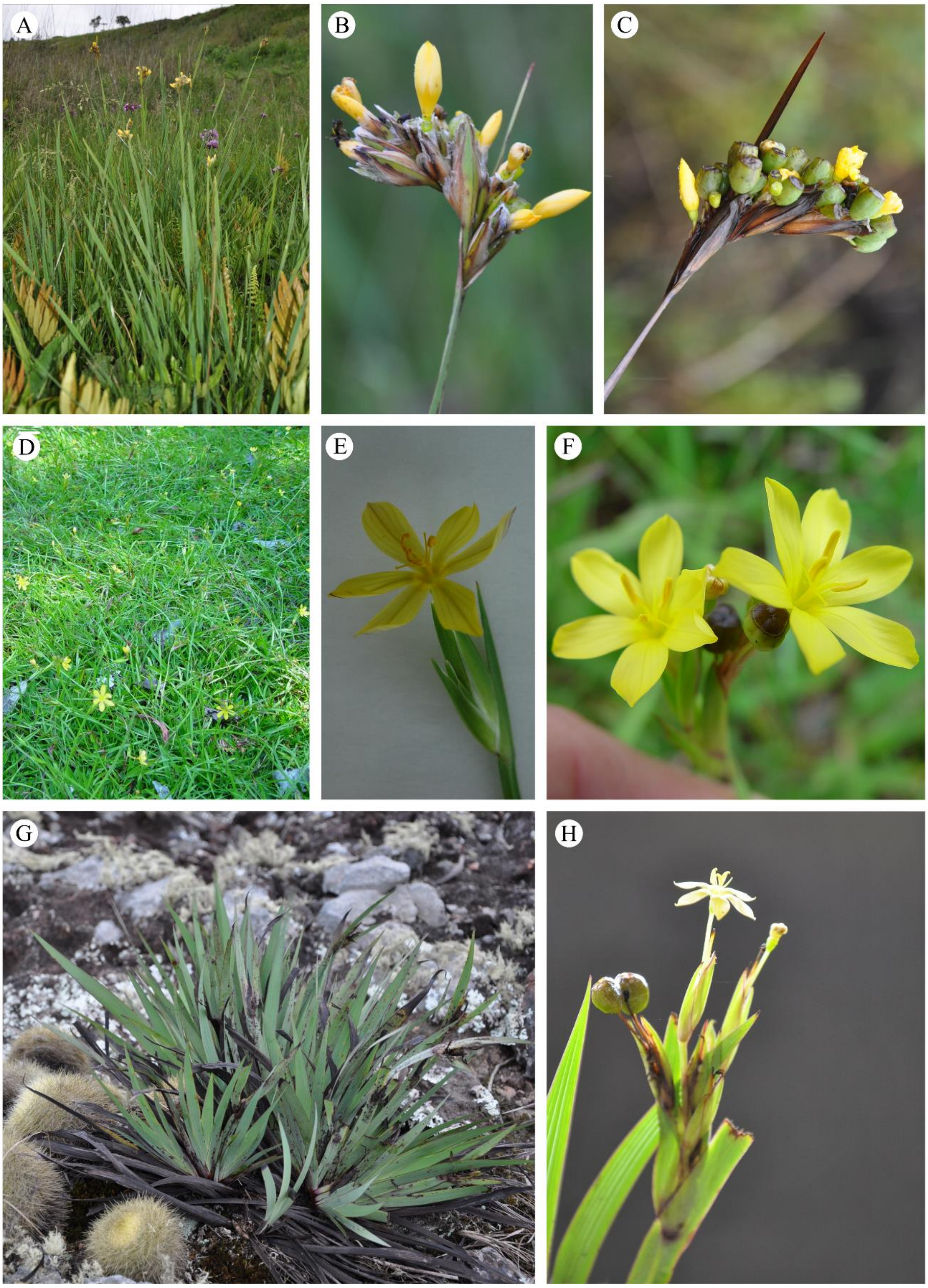

FIGURE 10. *S. coalitum* A. Habit. B. Synflorescence with membranaceous bracteoles exsert from the valves. *Sisyrinchium congestum*: C. Synflorescence. *Sisyrinchium decumbens*: D. Population in antropogenic habitat. E. Synflorescence. F. Flowers. *Sisyrinchium flabellatum*: G. Habit. H. Synflorescence. A–B: *L. Eggers & T.T. Souza-Chies 597* (ICN). C: *A.M. Aita & L. Eggers 15* (ICN). D–E: *L. Eggers & T.T. Souza-Chies 151* (ICN). F: *L. Eggers & T.T. Souza-Chies 570* (ICN). G–H: *L. Eggers & T.T. Souza-Chies 584* (ICN).

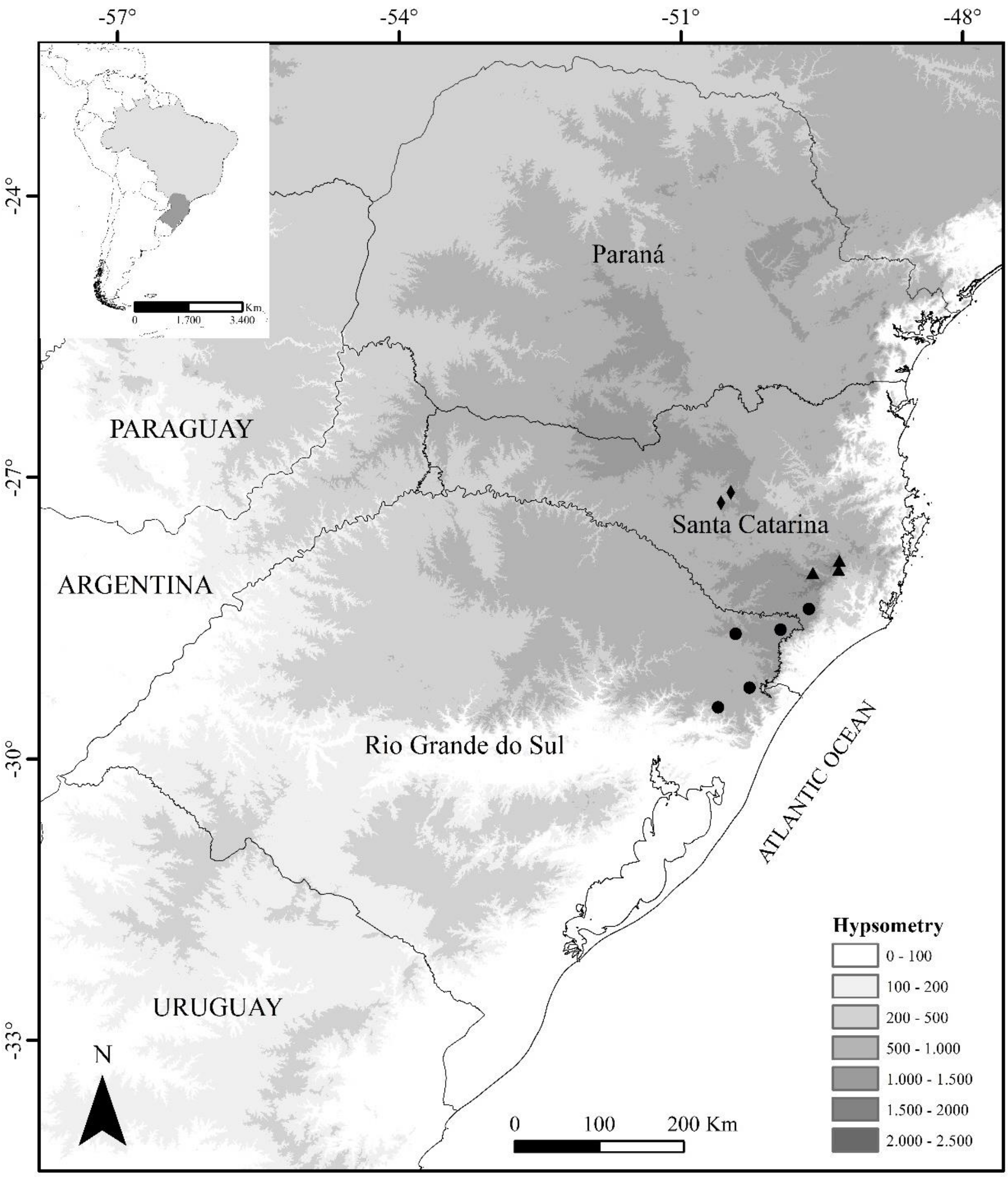

FIGURE 11: Distribution map of *Sisyrinchium coalitum* (diamond), *S. congestum* (triangle) and *S. decumbens* (circle) in Southern Brazil.

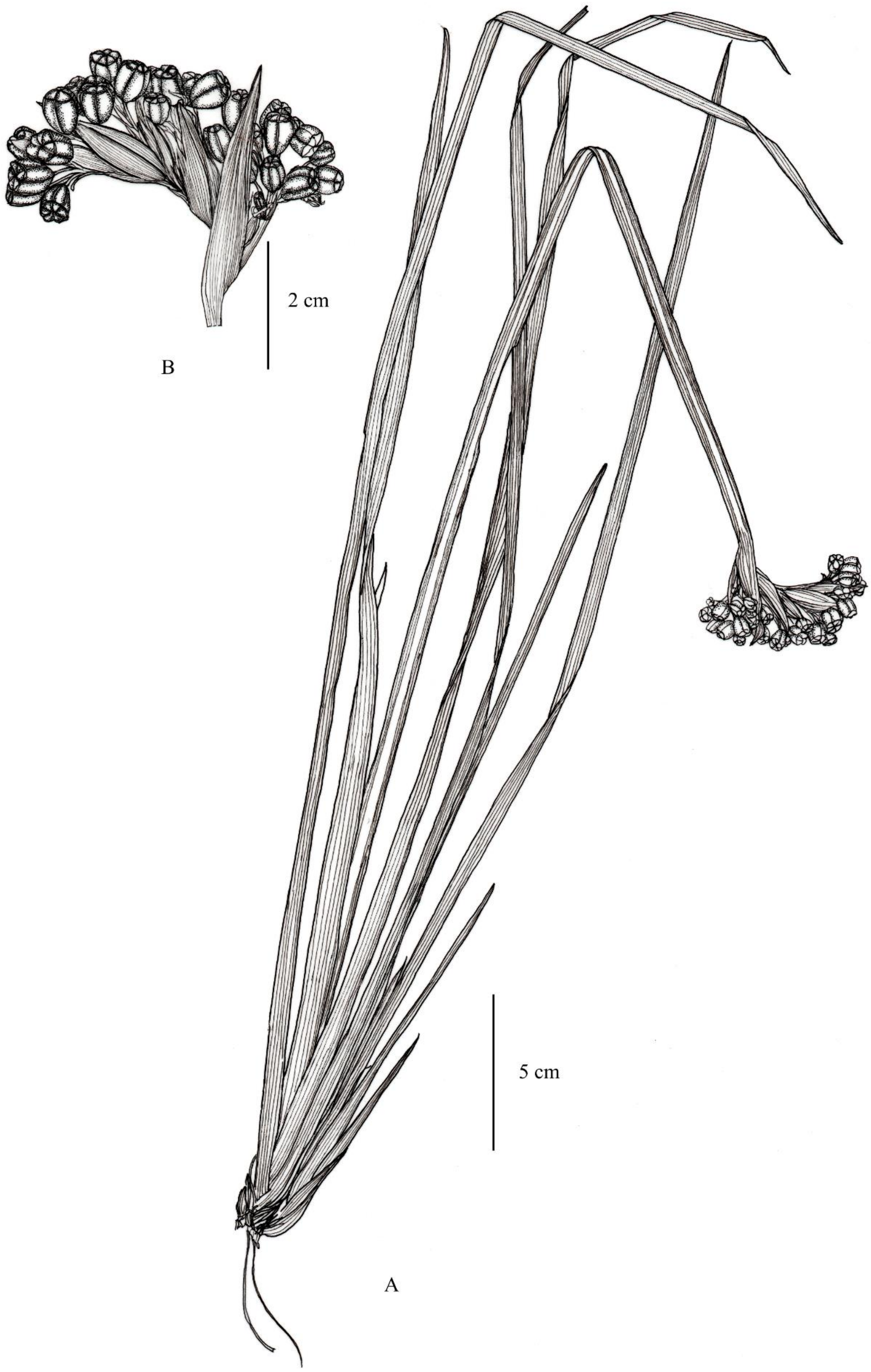

FIGURE 12. *Sisyrinchium congestum*. A. Habit. B. Synflorescence. From *A.M. Aita & L. Eggers 15* (ICN), reproduced from Aita (2013).

FIGURE 13. *Sisyrinchium decumbens*. A. Habit. B. Inflorescence. C. Synflorescence with pedunculate riphidia. From *A.M. Aita & L. Eggers* ***151*** **(ICN), r**eproduced from Aita *et al*. (2013).

FIGURE 14. *Sisyrinchium densiflorum*. A. Habit. B. Synflorescence. From *C.D. Inácio et al. 304 and 263* (ICN), illustration by Anelise Scherer.

FIGURE 15. *Sisyrinchium densiflorum*: A. Habit. B. Synflorescence with fruits. C. Flowers and fruits. *Sisyrinchium marginatum*: D. Habit. E. Synflorescence and flowers. F. Fruits. *Sisyrinchium nidulare*: G. Habit. H. Flowers. I. Fruits and flower. A−C: *C.D. Inácio & E.D. Lozano 304* (ICN). D−F: *C.D. Inácio & A.P. Schmitz 143* (ICN). G−I*: C.D. Inácio & E.D. Lozano 301* (ICN).

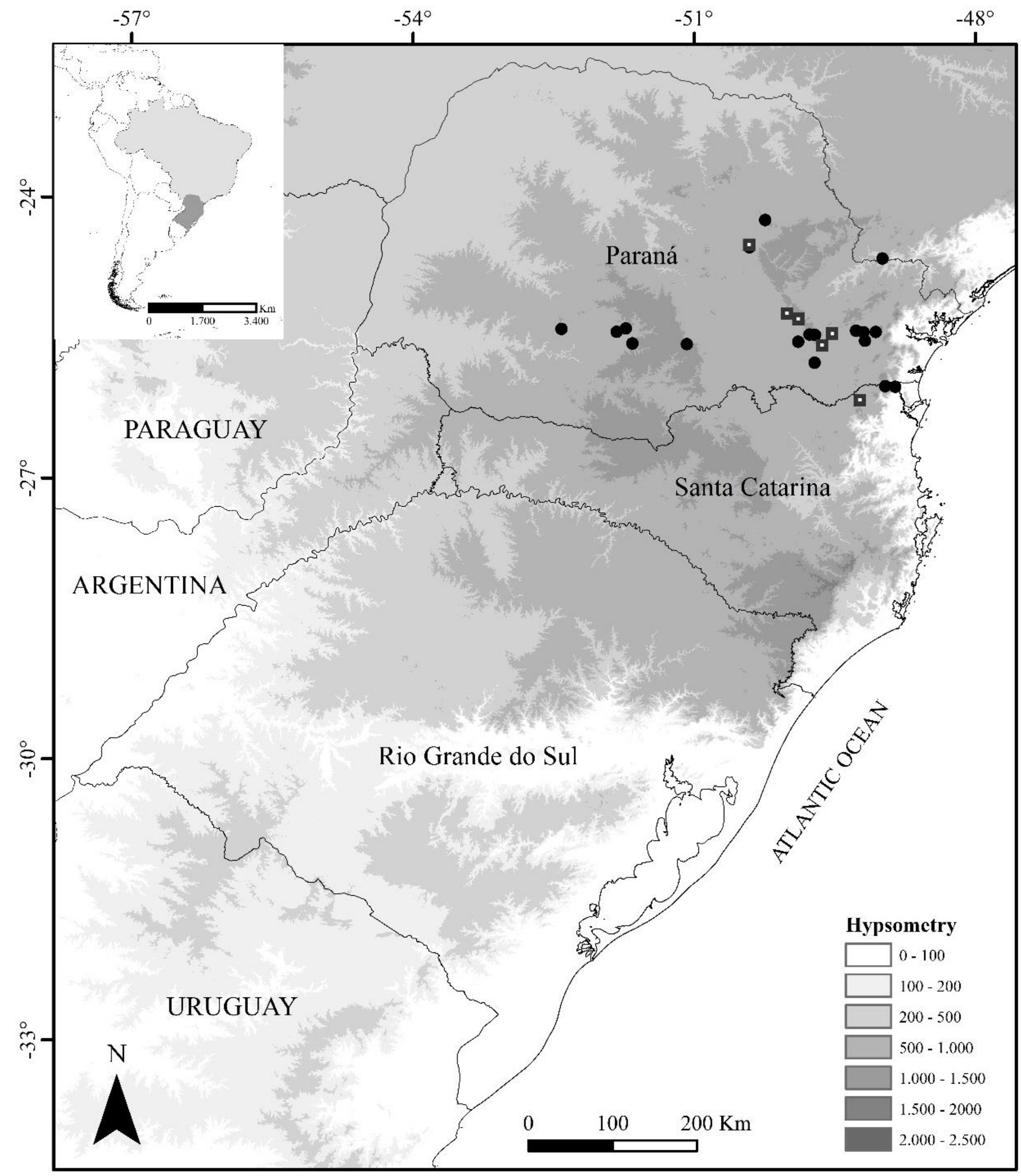

FIGURE 16: Distribution map of *Sisyrinchium densiflorum* (square) and *S. nidulare* (circle) in Southern Brazil.

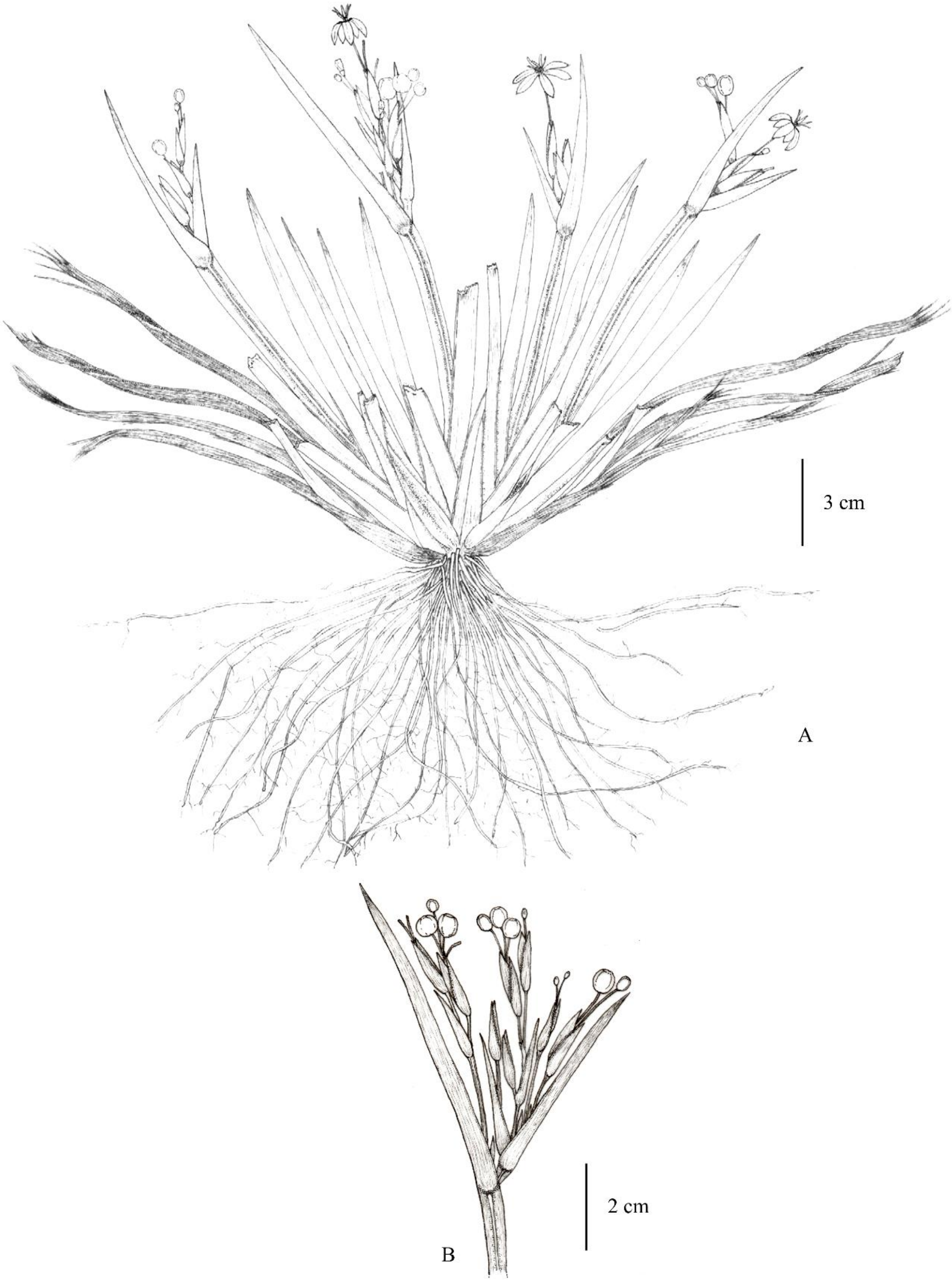

FIGURE 17. *Sisyrinchium flabellatum*. A. Habit. B. Synflorescence. From *L. Eggers & T.T. Souza-Chies 584* (ICN), reproduced from Aita *et al.* (2013).

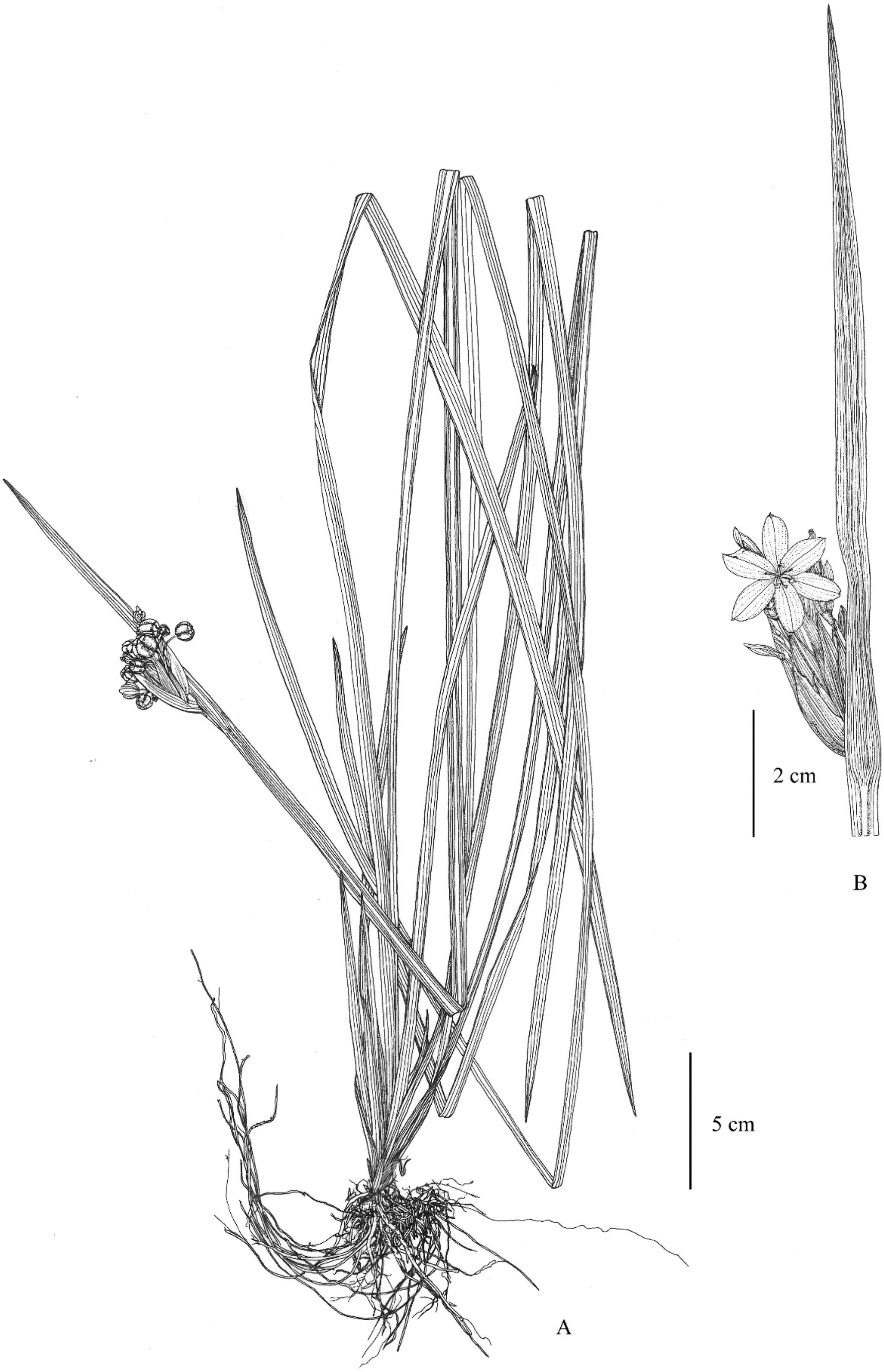

FIGURE 18. *Sisyrinchium marginatum*. A. Habit. B. Synflorescence. From *C.D. Inácio et al. 143* and *L. Eggers & T.T. Souza-Chies 132* (ICN), illustration by Anelise Scherer.

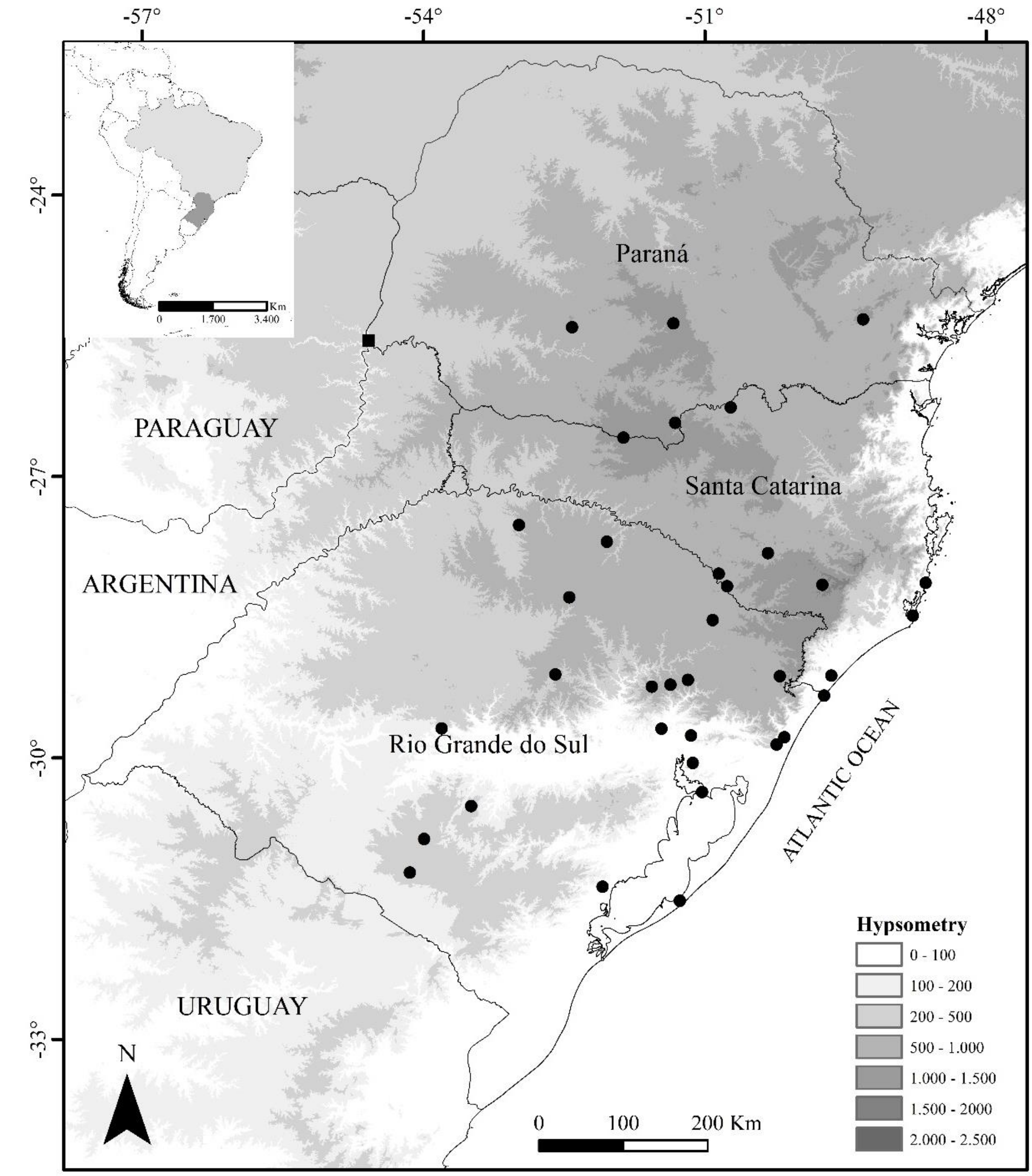

FIGURE 19: Distribution map of *Sisyrinchium marginatum* (circle) and *S. oxyspathum* (square) in Southern Brazil.

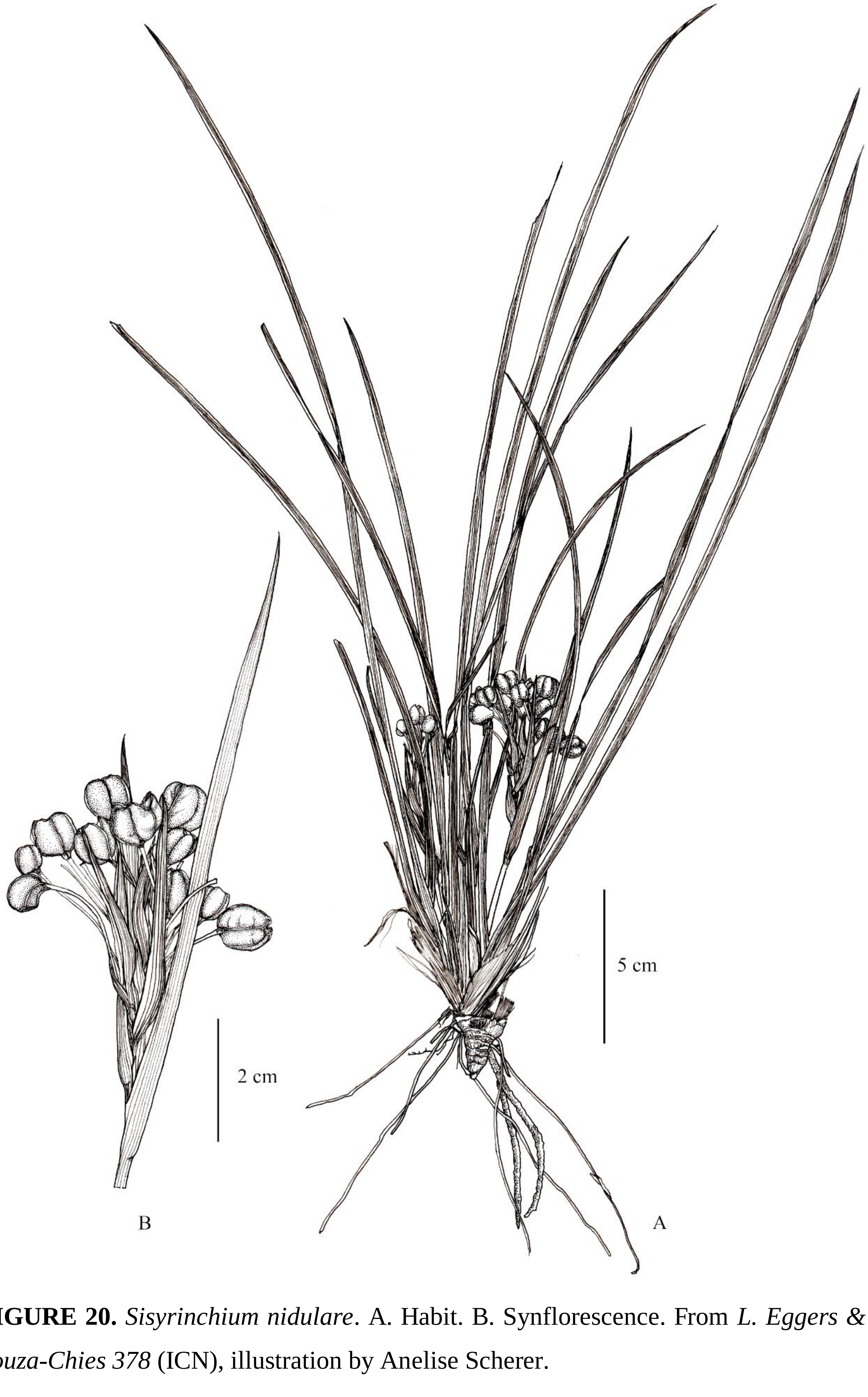

FIGURE 20. *Sisyrinchium nidulare*. A. Habit. B. Synflorescence. From *L. Eggers & T.T. Souza-Chies 378* (ICN), illustration by Anelise Scherer.

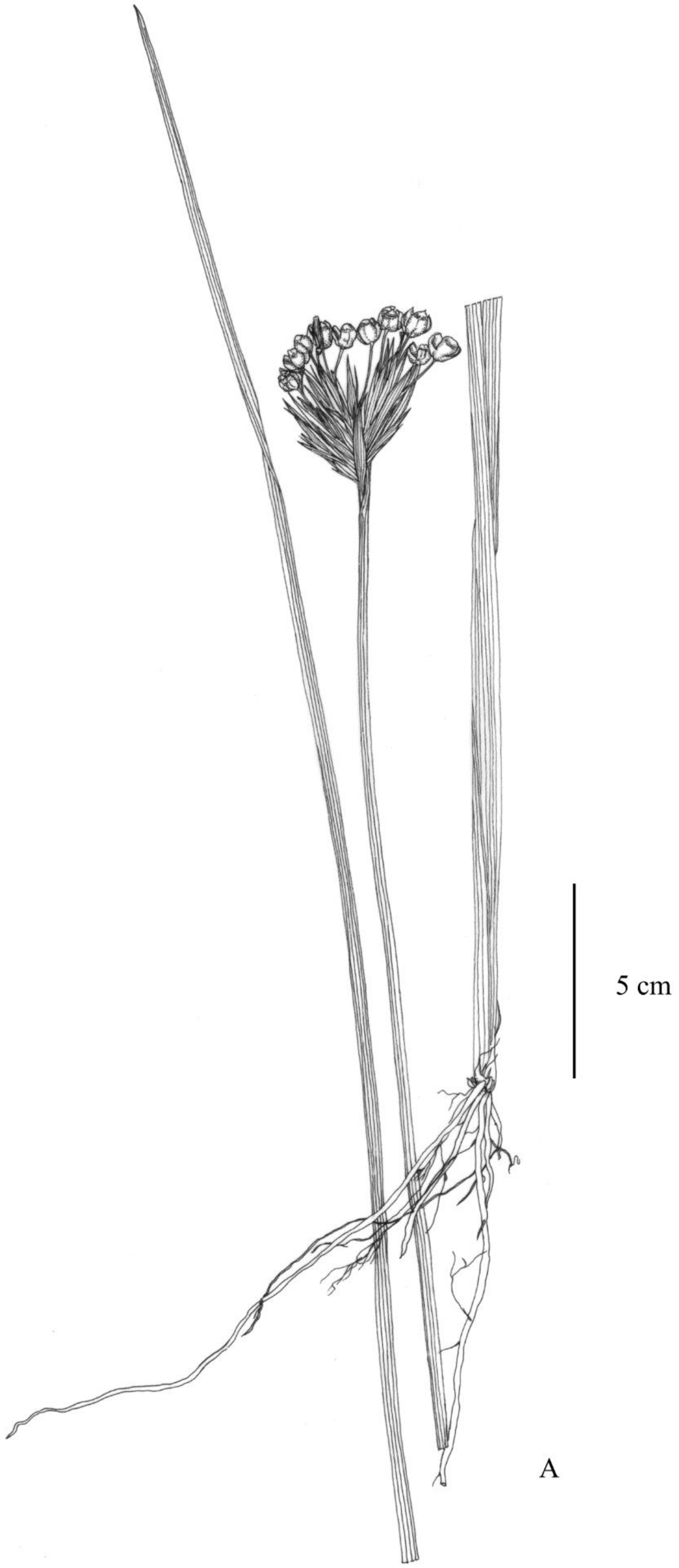

FIGURE 21. *Sisyrinchium oxyspathum*. A. Habit. From *José s.n.* (MBM 85455), illustration by Anelise Scherer.

FIGURE 22. *Sisyrinchium oxyspathum*: A. Synflorescence. *Sisyrinchium palmifolium*: B. Habit. C. Synflorescence and fruits. D. Flowers. E. Staminal column and style branches. *Sisyrinchium paludosum*: F. Collected sample. G. Synflorescence. A: *José s.n.* (MBM 85455). B−E: *C.D. Inácio et al. 132* (ICN). F−G: *L. Eggers & T.T. Souza-Chies 680* (ICN).

FIGURE 23. *Sisyrinchium palmifolium.* A. Habit. B. Synflorescence. From *A.M. Aita 102* (ICN), reproduced from Aita (2013).

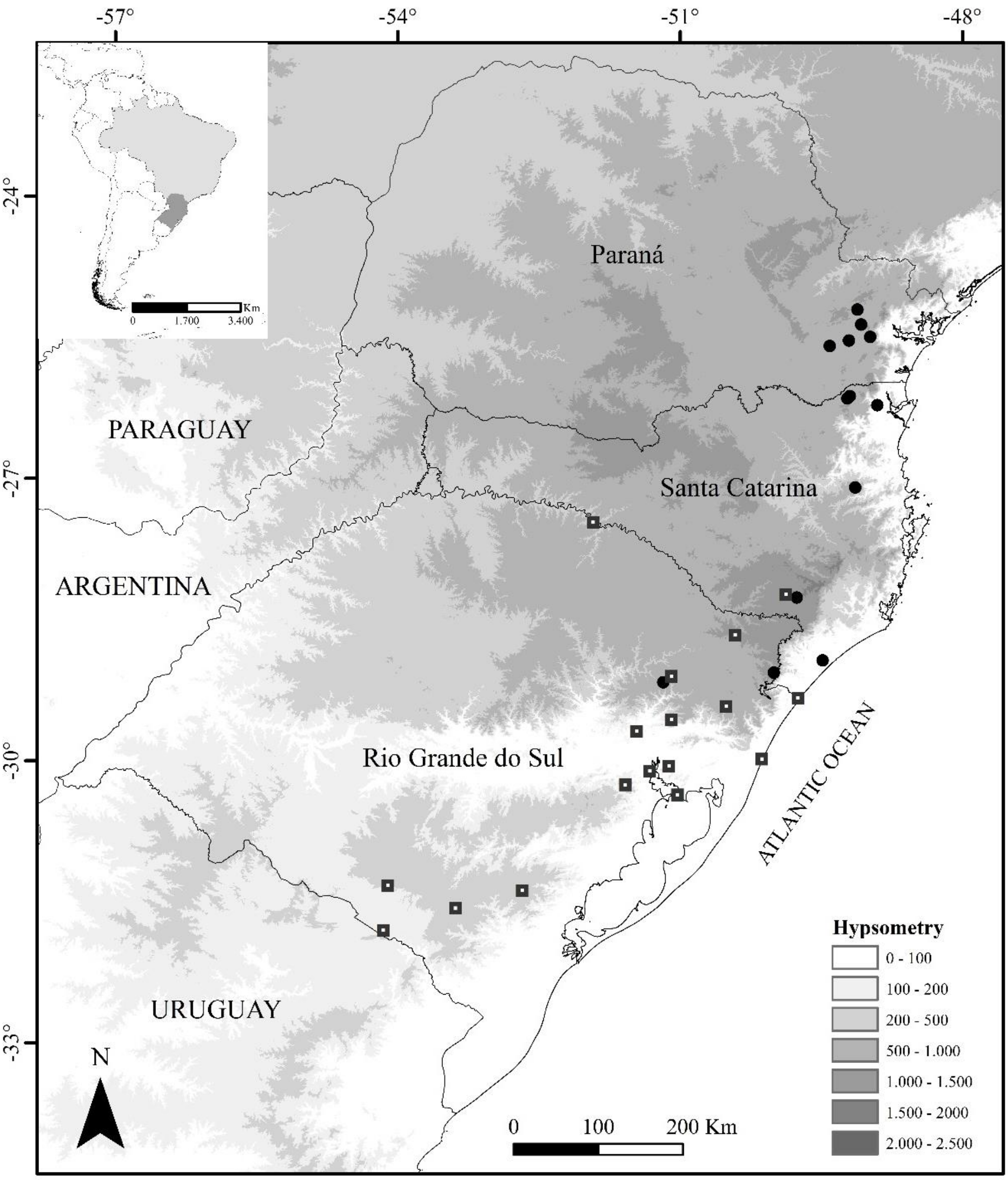

FIGURE 24: Distribution map of *Sisyrinchium palmifolium* (square) and *S. plicatulum* (circle) in Southern Brazil.

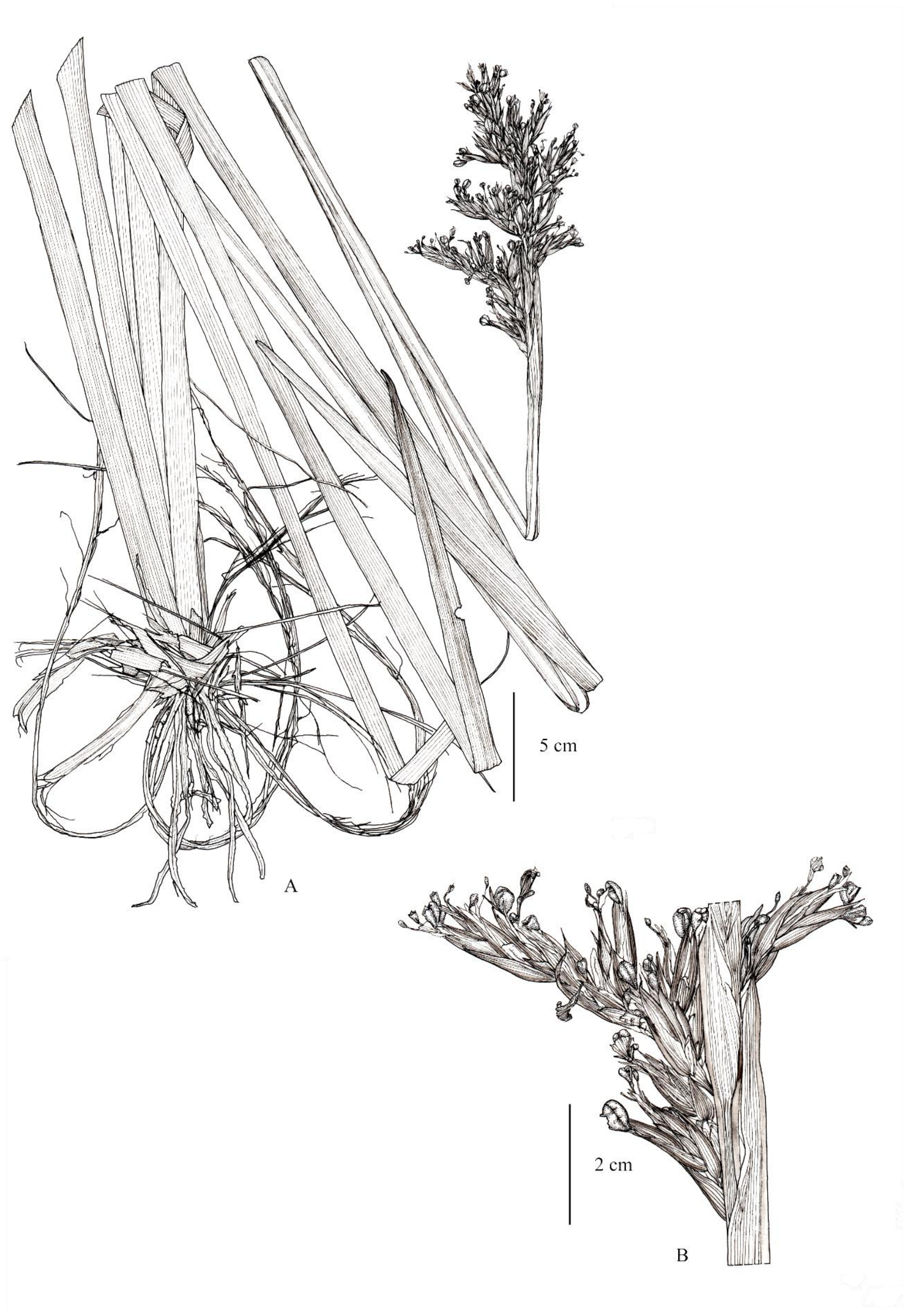

FIGURE 25. *Sisyrinchium paludosum*. A. Habit. B. Detail of part of the synflorescence. From *L. Eggers & T.T. Souza-Chies 567* (ICN), reproduced from Aita (2013).

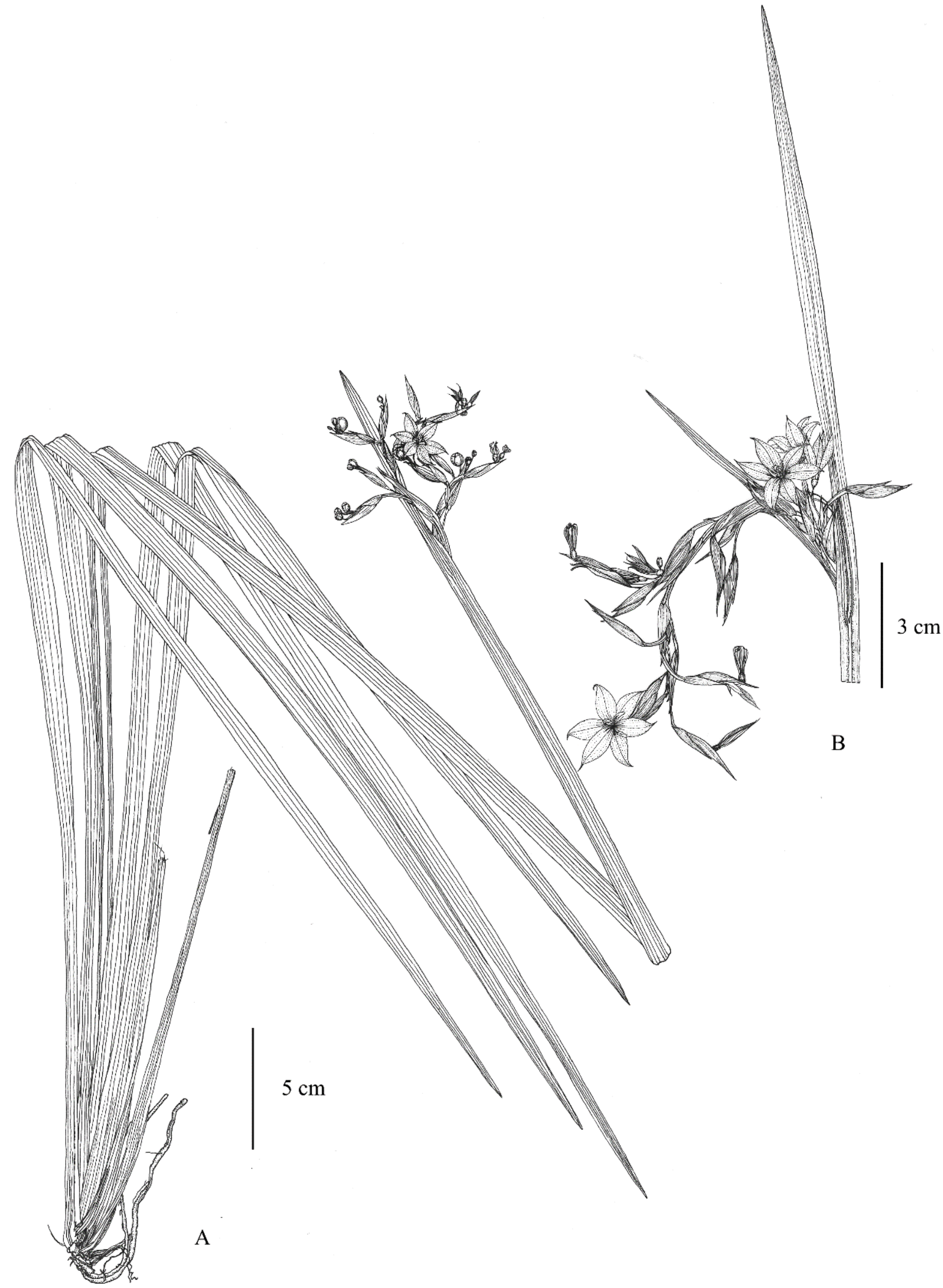

FIGURE 26. *Sisyrinchium plicatulum* Ravenna. A. Habit. B. Synflorescence. From *C.D. Inácio et al. 210* and *L. Eggers & T.T. Souza-Chies 320* (ICN), illustration by Anelise Scherer.

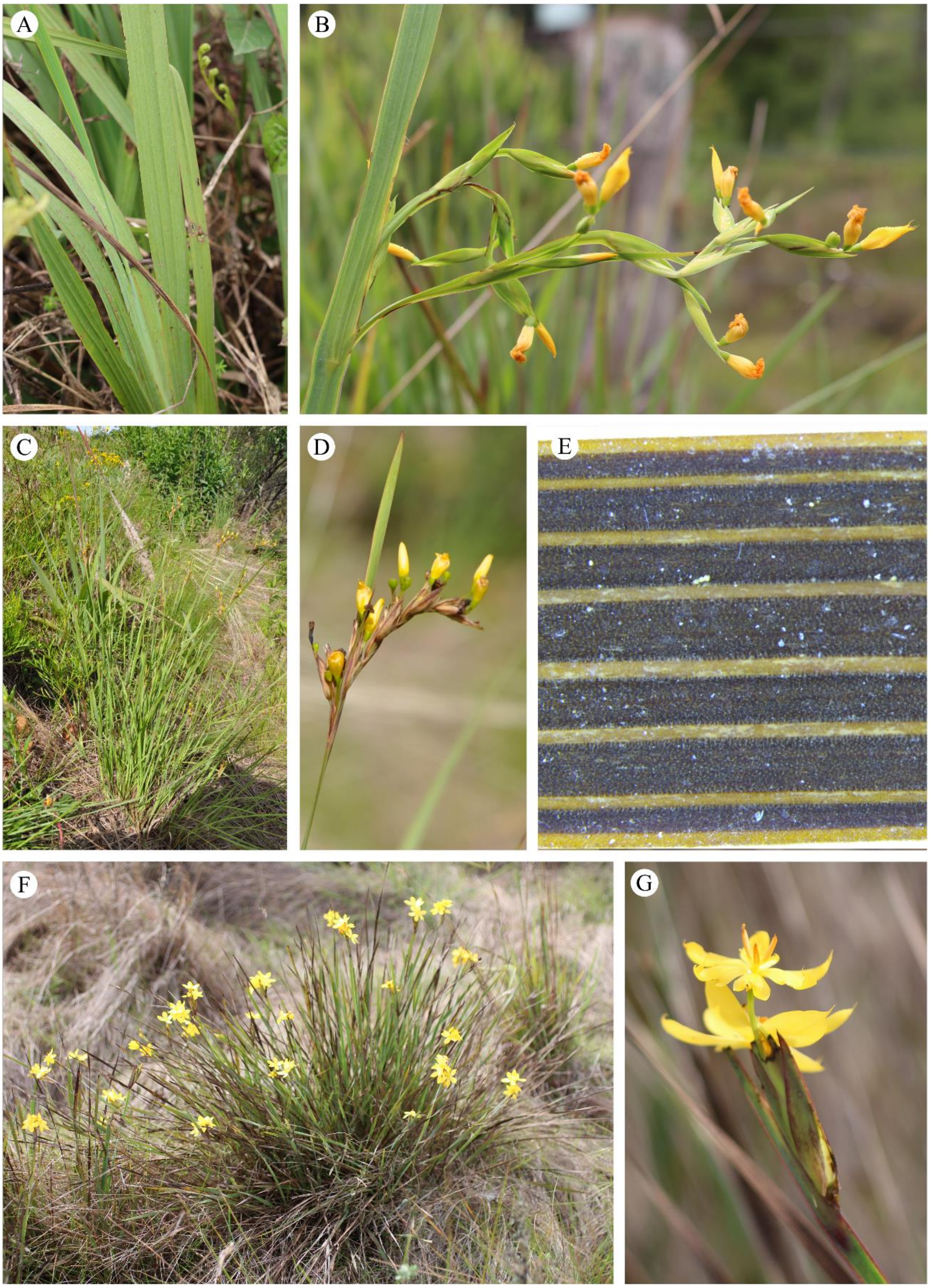

FIGURE 27. *Sisyrinchium plicatulum*: A. Plicate leaves. B. Synflorescence. *Sisyrinchium rectilineum*. C. Habit. D. Synflorescence. *Sisyrinchium wettsteinii*. E. Leaves with dense papillae. F. Habit. G. Synflorescence. A−B: *C.D. Inácio et al. 210* (ICN). C−D: A.M. Aita & L. Eggers 6 (ICN). E: *M. Wacket s.n.* (WU 65712!). F−G: *C.D. Inácio et al. 224* (ICN).

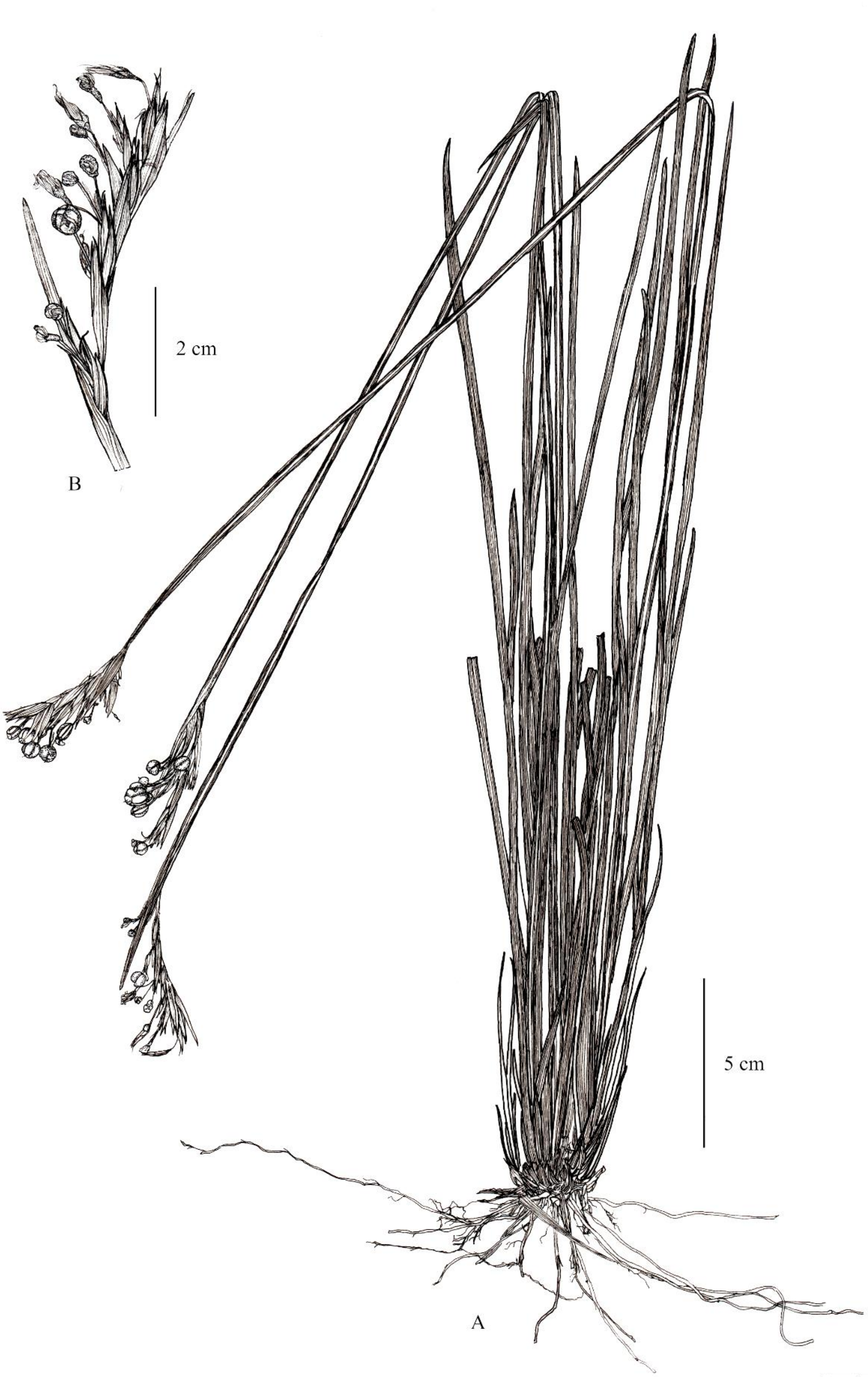

FIGURE 28. *Sisyrinchium rectilineum*. A. Habit. B. Synflorescence. From *A.M. Aita & L. Eggers 4* (ICN), reproduced from Aita (2013).

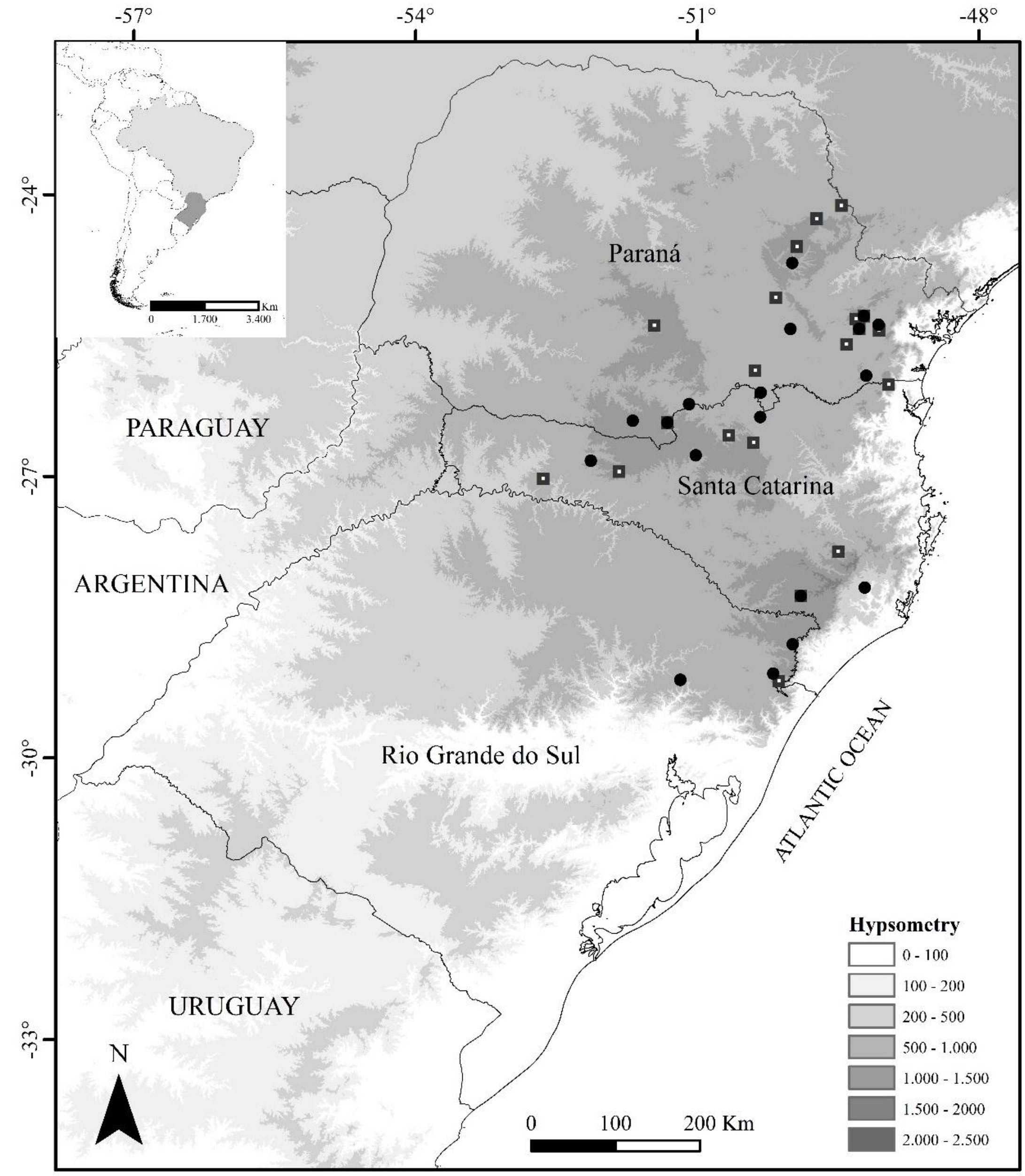

FIGURE 29: Distribution map of *Sisyrinchium rectilineum* (circle) and *S. wettsteinii* (square) in Southern Brazil.

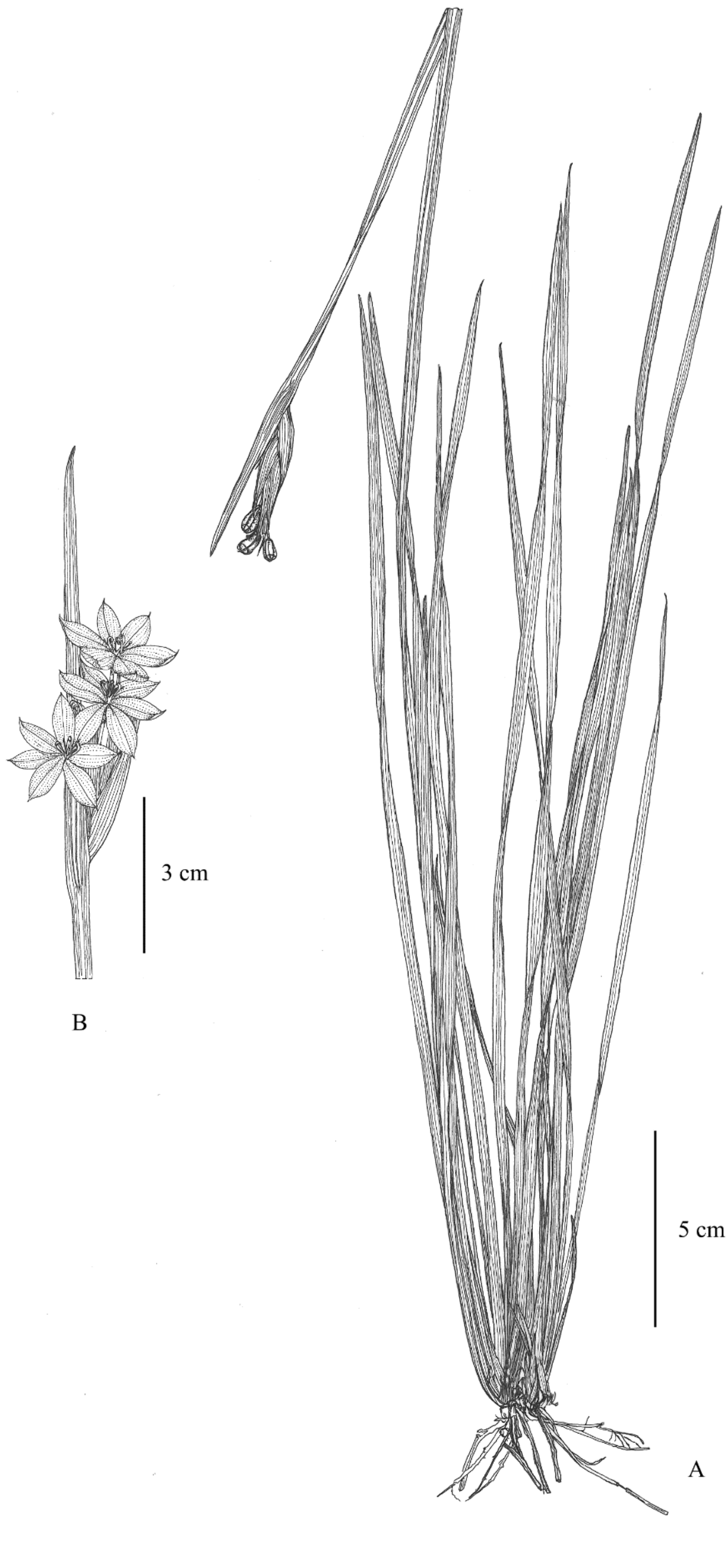

FIGURE 30. *Sisyrinchium wettsteinii*. A. Habit. B. Synflorescence. From *C.D. Inácio et al. 224* and *248* (ICN), illustration by Anelise Scherer.

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CONSIDERAÇÕES FINAIS

CONSIDERAÇÕES FINAIS

Os resultados desta pesquisa trouxeram importantes contribuições ao estudo de *Sisyrinchium* quanto a sua classificação infragenérica e ao estudo detalhado de táxons. Os trabalhos filogenéticos com o gênero (Chauveau *et al*. 2011; Karst & Wilson 2012) já indicavam a necessidade de uma revisão das seções até então propostas com base em caracteres morfológicos. Tendo em vista uma taxonomia integrativa, muito importante quando se trabalha com táxons de complexa história evolutiva, foi apresentada, no primeiro capítulo desta tese, a análise reunindo dados morfológicos, moleculares e biogeográficos a fim de caracterizar categorias taxonômicas com mais precisão. O resultado desta análise foi a circunscrição de dez seções, sendo sete retrabalhadas em relação aos caracteres morfológicos diagnósticos e três novas seções, com base em amostragem de cerca de 50% da diversidade do gênero. Não foram encontradas sinapomorfias morfológicas individuais que sustentassem essa classificação, assim, o uso de sinapomorfias moleculares associadas a um conjunto de caracteres morfológicos possibilitou a caracterização das seções. O estudo evidenciou também 11 espécies ainda não descritas pela ciência, com base nos marcadores moleculares utilizados. Três destas espécies estão descritas no segundo capítulo deste trabalho, uma da seção *Viperella* e duas da seção *Cephalanthum*. As demais espécies (ou morfoespécies) necessitam de mais coletas e, eventualmente, estudos com outras abordagens para auxiliar na sua delimitação. A classificação infragenérica aqui proposta poderá delimitar futuros estudos taxonômicos em toda a distribuição geográfica do gênero.

A revisão taxonômica das seções *Cephalanthum* e *Viperella* (*pro parte*), juntamente com a descrição das três espécies novas e uma espécie relacionada, permitiu confirmar a ocorrência de 41 táxons destes grupos para a Região Sul do Brasil, superando os dados disponíveis ao início deste estudo. Em 2010, a lista de espécies de *Sisyrinchium* para o Brasil era de 58 e para a Região Sul havia 48 confirmados (Eggers 2010). Somando os 41 táxons aqui apresentados aos cerca de 20 que faltam ser finalizados para a completa revisão taxonômica da Região Sul (dez restantes da seção *Viperella*, relacionados a *S. vaginatum* e dez pertencentes a outras seções menores), totaliza-se 61 táxons, número superior ao estimado para o Brasil em 2010.

A revisão nomenclatural dos táxons de *Sisyrinchium* na América do Sul, tanto para o Brasil, quanto para outros países, necessita ainda ser continuada, pois muitas espécies não tem a indicação de um holótipo, somente síntipos. Além disto, diversas espécies descritas por Ravenna apresentam holótipos não acessíveis (por estarem em seu próprio herbário, incendiado?) ou estes não estão nos herbários indicados por ele. No presente estudo, foram designados 11 lectótipos e três neótipos. Nesse processo, cabe destacar a importância das revisões dos principais herbários da Região Sul, de importantes herbários do Rio de Janeiro e São Paulo, da Argentina, do Uruguai e das coleções emprestadas dos herbários GH, NY e US, nos quais inúmeros materiais tipo foram localizados e puderam ser analisados, já que uma revisão ampla do gênero para a Região Sul do Brasil nunca havia sido realizada.

Considerando a distribuição geográfica dos táxons até o momento estudados, tem-se um total de 21 táxons exclusivos do Brasil. Destes, 16 táxons são exclusivos da Região Sul do Brasil, dentre os quais, quatro táxons só ocorrem no Paraná (*S. brasiliense, S. purpurellum* subsp. *trichospathum, S. sectiandrum, S. teleanthum*); quatro estão distribuídos somente em Santa Catarina (*S. albilapidense*, *S. caeteanum*, *S. coalitum*, *S. congestum*); dois ocorrem apenas no Rio Grande do Sul (*S. bromelioides*, *S. flabellatum*); e os outros seis estão presentes em dois ou nos três Estados da Região Sul (*S. decumbens*, *S. densiflorum*, *S. elegantulum*, *S. paludosum*, *S. pendulum*, *S. purpurellum*).

Sisyrinchium platycaule e *S. oxyspathum* são novas ocorrências para o Brasil e *S. albilapidense* e *S. elegantulum* foram pela primeira vez recoletados, após a descrição original.

Dos 41 táxons aqui apresentados, somente *S. teleanthum* (seção *Cephalanthum*) e *S. oxyspathum* (seção *Viperella*) não foram encontrados nas expedições a campo realizadas, e as descrições foram baseadas em material de herbário (uma exsicata de cada) e no protólogo. O local da coleta de *S. teleanthum* (Paraná, Tijucas do Sul, Rincão) não pode ser explorado por falta de informações precisas e a coleta data de 1961, devendo-se realizar outras expedições à região para certificar a existência da espécie. Quanto a *S. oxyspathum*, não foi possível realizar coletas na região de Foz do Iguaçu, para que se pudesse obter mais material, tendo sido o material da descrição original coletado em 1982.

Sisyrinchium hasslerianum e *S. fasciculatum* (seção *Cephalanthum*) são espécies muito semelhantes na parte vegetativa. A diferença observada para os dois táxons foi a densidade de tricomas na coluna estaminal. Conforme relatado nos comentários, estas espécies tem sido objeto de divergência entre diferentes pesquisadores. Assim, sugere-se um maior número de coletas e observação de plantas na natureza, estudos de biologia reprodutiva e outras abordagens para complementar as análises.

Sisyrinchium purpurellum subsp. *purpurellum* (seção *Cephalanthum*) apresenta um parátipo que consideramos que difere muito dos demais (*Hatschbach 27582* NY!), como mencionado nos comentários. As coletas *C.D. Inácio et al. 109, 123, 231* (ICN!), *L. Eggers & T.T. Souza-Chies 93, 126, 689* (ICN!) e *L. Eggers et al. 832* (ICN!) são similares a este parátipo. Acreditamos que estas amostras devem ser analisadas detalhadamente e novas coletas devem ser feitas nestas regiões para que seja possível determinar se esta variação faz parte da variabilidade morfológica de *S. purpurellum* subsp. *purpurellum* ou se pode se tratar de um novo táxon.

Ainda com relação a táxons da seção *Cephalanthum*, *S. luzula*, amplamente citado em referências bibliográficas e com uma distribuição geográfica que, com certeza, excede sua ocorrência natural, não foi apresentado aqui, pois concluímos que é uma espécie que não ocorre na Região Sul. *Sisyrinchium luzula* Klotzsch ex Klatt foi inicialmente descrita para Minas Gerais, mas diversos materiais com morfologia semelhante (ou seja, folhas e escapos teretes, sinflorescência fasciculiforme e flores purpúreas) foram determinados como *S. luzula*. A respeito da cor da flor desta espécie, cabe destacar que há uma confusão com relação a esta informação, visto que no protólogo (Klatt 1861-1862a) ela está indicada como "*floribus roseis*" e, no entanto, no tipo, verifica-se a indicação "*fl. auri*". Provavelmente, há um engano na descrição de Klatt, pela possível análise de material de exsicatas, *in siccum*, visto que, inequivocamente, a espécie apresenta flores amarelas. Na Região Sul, há ainda espécimes que não se encaixam nas descrições das espécies deste grupo e que precisam ser melhor analisadas.

Em relação a seção *Viperella*, *S. caeteanum* foi descrito para Minas Gerais (MG), mas o único material tipo não foi possível de ser acessado e nenhum outro material foi visto com esta identificação. Foi realizada uma expedição de coleta a MG, mas a espécie não foi encontrada. Também foram consultadas imagens de espécimes do grupo de táxons relacionados a *S. palmifolium* dos herbários de MG, pelo *SpeciesLink* e não foram encontradas coletas para a mesma localidade ou que concordem com a descrição. Diante disto, julgamos ser adequado designar um neótipo para a espécie que, mesmo sendo de outra região (Santa Catarina), possui medidas de acordo com o protólogo, com pequenos ajustes.

Sisyrinchium nidulare (seção *Viperella*) apresenta grande variação morfológica, desde folhas estreitas a mais largas, de escapos curtos a longos. Estudos focados nestes morfotipos poderiam auxiliar em uma circunscrição mais precisa da espécie, tendo em vista que quando as folhas são mais largas e o escapo não é curto, os espécimes se assemelham muito a *S. densiflorum*.

Sisyrinchium palmifolium e outras espécies relacionadas (seção *Viperella*), abordadas ou não neste trabalho (*e.g. S. palmifolium* subsp. *fuscoviride* (Ravenna) Ravenna) necessitam ainda de estudos e/ou análises estatísticas multivariadas, biologia reprodutiva ou outras abordagens (como moleculares ou anatômicas) para esclarecimento de sua circunscrição. Consideramos que o grande problema com relação a estas espécies é o entendimento do desenvolvimento da inflorescência. As flores das espécies da seção *Viperella* são muito semelhantes, o que levou pesquisadores à sinonimização de vários táxons, no entanto, analisando as sinflorescências, percebem-se diferentes conformações e, em uma mesma espécie, um tipo de sinflorescência não se transforma em outro.

Sisyrinchium marginatum é apresentado neste trabalho como um nome válido, após, por centenas de anos, ser considerado sinônimo de *S. palmifolium*. Embora agora possamos indicar algumas diferenças bastante nítidas, certas particularidades foram reveladas em um estudo de biologia reprodutiva e do sistema de polinização em populações de *S. palmifolium* e *S. marginatum*, no Parque Estadual de Itapuã, Rio Grande do Sul (dados não apresentados aqui), o qual evidenciou que as espécies apresentam diferenças no horário de abertura floral, na diversidade de polinizadores e no tamanho de frutos, reiterando a distinção entre elas.

Sisyrinchium rectilineum (seção *Viperella*) é outra espécie que apresenta considerável variabilidade, principalmente com relação à presença de papilas na superfície foliar. Conforme já abordado, consideramos que a presença e densidade de papilas deveriam ser melhor investigadas. Atualmente, não temos certeza a que nível uma variação neste caráter poderia ser uma resposta ao ambiente ou se é um caráter intrínseco, estável. *Sisyrinchium paludosum* é uma espécie que pode ou não apresentar papilas enquanto, *S. wettsteinii* tem papilas em grande densidade.

Em geral, consideramos que estudos específicos sobre a organização das sinflorescências, análises multivariadas de caracteres e pesquisas de biologia da reprodução e polinização auxiliarão no entendimento de outras espécies do gênero e, principalmente, na delimitação de táxons próximos, evitando a aplicação de nomes duvidosos. Além destas abordagens, pesquisas com anatomia comparada, filogeografia e genética de populações também podem contribuir para esclarecimentos taxonômicos no gênero.

Os dados obtidos neste estudo permitiram ampliar os conhecimentos sobre o gênero *Sisyrinchium* e fornecer informações para a identificação das espécies através das chaves de identificação, ilustrações, fotos, distribuição geográfica e comentários. Espera-se que os problemas taxonômicos ainda existentes sejam motivo de investigação em futuros estudos.

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ANEXO

MATERIAL EXAMINADO ADICIONAL

SEÇÃO CEPHALANTHUM

Sisyrinchium commutatum subsp. commutatum

Brazil						
Bahia		Morro do Chapéu: Cachoeira do Rio Ferro Doido. Trilha que liga a estrada do feijão ao vale.	30 April 1999	*F. França et al.*	*2760*	SPF
Rio de Janeiro		Serra do Itatiaia	October 1903	*P. Dusén*	*2101*	R
Minas Gerais	**Caldas**		29 October 1864	*A.F. Regnell*	*1444*	R 51305, 51286
Minas Gerais	**Camanducaia**	Estrada secundária entre Camanducaia e Monte Verde	07 November 2014	*C.D. Inácio et al.*	*293*	ICN
Minas Gerais	**Camanducaia**	Monte Verde, Campo de Altitude Impactado	21 October 2002	*L.D. Meireles*	*1235*	UEC
Minas Gerais	**Camanducaia**	Monte Verde, Campo de Altitude Impactado	22 October 2002	*L.D. Meireles*	*1240*	UEC
Minas Gerais	**Poços de Caldas**	Parque Nacion Neto. Potrero 30	30 September 1999	*E. Tameirão Neto*	*2974*	SPF
Minas Gerais	**Poços de Caldas**	Campo do Saco	04 September 1980	*H.F. Leitão Filho et al.*	*40*	UEC
Minas Gerais	**Poços de Caldas**	Próximo a Poços de Caldas.	30 September 1980	*H.F. Leitão Filho et al.*	*57*	UEC
Minas Gerais	**Poços de Caldas**	Pedra Balão.	07 September 1978	*L.d´A. Freire de Carvalho*	*1014*	RB
Minas Gerais		km 421 da BR-3, 1400	01 November 1964	*H. Sick & G.F.J. Pabst*	*8283*	LP
Paraná				*J.C. Lindeman & J.H. Haas*	*3274*	RB
Paraná	**Candói**	BR 277, km 385, em direção à Guarapuava	19 November 2010	*L. Eggers & T.T. Souza-Chies*	*616*	ICN
Paraná	**Castro**	PR 151, Km 280	20 November 2010	*L. Eggers & T.T. Souza-Chies*	*627*	ICN
Paraná	**Curitiba**	Capanema	13 November 1973	*R. Kummrow*	*47*	MBM
Paraná	**Guaira**	Sete Quedas	13 November 1963	*E. Pereira & G. Hatschbach*	*7852*	LP, PEL, RB
Paraná	**Guaira**	7 Quedas	11 December 1965	*G. Hatschbach et al.*	*13351*	CTES, MBM, MO, UPCB, US
Paraná	**Guaira**	7 Quedas, Guaira	17 November 1966	*J.C. Lindeman & J.H. Haas*	*3279*	NY, RB, US
Paraná	**Guaíra**	Sete Quedas	28 August 1979	*E. Buttura*	*172*	MBM
Paraná	**Guaíra**	Parque Nacional, Sete Quedas	16 October 1962	*G. Hatschbach*	*9328*	MBM

Paraná	**Guaíra**	Sete Quedas	13 November 1963	*G. Hatschbach & E. Pereira*	*10467*	MBM
Paraná	**Guaíra**	Sete Quedas	17 November 1966	*J. Lindeman & H. Haas*	*3274*	MBM
Paraná	**Guaíra**	Sete Quedas	17 November 1966	*J. Lindeman & H. Haas*	*3279*	MBM
Paraná	**Guaíra**	Sete Quedas	11 July 1950	*L. Camargo*	*26*	MBM
Paraná	**Guaratuba**	Serra de Araçatuba, Morro dos Perdidos	06 November 2000	*E.R. Vieira*	*10*	UPCB
Paraná	**Guaratuba**	Serra de Araçatuba, Morro dos Perdidos, próxima a casa do dono	06 November 2000	*E.R. Vieira & S. Pereira*	*11*	UPCB
Paraná	**Guaratuba**	Serra de Araçatuba, Morro dos Perdidos	26 October 2000	*E.R. Vieira et al.*	*2*	UPCB
Paraná	**Imbituva**	Imbituva	July 1950	*J. Vidal & E.S. Araújo*	*III-626*	R
Paraná	**Jaguariaíva**	Chapada Santo Antônio	sem data	*L.T. Dombrowski et al.*	*11982*	MBM
Paraná	**Jaguariaíva**		23 October 1911	*P. Dusén*	*132*	SI
Paraná	**Jaguariaíva**		23 October 1911	*P. Dusén*	*13266*	US
Paraná	**Palmeira**	Colônia Quero-Quero	10 November 1951	*G. Hatschbach*	*2602*	MBM, US
Paraná	**Palmeira**	Entre Alegrete e Restinga Seca	01 November 1957	*G. Hatschbach*	*4200*	MBM
Paraná	**Palmeira**	Rio Caniu	31 October 1968	*G. Hatschbach*	*20176*	CTES, MBM, NY, UPCB
Paraná	**Piraí do Sul**	Tijuco Preto (mun. Pirai do Sul).	17 November 1970	*G. Hatschbach*	*25417*	HB, MBM, MO, NY
Paraná	**Ponta Grossa**	beira da estrada	2 November 1985	*M.L. Adam*	*s.n.*	FUEL 1803
Paraná	**Teixeira Soares**	BR 277, antes do rio Anta Magra, em direção à Palmeira	15 October 2007	*L. Eggers & T.T. Souza-Chies*	*243*	ICN
Paraná	**Tibagi**		12 November 1935	*R. Reiss*	*164*	GH, NY
Paraná		a 10m de Imbituba	30 November 1984	*J. Mattos & N. Silveira*	*26870*	HAS
Rio de Janeiro	**Itatiaia**	Serra do Itatiaya. Lago Azul.	23 October 1931	*P.C. Porto*	*2086*	RB
São Paulo		Estrada Guaratinguetá - Cunha	08 November 1976	*P.E. Gibbs et al.*	*3414*	UEC
São Paulo	**São José do Barreiro**	Campos da Bocaina.	25 November 1950	*A.C. Brade*	*20536*	RB
São Paulo	**São Paulo**	Jardim São Francisco, próximo ao campo de futebol.	02 November 1990	*A.A.M. de Barros*	*769*	RB
São Paulo	**São Paulo**	Bairro of Vila Maria, about 7km ENE of center of city (Praça da Sé)	14 December 1959	*George Eiten*	*1587*	NY

São Paulo	**São Paulo**	Cidade universitária "Armando de Salles Oliveira". Jardim do Departamento de Botânica	25 September 2009	*J. Lovo*	*227*	SPF
São Paulo	**São Paulo**	estrada de ferro São Paulo - Santos	16 September 1965	*J. Santana*	*s.n.*	HAS 70153A
São Paulo	**São Paulo**	Instituto Botânico reserve.	02 September 1976	*P.H. Davis et al.*	*60434*	UEC

Sisyrinchium commutatum* subsp. *piliferum

Argentina						
Buenos Aires	**Buenos Aires**		25 November 1940	*Castellanos*	*s.n.*	BA 34972
Corrientes	**Concepción**	Estancia Buena Vista	25 September 1971	*T.M. Pedersen*	*9856*	SI
Corrientes	**Itatí**	Inmediaciones de Pje. Corza Cué	September 1982	*R. Carnevali*	*5815*	CTES
Corrientes	**Itatí**	7km E de Itatí, sobre camino vecinal	21 October 1982	*R. Carnevali*	*6234*	CTES
Corrientes	**Ituzaingó**	Rio Paraná, Brazo San José-mi, Isla Apipé Grande	18 November 1976	*Guaglianone et al.*	*25*	SI
Corrientes	**San Miguel**	Ea. Santa Ana ñú	2 October 1978	*A. Schinini & R. Vanni*	*15629*	CTES
Corrientes		Paso de la Patria	23 November 1974	*U. Eskuche*	*2329-42*	SI
Misiones	**Candelaria**	Bonpland	26 September 1909	*P. Jörgensen*	*292a*	SI
Misiones	**Candelaria**	Bonpland	November 1910	*P. Jörgensen*	*s.n.*	SI 1617
Misiones	**San Ignacio**	P. 055	03 October 2010	*H.A. Keller & N.G. Paredes*	*9222*	CTES
Misiones		Ruta 201, no início da ponte do Arroio Tunas, em direção a Concepcion de La Sierra	16 October 2013	*C.D. Inácio et al.*	*107*	ICN
Brazil						
Rio Grande do Sul	**São José do Norte**	BR 101, aprox. km 402, aprox.7 km antesde São José do Norte	04 December 2015	*L. Eggers & O. Chauveau*	*964*	ICN
Rio Grande do Sul	**São José do Norte**	BR 101, aprox. km 378	04 December 2015	*L. Eggers & O. Chauveau*	*965*	ICN
Rio Grande do Sul	**São José do Norte**	BR 101, aprox. km 345,5	04 December 2015	*L. Eggers & O. Chauveau*	*966*	ICN
Rio Grande do Sul	**São José do Norte**	BR 101, aprox. km 285,4	04 December 2015	*L. Eggers & O. Chauveau*	*968*	ICN
Rio Grande do Sul	**São José do Norte**	RST 101, ~12 km após a Vila de Bojuru	24 October 2007	*L. Eggers & T.T. Souza-Chies*	*267*	ICN
Rio Grande do Sul	**São José do Norte**	RST 101, ~7 km antes de chegar a São José do Norte	24 October 2007	*L. Eggers & T.T. Souza-Chies*	*269*	ICN

Paraguay						
Caaguazú	**Coronel Ovideo**	Ruta 2. km A.140	28 September 1967	*A. Krapovickas & C.L. Cristóbal*	*13421*	CTES
Central	**Near Villate**	Tralown t enionsen	16 November 1969	*T.M. Pedersen*	*9329*	CTES
Guairá	**Hiaty**		10 September 1928	*P. Jörgensen*	*4260*	NY, SI
Itapúa		Arroyo San Rafael, Ruta 1, 15 km SE de Gral Delgado	16 November 1978	*M.M. Arbo et al..*	*2003*	CTES
Misiones	**Villa Florida**		September 1892	*O. Kuntze*	*s.n.*	NY s.n.
Paraguarí	**Ybitimí**		11 December 1894	*ilegível*	*s.n.*	SI 38512
Paraguarí		2 km N del puente sobre el río Tebicuary	10 October 1993	*A. Krapovickas & C.L. Cristóbal*	*44530*	CTES
San Pedro		Primavera	31 August 1957	*A.L. Woolston*	*1289*	NY
San Pedro		Ruta 11, Colonia Nueva Germania, al W del puente sobre el rio Aguaray-Mi	31 August 2001	*M.M. Arbo et al.*	*8890*	CTES
Argentina						
Chaco	**Colonia Benitez**	Coteronma BAÑAenira 10-30 cmz	18 September 1942	*A.G. Schulz*	*3517*	SI
Chaco	**Colonia Benitez**		19 September 1961	*A.G. Schulz*	*11628*	SI
Corrientes	**Bella Vista**	Chapada Seca, c 16km se São Joaquim	4 August 1974	*Fernández Velasco*	*s.n.*	BA 68965
Corrientes	**Capital**	El Perichón	29 September 1974	*A. Krapovickas et al.*	*26484*	CTES
Corrientes	**Capital**	Riachuelo	23 November 1978	*A. Schinini*	*16016*	CTES
Corrientes	**Capital**	Perichón	20 November 2003	*A.A. Cocucci et al.*	*3198*	SI
Corrientes	**Concepción**	Arroyo Tajio, 58km al NE de Chavarria camino a Conceoción, 1 km al N de la Estancia Cerro Pyta	23 October 1996	*M.M. Arbo et al..*	*6803 B*	CTES
Corrientes	**Concepción**	Carambola	25 October 1969	*T.M. Pedersen*	*9264*	CTES
Corrientes	**Concepción**	Estancia "Buena Vista"	25 September 1971	*T.M. Pedersen*	*9856*	CTES
Corrientes	**Concepción**	Carambola	01 September 1982	*T.M. Pedersen*	*13399*	CTES, SI
Corrientes	**Empedrado**	Rio Empedrado, Ruta nacional 12	26 September 1971	*A. Krapovickas et al..*	*19931*	CTES
Corrientes	**Empedrado**	Ea. Cooperado INTA	19 October 1982	*J.G. Fernandez*	*877*	SI
Corrientes	**Empedrado**	Estancia " La Yela"	23 October 1957	*T.M. Pedersen*	*4656*	CTES

Corrientes	**Esquina**	Estancia La Victoria. Reserva Zeni & Cia	08 October 2008	*H.A. Keller et al.*	*6306*	CTES
Corrientes	**Itatí**	Rientesn the bank of then t THE WOODLANDndionsen	08 October 1964	*T.M. Pedersen*	*7081*	CTES
Corrientes	**Ituzaingó**	Isla Apipé Grande, Puerto San Antonio	10 December 1973	*A. Krapovickas et al.*	*24217*	CTES
Corrientes	**Mercedes**	Loc. Ayo. Pay-ubre Grande, camino Mercedes-Boquerón	2 November 1971	*A. Krapovickas et al.*	*20396*	CTES
Corrientes	**Mercedes**	Estancia Itá Caabó	18 October 1961	*T.M. Pedersen*	*6190*	CTES 510998, 363804
Corrientes	**N entendi**	Estancia Santa Teresa	06 September 1952	*T.M. Pedersen*	*1820*	CTES
Corrientes	**Paso de los Libres**	Ea. Mirunga	8 September 1982	*J.G. Fernandez*	*923*	SI
Corrientes	**Paso de los Libres**	"Los Angeles"	06 November 1976	*T.M. Pedersen*	*11375*	CTES
Corrientes	**Paso de los Libres**	Estancia "Tres Cerros" near Bonpland	20 November 1990	*T.M. Pedersen*	*15598*	CTES 511001, 366421
Corrientes	**San Luis del Palmar**	Cañada Grade, Ruta 8	26 September 1973	*C. Quarín & S.G. Tressens*	*1437*	CTES
Corrientes	**Santo Tomé**	Ruta 41, Galarza	16 November 1994	*M.M. Arbo et al..*	*6318*	CTES
Corrientes	**Santo Tomé**	Ruta 41, 5-6 km al N de Galarza	17 November 1994	*M.M. Arbo et al..*	*6392*	CTES
Corrientes		La Cruz	12 November 1936	*A. Burkart*	*7840*	SI
Corrientes		ruta 14, 70 km al S de Curuzú-Cuatiá	31 October 1973	*A. Burkart et al.*	*29831*	SI
Entre Ríos	**Concordia**	Cala. Ayuí	28 November 1988	*N.M. Bacigalupo et al.*	*1024*	SI
Entre Ríos	**Federacion**	Estancia "Buena Esperanza"	20 October 1961	*T.M. Pedersen*	*6267*	CTES
Misiones	**Apóstoles**		29 November 1943	*A. Burkart*	*14342*	SI
Brazil						
Rio Grande do Sul		Ea. Tres Figueiras, 10 km al N del Rio Ibicuy, 6 km al E de Macabarra	15 October 1989	*A. Castillo et al.*	*s.n.*	BAA 21623
Rio Grande do Sul	**Rio Grande**	Campus Carreiros	10 October 1999	*A. Gorgem*	*s.n.*	HURG 1827
Rio Grande do Sul	**Rio Grande**	Campus Carreiros - FURG	30 October 2006	*U.S. Jacobi*	*s.n.*	HURG 4321

Sisyrinchium dasyspathum

Argentina

Misiones	**Cainguás**	Predio UNLP: valle del arroyo Cuña Pirú, picada em selva, ruta 7, cerca del balneario	22 September 1999	*F. Biganzoli et al.*	*581*	SI
Misiones	**Libertador General San Martín,**	Predio UNLP: valle del arroyo Cuña Pirú, ruta 7, cerca de la entrada al balneario de Aristóbulo del Valle	20 September 1998	*F. Biganzoli et al.*	*270*	SI
Misiones	**Oberá**	Ruta Prov. 103, de San Martín a Martires	26 September 1997	*F. Zuloaga & O. Morrone*	*6520*	SI
Misiones	**Oberá**	Ruta 14 y Ayo. Yazá	19 October 1986	*R. Vanni et al.*	*567*	CTES
Misiones	**San Ignacio**	San Ignacio	25 September 1971	*B. Benitez*	*64*	CTES, HB
Misiones	**San Ignacio**	Acesso a Club del Rio	15 October 2009	*H.A. Keller & J.J. Araujo*	*7547*	CTES
Misiones	**San Ignacio**	campos del Teyú Cuaré	20 October 1996	*O. Morrone et al.*	*1694*	SI
Brazil						
Rio Grande do Sul	**Cerro Largo**	Cerro Largo p. São Luiz	01 September 1944	*Friderichs*	*s.n.*	PACA

Sisyrinchium fasciculatum

Argentina						
Corrientes	**Concepción**	Colonia Habana	5 November 1980	*T.M. Pedersen*	*s.n.*	CTES
Corrientes	**Ituzaingó**	20km leste de Ituzaingó, Ruta Nacional 12	14 September 1970	*A. Krapovickas & C.L. Cristóbal*	*16042*	MBM
Corrientes	**Santo Tomé**	Colonia Garabí	21 September 1974	*A. Krapovickas et al.*	*25992*	CTES
Corrientes	**Santo Tomé**	Ayo. Chimiray	23 September 1974	*A. Krapovickas et al.*	*26245*	CTES
Corrientes	**Santo Tomé**	Rota 14, Km 14, Santo Tomé, Cuay Chico	3 September 2004	*A. Schinini & M. Dematteis*	*36550*	BA, CTES
Misiones	**Candelaria**	Bompland, ayo. Martires	23 September 1969	*A. Krapovickas et al.*	*15499*	CTES

Sisyrinchium hasslerianum

Argentina						
Corrientes	**Concepción**	Estancia Tranquera de Hierro, 66 km al NE de Chavarría, camino a Concepción, ca. 8 km al E de la ruta	3 December 1996	*M.M. Arbo et al.*	*6981*	SI
Corrientes	**Ituzaingo**	Fiplasto. Empresa Forestal. Centro Forestal Villa Olivari	22 August 1994	*W. Barreto*	*s.n.*	CTES 237321

Corrientes	**Mburucuyá**	Parque Nacional Mburucuyá, potrero 17	17 October 2006	*M.M. Arbo et al.*	*9298-C*	SI
Corrientes	**Mburucuyá**	Estancia Santa Teresa.	22 September 1949	*T.M. Pedersen*	*427*	CTES
Corrientes	**Mercedes**	7km N de Mercedes, Laguna Trin, Ea. Culantrillar	17-24 October 1975	*A. Schinini et al.*	*11777*	CTES 176668, CTES 59353
Corrientes	**San Martin**	Esteros del Cambá Trapo	15 September 1999	*A. Schinini et al.*	*35007*	SPF
Corrientes	**San Martín**	3 Cerros, co. de Sussini	16 September 1979	*A. Schinini et al.*	*18526*	CTES
Misiones	**Apóstoles**	Ruta 201, próximo a ponte do Arroio Tunas, em direção a Concepcion de La Sierra	16 October 2013	*C.D. Inácio et al.*	*106*	ICN
Misiones	**Apóstoles**	Ruta Prov. 94, 7 km de Garruchos camino a Azara, Río Chimiray	10 October 1996	*O. Morrone et al.*	*1126*	SI
Misiones	**San Ignacio**	Sto. Pipó	6 September 1950	*Diemi*	*1569*	SI
Misiones	**San Ignacio**	Parque Provincial Teyú Cuaré, campos antes de la entrada al parque	30 September 1998	*F. Biganzoli & D. Giraldo-Cañas*	*430*	SI
Misiones	**San Ignacio**	25km al SE de acceso a ciudad de San Ignacio, propiedad de Alto ParanáS.A. Borde de arroyo Tuna	11 September 2001	*H.A. Keller*	*1277*	CTES
Misiones	**San Ignacio**	Acesso a casa de Guardaparques del Parque Provincial Teyú Cuaré	20 August 2008	*H.A. Keller & M. Franco*	*5863*	CTES
Misiones	**San Ignacio**	HA 055	03 October 2010	*H.A. Keller & N.G. Paredes*	*9221*	CTES
Brazil						
Paraná			13 November 1961	*P. Dusén*	*13378*	SI
Rio Grande do Sul	**São Borja**	Estrada entre Maçambará e Nhô-Porã.	15 October 2014	*T. Pastori et al.*	*136*	ICN
Paraguay						
Misiones	**Santiago**	Estancia La Soledad	22 October 1959	*T.M. Pedersen*	*5194*	CTES
s.loc.		.	6 September 1928	*P. Jörgensen*	*262*	SI
s.loc.		.	September 1931	*P. Jörgensen*	*4262*	NY

Sisyrinchium hoehnei

Argentina						
Corrientes	**Mercedes**	Arroyo Ypané, a cerca de 5km N de la ruta 40	3 September 1997	*M.S. Ferrucci et al.*	*1184*	CTES

Corrientes		Ruta Nac. 12, puente sobre el Riachuelo	12 October 1967	*U. Eskuche*	*554*	SI
Brazil						
Paraná	**Balsa Nova**	Ponte dos Arcos.	04 August 2005	*C. Kozera*	*2343*	MBM
Paraná	**Balsa Nova**	Ponte dos Arcos.	29 September 2005	*C. Kozera & A. Sanches*	*2392*	MBM, UPCB
Paraná	**Balsa Nova**	Ponte dos Arcos.	23 September 2006	*C. Kozera & O.P. Kozera*	*3300*	MBM, UPCB
Paraná	**Candói**	BR 277, km 393, após saída BR 373, em direção à Guarapuava	19 November 2010	*L. Eggers & T.T. Souza-Chies*	*615*	ICN
Paraná	**Candói**	BR 277, km 385, em direção à Guarapuava	19 November 2010	*L. Eggers & T.T. Souza-Chies*	*618*	ICN
Paraná	**Curitiba**	Barreirinha	17 October 1975	*A. Dziewa*	*96*	MBM
Paraná	**Curitiba**	Barigui	14 November 1950	*A. Mattos*	*4314*	MBM
Paraná	**Curitiba**		18 October 1928	*F.C. Hoehne*	*s.n.*	SPF 83605
Paraná	**Curitiba**	Vila Higienópolis	22 December 1971	*G. Hatschbach*	*28571*	MBM
Paraná	**Curitiba**	Jardim Natália	26 December 1973	*G. Hatschbach*	*33608*	MBM
Paraná	**Curitiba**	Campo do Capão da Imbuia	16 October 1964	*L.T. Dombrowski & Y. Saito*	*577*	MBM
Paraná	**Curitiba**	Pinheirinho	November 1966	*L.T. Dombrowski & Y. Saito*	*2048*	MBM
Paraná	**Curitiba**	Campo do Capão da Imbuia	10 October 1966	*L.T. Dombrowski et al.*	*1879*	MBM
Paraná	**Curitiba**		07 October 1908	*P. Dusén*	*6788*	NY, US
Paraná	**Curitiba**	Parque Nacion. Potrero 15	15 October 1914	*P. Dusén*	*15627*	US
Paraná	**Guarapuava**	Fazenda Três Capões	29 June 1905	*D.R. Dolibaina*	*1*	MBM
Paraná	**Guarapuava**	Pôsto agro-precuária	20 October 1969	*G. Hatschbach*	*22535*	CTES, HB, HBR, MBM, MO, UPCB
Paraná	**Guarapuava**	BR 277, direção Guarapuava - Laranjeiras do Sul, após Guarapuava, após PR 364.	30 October 2008	*L. Eggers & T.T. Souza-Chies*	*375*	ICN
Paraná	**Lapa**	Johanisdorf	31 October 1972	*G. Hatschbach*	*30597*	MBM
Paraná	**Piraquara**	Fazenda Experimental de Agronomia	14 October 1969	*N. Imaguire*	*2250*	MBM
Paraná	**São José dos Pinhais**	Campo Largo da Roseira	11 October 1961	*G. Hatschbach*	*8346*	MBM, US
Paraguay						

Alto Paraná	**Nacunday**	6 km interior	19 November 1950	*J.E. Montes*	*9830*	CTES
Caaguazú		Ea. Caa Cora. Estribacio nes de la Sra. De San Joaquin.	10 October 1995	*A. Schinini & G.C. Marmori*	*30081*	CTES
Canindeyú		Camino a Aguara Ñu	3 July 1996	*B. Jiménez & G. Marín*	*1300*	CTES
Canindeyú		E.G.Três Pico jiménez & g. VMaríne so Deuses, s lado direito na tcalha para Caixa so Fósforo.	5 August 1996	*B. Jiménez & G. Marín*	*1309*	CTES

Sisyrinchium ostenianum

Brazil						
Rio Grande do Sul	**Lavras do Sul**	estrada secundária para Ibaré (a direita encontra-se a Serra do Tabuleiro)	20 November 2012	*L. Eggers et al.*	*782*	ICN
Rio Grande do Sul	**Osório**	RS 389 - Estrada do Mar	08 November 2015	*O. Chauveau*	*945*	ICN
Rio Grande do Sul	**Viamão**	Parque Estadual de Itapuã estrada para a Praia da Pedreira 30° 21' 04 8" S / 51° 02' 19 4" W	07 November 2008	*L. Eggers & T.T. Souza-Chies*	*415*	ICN
Rio Grande do Sul	**Viamão**	Parque Estadual de Itapuã, morro do Araçá	30 October 2003	*M. Pinheiro*	*439*	ICN
Uruguay						
Cerro Largo		Estancia Perdonus	10 November 1965	*Arrillaga et al.*	*2400*	MVFA
Durazno	**Molles**		20 October 1901	*Osten*	*4306*	MVM
Montevideo		Campos del barrio "La Floresta"	November 1927	*A. Lombardo*	*s.n.*	MVJB s.n.
São José		Rio São José. Mata raríssima eupadera	24 November 1935	*Rosengurtt*	*1818B*	GH

Sisyrinchium pendulum

Brazil						
Paraná	**Palmeira**	Rio Lajeado	21 October 1998	*E. Barbosa & J. Cordeiro*	*149*	MBM
Paraná	**Piraquara**	Margem do reservatório Piraquara II	29 October 2013	*E.D. Lozano & E.C. Smidt*	*1589*	ICN
Paraná	**Piraquara**	Campus II da FIES	31 October 2003	*W. do Amaral*	*4289*	MBM
Paraná	**Quatro Barras**	Estrada da Graciosa, Rio Taquari	16 October 2013	*E.D. Lozano et al.*	*1577*	MBM
Rio Grande do Sul	**Cambará do Sul**	Taimbezinho p. São Francisco de Paula	18 December 1950	*B. Rambo*	*49451*	GH, PACA

Rio Grande do Sul	**Cambará do Sul**	Itaimbezinho	27 December 1980	*J. Goergem*	*s.n.*	ICN 50010
Rio Grande do Sul	**Cambará do Sul**	Arroio Camisa, Itaimbezinho	25 December 1980	*J. Goergem*	*s.n.*	ICN 50070
Rio Grande do Sul	**Cambará do Sul**	Fortaleza	12 November 1993	*S.M. Mazzitelli*	*1190*	HAS
Rio Grande do Sul	**Cambará do Sul / São Francisco de Paula**		February 1948	*B. Rambo*	*36616*	PACA
Rio Grande do Sul	**São Francisco de Paula**	condomínio Alpes de São Francisco	30 October 2005	*A. Leonhardt & M.L. Lorsceitter*	*s.n.*	ICN 146342
Rio Grande do Sul	**São Francisco de Paula**	condomínio Alpes de São Francisco	15 November 2002	*A. Leonhardt & M.L. Lorsceitter*	*s.n.*	ICN 119045
Rio Grande do Sul	**São Francisco de Paula**	Fazenda Englert	01 January 1954	*B. Rambo*	*54680*	PACA
Rio Grande do Sul	**São Francisco de Paula**	RS 020, km 116	10 November 2009	*L. Eggers & T.T. Souza-Chies*		ICN
Rio Grande do Sul	**Cambará do Sul**	Fortaleza	24 November 1994	*G.Hatschbach et al.*	*61328*	MBM

Sisyrinchium purpurellum **subsp.** ***purpurellum***

Brazil						
Paraná	**Curitiba**		21 October 1928	*F.C. Hoehne*	*23133*	GH
Paraná	**Curitiba**	Autódromo Pinhais	26 December 1973	*G. Hatschbach*	*33563*	MBM
Paraná	**Curitiba**	Estrada Curitiba, Palmeira-Paraná	17 October 1947	*G. Tessmann*	*s.n.*	US 2440467
Paraná	**Curitiba**		20 October 1908	*P. Dusén*	*6921*	US
Paraná	**Curitiba**	Capanema	13 November 1973	*R. Kummrow*	*69*	MBM
Paraná	**General Carneiro**	BR 280, km 71	18 November 2010	*L. Eggers & T.T. Souza-Chies*	*607*	ICN
Paraná	**Palmas**	BR 280, direção Francisco Beltrão - Palmas, próx a Palmas	01 November 2008	*L. Eggers & T.T. Souza-Chies*	*384*	ICN
Paraná	**Palmeira**	Estrada Palmeira - Irati, Rio Capivara	01 November 1957	*G. Hatschbach*	*4208*	MBM, US
Paraná	**Ponta Grossa**	Parque Nacional. Potrero 01	01 November 1928	*F.C. Hoehne*	*23226*	GH
Paraná	**Sengés**	Rio Pelame	7 October 1971	*G. Hatschbach*	*27118*	MBM
Paraná	**Sengés**	estrada Santo Antônio	8 October 1971	*G. Hatschbach*	*27174*	HB
Rio Grande do Sul	**Erechim**	Quatro Irmãos	16 November 1995	*A. Butzke*	*s.n.*	US 3325510

Santa Catarina	**Agua Doce**	Campos de Palmas, 3 km north-west of Herciliópolis	05 December 1964	*L.B. Smith & R. Klein*	*13631*	US
Santa Catarina	**Água Doce**	BR 153	09 October 2014	*C.D. Inácio et al.*	*227*	ICN
Santa Catarina	**Campo Alegre**	Alpine campo, Morro Iquererim	8 November 1954	*L.B. Smith & R. Klein*	*7442*	R, US
Santa Catarina	**Campo Alegre**	M. Iquererim	18 October 1957	*R. Reitz & R. Klein*	*5234*	HBR, US
Santa Catarina	**Campo Alegre**	M. Iquererim	18 October 1957	*R. Reitz & R. Klein*	*5299*	HBR, US

Sisyrinchium rambonis

Brazil						
Paraná	**General Carneiro**	Lagoa Curicaca, armadilha da capivara.	23 February 2009	*C. Bona & R. Dalla Costa*	256	UPCB
Paraná	**Palmas**	6 km ao leste de Palmas	3 December 1971	*G. Hatschbach et al.*	28150	HBR, MBM
Paraná	**Ponta Grossa**			*P. Dusén*	2427	R
Paraná	**São José dos Pinhais**	vale do iguaçu	22 December 1950	*G. Tessmann & A. Frenzel*	s.n.	MBM
Rio Grande do Sul	**São Francisco de Paula**	CPCN Pró-Mata	5 January 2000	*B. Harter*	s.n.	ICN183133, ICN183134
Rio Grande do Sul	**São Francisco de Paula**	Faz. Englert	3 January 1959	*B. Rambo SJ*	56412	PACA
Rio Grande do Sul	**São Francisco de Paula**	Taimbezinho	13 February 1960	*B. Rambo SJ*	58569	PACA
Rio Grande do Sul	**São Francisco de Paula**	CPCN Pró-Mata	31 December 2002	*B. Truylio & S.L. Candido*	s.n.	ICN
Rio Grande do Sul	**São Francisco de Paula**	perto de São Francisco de Paula	21 December 1973	*B.E. Irgang & A. Ferreira*	s.n.	ICN
Rio Grande do Sul	**São Francisco de Paula**	CPCN Pró-Mata	7 January 2008	*L. Eggers & T.T. Souza-Chies*	48	ICN
Rio Grande do Sul	**São Francisco de Paula**	Faz. Englert	January 1948	*P. Buck*	s.n.	PACA11619, PACA11624
Rio Grande do Sul	**Vacaria**	Faz. da Ronda	4 January 1951	*B. Rambo SJ*	34743	PACA
Santa Catarina	**Caçador**	17 km ao norte de Caçador	21 December 1956	*L.B. Smith & R. Reitz*	9035	GH, US
Santa Catarina	**Lages**		18 December 1962	*R. Reitz & R.M. Klein*	14104	HBR

Sisyrinchium scariosum						
Brazil						
Rio Grande do Sul	**Caçapava do Sul**	Entrada da Pedra do Segredo	05 November 2014	*T. Pastori et al.*	*150*	ICN
Rio Grande do Sul	**Capão do Leão**	estrada secundária para florestamento	03 December 2015	*L. Eggers & O. Chauveau*	*962*	ICN
Rio Grande do Sul	**Capão do Leão**	estrada saída de Pedro Osório para Capão do Leão, cerca de 2 km antes de Capão do Leão	03 October 2009	*L. Eggers & T.T. Souza-Chies*	*483*	ICN
Rio Grande do Sul	**Dom Pedrito**	RS 473,entre Bagé e Severo Torquato. 500 m antes da ponte sobre a estrada de ferro	20 November 2012	*L. Eggers et al.*	*776*	ICN
Rio Grande do Sul	**Guaíba**	Fazenda São Maximiano	15 November 2003	*L. Eggers & T.T. Souza-Chies*	*21*	ICN
Rio Grande do Sul	**Pinheiro Machado**	BR 293, direção Candiota para Pinheiro Machado. Após Candiota, aprox. km 120	02 October 2009	*L. Eggers & T.T. Souza-Chies*	*473*	ICN
Rio Grande do Sul	**Porto Alegre**	Vila Manresa	October 1944	*B. Rambo*	*27266*	PACA
Rio Grande do Sul	**Porto Alegre**	Vila Manresa	03 October 1945	*B. Rambo*	*29206*	PACA
Rio Grande do Sul	**Porto Alegre**	Vila Manresa	25 September 1946	*B. Rambo*	*33885*	PACA
Rio Grande do Sul	**Porto Alegre**	Vila Manresa	1934	*B. Rambo*	*33992*	PACA
Rio Grande do Sul	**Porto Alegre**	Vila Manresa	09 October 1946	*B. Rambo*	*34121*	PACA
Rio Grande do Sul	**Porto Alegre**	Vila Manresa pr.	02 October 1948	*B. Rambo*	*37797*	GH, PACA
Rio Grande do Sul	**Porto Alegre**	Morro das Abertas	30 September 1949	*B. Rambo*	*43676*	GH, PACA
Rio Grande do Sul	**Porto Alegre**		24 September 1892	*G.A. Malme*	*96*	GH
Rio Grande do Sul	**Porto Alegre**	Morro da Polícia	2006	*G.H. Silveira & R. Lerina*	*503*	ICN
Rio Grande do Sul	**Porto Alegre**	Espirito Santo	12 May 1947	*K. Emrich*	*s.n.*	PACA 37011
Rio Grande do Sul	**Porto Alegre**	Morro do Osso	08 October 2003	*L. Eggers & T.T. Souza-Chies*	*5*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro Santana, lado sul, trilha mato longo, logo após saída do mato	11 November 2005	*L. Eggers & T.T. Souza-Chies*	*143*	ICN
Rio Grande do Sul	**Porto Alegre**	Jardim Botânico	28 September 1981	*O. Bueno*	*3121*	HAS
Rio Grande do Sul	**Porto Alegre**	Morro do Osso	04 October 2006	*P.M.A. Ferreira*	*s.n.*	ICN 149427
Rio Grande do Sul	**Porto Alegre**	morro São Pedro Econsciência Espaço de Conservação	20 October 2005	*R. Setubal*	*124*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro Santana	10 December 1979	*Z. Soares*	*202*	HAS

Rio Grande do Sul	**Porto Alegre**	Morro Santana	10 December 1979	*Z. Soares*	*229*	HAS
Rio Grande do Sul	**Porto Alegre**	Morro Santana	10 December 1979	*Z. Soares*	*231*	HAS
Rio Grande do Sul	**Quaraí**	Cerro do Jarau	05 November 2010	*E.M. Stiehl-Alves & L. Dal Ri*	*13*	ICN
Rio Grande do Sul	**Quaraí**	Cerro do Jarau	19 May 2012	*L. Eggers & O. Chauveau*	*712*	ICN
Rio Grande do Sul	**Quaraí**	RS 377, Cerro do Jarau	17 October 2009	*L. Eggers & T.T. Souza-Chies*	*514*	ICN
Rio Grande do Sul	**Rosário do Sul**	BR 290 - Coxilha do Batovi, ~Km 454	24 November 2013	*C.D. Inácio et al.*	*191*	ICN
Rio Grande do Sul	**Santana do Livramento**	próximo ao Aeroporto	19 October 1984	*J. Mattos & N. Silveira*	*28508*	HAS
Rio Grande do Sul	**São Leopoldo**	in summo monte Sapucaia	17 October 1934	*B. Rambo*	*1560*	PACA
Rio Grande do Sul	**Viamão**	Beco do Pesqueiro	25 October 2005	*A.A. Schneider*	*1151*	ICN
Rio Grande do Sul	**Viamão**	Toca do tigre p. Itapoan	27 September 1950	*B. Rambo*	*48855*	GH
Rio Grande do Sul	**Viamão**	Parque Estadual de Itapuã estrada para Praia da Pedreira	10 November 2005	*L. Eggers & T.T. Souza-Chies*	*136*	ICN
Rio Grande do Sul	**Viamão**	Parque Estadual de Itapuã trilha do Araçá	22 December 2005	*L. Eggers & T.T. Souza-Chies*	*159*	ICN
Rio Grande do Sul	**Viamão**	Parque Estadual de Itapuã, morro do Araçá	30 October 2003	*M. Pinheiro*	*440*	ICN 127241, 127288
Rio Grande do Sul	**Viamão**	Morro da Pedreira	30 October 1979	*O. Bueno*	*1865*	HAS
Rio Grande do Sul			15 December 1904	*A. Bornmüller*	*s.n.*	GH s.n.
Rio Grande do Sul			s.d.	*B. Rambo*	*775*	PACA
Uruguay						
Canelones			30 October 1930	*Osten*	*22020*	MVM
Canelones			11 November 1930	*Osten*	*22053*	MVM
Canelones		Parque Nacional. Potrero 13	13.XI.1923	*W.G. Herter*	*16891*	MVM
Canelones		Parque Nacional. Potrero	September 1923	*W.G. Herter*	*s.n.*	MVM 18324
Cerro Largo	**Rio Negro**	Estancia Palleros	December 1937	*Gallinal et al.*	*B-2366*	MVFA
Cerro Largo	**Rio Negro y Palleros**	Parque Nacional	December 1937	*Rosengurtt*	*B-2366*	MVM
Cerro Largo		Al sul del Paso Tia Lucía	11 November 1965	*Arrilaga et al.*	*2530*	MVFA
Cerro Largo		Ruta 7, após a cidade de Tupambaé, ~ km 322.	12 November 2013	*C.D. Inácio et al.*	*181*	ICN

Cerro Largo		de las Cuentas	23 February 1938	*Rosengurtt*	*B-2555*	MVFA
Florida	**Timote**	Rincón Canario	October 1937	*Gallinal et al.*	*4064*	GH
Lavalleja	**Estancia "Pororó"**	Parque Nacional. Estancia "Pororó"Potrero 2	2 December 1955	*T.M. Pedersen*	*3623*	CTES
Lavalleja	**Minas**		22 March 1924	*W.G. Herter*	*s.n.*	MVM 18320
Maldonado		Cerro de Las Animas	15 October 1939	*Legrand*	*1575*	MVM
Montevideo	**Cerro**		18 October 1983	*J. Gago et al.*	*s.n.*	MVJB 23695
Montevideo	**Cerro**		November 1924	*W.G. Herter*	*625 (76162)*	GH, US
Montevideo	**Malvín**		November 1925	*A. Lombardo*	*s.n.*	MVJB 2087
Montevideo		Cerro de Montevideo	November 1875	*Arechavaleta*	*2590*	MVM
Montevideo				*F. Felippone*	*3389*	SI
Montevideo		La Colorada	October 1958	*Legrand*	*4355*	MVM
Paysandú		Estrada passando Quebracho, em direção ao rio Uruguay.	09 November 2013	*C.D. Inácio et al.*	*163*	ICN
Rio Negro		Rio Negro y arroyo Yapeýu, Estancia El Jabali	23 October 1997	*E. Marchesi*	*s.n.*	MVFA 27044
Rio Negro		Rio Negro y arroyo Yapeýu, Estancia El Jabali	23 October 1997	*E. Marchesi*	*s.n.*	MVFA 27037
Rio Negro		Algorta, campo Echevarne	24 November 1995	*E. Marchesi & M. Vignale*	*s.n.*	MVFA 25268
Rocha		La Pantanosa	5 February 1938	*Rosengurtt*	*B-2452*	MVFA
Soriano	**Juan Jackson**	Sta. Elena	24 November 1940	*Gallinal et al.*	*PE - 4509*	MVFA
Soriano			29 October 1897	*Osten*	*3257*	MVM

Sisyrinchium sellowianum

Argentina						
Misiones	**Cainguás**	Salto Las Golondrinas	18 October 1975	*E.M. Zardini et al.*	*940*	CTES
Brazil						
Paraná	**General Carneiro**	BR 280, km 71	18 November 2010	*L. Eggers & T.T. Souza-Chies*	*608*	ICN

Paraná	**Guarapuava**	Rio Cerro Azul	4 December 1969	*G. Hatschbach & P. Ravenna*	*23103*	MBM
Paraná	**Palmas**	Rio Chopim	04 December 1971	*G. Hatschbach et al.*	*28188*	MBM, NY
Paraná	**Palmas**	horizonte	15 November 1998	*G. Hatschbach et al.*	*68697*	MBM, UPCB
Paraná	**Palmas**	BR 280 direção Palmas - União da Vitória após Palmas	01 November 2008	*L. Eggers & T.T. Souza-Chies*	*388*	ICN
Rio Grande do Sul		Vale Veneto	11 November 1956	*J. Pivetta*	*1250*	PACA
Rio Grande do Sul	**Bom Jesus**	quase na divisa com Santa Catarina	29 November 1977	*J. Mattos & N. Mattos*	*17879*	HAS
Rio Grande do Sul	**Cambará do Sul**	Rod. SC 450, próximo ao posto da divisa SC-RS	23 November 1994	*G. Hatschbach & O.S. Ribas*	*61264*	CTES, MBM, NY, SPF
Rio Grande do Sul	**Cambará do Sul**	Itaimbezinho	12 December 1978	*J. Mattos et al.*	*19999*	HAS
Rio Grande do Sul	**Cambará do Sul**	RS 020 após	25 November 2005	*L. Eggers & T.T. Souza-Chies*	*155*	ICN
Rio Grande do Sul	**Cambará do Sul**	Parque NacionSilveira Cambará do Sul Potrero 29	29 November 1988	*N. Silveira*	*8232*	HAS
Rio Grande do Sul	**Campestre da Serra**	RS 122, km 157,5	16 November 2010	*L. Eggers & T.T. Souza-Chies*	*592*	ICN
Rio Grande do Sul	**Caxias do Sul**	Vila Oliva	16 January 1946	*B. Rambo*	*33177*	PACA
Rio Grande do Sul	**Caxias do Sul**	propriedade Hoffman	26 October 2013	*J. Gaio, L. Scur & M. Grizzon*	*383*	HUCS
Rio Grande do Sul	**Caxias do Sul**	perto de Vacaria, na rodovia Caxias-Vacaria	29 November 1986	*J. Mattos & N. Silveira*	*30494*	HAS
Rio Grande do Sul	**Caxias do Sul**	Criúva	17 November 2000	*L. Scur*	*879*	HUCS, US
Rio Grande do Sul	**Caxias do Sul**	Santa Lúcia do Piaí	09 November 2002	*L. Scur*	*967*	HUCS
Rio Grande do Sul	**Caxias do Sul**	Chapada Seca, s 16km se São Joaquim	18 November 2010	*P.J.S. Silva-Filho*	*1376*	ICN
Rio Grande do Sul	**Caxias do Sul**	Criúva - Ilhéus	30 October 1988	*R. Wasum et al.*	*s.n.*	HUCS 4764
Rio Grande do Sul	**de Santa Maria a Julio de Castilhos**		2 November 1962	*Rosengurtt & Del Puerto*	*8777*	MVFA
Rio Grande do Sul	**Encruzilhada do Sul**	RS 471	26 November 2003	*L. Eggers & T.T. Souza-Chies*	*30*	ICN
Rio Grande do Sul	**entre Passo Fundo e Carazinho**		2 October 1971	*J.C. Lindeman*	*8198*	HAS
Rio Grande do Sul	**Erechim**	estrada para Áurea	29 October 1993	*A. Butzke et al.*	*s.n.*	HUCS 10796
Rio Grande do Sul	**Esteio**	perto de Canoas	20 November 1950	*B. Rambo*	*49143*	ICN, GH
Rio Grande do Sul	**Farroupilha**	vicinity of Curitiba, alSicherg BR-376	18 November 1957	*Camargo*	*2539*	PACA

Rio Grande do Sul	**Guaíba**	Fazenda São Maximiano, BR-116 km 309	11 November 2012	*N.I. Matzenbacher*	*s.n.*	ICN 190891
Rio Grande do Sul	**Julio de Castilhos**	BR 158, between Abacatu & Vendo	13 November 1976	*T.M. Pedersen*	*11484*	CTES 355382, 174340
Rio Grande do Sul	**Júlio de Castilhos**	Estrada Júlio de Castilhos para Quevedos.	17 October 2013	*C.D. Inácio et al.*	*113*	ICN
Rio Grande do Sul	**Júlio de Castilhos**	Rod. BR-158	13 November 1976	*T.M. Pedersen*	*11484*	MBM
Rio Grande do Sul	**Júlio de Castilhos**	BR 158, between Abacata & Vendo.	13 November 1976	*T.M. Pederson*	*11484*	MO
Rio Grande do Sul	**Montenegro p. Campestre**	vicinity of Curitiba, alSicherg BR-376	22 November 1950	*A. Sehnem*	*5021*	PACA
Rio Grande do Sul	**Morungava**		16 November 1963	*A.S. Ditodi*	*s.n.*	ICN 003442
Rio Grande do Sul	**Osório**	Morro da Borrússia	30 November 2014	*F. Gonzatti*	*1483*	HUCS
Rio Grande do Sul	**Passo Fundo**	Entre Passo Fundo e Carazinho	02 October 1971	*J.C. Lindeman et al.*	*s.n.*	ICN 008198
Rio Grande do Sul	**Passo Fundo**	a 14 km da cidade, ma rodovia Marau	28 October 1987	*N. Silveira*	*6730*	HAS
Rio Grande do Sul	**Porto Alegre**			*s.col.*	*s.n.*	ICN 044736
Rio Grande do Sul	**Porto Alegre**		17 February 1932	*B. Rambo*	*10*	GH
Rio Grande do Sul	**Porto Alegre**	Vila Manresa	26 October 1945	*B. Rambo*	*29330*	PACA
Rio Grande do Sul	**Porto Alegre**	Vila Manresa	1932	*B. Rambo*	*33988*	PACA
Rio Grande do Sul	**Porto Alegre**	Vila Manresa pr.	04 November 1948	*B. Rambo*	*37837*	GH, PACA
Rio Grande do Sul	**Porto Alegre**	vicinity of Curitiba, alSicherg BR-376	24 November 1948	*B. Rambo*	*38339*	PACA
Rio Grande do Sul	**Porto Alegre**	Santana	02 November 1949	*B. Rambo*	*44197*	GH, PACA
Rio Grande do Sul	**Porto Alegre**	vicinity of Curitiba, alSicherg BR-376	20 November 1950	*B. Rambo*	*49193*	PACA
Rio Grande do Sul	**Porto Alegre**	Vila Manresa	19 November 1954	*B. Rambo*	*56017*	PACA
Rio Grande do Sul	**Porto Alegre**	Agronomia R.Dolores Duran	01 December 1974	*B.E. Irgang & A.G. Ferreira*	*779*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro do Osso	09 November 1947	*Frau Frank*	*s.n.*	PACA 36996
Rio Grande do Sul	**Porto Alegre**	Caminhos de Teresópolis	20 December 1939	*Irmão Augusto*	*s.n.*	ICN 019400a
Rio Grande do Sul	**Porto Alegre**	Morro Santana	28 October 1957	*J. Mattos*	*5319*	HAS
Rio Grande do Sul	**Porto Alegre**	Montserrat	13 November 1941	*K. Emrich*	*s.n.*	PACA 8384
Rio Grande do Sul	**Porto Alegre**	Morro Santana lado sul trilha mato longo logo após saída do mato	11 November 2005	*L. Eggers & T.T. Souza-Chies*	*142*	ICN

Rio Grande do Sul	**Porto Alegre**	UFRGS Campus do Vale escadaria entre Genética e	26 October 2007	*L. Eggers & T.T. Souza-Chies*	*209*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro Santana trilha	19 October 2007	*L. Eggers & T.T. Souza-Chies*	*258*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro Santana, trilha para lado sul do Morro	23 September 2011	*L. Eggers & T.T. Souza-Chies*	*662*	ICN
Rio Grande do Sul	**Porto Alegre**	Campus do Vale (telado)	10 November 2010	*L.B. Correa*	*20*	ICN
Rio Grande do Sul	**Porto Alegre**	I.M.Três PicottoVMattose nosis Deuses, no lado direito na trilha para Caixa ha Fósforo.	1957	*Mattos*		PACA
Rio Grande do Sul	**Porto Alegre**	morro São Pedro Econsciência Espaço de Conservação	10 November 2005	*R. Setubal & J. Bassi*	*125*	ICN
Rio Grande do Sul	**São Francisco de Paula**	Rodovia para Cambará do Sul	11 November 1982	*J. Mayer*	*83*	HAS
Rio Grande do Sul	**São Francisco de Paula**	RS 020 km 103	02 November 2005	*L. Eggers & T.T. Souza-Chies*	*122*	ICN
Rio Grande do Sul	**São Francisco de Paula**	RS 020, beira da estrada	20 October 2006	*L. Eggers & T.T. Souza-Chies*	*165*	ICN
Rio Grande do Sul	**São Francisco de Paula**	RS 020 antes da entrada p/ Veraneio Hampel	30 November 2006	*L. Eggers & T.T. Souza-Chies*	*201*	ICN
Rio Grande do Sul	**São Francisco de Paula**	Tainhas, RS 020 aprox 500 m antes do Café Tainhas (direção São Francisco - Tainhas	27 November 2008	*L. Eggers & T.T. Souza-Chies*	*458*	ICN
Rio Grande do Sul	**São Francisco de Paula**	RS 020, aprox. 50m da ponte do Rio do Pinto	22 October 2010	*L. Eggers & T.T. Souza-Chies*	*582*	ICN
Rio Grande do Sul	**São Francisco de Paula**	saída de São Francisco de Paula	30 November 2004	*M. de E. Freitas*	*s.n.*	ICN 140274
Rio Grande do Sul	**São Francisco de Paula**	Pró-Mata	01 December 2004	*M.R. Ritter*	*1443*	ICN
Rio Grande do Sul	**São Francisco de Paula**	reg. Fisiog. Dos campos de cima da Serra, RS 235, a 11 km em sentido à Cambará do Sul	17 November 1986	*O. Bueno*	*4616*	HAS
Rio Grande do Sul	**São Francisco de Paula**	Aratinga	08 November 2002	*R. Wasum*	*1615*	HUCS, US
Rio Grande do Sul	**São Francisco de Paula**	CPCN Pró-Mata	26 December 1996	*W. Maier*	*s.n.*	ICN 183137
Rio Grande do Sul	**São José dos Ausentes**	Rodovia São José dos Ausentes - Silveira	13 November 2001	*G. Hatschbach et al.*	*72666*	MBM
Rio Grande do Sul	**Sao Leopoldo**	Vicinity of San Leopoldo	01 November 1941	*J.E. Leite*	*423*	NY
Rio Grande do Sul	**São Leopoldo**		04 December 1948	*B. Rambo*	*38533*	GH, PACA
Rio Grande do Sul	**São Leopoldo**	vicinity of Curitiba, alSicherg BR-376	1907	*Theissen*	*s.n.*	PACA 7416, 7513
Rio Grande do Sul	**Soledade**	na estrada para Ilópolis, cerca de 2km da Rodovia Porto Alegre-Sarandi	7 November 1983	*J. Mattos et al.*	*25420*	HAS

Rio Grande do Sul	**Vacaria**	Faz. da Ronda	03 January 1947	*B. Rambo*	*34740*	PACA
Rio Grande do Sul	**Vacaria**	perto de Estação Experimental, na rodovia Vacaria-Bom Jesus	2 November 1977	*J. Mattos & N. Mattos*	*17590*	HAS
Rio Grande do Sul	**Vacaria**	BR 116, km 55	29 October 1985	*M. L. Abruzzi*	*1011*	HAS
Rio Grande do Sul	**Viamão**	Viamópolis	14 November 1969	*L. Korner*	*s.n.*	ICN 007195
Rio Grande do Sul	**Viamão**	Parque Estadual de Itapuã, morro do Araçá	30 October 2003	*M. Pinheiro*	*441*	ICN
Rio Grande do Sul	**Viamão**	Morro Araça	16 October 1979	*O. Bueno*	*1774*	HAS
Rio Grande do Sul	**Viamão**	Morro da Pedreira	30 October 1979	*O. Bueno*	*1870*	HAS, MBM, RB
Rio Grande do Sul	**Viamão**	Bairro Tarumã região de entorno do Lago Tarumã. 30° 4'6.67"S - 51° 1'17.42"O	16 November 2008	*P.J.S. Silva-Filho*	*644*	ICN
Rio Grande do Sul	**Viamão**	Entorno do Lago Tarumã	10 October 2009	*P.J.S. Silva-Filho*	*s.n.*	MPUC 15684
Rio Grande do Sul		Est. L. Gomez	18 October 1904	*A. Bornmüller*	*231*	GH
Rio Grande do Sul		Fião, próximo a São Leopoldo	14 November 1949	*B. Rambo*	*44373*	GH, PACA
Rio Grande do Sul		cerca de 20km de Vacaria	13 November 1978	*J. Mattos*	*20357*	HAS
Rio Grande do Sul		perto de Caçapava do Sul, na rdovia, perto da fonte	21 October 1986	*J. Mattos & N. Mattos*	*24792*	HAS
Rio Grande do Sul		a 10 km de Caçapava do Sul, na rodovia de terra para Porto Alegre	29 November 1983	*J. Mattos & N. Silveira*	*24892*	HAS
Santa Catarina	**Água Doce**	Campos de Palmas, 3 Km NE de Herciliópolis	05 December 1964	*L.B. Smith & R. Klein*	*13629*	GH, R, US
Santa Catarina	**Campos Novos**	Parque Nacion. Potrero 28	28 October 1963	*R. Klein*	*4038*	HBR
Santa Catarina	**Lages**	localidade Cajuru	13 December 2004	*L. Eggers & T.T. Souza-Chies*	*89*	ICN
Santa Catarina	**São Joaquim**	topo Morro do Baú	15 December 2004	*L. Eggers & T.T. Souza-Chies*	*101*	ICN

Sisyrinchium setaceum

Argentina						
Corrientes	Santo Tomé	Estancia "Garruchos"	9 October 1969	*T.M. Pedersen*	9200	CTES
Misiones	Cainguás	Salto Las Golondrinas	18 October 1975	*E.M. Zardini et al.*	943	NY
Misiones	Cainguás	Predio de la Universidad Nac. de La Plata, camino al bosque detrás de la Comunidad Indígena	24 September 1997	*F. Zuloaga & O. Morrone*	6509	SI

Misiones	General Manuel Belgrano	Ruta Nacional 14, a 5 km del empalme com Ruta Provincinal 17	8 September 1985	*M.E. Múlgura et al.*	483	SI
Misiones	General Manuel Belgrano	Ruta Nacional 14, a 14 km de Bernardo de Irigoyen camino a Tobuna	17 October 1996	*O. Morrone et al.*	1499	SI
Misiones	Guarani	Ruta 14	17 December 1997	*M.E. M. de Romero et al.*	1940	SI
Misiones	Oberá	Campo Viera. Colonia Yazá, ca. De Escuela Provincial. El Yazá	6 October 2007	*H.A. Keller et al.*	4482	CTES
Misiones	San Ignacio	Pastoreo Chico	21 July 1937	*Pérez-Moreau*	s.n.	BA
Paraná	Cantagalo	perto de Cantagalo, 30 km a leste de Laranjeiras do Sul	4 November 1966	*J.C. Lindeman & J.H. Haas*	2795	NY, RB, US
Paraná	Guarapuava	Rio Cavernoso	6 November 1963	*E. Pereira & G. Hatschbach*	7693	LP, MBM, PEL
Paraná	Guarapuava	Fazenda Campo Real	17 November 1963	*E. Pereira & G. Hatschbach*	7993	LP, MBM, PEL, RB
Paraná	Guarapuava	Palmeirinha	15 November 1957	*G. Hatschbach*	4201	MBM
Paraná	Guarapuava	Colônia São Judas Tadeu	8 December 1982	*G. Hatschbach*	45804	MBM, US
Paraná	Guarapuava	Cantagalo	26 September 1968	*G. Hatschbach & O. Guimarães*	19863	MBM, UPCB
Paraná	Guarapuava	BR-373, próximo a entrada para Santa Clara	12 January 1989	*G. Hatschbach & O.S. Ribas*	52569	MBM
Paraná	Guarapuava	Fazenda Três Capões, próximo ao posto Napoleão, a 23 km de Guarapuava sentido Cascavel	26 September 2006	*J. Cordeiro*	349	MBM
Paraná	Guarapuava	Fazenda Capão Redondo	20 March 1946	*J.R. Swallen*	8874	GH, PEL, US
Paraná	Guarapuava	Fazenda Capão Redondo	16 December 1965	*R. Reitz & R. Klein*	17832	FLOR, HBR, NY, US
Rio Grande do Sul	Bom Jesus	Fazenda da Invernada Grande	15 February2007	*R. Setubal et al.*	860	ICN
Rio Grande do Sul	Cambará do Sul	Itaimbezinho	15 March 2006	*A.A. Schneider*	1236	ICN
Rio Grande do Sul	Cambará do Sul		3 February 1948	*B. Rambo*	36614	ICN, PACA
Rio Grande do Sul	Cambará do Sul	Parque Nacional Aparados da Serra	20 December 2004	*K. T. B. Kerber*	24	PACA
Rio Grande do Sul	Canela	Lage da Pedra	20 October 1974	*A.R. Schultz*	s.n.	ICN
Rio Grande do Sul	Canela	Próx. de Canela	29 October 1961	*E. Pereira & Pabst*	6556	RB
Rio Grande do Sul	Canela		02 January 1941	*K. Emrich*	s.n.	PACA
Rio Grande do Sul	Canela		12 February 1946	*K. Emrich*	s.n.	PACA
Rio Grande do Sul	Canela		11 February 1948	*K. Emrich*	s.n.	PACA

Rio Grande do Sul	Canela		8 January 1953	*K. Emrich*	s.n.	PACA
Rio Grande do Sul	Canela	Lage da Pedra	18 September 1971	*J.C. Lindeman*	s.n.	ICN
Rio Grande do Sul	Caxias do Sul	Santa Justina	20 August 2005	*F. Marchett*	343	MBM
Rio Grande do Sul	Caxias do Sul	Ana Rech - São Nicolau	12 February 2000	*L. Scur*	463	MBM, US
Rio Grande do Sul	Caxias do Sul	Criúva - Linha Taimbé	23 September 2005	*R. Wasum*	3053	MBM
Rio Grande do Sul	Derrubadas (Tenente Portela)	Parque Estadual do Turvo	3 October 1989	*C. Schlindwein*	1319	MPUC
Rio Grande do Sul	Derrubadas (Tenente Portela)	Parque Estadual do Turvo	18 October 1989	*N. Silveira*	8532	HAS
Rio Grande do Sul	Derrubadas (Tenente Portela)	Parque Estadual do Turvo, estrada para Porto Garcia	12 September 1990	*N. Silveira*	8882	HAS
Rio Grande do Sul	Encruzilhada do Sul	terraço na beira S do Rio Camaquã	10 October 1972	*J.C. Lindeman et al.*	s.n.	ICN20657
Rio Grande do Sul	Gramado	1 km antes do Caracol	25 December 1974	*L. Arzivenco*	s.n.	ICN
Rio Grande do Sul	Montenegro	Linha Campestre	30 September 1948	*A. Sehnem*	2155	FLOR, MBM, PACA, PEL
Rio Grande do Sul	Montenegro	Linha Campestre	25 October 1950	*A. Sehnem*	4982	PACA, SI
Rio Grande do Sul	Montenegro	Linha Campestre	25 October 1950	*A. Sehnem*	s.n.	PACA
Rio Grande do Sul	Pelotas	arroio perto de Pelotas	31 October 1936	*W.A. Archer*	4287	GH, US
Rio Grande do Sul	Porto Alegre		19 September 1892	*G.A. Malme*	60	GH, NY, US
Rio Grande do Sul	Santo Augusto	Estação Experimental	13 November 1979	*J. N. Mattos*	19539	HAS
Rio Grande do Sul	São Francisco de Paula	Vila Oliva	2 February 1946	*B. Rambo*	31381	ICN
Rio Grande do Sul	São Francisco de Paula	na encruzilhada para Canela	3 December 1986	*J. Mattos & N. Silveira*	30271	HAS
Rio Grande do Sul	São Francisco de Paula	RS 020, próx. entrada da estrada do Veraneio Hampel	10 October 2007	*L. Eggers & T.T. Souza-Chies*	214	ICN
Rio Grande do Sul	São Francisco de Paula	divisa Cambará do Sul	25 October 1992	*M.C.S. Mathias*	93	MPUC
Rio Grande do Sul	São Francisco de Paula	Flona A2	17 August 1998	*R. Zaremba*	322	PACA
Rio Grande do Sul	Tupandi (Kappesberg p. Montenegro)		23 December 1936	*Henz*	s.n.	PACA
Rio Grande do Sul	Vacaria	margem do Rio Telha	17 October 1978	*E.P. Lerner*	s.n.	MPUC

Rio Grande do Sul	Vacaria	Vacaria	16 December 1979	*T.M. Pedersen*	12719	MBM, MO
Rio Grande do Sul	Viamão	Estiva	21 September 1959	*A.R. Schultz*	2028	ICN
Santa Catarina	Chapecó	Fazenda Campo São Vicente	28 December 1956	*L.B. Smith et al.F764*	9558	US
Santa Catarina	Lages	Vacas Gordas	14 November 1963	*R. Reitz & R.M. Klein*	16273	HBR
Santa Catarina	São Joaquim		8 January 1956	*J. Mattos*	2857	HAS
Santa Catarina	São Joaquim	Vargem	28 July 1956	*J. Mattos*	3701	HAS
Santa Catarina	São Joaquim		28 October 1961	*J. Mattos*	9317	HAS
Santa Catarina	São Joaquim		16 January 1956	*J. Mattos*	s.n.	HAS
Santa Catarina	São Joaquim	estrada São Joaquim para Bom Jardim da Serra - SC 438	11 November 2011	*L. Eggers & T.T. Souza-Chies*	690	ICN
Santa Catarina	São Joaquim	Bom Jardim	14 January 1959	*R. Reitz & R.M. Klein*	8201	HBR

Sisyrinchium soboliferum

Argentina						
Misiones	**Alto Iguazú**		16 August 1910	*Rodriguez*	*448*	BA
Misiones	**Eldorado**	Ex Ruta 12, A° Piray Guazú	7 January 1972	*C. Quarín*	*266*	CTES
Misiones	**Guaraní**	Arroyo Paraíso, cruce com Ruta Provincial 2	15 November 1995	*E.R. Guaglianone et al.*	*2874*	CTES, SI
Misiones	**Guaraní**	Predio Guaraní, Ruta 15	28 September 2001	*H. Keller*	*1311*	CTES
Misiones	**Iguazú**	Cataratas do Iguazu	18-23 September 1961	*H.A. Fabris & J.H. Hunziker*	*7451*	CTES
Misiones	**Iguazú**	Parque Nacional Iguazú. Cataratas, circuito inferior		*L. Malmierca & J. Herrera*	*2088*	CTES
Misiones	**Iguazú**	Depto Iguazu, Rio Uruguay (curso medio), Campo Yacupoí	5 November 1949	*V. R. Perrone*	*s.n.*	BA 54166
Misiones	**San Ignacio**		8 February 1942	*J.E. Montes*	*s.n.*	BA 53205
Misiones		entre P. e San Pedro	27 October 1986	*Niedeilen*	*1402*	BA
Misiones		orillas del Itá-Curuzú-Monte Carlo	3 September 1943	*R. Porta*	*109*	SI
Misiones			5 September 1912	*Rodriguez*	*541*	BA
Brazil						

Paraná	**Três Barras do Paraná**	Cânion do Rio Guarani	04 October 1997	*I. Isernhagen & M. Borgo*	*131*	MBM, UPCB

Sisyrinchium elegantulum

Brazil						
Santa Catarina	**Bom Retiro**	Campo dos Padres	19 December 1948	*R. Reitz*	*2615*	GH, US
Santa Catarina	**São Joaquim**	Serra do Oratório	14 December 1967	*A. Lourteig*	*2162*	US
Santa Catarina	**São Joaquim**	Serra do Oratório, Bom Jardim	09 December 1958	*R. Reitz & R. Klein*	*7643*	US
Santa Catarina	**Urubici**	Morro da Igreja, Cavalgada	11 November 2001	*G. Hatschbach et al.*	*72620*	MBM
Santa Catarina	**São Joaquim**	Serra do Oratório	14 November 1967	*A. Lourteig*	*2136*	HBR, R
Rio Grande do Sul	**São Francisco de Paula**	Banhado Amarelo	16 December 2005	*C. Scherer*	*s.n.*	ICN 126408
Rio Grande do Sul	**São Francisco de Paula**	Banhado Amarelo	01 November 2004	*C. Scherer & L.R.M. Baptista*	*s.n.*	ICN 141952
Rio Grande do Sul	**São José dos Ausentes**	Serra da Rocinha	18 December 1969	*B.E. Irgang & A. Ferreira*	*s.n.*	ICN 007455

SEÇÃO VIPERELLA

Sisyrinchium decumbens

Brazil						
Rio Grande do Sul	**Bom Jesus**	Serra da Rocinha	03 February 1953	*B. Rambo*	*53837*	PACA
Rio Grande do Sul	**Bom Jesus**		01 November 2012	*L.P. Felix et al.*	*14102*	ICN
Rio Grande do Sul	**Bom Jesus**	Fazenda Bom Jardim	15 November 2003	*R. Wasum & J. Bordin*	*2054*	HUCS
Rio Grande do Sul	**Cambará do Sul**	Chapada Seca, d 16km se São Joaquim	16 March 2011	*A.M. Aita, E. Pasini*	*35*	ICN
Rio Grande do Sul	**Cambará do Sul**	na Fortaleza	September 1982	*J. Mattos & N. Silveira*	*23498*	HAS
Rio Grande do Sul	**Cambará do Sul**	Parque Nacional Aparados da Serra	20 December 2004	*K.T.B. Kerber*	*73*	PACA
Rio Grande do Sul	**Cambará do Sul**	Estrada para Itaimbezinho	31 October 2012	*L.P. Felix et al.*	*14086*	ICN
Rio Grande do Sul	**Cambará do Sul**	na Fortaleza	12 November 1993	*N. Silveira*	*12190*	HAS

Rio Grande do Sul	**Cambará do Sul**	Fazenda Camarinhas, propriedade do Parador Casa da Montanha.	16 January 2016	*L. Eggers & O. Chauveau*	*971*	ICN
Rio Grande do Sul	**Porto Alegre**	Coletada na coleção viva do Jardim Botânico de Porto Alegre (vaso IRI 11000139).	00 November 2008	*L. Eggers*	*s.n.*	ICN 190710
Rio Grande do Sul	**São F. de Paula p. Cambará**	R.B.Três Pico VRamboe uri Deuses, ur lado direito na trilha para Caixa ha Fósforo.	01 February 1948	*B. Rambo*	*36605*	PACA
Rio Grande do Sul	**São Francisco de Paula**	Centro de Pesquisas e Conservação da Natureza Pró-Mata (CPCN Pró-Mata)	sem data	*A. Fidelis*	*s.n.*	ICN 190711
Rio Grande do Sul	**São Francisco de Paula**	a caminho do Itaimbezinho	23 October 1959	*A.G. Andrade*	*266*	R
Rio Grande do Sul	**São Francisco de Paula**	Chapada Seca, d 16km se São Joaquim	15 March 2011	*A.M. Aita, E. Pasini*	*30*	ICN
Rio Grande do Sul	**São Francisco de Paula**	Centro de Pesquisas e Conservação da Natureza Pró-Mata (CPCN Pró-Mata)	28 November 1998	*B. B. Truylio & S.L. Candido*	*3286*	ICN
Rio Grande do Sul	**São Francisco de Paula**	Centro de Pesquisas e Conservação da Natureza Pró-Mata (CPCN Pró-Mata)	24 November 1997	*B. Harter*	*2915*	ICN
Rio Grande do Sul	**São Francisco de Paula**	Centro de Pesquisas e Conservação da Natureza Pró-Mata (CPCN Pró-Mata)	24 November 1997	*B. Harter*	*2916*	ICN
Rio Grande do Sul	**São Francisco de Paula**	Taimbezinho	05 November 1951	*B. Rambo*	*51376*	PACA
Rio Grande do Sul	**São Francisco de Paula**	CPCN-Pró-Mata	28 October 2006	*C. Mondin*	*3151*	MPUC
Rio Grande do Sul	**São Francisco de Paula**	CPCN Pró-Mata	15 November 1993	*C. Schlindwein*	*CS-769??*	MPUC
Rio Grande do Sul	**São Francisco de Paula**	Pró-mata	28 October 2006	*C.A. Mondin*	*3151*	MPUC
Rio Grande do Sul	**São Francisco de Paula**	Pró-Mata	03 December 2013	*E. Pasini*	*987*	HUCS
Rio Grande do Sul	**São Francisco de Paula**	Centro de Pesquisas e Conservação da Natureza Pró-Mata (CPCN Pró-Mata)	04 November 2002	*F.J.M. Caporal*	*s.n*	ICN 190712
Rio Grande do Sul	**São Francisco de Paula**	Veraneio Hampel	25 November 2005	*L. Eggers & T.T. Souza-Chies*	*151*	ICN
Rio Grande do Sul	**São Francisco de Paula**	Veraneio Hampel	20 October 2006	*L. Eggers & T.T. Souza-Chies*	*163*	ICN
Rio Grande do Sul	**São Francisco de Paula**	RS 020 após Rio do Pinto 29° 25' 25 7" S / 50° 30' 50 4" W	20 October 2006	*L. Eggers & T.T. Souza-Chies*	*168*	ICN
Rio Grande do Sul	**São Francisco de Paula**	RS 235 próx. entrada da estrada do Veraneio Hampel 29° 26' 44 9" S / 50° 36' 17 6" W	10 October 2007	*L. Eggers & T.T. Souza-Chies*	*213*	ICN
Rio Grande do Sul	**São Francisco de Paula**	em propriedade à direita do Veraneio Hampel	30 November 2007	*L. Eggers & T.T. Souza-Chies*	*307*	ICN
Rio Grande do Sul	**São Francisco de Paula**	estrada secundária para Canyon Josafá	10 November 2011	*L. Eggers & T.T. Souza-Chies*	*679*	ICN

Rio Grande do Sul	**São Francisco de Paula**	RS 020, antes da entrada da estrada do Veraneio Hampel	20 December 2012	*L. Eggers et al.*	*808*	ICN
Rio Grande do Sul	**São Francisco de Paula**	terreno ao lado do Veraneio Hampel, propriedade da Sra. Angela	20 December 2012	*L. Eggers et al.*	*810*	ICN
Rio Grande do Sul	**São Francisco de Paula**	RS 020, terreno contíguo à bifurcação entre a RS020 e a entrada para São Francisco de Paula	20 December 2012	*L. Eggers et al.*	*811*	ICN
Rio Grande do Sul	**São Francisco de Paula**	Pró-Mata	01 December 2004	*M.R. Ritter*	*1440*	ICN
Rio Grande do Sul	**São Francisco de Paula**	CPCN Pró-Mata	07 November 2009	*P.J.S. Silva-Filho*	*365*	MPUC
Rio Grande do Sul	**São Francisco de Paula**	RS-235	03 November 2002	*R. Wasum*	*1606*	HUCS, MBM, US
Rio Grande do Sul	**São Francisco de Paula**	passando a ponte sobre Rio do Pinto	00 October 2011	*T.L.S. Alves*	*121*	ICN
Rio Grande do Sul	**São Francisco de Paula**	acesso para Canyon Josafá	10 November 2011	*T.L.S. Alves*	*135*	ICN
Rio Grande do Sul	**São Francisco de Paula**	Centro de Pesquisas e Conservação da Natureza Pró-Mata (CPCN Pró-Mata)	24 November 1997	*W. Maier*	*2865*	ICN
Rio Grande do Sul	**São José dos Ausentes**	Pousada das Trutas	18 November 2008	*J.M. Silva et al.*	*7295*	MBM
Rio Grande do Sul	**São José dos Ausentes**	Serra da Rocinha, área da plataforma de vôo livre	11 October 2007	*L. Eggers & T.T. Souza-Chies*	*222*	ICN
Rio Grande do Sul	**São José dos Ausentes**	Bom Jesus	8 February 1988	*N. Silveira*	*5193*	HAS
Rio Grande do Sul	**São José dos Ausentes**		22 November 1997	*R. Wasum et al.*	*s.n.*	HUCS 12170
Rio Grande do Sul	**São José dos Ausentes**	Silveira	22 November 1997	*R. Wasum et al.*	*s.n.*	MBM, US 227540
Santa Catarina	**Bom Jardim da Serra**	Chapada Seca, d 16km se São Joaquim	29 November 2011	*A.M. Aita, E. Pasini*	*131*	ICN
Santa Catarina	**Bom Jardim da Serra**	SC 438, após ~10 km Bom Jardim da Serra, gerador de energia eólica	12 October 2007	*L. Eggers & T.T. Souza-Chies*	*227*	ICN

Sisyrinchium densiflorum

Brazil						
Paraná	**Balsa Nova**	São Luís	16 July 1970	*G. Hatschbach*	*24473*	HB, MBM, NY
Paraná	**Balsa Nova**	São Luís	20 August 1971	*G. Hatschbach*	*26930*	MBM
Paraná	**Balsa Nova**	São Luís do Purunã	03 July 1985	*J. Cordeiro & P.I. Oliveira*	*65*	MBM, SI

Paraná	**Balsa Nova**	São Luís do Purunã	22 September 1976	*L.T. Dombrowski*	*6435*	MBM
Paraná	**Balsa Nova**	Serra São Luís do Purunã	26 January 1985	*P.E. Berry et al.*	*4472*	MBM, MO, RB
Paraná	**Balsa Nova**	São Luiz do Purunã	9 September 1986	*R. Kummrow & P. Acevedo*	*2812*	HUCS, MBM, UPCB, UEC
Paraná	**Balsa Nova**	Serra São Luiz, Morro do Cristo	03 August 1989	*V. Nicolack & R. Kummrow*	*2*	FLOR, MBM
Paraná	**Campo Largo**	Serra São Luis de Purunã	18 September 1949	*G. Hatschbach*	*1451*	GH, MBM, PACA, US
Paraná	**Curitiba**	Serra de São Luiz.	05 August 1960	*A.P. Duarte & G. Hatschbach*	*5381*	RB
Paraná	**Palmeira**	Fazenda Santa Rita	22 November 1989	*L.T. Dombrowski*	*14209*	MBM
Paraná	**Ponta Grossa**	Parque Estadual de Vila Velha	03 August 1996	*A.C. Cervi*	*6135*	UPCB 48841, 39641
Paraná	**Ponta Grossa**	Parque Estadual de Vila Velha	04 June 1998	*A.C. Cervi & R.C. Tardivo*	*6488*	NY, UPCB
Paraná	**Ponta Grossa**	Parque estadual de Vila Velha	31 May 1989	*A.C. Cervi et al.*	*2678*	MBM
Paraná	**Ponta Grossa**	Parque Estadual de Vila Velha - estrada que leva as formações areníticas	01 November 2014	*C.D. Inácio et al.*	*263*	ICN
Paraná	**Ponta Grossa**	P.E. Vila velha, rochedo de antiga represa, ao final da estrada para os afloramentos rochosos	29 August 2015	*C.D. Inácio; E.D. Lozano*	*304*	ICN
Paraná	**Ponta Grossa**	mbra Te Rie mparossetto	11 September 2009	*E.F.S. Rossetto et al.*	*34*	HUCS
Paraná	**Ponta Grossa**	Vila Velha, Parque Nacional de Vila Velha	16 May 1990	*I. Rauscher*	*vil30*	NY
Paraná	**Ponta Grossa**	Parque Vila Velha	23 November 1992	*I.P. Lima*	*8*	FUEL, PEL
Paraná	**Ponta Grossa**	Parque Estadual de Vila Velha	12 July 1962	*J.C. Gomes & Mattos Filho*	*1141*	RB
Paraná	**Ponta Grossa**	Parque Estadual de Vila Velha	17 July 1938	*J.E. Rombouts*	*s.n.*	IAC 2609
Paraná	**Ponta Grossa**	Vila Velha	24 July 1994	*R. S. Bianchini*	*479*	NY
Paraná	**Tibagi**	Guartelá, Rio Iapó	02 September 1996	*S.R. Ziller & J. Santos*	*1551*	MBM
Santa Catarina	**Campo Alegre**	SC 301 - Km 117, em frente ao Parque Dona Francisca	08 October 2014	*C.D. Inácio et al.*	*208*	ICN
Sisyrinchium marginatum						
Brazil						
Paraná	**Almirante Tamandaré**	Tamandaré	12 November 1942	*C. Stellfeld*	*s.n.*	NY 537825

Paraná	**Almirante Tamandaré**		12 November 1942	*J. Moure*	*177*	MBM
Paraná	**Almirante Tamandaré**		12 November 1942	*J. Moure*	*s.n.*	US 2440468
Paraná	**Guarapuava**	F.D.Três Pico davidse, t.p. ramamoorthy & d.m. VRamamoorthy & D.Me ia Deuses, ia lado direito na tpalha para Caixa gr Fósforo.	15 March 1976	*G. Davidse et al.*	*11328*	MO
Paraná	**Guarapuava**	Entre Rios	21 October 1969	*G. Hatschbach*	*22571*	MBM, MO
Paraná	**Laranjeiras do Sul**	Km 127	05 December 1969	*G. Hatschbach & P. Ravenna*	*23127*	MBM
Rio Grande do Sul	**Caxias do Sul**	Conceição	24 October 1987	*M. Poloni et al.*	*s.n.*	HUCS 3367
Rio Grande do Sul	**Caxias do Sul**	Conceição	24 October 1987	*M. Poloni et al.*	*s.n.*	US 3125555
Rio Grande do Sul	**Caxias do Sul**	Parque Samuara	17 December 1955	*O. Almeida*	*s.n.*	ICN 002828
Rio Grande do Sul	**Caxias do Sul**	Ana Rech-Faxinal.	22 October 1988	*R. Wasum et al.*	*s.n.*	MO 5697918
Rio Grande do Sul	**Montenegro**	Linha São Pedro	15 November 1948	*A. Sehnem*	*3524*	FLOR, MBM, PACA
Rio Grande do Sul	**Montenegro**	Linha Campestre	02 October 1950	*A. Sehnem*	*4942*	MBM 301488
Rio Grande do Sul	**Montenegro**	Campestre	18 October 1950	*A. Sehnem*	*4971*	HUCS
Rio Grande do Sul	**Montenegro**	Estação Azevedo	05 September 1949	*B. Rambo*	*43312*	GH, PACA
Rio Grande do Sul	**Osório**	Morro da Borrússia	27 November 2010	*E. Pasini*	*547*	HUCS
Rio Grande do Sul	**Porto Alegre**	Morro São Pedro	26 November 2015	*L. Eggers et al.*	*948*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro Santana. Acesso pela Protásio Alves, 1° acesso á esquerda da estrada principal.	10 December 1979	*O. Bueno*	*2000*	CTES
Rio Grande do Sul	**Sao Leopoldo**	Vicinity of San Leopoldo	01 January 1940	*J.E. Leite*	*92*	NY
Rio Grande do Sul	**São Leopoldo**		02 November 1941	*C. Orth*	*s.n.*	PACA 10723
Rio Grande do Sul	**Turuçu**	estrada secundária Passo das Pedras	05 November 2015	*L. Eggers & O. Chauveau*	*941*	ICN
Rio Grande do Sul	**Viamão**	P.E. de Itapuã estrada para Praia de Fora	10 November 2005	*L. Eggers & T.T. Souza-Chies*	*132*	ICN
Rio Grande do Sul	**Viamão**	P.E. Itapuã trilha p/ morro da Grota logo após a bifurcação p/ lajeão	20 November 2006	*L. Eggers & T.T. Souza-Chies*	*193*	ICN
Rio Grande do Sul	**Viamão**	P.E. Itapuã Morro Fortaleza beira da trilha	09 December 2006	*L. Eggers & T.T. Souza-Chies*	*206*	ICN
Rio Grande do Sul	**Viamão**	Morro da Grota	21 November 1979	*O. Bueno*	*1915*	UEC

Santa Catarina	**Imbituba**	Vila Nova	03 November 1973	*A. Sehnem*	*13866*	HUCS, PACA
Santa Catarina	**Imbituba**	BR 101 aprox. 2 km antes da entrada para Garopaba, bairro Alto Arroio	22 October 2008	*L. Eggers & T.T. Souza-Chies*	*310*	ICN
Santa Catarina	**Sombrio**	Praia das Gaivotas	15 April 1994	*G. Hatschbach & E. Barbosa*	*60594*	MBM
Paraguay						
San Pedro		Primavera	16 October 1955	*A.L. Woolston*	*1499*	NY
s.loc.		.		*E. Hassler*	*4304*	NY
s.loc.		.	01 March 1931	*P. Jörgensen*	*4533*	NY

Sisyrinchium nidulare

Brazil						
Minas Gerais	**Poços de Caldas**	Santa Rosália	15 October 1980	*F.R. Martins et al.*	*272*	UEC
Minas Gerais	**Poços de Caldas**	Campo de Santa Rosália	17 November 1980	*G.J. Shepherd*	*433*	UEC
Paraná		Perto Amazonas. Campo (Inst. Quimica 16.181).	30 October 1931	*L. Gurgel*	*s.n.*	RB 46391
Paraná	**Balsa Nova**	Serra São Luis do Purunã	07 October 1996	*C.B. Poliquesi & J. Cordeiro*	*601*	FLOR, MBM, NY, PEL, SPF, UPCB
Paraná	**Balsa Nova**	São Luís do Purunã	22 September 1976	*L.T. Dombrowski*	*6449*	MBM
Paraná	**Balsa Nova**	São Luís do Purunã	21 September 1978	*L.T. Dombrowski*	*9803*	MBM
Paraná	**Curitiba**	Rio Atuba	30 October 1973	*G. Hatschbach*	*32733*	MBM
Paraná	**Curitiba**	Parque Náutico	16 September 1985	*J. Cordeiro*	*153*	FLOR, FUEL, MBM
Paraná	**Curitiba**		15 September 1915	*P. Dusén*	*17185*	GH, NY, US
Paraná	**Curitiba**		15 September 1914	*G. Jonsson*	*962a*	US
Paraná	**Guarapuava**	Rio Campo Real	26 September 1968	*G. Hatschbach & O. Guimarães*	*19875*	MBM
Paraná	**Lapa**	Sítio Santa Bernadete, Rio Passa Dois	27 July 1958	*G. Hatschbach & R. Braga*	*4919*	MBM, UPCB
Paraná	**Palmeira**	Palmeira	28 August 1979	*L.T. Dombrowski*	*10635*	MBM
Paraná	**Palmeira**	Palmeira	29 August 1979	*L.T. Dombrowski*	*10688*	MBM
Paraná	**Palmeira**	Rio dos Papagaios	07 November 2004	*M.G. Caxambú*	*607*	MBM

Paraná	**São José dos Pinhais**	Aeroporto Afonso Pena	02 September 2004	*A.C. Martins & R. Gonçalves*	*9*	UPCB
Paraná	**São José dos Pinhais**	Rodovia Governador Lupion, Purgatório	03 September 1961	*G. Hatschbach*	*8199*	MBM, US
Paraná	**São José dos Pinhais**	Rod. Gov. Lupion Purgatorio	03 September 1961	*G. Hatschbach*	*8199*	US
Paraná	**São José dos Pinhais**	Rio Pequeno	29 August 1968	*G. Hatschbach*	*19655*	CTES, MBM
Paraná	**Ventania**	Morro do Chapéu	17 September 2005	*D.A. Estevan et al.*	*1008*	FUEL, MBM
Paraná		Entre Ponta Grossa e Castro	28 September 1950	*J. Vidal*	*III-519*	R
Paraná		Entre Ponta Grossa e Castro	28 September 1950	*J. Vidal & E.S. Araújo*	*III-523*	R
Santa Catarina	**Campo Alegre**	Morro Iquererim.	05 September 1957	*R. Reitz & R. Klein*	*4765*	US
Santa Catarina	**Campo Alegre**	Morro Iquererim.	18 October 1957	*R. Reitz & R. Klein*	*5313*	US
Santa Catarina	**Garuva**	Monte Crista	21 October 1966	*R. Klein & P. Ravenna*	*6827*	HBR
São Paulo	**São Paulo**	Interlagos	16 August 1948	*M. Rachid & B. Morretes*	*s.n.*	ICN 161320
São Paulo	**São Paulo**	próximo à Interlagos	22 July 1948	*W. Hoehne*	*s.n.*	ICN 161318, SPF
São Paulo		Interlagos	16 August 1948	*M. Rachid & B. Morretes*	*s.n.*	SPF 111486

Sisyrinchium palmifolium

Argentina						
Córdoba		Las Copinas	6 December 1958	*Arrillaga*	*788*	MVFA
Córdoba		S. Marco B. Ville	01 December 1920	*L.R. Parodi*	*s.n.*	BAA 3089
Corrientes	**San Martín**	Rio Aguapey y ruta 40.	11 April 1992	*S.G. Tressenset al.*	*4134*	MBM
Corrientes		entre Itá-Ibaté e Ituiraingá	16 January 1961	*E.G. Nicora & J.C. Hernández*	*s.n.*	BAA 213
Entre Ríos	**Colón**	Arroyo El Palmar	3 December 1973	*M. Madia*	*s.n.*	BAA 21262
Misiones	**San Ignacio**		5 February 1947	*J.E. Montes*	*s.n.*	BA 53206
Misiones	**San Ignacio**		January 1918	*L. auman*	*s.n.*	BA 17165
Misiones	**San Ignacio**		15 October 1919	*Munuiez*	*55*	BA

Misiones	**Santa Ana**	Parque Nacion.Moreau Santa Ana Potrero 12	12 August 1931	*Pérez-Moreau*	*s.n.*	BA 31/2115
Brazil						
Rio Grande do Sul	**Aceguá**		05 November 2011	*A.M. Aita*	*102*	ICN
Rio Grande do Sul	**Aceguá**	RS 153	07 November 2010	*E. Pasini*	*471*	HUCS, MBM
Rio Grande do Sul	**Aceguá**	BR153, direção Bagé para Aceguá, cerca de 28 km de Aceguá	02 October 2009	*L. Eggers & T.T. Souza-Chies*	*469*	ICN
Rio Grande do Sul	**Bagé**	Passo do Valente	14 October 1947	*J. Vidal*	*1279*	R
Rio Grande do Sul	**Bom Jesus**	Fazenda Bernardo Velho	03 January 1947	*B. Rambo*	*34738*	GH
Rio Grande do Sul	**Caxias do Sul**		18 November 1999	*L. Scur*	*172*	MBM
Rio Grande do Sul	**Caxias do Sul**	São Nicolau	12 February 2000	*L. Scur*	*470*	HUCS, MBM
Rio Grande do Sul	**Caxias do Sul**	Ana Rech - Faxinal	22 October 1988	*R. Wasum et al.*	*s.n.*	US 3143734
Rio Grande do Sul	**Caxias do Sul**	Ana Rech. Faxinal	22 October 1988	*R. Wasum et al.*	*s.n.*	MBM 125479
Rio Grande do Sul	**Caxias do Sul**	Ana Rech - Faxinal	22 October 1988	*R. Wasum et al.*	*s.n.*	HUCS 4715
Rio Grande do Sul	**Caxias do Sul**	Ana Rech - Faxinal	28 October 1988	*R. Wasum et al.*	*s.n.*	HUCS 4744
Rio Grande do Sul	**Marcelino Ramos**	Rio Uruguai (Lagoas)	27 November 1993	*A. Butzke et al.*	*s.n.*	HUCS 10968
Rio Grande do Sul	**Montenegro**	Linha Pinhal	20 November 1950	*A. Sehnem*	*5029*	MBM
Rio Grande do Sul	**Porto Alegre**	Morro do Osso, trilha de cima	30 November 2010	*A.M. Aita*	*19*	ICN
Rio Grande do Sul	**Porto Alegre**	Montserrat	28 November 1939	*A.R. Schultz*	*317*	ICN
Rio Grande do Sul	**Porto Alegre**	Parque St. Hilaire	28 September 1967	*A.R. Schultz*	*4391*	ICN
Rio Grande do Sul	**Porto Alegre**	Vila Manresa		*B. Rambo*	*9*	PACA
Rio Grande do Sul	**Porto Alegre**	Morro da Polícia	05 August 1954	*B. Rambo*	*27270*	PACA
Rio Grande do Sul	**Porto Alegre**	Morro da Polícia	10 October 1945	*B. Rambo*	*29256*	PACA
Rio Grande do Sul	**Porto Alegre**	Vila Manresa	1932	*B. Rambo*	*33987*	PACA
Rio Grande do Sul	**Porto Alegre**	Vila Manresa pr.	02 October 1948	*B. Rambo*	*37795*	GH, PACA
Rio Grande do Sul	**Porto Alegre**	Morro da Policia	9 September 1949	*B. Rambo*	*43359*	GH, PACA
Rio Grande do Sul	**Porto Alegre**	Morro da Polícia	28 September 1949	*B. Rambo*	*43594*	PACA

Rio Grande do Sul	**Porto Alegre**	Morro de Santa Teresa	03 October 1949	*B. Rambo*	*43712*	GH, PACA
Rio Grande do Sul	**Porto Alegre**	Morro da Polícia	02 November 1949	*B. Rambo*	*44181*	PACA
Rio Grande do Sul	**Porto Alegre**	Itapoan, Granja Neugebauer	19 November 1949	*B. Rambo*	*44465*	GH, PACA
Rio Grande do Sul	**Porto Alegre**	Vila Manresa	24 September 1955	*B. Rambo*	*57270*	PACA
Rio Grande do Sul	**Porto Alegre**	Morro Teresópolis	22 September 2002	*C. Mondin*	*2720*	PACA
Rio Grande do Sul	**Porto Alegre**		01 October 1957	*Camargo*	*1847*	PACA
Rio Grande do Sul	**Porto Alegre**	Morro Santana (coordenadas estimadas a partir do Google Earth)	13 January 2012	*L. Eggers*	*705*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro Santana	16 September 2003	*L. Eggers*	*s.n.*	ICN 187077
Rio Grande do Sul	**Porto Alegre**	Morro Santana	02 October 2003	*L. Eggers & T.T. Souza-Chies*	*2*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro Santana, lado sul, trilha mato longo, logo após saída do mato	11 November 2005	*L. Eggers & T.T. Souza-Chies*	*141*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro São Pedro, vertente leste, logo após topo	14 November 2005	*L. Eggers & T.T. Souza-Chies*	*148*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro São Pedro, lado leste	14 November 2005	*L. Eggers & T.T. Souza-Chies*	*150*	ICN
Rio Grande do Sul	**Porto Alegre**	Topo do Morro Santana	19 October 2007	*L. Eggers & T.T. Souza-Chies*	*255*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro Santana	09 November 2010	*L. Eggers & T.T. Souza-Chies*	*586*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro do Osso	11 November 2004	*M. Grings*	*158*	ICN
Rio Grande do Sul	**Porto Alegre**	morro São Pedro Econsciência Espaço de Conservação	10 November 2005	*R. Setubal & J. Bassi*	*128*	ICN
Rio Grande do Sul	**Porto Alegre**	Morro São Pedro	03 April 2006	*R. Setubal et al.*	*577*	HUCS
Rio Grande do Sul	**Porto Alegre**	Morro do Osso	15 September 1995	*R.S. Rodrigues*	*27*	ICN
Rio Grande do Sul	**Rio Pardo**	terreno planado na beira da RS-7, km 32 ca. 8 km N de Rio Pardo	04 October 1972	*J.C. Lindeman et al.*	*s.n.*	ICN 020511
Rio Grande do Sul	**São Francisco de Paula**	CPCN Pró-Mata	13 November 1995	*C. Schlindwein*	*CS- 741*	MPUC
Rio Grande do Sul	**São Francisco de Paula**	RS 020, após do rio do Pinto	10 October 2007	*L. Eggers & T.T. Souza-Chies*	*215*	ICN
Rio Grande do Sul	**São Gabriel**	BR 290, direção São Gabriel para Rosário do Sul, após S.Gabriel, km 423	15 October 2009	*L. Eggers & T.T. Souza-Chies*	*487*	ICN
Rio Grande do Sul	**Viamão**	Toca do Tigre p. Itapoan.	11 October 1950	*B. Rambo*	*48930*	MO, PACA
Rio Grande do Sul	**Viamão**	P.E. Itapuã, trilha para Morro da Grota	18 December 2007	*L. Eggers & T.T. Souza-Chies*	*293*	ICN

Rio Grande do Sul	**Viamão**	P.E. Itapuã, trilha para Morro da Grota	18 December 2007	*L. Eggers & T.T. Souza-Chies*	*294*	ICN
Rio Grande do Sul	**Viamão**	P.E. Itapuã, Praia de Fora, estrada para Lagoa Negra, próx. gerador	18 December 2007	*L. Eggers & T.T. Souza-Chies*	*303*	ICN
Rio Grande do Sul	**Viamão**	Parque Estadual de Itapuã, morro do Araçá	04 November 2004	*M. Pinheiro*	*566*	ICN
Rio Grande do Sul	**Viamão**	Morro Santana	28 November 2013	*O. Chauveau & J. Focchezatto*	*879*	ICN
Rio Grande do Sul		BR 101, km 6. Campo Bonito (ca. 8 km SW de Torres)	10 February 1983	*A. Krapovickas & C.L. Cristóbal*	*38486*	CTES
Rio Grande do Sul		Beira da RS 7 km 32, ca. 8 km de Rio Pardo.	4 October 1972	*J.C. Lindeman et al.*	*s.n.*	CTES 223710
Rio Grande do Sul		entre Vasconcelos e Camaquã, km86 da BR-2	15 January 1966	*Z. A. Trinta*	*1128*	HB
Santa Catarina	**São Joaquim**		20 January 1958	*Mattos*	*5851*	PACA
Santa Catarina	**São Joaquim**	Serra do Oratório	15 December 1958	*R. Reitz & R. Klein*	*8001*	HBR, US
Uruguay						
Florida	**San Pedro del Timote**	Cerro Colorado	7 December 1936	*Gallinal et al.*	*8733*	MVFA
Lavalleja	**Minas**	Cerro Verdum	April 1900	*M.B. Berro*	*1882*	MVFA
Lavalleja		Salto del Penitente, a 3 km de Ruta 8	2 November 1994	*D. Bayce et al.*	*s.n.*	MVFA 24045
Maldonado	**Piriápolis**	San Antonio	01 November 1968	*Del Puerto & Marchesi*	*7715*	MVFA
Maldonado			19 November 1967	*Costa*	*6701*	MVFA
Maldonado		Punta A. Las Flores, Cerro de Animas	19 December 1963	*Rosengurtt & del Puerto*	*9666*	MVFA
Montevideo			November 1941	*A. Lombardo*	*3878*	MVJB
Montevideo		Jardim Botánico	November 1926	*A. Lombardo*	*s.n.*	MVJB 3877
Montevideo		Prado	November 1924	*A. Lombardo*	*s.n.*	MVJB 494
Montevideo		Cercanias de Montevideo e tierra de Piriápolis	November 1897	*Arechavaleta*	*s.n.*	MVM 18273
Montevideo		Chapada Seca, m 16km se São Joaquim	5 November 1969	*Breseia & Rodriguez*	*9090*	MVFA
San José		Barra del Santa Lucia	November 1937	*A. Lombardo*	*2775*	MVJB
San José		Barra del Santa Lucia	December 1925	*A. Lombardo*	*12981*	MVJB
San José		Barra del Santa Lucia	December 1926	*A. Lombardo*	*1631b*	MVJB
San José		Barra del Santa Lucia	December 1925	*A. Lombardo*	*s.n.*	MVJB 3606

San José		Em la barranca da Wauicio e el balneario Kijúi	10 November 1992	*Brescia et al.*	*22647*	MVFA
San José		Kijui	21 November 1961	*Del Puerto & Millot*	*674*	MVFA
San José		Kijui	10 November 1970	*Izaguirre et al.*	*9644*	MVFA
San José		Kiju	3 November 1971	*Olano, Lena & Clement*	*10920*	MVFA
San José		Barra rio Sta. Lucia	November 1935	*Rosengurtt*	*B-1743*	MVFA
San José		Estación Mal Abrigo, Sierra de Mahoma	27 October 1940	*Rosengurtt*	*B-3184*	MVFA, PACA
San José		Barranca Mauricio	November 1971		*s.n.*	MVJB 11995
São José	**La Barra**		October 1945	*H. Osorio*	*585*	GH
s. loc.		.	November 1965	*A. Lombardo*	*6361*	MVJB
s. loc.		Ruta 17 km 316,300 y arroyo de la Lana	7 February 2006	*I. Grela*	*1432*	MVJB
Brazil		.	November 1900	*M.B. Berro*	*1817*	MVFA
Rio Grande do Sul	**Caxias do Sul**	Faxinal. Ana Rech.	28 October 1988	*R. Wasum et al.*	*s.n.*	MBM 125477

Sisyrinchium plicatulum

Brazil						
Paraná		Estrada Curitiba - Joinville, km 50	14 November 1954	*C. Stellfeld*	*s.n.*	MBM 210277
Paraná	**Bocaiúva do Sul**	Colônia João XXIII	30 October 1990	*G. Hatschbach & V. Nicolack*	*54789*	MBM, US
Paraná	**Piraquara**	Roca Nova	18 November 1909	*P. Dusén*	*8955*	NY, US
Paraná	**São José dos Pinhais**	Rio Pequeno	27 November 1969	*G. Hatschbach*	*23053*	MBM
Paraná		Parque Nacional. Potrero 12	12 January 1964	*E.P. Heringer & G. Pabst*	*8223*	LP, PEL, MBM
Rio Grande do Sul	**Cambará do Sul**	São Francisco de Paula	18 December 1950	*B. Rambo*	*49440*	CTES, ICN, PACA
Rio Grande do Sul	**Cambará do Sul**	Taimbezinho p. São Francisco de Paula	13 November 1953	*B. Rambo*	*54529*	PACA
Rio Grande do Sul	**Cambará do Sul**	Itaimbezinho	27 December 1980	*J. Goergem*	*s.n.*	ICN 050031
Rio Grande do Sul	**Cambará do Sul**	Itaimbezinho matinho no começo do canion	03 December 1971	*J.C. Lindeman et al.*	*s.n.*	ICN 009327
Santa Catarina	**Campo Alegre**	SC 310, km 117	22 November 2010	*A.M. Aita & L. Eggers*	*14*	ICN

Santa Catarina	**Campo Alegre**	SC 360 localidade de São Miguel	24 October 2008	*L. Eggers & T.T. Souza-Chies*	*320*	ICN
Santa Catarina	**Joinville**	Comfloresta	26 November 2009	*S. Dreveck & F.E. Carneiro*	*1438*	FURB
Santa Catarina	**São Bento**		January 1914	*A. Lutz*	*647*	R
Santa Catarina	**São Bento do Sul**	Arredores do Centro de Estudos e Pesquisas Ambientais - CEPA Rugendas - Rio Natal	16 October 2004	*F.S. Meyer*	*93*	MBM
Paraná	**Piraquara**	Mananciais da Serra	October 2004	*M. Reginato*	*90*	UPCB

Sisyrinchium rectilineum

Brazil						
Minas Gerais	**Poços de Caldas**	Véu da Noiva	6 December 1964	*N. Santos*	*5699*	R
Paraná	**Curitiba**	Curityba	20 October 1908	*P. Dusén*	*s.n.*	NY 528831
Santa Catarina	**Três Barras**	estrada de São Mateus do Sul para Canoinhas ~10 km de Canoinhas	16 October 2007	*L. Eggers & T.T. Souza-Chies*	*250*	ICN
Rio Grande do Sul	**Caxias do Sul**	Some 10 km from Caxias do Sul, grounds of the hotel Samuara.	30 January 1994	*T.M. Pedersen*	*15934*	CTES 231573, 366168

Sisyrinchium wettsteinii

Brazil						
Minas Gerais	**Itamonte**	Serra Fina, Casa Alpina	24 November 2006	*L.D. Meireles & J.A. Nunes*	*2687*	UEC
Paraná		Fazenda Thalia		*H. Moreira Filho*	*428*	NY
Paraná		Auto estrada Curitba - Paranaguá, próximo ao Rio Pequeno	08 November 1960	*R. Braga et al.*	*334*	UPCB
Paraná	**Almirante Tamandaré**	Campo Magro	23 September 1957	*G. Hatschbach*	*4123*	HB, MBM
Paraná	**Curitiba**	Parque Náutico	2 October 1983	*G. Hatschbach*	*48795*	CTES, MBM, US
Paraná	**Curitiba**	Capanema	12 October 1983	*G. Hatschbach & A.C. Cervi*	*46848*	HUCS
Paraná	**Curitiba**	Parque da Cidade	21 October 1981	*J.R. Cure*	*s.n.*	UPCB 11903
Paraná	**Curitiba**	Umbará	10 September 1974	*L.T. Dombrowski*	*5381*	MBM
Paraná	**Curitiba**	Capão da Imbuia	14 October 1966	*L.T. Dombrowski & Y. Saito*	*1886*	MBM

Paraná	**Palmas**	Horizonte	15 November 1998	*G. Hatschbach et al.*	*68680*	MBM, NY, UPCB
Paraná	**Piraquara**	Fazenda Experimental de Agronomia	21 October 1970	*N. Imaguire*	*2551*	MBM 210322, 161983, 161989
Paraná	**Piraquara**	Fazenda Experimental de Agronomia	15 October 1979	*N. Imaguire*	*5461*	MBM
Paraná	**São Mateus do Sul**	margem do Rio Iguaçu	18 April 2005	*R. Wasum*	*2625*	HUCS
Paraná	**São Mateus do Sul**	Colônia Iguaçú	05 October 2007	*R. Wasum*	*4329*	HUCS ICN
Paraná	**São Mateus do Sul**	Fazenda do Durgo		*S.M. Silva & R.M. Britez*	*816*	MBM 210315, 125576, UEC, UPCB
Rio de Janeiro	**Itatiaia**	Planalto.	08 February 1945	*A.C. Brade*	*17408*	RB
Rio de Janeiro	**Itatiaia**	Estrada Nova km15.	01 May 1950	*A.C. Brade*	*20325*	RB
Rio de Janeiro	**Itatiaia**	Itatiaia, retiro prope ribeirão da passagem	November 1903	*C. Moreira*	*2*	R
Rio de Janeiro	**Itatiaia**	Itatiaia, in campo lapidoso prope Agulhas Negras	December 1903	*C. Moreira*	*35*	R
Rio de Janeiro	**Itatiaia**	Parque Nacional da Itatiaia. Planalto.	12 April 1977	*G. Martinelli & R. Harley*	*1607*	RB
Rio de Janeiro	**Itatiaia**	Abrigo Rebouças Itatiaia	30 December 1966	*H.E. Strang*	*736*	NY
Rio de Janeiro	**Itatiaia**	Itatiaia, Abrigo Rebouças	30 December 1966	*H.E. Strang*	*897*	NY
Rio de Janeiro	**Itatiaia**	Abrigo Rebouças, Itatiaia	30 December 1966	*H.E. Strang & A. Castellanos*	*814*	NY
Rio de Janeiro	**Itatiaia**	Parque Nacional de Itatiaia, trilha para o Pico das Agulhas Negras	27 September 1995	*J.M.A. Braga et al.*	*2844*	RB
Rio de Janeiro	**Itatiaia**	Parque Nacional de Itatiaia, Planalto, trilha para as Prateleiras	24 January 1996	*J.M.A. Braga et al.*	*3203*	RB, SPF
Rio de Janeiro	**Itatiaia**	Abrigo Rebouças.	11 October 1977	*P.J.M. Maas & G. Martinelli*	*3178*	RB
Rio de Janeiro		Serra do Itatiaia	9 January 1896	*E. Ule*	*650*	R
Rio de Janeiro		Serra do Itatiaia	19 May 1902	*P. Dusén*	*278*	R
Rio de Janeiro		Ad confines Rio de Janeiro - Minas Gerais. In graminosis partis superioris montis Itatiaya	September 1901	*Wettstein & Schiffner*	*s.n.*	WU 65713
Rio Grande do Sul	**Caxias do Sul**	Galópolis	06 October 2000	*A. Kegler*	*1062*	HUCS, US
Rio Grande do Sul	**Caxias do Sul**	Santa Isabel	07 October 2000	*L. Scur*	*850*	HUCS
Santa Catarina		Ca. 6 Km de Bom Jardim da Serra para Lauro Miller.	12 November 2005	*M.D. Moraes*	*781*	UEC
Santa Catarina		Serra do Quiriri	14 November 2005	*M.D. Moraes*	*807*	UEC

Santa Catarina	**Bom Retiro**	Campo dos Padres, pela Fazenda Santo Antônio	23 January 1957	*L.B. Smith & R. Reitz*	*10309*	US
Santa Catarina	**Bom Retiro**	Parque Nacion. Potrero 26	26 October 1957	*R. Reitz & R. Klein*	*5487*	HBR
Santa Catarina	**Campo Alegre**	Serra do Quiriri	20 September 2001	*O.S. Ribas et al.*	*3696*	MBM
Santa Catarina	**Irani**	Campo de Irani	13 October 1964	*L.B. Smith & R. Reitz*	*12468*	HBR
Santa Catarina	**São Joaquim**	Curral Falso, Bom Jardim	10 December 1958	*R. Reitz & R. Klein*	*7782*	US
Santa Catarina		Serra do espigão	20 October 1961	*E. Pereira*	*6280*	RB
Santa Catarina		Serra do Espigão, BR-2	20 October 1961	*G. Pabst & E. Pereira*	*6107*	HB, LP, MBM, PEL, R
s. loc.		.	24 October 1914	*G. Jonsson*	*1204a*	US