

UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL
INSTITUTO DE BIOCÊNCIAS

**ESTUDO TAXONÔMICO DE SETE SEÇÕES DO GÊNERO *RHYNCHOSPORA*
VAHL (CYPERACEAE) NO RIO GRANDE DO SUL, BRASIL**

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Dissertação apresentada ao Programa de Pós-Graduação em Botânica como um dos requisitos para obtenção do grau de Mestre em Botânica, pela Universidade Federal do Rio Grande do Sul.

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Porto Alegre

2013

Agradecimentos

À minha família: meus pais, Pedro Joel Silva da Silva e Ângela Mari Silveira da Silva, que sempre me estimularam, e que com certeza me influenciaram muito para eu ter percorrido este caminho e ter chegado até esta nova etapa de minha vida. Aos meus avós, Hugo Corrêa, Mary Giambastiani e Palmira da Silva, que desde pequeno sempre me incentivaram e me proporcionaram momentos de contato com as plantas e a terra.

À minha orientadora, Ilsi Iob Boldrini, com quem pude compartilhar diversas questões do meu trabalho, que sempre me ajudou com seu vasto conhecimento, e que mesmo sendo muito amiga e divertida, sempre soube dar uns bons "paratiquietos" e botar nos eixos este "bocó".

Aos meus irmãos, Diogo e Carolina, pela amizade, carinho e acompanhamento. Ao meu amigo irmão Eric Thomas, pela grande amizade, sempre companheiro em todos os momentos de minha vida.

Aos colegas de laboratório, Mariana Vieira, Cleusa Vogel Ely, Pedro Maria, Camila Leal Bonilha, Bianca Andrade, Rosângela Rolim, Gabriel Ermiliano, Fabio Piccin, Luciana Menezes, Graziela Minervini, e Prof. Gerhard Overbeck pela amizade, conselhos, convívio, gargalhadas, "janelas abertas", churrascos na ecologia, na casa Ilsi... e por terem me aguentado os "incomodando", principalmente Mariana e Cleusa.

Aos amigos parceiros das expedições de coleta, Martin Grings, Ângelo Schneider, Eduardo Pasini, Jaqueline Durigon, Rafael Trevisan, Rodrigo Ardisson, Cassiano Welker, Edson Carvalho, Cleusa Vogel Ely e Luciana Menezes. Tanto pela amizade quando pelos conhecimentos adquiridos.

Ao Prof. Dr. Rafael Trevisan, com quem pude discutir questões específicas do gênero *Rhynchospora* e sobre nomenclatura botânica.

Aos funcionários do herbário ICN, Camila Carneiro, Mateus e Márcia. Aos curadores e funcionários de outros herbários visitados.

À Prof. Dr. Heinrich Hasenack e Luana de Lima e Silva, pela confecção dos mapas de distribuição das espécies.

Ao professor Cláudio Augusto Mondin, por sua amizade, apoio e acompanhamento durante a minha primeira fase acadêmica. Com certeza influenciaste bastante na minha jornada.

A todos meus amigos, que em diferentes momentos da minha vida me apoiaram. E que me proporcionaram momentos de dificuldades, reflexão e crescimento. Queria poder citar todos vocês aqui, mas são inúmeros, lendo saberão, vocês fazem parte do que sou hoje.

À CAPES pela bolsa concedida.

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Apresentação

Esta dissertação é apresentada na forma de dois artigos:

1- Estudo taxonômico de sete seções do gênero *Rhynchospora* Vahl (Cyperaceae) no Rio Grande do Sul, Brasil

2- Taxonomic novelties in *Rhynchospora*, and a key to sect. *Luzuliformes* Kük. species

A formatação de ambos artigos é baseada no modelo exigido para publicação na revista *Phytotaxa* (<http://www.mapress.com/phytotaxa/author.htm> <acessado em 06 April 2013>), onde pretendemos publicá-los.

INTRODUÇÃO GERAL

Segundo Muasya *et al.* (2009), Cyperaceae Juss. é uma família monofilética e irmã de Juncaceae Juss., ambas inseridas na ordem Poales (Stevens 2001 onwards). Cyperaceae compreende 109 gêneros e 5.424 espécies com distribuição quase cosmopolita (Govaerts *et al.* 2009). De acordo com Goetghebeur (1998), quase a metade das espécies pertence a somente dois gêneros: *Carex* L. (1.757 espécies) e *Cyperus* L. (686 espécies).

O gênero *Rhynchospora* foi publicado por Vahl (1805) com 19 espécies, sendo que destas, três eram novas para a ciência e as outras estavam anteriormente incluídas em outros gêneros, principalmente *Schoenus* L.

Segundo Muasya *et al.* (2009) e Simpson *et al.* (2007), o gênero *Rhynchospora* está inserido na tribo Schoeneae, na subfamília Cyperoideae. Apesar de algumas espécies serem citadas para a África, Europa e Ásia, sua distribuição é, sobretudo, neotropical, sendo que a maioria das espécies está distribuída entre as latitudes 20°N e 20°S (Araújo 2001). Grande parte destas espécies é heliófita, habitando principalmente lugares abertos e úmidos, como margem de rios e lagoas, mas também são encontradas em terrenos secos, pedregosos e locais elevados, e até mesmo em ambientes sombreados, como bordas de mata de galeria e interiores de mata (Barros 1945, Guaglianone 1979, 1981, Bryson & Carter 2008; Fig. I).

Segundo Goetghebeur (1998), esse gênero apresenta atualmente cerca de 250 espécies com concentração na América tropical. No Brasil, *Rhynchospora* é o gênero mais abundante da família, com 157 espécies, destas, 40 são endêmicas. Vinte e três espécies brasileiras possuem ampla distribuição e são em sua maior parte espécies ruderais ou invasoras (Alves *et al.* 2009). Segundo a Lista de Espécies da Flora do Brasil (Alves *et al.* 2013) o número de espécies é de 140, com 33 espécies endêmicas.

As espécies de *Rhynchospora* caracterizam-se pelas espiguetas com glumas dispostas espiraladamente, as glumas superiores floríferas, flores bissexuadas, ou então apenas uma flor bissexuada inferior e as superiores estaminadas. Apresentam estilopódio persistente sobre o fruto e aquênio geralmente com cerdas perigoniais (Barros 1960). As folhas não apresentam lígula, as inflorescências podem ser corimbódios, paniculódios, antelódios ou capitadas e os frutos são do tipo aquênio, o qual é obovado e dorsiventralmente lenticular (Goetghebeur 1998).

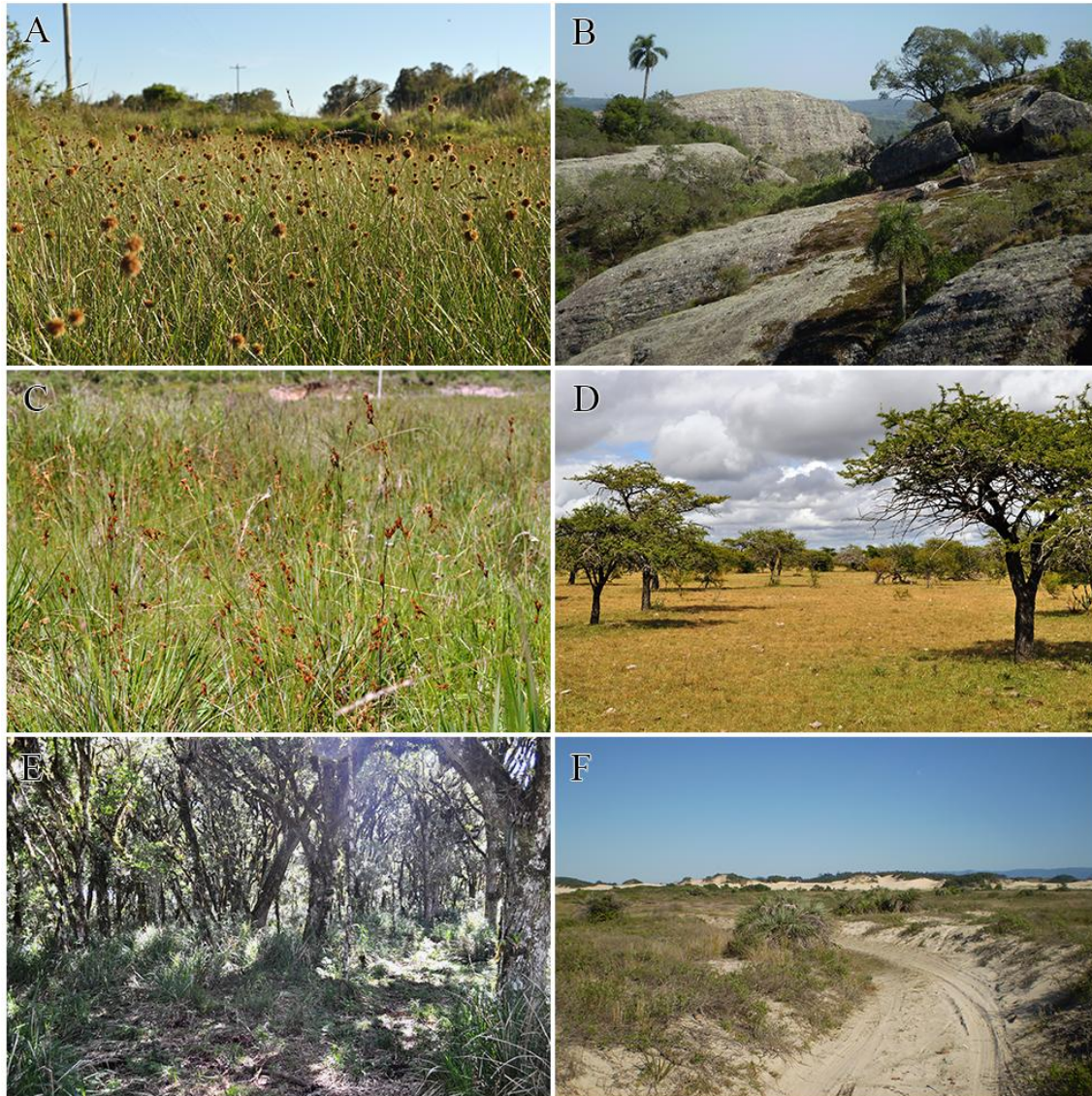


Figura I. Diversidade de habitats em que foram encontrados indivíduos do gênero *Rhynchospora*. A, baixadas úmidas, Tapes; B; afloramentos rochosos, Caçapava do Sul; C, turfeiras em São Francisco de Paula; D; campos secos, Parque do Espinilho; E, interiores de mata em São Francisco de Paula; E, e campos arenosos da planície costeira, Torres.

A terminação "odio" que é utilizada para a classificação das inflorescências de Cyperaceae, remete à proposta introduzida por Troll (1964), que as nomeia desta forma devido ao fato das inflorescências desta família serem indefinidas, e não definidas, como é o caso das inflorescências do tipo panícula, corimbo e antela (Kukkonen 1994).

Quanto à classificação infragenérica, várias propostas já foram feitas (Kunth 1837, Nees 1842, Boeckeler 1873, Clarke 1900), mas o trabalho mais completo e

utilizado até hoje é o de Kükenthal (1949, 1950, 1951), que se baseia nos estudos anteriores. Esta classificação é apresentada da seguinte maneira: dois subgêneros, cinco partes (classificação intermediária entre subgênero e as seções), 28 seções e 211 espécies (Fig. II).

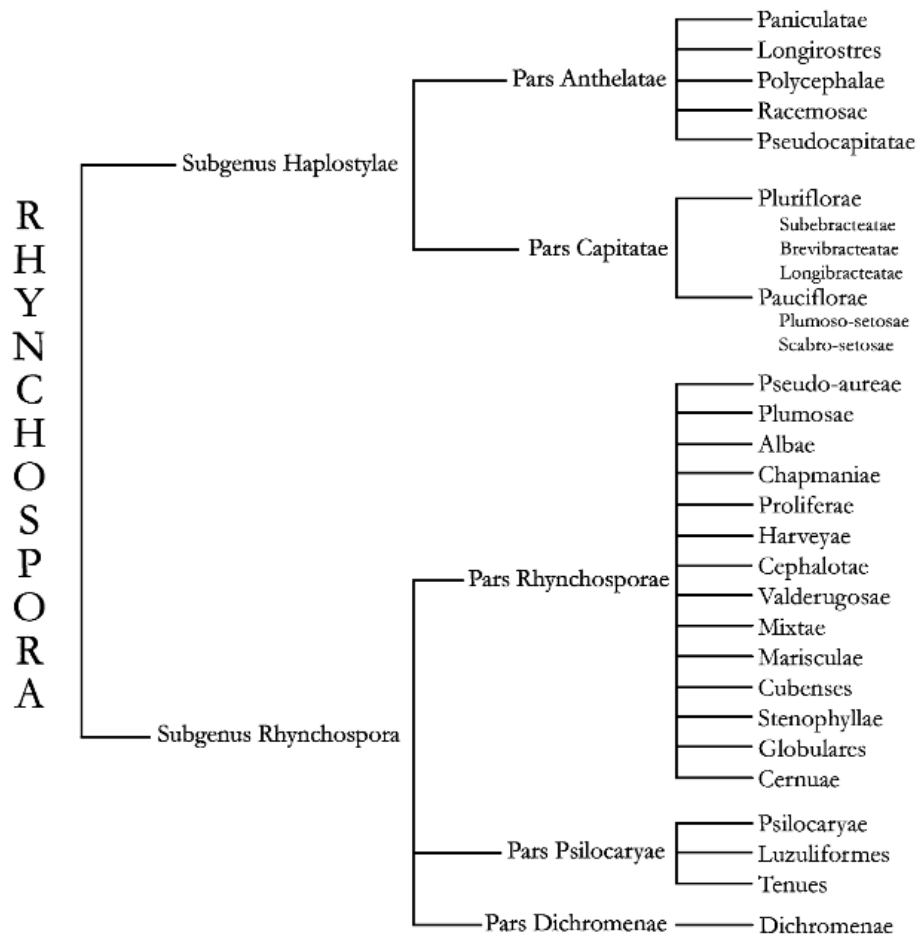


Figura II. Cladograma com a classificação infragenérica de Kükenthal, apresentado por Thomas *et al.* (2008).

Thomas *et al.* (2008) realizaram estudos moleculares preliminares para testar a classificação infragenérica de Kükenthal para o gênero *Rhynchospora* e *Pleurostachys* Brongn. O estudo utilizou 41 sequências de 22 das 28 seções de Kükenthal, mais três espécies de três seções do gênero *Pleurostachys*. Os resultados mostram que o gênero *Pleurostachys* está inserido dentro de *Rhynchospora*, e que, com algumas exceções, as seções testadas parecem ser monofiléticas. No entanto, a divisão nos subgêneros *Haplostylae* e *Rhynchospora* parece ser artificial.

Barros (1945, 1960), em trabalhos realizados na Argentina e Santa Catarina, cita e descreve a maior parte das espécies de *Rhynchospora* que ocorrem no Rio Grande do Sul, sendo uma importante ferramenta para a identificação. No entanto, as descrições são muito simplificadas, com poucas exsiccatas indicadas no material examinado, e há problemas quanto à circunscrição de algumas espécies. Outros estudos abordando, na maioria das vezes, seções do gênero ou pequenos grupos de espécies relacionadas, já foram realizados (Araújo 2001, 2012, Guaglianone 1979, 1980, 1981, 1982, 2001, Rocha & Luceño 2002), no entanto ainda são insuficientes para se conhecer a riqueza, a diversidade e o estado de conservação do gênero no Estado.

Capítulo 1

Taxonomic study of seven sections of the genus *Rhynchospora* (Cyperaceae) in Rio Grande do Sul, Brazil

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ABSTRACT

Rhynchospora is the richest genus of Cyperaceae in Brazil, with about 150 species, of which 40 are considered endemic to the country. They occur in all Brazilian biomes, in the most diverse habitats. Although there are recent studies on the genus, they are still insufficient, a large number of sections have not yet been reviewed. With knowledge obtained in field trips, literature and herbaria reviewed, this work aims to contribute to the taxonomic classification of the genus *Rhynchospora*, bringing the study of sections *Paniculatae*, *Polycephalae*, *Racemosae*, *Valderugosae*, *Psilocaryae*, *Luzuliformes* and *Spermodontes* in the state of Rio Grande do Sul, Brazil, and providing full descriptions, illustration of the habits, photos of spikelets and achenes, and distribution maps for the 14 species registered.

INTRODUCTION

Cyperaceae Juss is a monophyletic family and is sister of Juncaceae Juss., both are inserted in the order Poales (Stevens 2001 onwards, Chase et al., 2006, Givnish *et al.*, 2006, Givnish *et al.* 2010). Cyperaceae comprises 109 genera and 5.424 species and have subcosmopolitan distribution (Govaerts *et al.* 2009). According Goetghebeur

(1998), almost half of the species belong to only two genera: *Carex* L. (1.757 species) and *Cyperus* L. (686 species).

The genus *Rhynchospora* Vahl (1805) was published with 19 species, of which three were new to science and the others were previously included in other genres, especially *Schoenus* L.

According Muasya *et al.* (2009), and Simpson *et al.* (2007), the genus *Rhynchospora* is placed in the tribe Schoeneae, within the subfamily Cyperoideae. Although some species are cited for Africa, Europe and Asia, its distribution is mainly neotropical, and most species are distributed between latitudes 20° N and 20° S (Araujo 2001).

Most of these species are heliophytic, inhabiting mainly open and humid areas, as margins of rivers and lakes, but also are found in dry, rocky and elevated locations, anthropized environments and even in shaded environments, such as edges and the herbaceous layer of forests (Barros 1945 Guaglianone 1979, 1981, Bryson & Carter 2008).

According Goetghebeur (1998), this genus has about 250 species with concentration in tropical America. In Brazil, *Rhynchospora* is the most abundant genus of the family, with 157 species, of which 40 are endemic. Twenty-three species occurring in Brazil have wide distribution and are mostly ruderal or invasive species (Alves *et al.* 2009).

Regarding the infrageneric classification, several proposals have been made during the past centuries (Kunth 1837, Nees 1842, Boeckeler 1873, Clarke 1900), but the most complete and cited work is from Kükenthal (1949, 1950, 1951), which is based on the previous studies. This classification is presented as follows: subgenus *Capitatae* C.B. Clarke and *Haplostyleae* (Nees) Benth. & Hook. This sugenus including species with stylus entire or shortly bifid, consisting of the groups (informal classification used by Kükenthal, level among subgenera and sections) *Anthelatae* Kuk., recognized by sinflorescences formed by paniculodia, antelodia or corimbodia, which includes sections *Longirostres* Kunth, *Paniculatae* Boeckeler, *Polycephalae* Kuk., *Pseudocapitatae* C.B. Clarke and *Racemosae* C.B. Clarke; and group *Capitatae* C.B. Clarke, recognized by sinflorescences formed by capitate heads, which includes sections *Pauciflorae* Kuk. and *Pluriflorae* Kuk. The subgenus *Diplostyleae* Benth. & Hook. (=subgenus *Rhynchospora* J. Vahl), characterized by stylus deeply divided, consisting of the groups *Rhynchospora* Griseb., with hypogynous bristles always present, which

includes sections *Albae* C.B. Clarke, *Cephalotae* Kuk., *Cernuae* Gale, *Chapmaniae* Gale, *Cubenses* Gale, *Fuscae* C.B. Clarke, *Globular* Gale, *Harveyae* Gale, *Marisculae* Kuk., *Mixtae* Kuk., *Plumosae* C.B. Clarke, *Proliferae* Kuk., *Pseudo-aureae* C.B. Clarke, *Stenophyllae* Kuk. and *Valderugosae* Kuk.; *Psilocarya* group (Torrey) CB Clarke, with hypogynous bristles absent, sinflorescence formed by more or less lax corimbodia, which includes the sections *Laevinuces* Kuk., *Luzuliformes* Kuk., *Psilocaryae* Benth. & Hook., *Spermodontes* Kuk. and *Tenues* Kuk.; and group *Dichromenae* (Michx.) Pfeiffer, with uncapitate sinflorescences and whitish to stramineous spikelet scales, which has no defined section.

Thomas *et al.* (2009) performed a preliminary molecular study to test the infrageneric classification of *Rhynchospora* and *Pleurostachys* Brongn proposed by Kükenthal. The study used 41 sequences from 22 of the 28 sections of Kükenthal, and three sequences from three sections of the genus *Pleurostachys*. The results show that the genus *Pleurostachys* is embedded within *Rhynchospora*, and, with some exceptions, the sections tested appear to be monophyletic. However, the division and the subgenus *Haplostylae* and *Rhynchospora* seem to be artificial.

Barros (1945, 1960) in their studies of Cyperaceae for Argentina and Santa Catarina, cites and describes most of *Rhynchospora* species that occur in Rio Grande do Sul, and are also an important tool for identification. However, the descriptions are too simplified, with few material revised, absence of habitat information, and there are problems concerning the division of some species.

In the state, we have record of 13 sections so far, *Dichromenae*, *Longirostres*, *Luzuliformes*, *Marisculae*, *Paniculatae*, *Pluriflorae*, *Polycephalae*, *Psilocaryae*, *Racemosae*, *Spermodontes*, *Stenophyllae*, *Tenues* and *Valderugosae*. Of these, *Dichromenae*, *Longirostres*, *Pluriflorae* and *Tenues* have already been studied (respectively, Thomas 1984, Guaglianone 2001, Araujo 2001 and 2012, and Rocha & Luceño 2002) and *Marisculae* *Stenophyllae* and are being studied by Weber & Trevisan (pers. comm.).

In order to complete the taxonomic review of *Rhynchospora* in the State, this paper presents, with the knowledge obtained in field trips, bibliographic and herbarium, the study of the sections *Luzuliformes*, *Paniculatae*, *Polycephalae*, *Psilocaryae*, *Racemosae*, *Spermodontes* and *Valderugosae* in Rio Grande do Sul, Brazil. Providing full descriptions, illustration of the habits, photos of spikelets and achenes, and distribution maps for the 14 species registered.

MATERIAL & METHODS

Six field trips were conducted to collect in the state of Rio Grande do Sul, passing through eight of the 11 regions of Fortes (1959), except Missões, Alto Uruguai and Planalto Médio. We traveled approximately 6350 km, totaling 27 days of fieldwork. The collected material was deposited in the collection of the herbarium ICN (UFRGS), and the duplicates were sent to herbaria that loaned material for ICN.

To analyze the circumscription of species, describe them and estimate their distribution, we analyzed a large number of exsiccatae from the main herbaria of the State (HAS, HUUCS, HURG, ICN, MPUC, PACA, PEL and SMDB), as well from the states of Santa Catarina (HBR e FLOR) and Paraná (MBM), and the province of Corrientes, Argentina (CTES). Part of these herbaria were visited (ICN, HAS, MPUC, HBR, FLOR and MBM) and the other party had its material revised through loans. In exception of the Herbarium of the University of Caxias do Sul (HUUCS), which is not registered in Index Herbarium, the acronyms follow Thiers (2013).

The *opera principia* and *typi* were observed mainly through JSTOR.org 2013 (<http://plants.jstor.org/>), Biodiversity Heritage Library 2007 (<http://www.biodiversitylibrary.org/>) and Botanicus.org 2013 (<http://www.botanicus.org/>) websites.

For describing the species, we used the largest number of exsiccatae possible, since they were collected in Rio Grande do Sul. When species had less than 10 exsiccatae collected in the State, we used specimens from Paraná and Santa Catarina to complement the descriptions.

The description of the sections was based on the work of Kükenthal. To describe the leaves, we considered only the basal ones. All measurements were based only on developed structures. The measures of achenes do not include stylopodium, which was measured separately. The terminology used in the descriptions is based on Stearn (1983), Kukkonen (1994) and Lucero & Vegetti (2012).

The geographical distribution of the species was mainly obtained using data from the examined material, the Lista de Espécies da Flora do Brasil (Alves *et al.* 2013), references from Tropicos.org (2013), the monograph of Kükenthal (1949, 1950 and 1951), and other auxiliary bibliographies, such as Guaglianone (1980 and 1981). In order to classify the phytogeographic domains, we used the criteria compiled and presented in the Lista de Espécies da Flora do Brazil (Alves *et al.* 2013).

The periods of flowering/fruitleing were estimated through field observations and the state and information from the material examined.

The geographic coordinates from the exsiccatae were kept in the same way as they were written for no loss of information.

The illustrations of the habit of species and sinflorescence details (Fig. 1: "A", "b", "E" and "f") were made from photographs taken with camera NIKON 5000, and later edited in Adobe Photoshop to acquire the aspect presented in this paper. The details of leaves (Fig. 1, "c" and "g") and achenes (Fig. 1, "d" and "h") were obtained through the stereoscopic microscope and also edited with the same program.

To mount the distribution maps (Fig. 20) we used only the information from the revised material. The points represent the geographical center of the municipality where a particular species was collected.

TAXONOMY

Rhynchospora Vahl (1805: 229). Type:—*R. alba* Vahl (1805:236). Description adapted from Kükenthal (1949).

Herbs perennial, rarely annual, caespitose or rhizomatous, rarely stoloniferous. Rhizomes short or elongated, covered by cataphylls. Stems trigonous, rigid or flexible, sometimes having a longitudinal groove, glabrous, scabrous or pilose at angles. Leaves linear, flat, filiform or canaliculate, with apex acute, glabrous to pilose, and may present scabrosities at the margins and veins. Sheath closed, ligulae absent, remaining entire after leaf senescence or dissociating into fibers. Sinflorescences in most cases of paniculodium type, formed by partial paniculodia, corimbodia, antelodia or capitate heads, and sometimes reduced to a single capitate head. Spikelets usually grouped into fascicles or solitary, sometimes in capitate heads, with color ranging from white to dark brown. Scales spirally arranged, the lower sterile, and the following fertile, whereas at least the first flower is hermaphrodite, the other may be hermaphrodite or only male. Stamens 2 or 3, rarely 1, with filaments flattened and whitish, anthers basifixed, dehiscence rimose. Achenes biconvex, usually obovate, stramineous, olivaceous, brown or blackish, surface rugose, scalariform, undulate, punctate, scrobiculate or almost smooth, hypogynous bristles 3–6 (rarely 1–2 or 7–13), or absent. Ovary 2-carpellate, unilocular. Stylus thin and long, deciduous, entire or deeply bifid, sometimes shortly

divided. Stylopodium persistent on the achene, pyramidal, conical, subulate, spatulate or lunate, base straight or bilobed, in some cases decurrent on the edges of the achene.

Key to the Sections of *Rhynchospora* in Rio Grande do Sul Brazil.

1. Style entire or shortly bifid.....2
- . Style deeply bifid.....6
2. Synflorescence formed by paniculodia, antelodia, corymbodia, capitate heads (sometimes with a single capitate head in *R. holoschoenoides*, if so, then achene with subulate stylopodium), hypogynous bristles scabrous never plumose, or absent.....3
- . Synflorescence always formed by a single capitate head, hypogynous bristles plumose, scabrous or absent.....*Pluriflorae*
3. Culms erect, leaves wide, hypogynous bristles 5–6 (rare absent).....4
- . Culms arching, leaves narrow, hypogynous bristles absent.....*Racemosae*
4. Synflorescences formed by corymbodia, antelodia or capitate heads.....5
- . Synflorescences formed paniculodia.....*Paniculatae*
5. Spikelets clustered in capitate heads or fascicles, hypogynous bristles flexible or absent, achene, with surface transversely rugose, transversely undulate-rugose (rare pitted to smooth).....*Polycephalae*
- . Spikelets always clustered in fascicles, hypogynous bristles rigid, achene irregularly and coarsely wrinkled, punctate.....*Longirostres*
6. Hypogynous bristles present.....7
- . Hypogynous bristles absent.....9
7. Achene slightly rugose with many transversal lines.....8
- . Achene strongly rugose, foveate, with few lines.....*Valderugosae*
8. Corymbodia ample and branched.....*Marisculae*
- . Corymbodia reduced and briefly branched.....*Stenophyllae*
9. Spikelets in more or less loose corymbodia, paniculodia or antelodia, scales stramineous to brown colored.....10
- . Spikelets in a single capitate head, scales whitish.....*Dichromena*
10. Leaves flattened, spikelets more or less obtuse, spikelet scales densely imbricated.....11
- . Leaves canaliculated or filiform, spikelets acute, spikelet scales loosely imbricated.....12
11. Spikelets generally producing more than five mature achenes, partial synflorescences in corymbodia or antelodia.....*Psylocaryae*

- Spikelets producing no more than three mature achenes, synflorescence formed by partial paniculodia.....*Luzuliformes*
- 12. Achene apex with a crown-like projection, surrounding the stylopodium*Spermedontes*
- Achene apex without that characteristic.....*Tenues*

Key to the species of *Rhynchospora* sects. *Luzuliformes*, *Paniculatae*, *Polycephalae*, *Psilocaryae*, *Racemosae*, *Spermodontes* e *Valderugosae* in Rio Grande do Sul, Brazil.

- 1. Synflorescences formed by paniculodia.....2
- Synflorescences of other type, not formed by paniculodia.....6
- 2. Hypogynous bristles present, spikelets 9–12 mm long, culms 85–161 cm long, leaves 5–15 mm wide....(Sect. *Paniculatae*)... *R. hieronymi* subsp. *montevidensis*
- Hypogynous bristles absent, spikelets 2.8–5 mm long, culms 9–77 cm long, leaves 0.8–5 mm wide.....(Sect. *Luzuliformes*)...3
- 3. Spikelet scales no longer than 4 mm, generally ovate, stramineous to brown.....4
- Spikelet scales 4–5 mm long, oblong to lanceoloid, always stramineous*R. crinigera*
- 4. Rhizomes 0,6–6 mm wide, leaves with or without two parallel vinaceous lines at the margins of abaxial leaf surface.....5
- Rhizomes 6–10 mm wide, leaves generally having two parallel vinaceous lines at the margins of abaxial leaf surface.....*R. praecincta*
- 5. Rhizomes 0.8–3 mm wide, elongated, leaves with two parallel vinaceous lines at the margin of abaxial leaf surface, spikelets in loose paniculodia, stylopodium 0.2–0.4 mm long.....*R. megapotamica*
- Rhizomes 2–6 mm wide, short, leaves allgreen, spikelets in congested paniculodia, stylopodium 0.4–0.6 mm long.....*R. boeckeleriana*
- 6. Hypogynous bristles present.....7
- Hypogynous bristles absent.....8
- 7. Synflorescence formed by corymbodia, spikelets 2–2.8 mm long, dark brown, achene clearly ondulate-rugose, stylopodium triangular(Sect. *Valderugosae*)...*R. brittoni*

- . Synflorescence formed by capitate heads, spikelets 4–6.5 mm long, stramineous, achene faintly undulate-rugose, stylopodium subulate(Sect. *Polycephalae*)...*R. holoschoenoides*
- 8. Leaves 5–14 mm wide.....9
- . Leaves 0.8–5 mm wide.....11
- 9. Spikelets brown, ovate to cylindrical, plants found in humid open areas, as fens and wetlands..... (Sect. *Psilocaryae*).....*R. robusta*
- . Spikelets stramineous, lanceoloid, plants found in herbaceous layer of atlantic rainforest.....(Sect. *Polycephalae*)...10
- 10. Synflorescence formed by loosely (rarely congested) corymbodia or antelodia, spikelets 7–9mm long, stylopodium conical-subulate.....*R. glaziovii*
- . Synflorescence formed by turbinate capitate heads, spikelets 8–14 mm long, stylopodium cylindrical-spatulate.....*R. splendens*
- 11. Spikelets brown, in more or less loose partial synflorescences, with densely imbricated scales and producing more than four mature achenes(Sect. *Psilocaryae*)...12
- . Spikelets stramineous, in congested partial synflorescences, with loosely imbricated scales and producing no more than three mature achenes.....13
- 12. Spikelets ovate to cylindrical, scales apex mostly caudate, with large hyaline margins, stylopodium clearly bilobate at the base.....*R. conferta*
- . Spikelets lanceoloid, scales apex mostly acute, with narrow hyaline margins, stylopodium faintly bilobate at the base.....*R. velutina*
- 13. Synflorescences formed by spikes of fascicles, achene without projections at the apex, stylopodium subulate, clearly narrower than the achene, plants found in well drained soils of the herbaceous layer in araucaria forest and atlantic cloud forests.....(Sect. *Racemosae*)...*R. biflora*
- . Synflorescences formed by corymbodia of fascicles, achene with a crown or tooth like projection at the apex, surrounding the stylopodium, stylopodium ligulate, slightly narrower than the achene, plants found in humid soils of the Pampa grasslands.....(Sect. *Spermodontes*)...*R. confinis*

Sect. *Luzuliformes* Kük. (1950:183)

Culms flexuous. Leaves flat and narrow. Sinflorescences formed by 2–4 paniculodia. Spikelets grouped in fascicles, fusiform to ovoid-lanceoloid, apex obtuse, all flowers hermaphrodite, most fertile. Rachilla among flowers short and rigid. Glumes membranaceous, shortly mucronate and loosely imbricated. Stamens 3. Stylus long, deeply bifid. Hypogynous bristles absent. Achene orbicular-obovate, turgid-biconvex, transversely undulate-rugose. Stylopodium pyramidal to depressed, semilunate, the same width as the apex of the achene, decurrent on the edges of the achene.

***Rhynchospora crinigera* Boeckeler (1888:28).** Type:—URUGUAY. **Montevideo**, en los bañados de la barra del Rio Santa Lucia, 18 November 1877, *J. Arechavaleta* 2522 (holotype: MVM photo!).

Figs. 1 (habit), 15A (spikelet), 15H (sinfl. detail), 15J (leaf detail), 17A (achene) and 20 (distribution map).

Perennial plants, caespitose-rhizomatous. Rhizomes 0.6–0.9 mm diameter, flexible and short, covered by cataphylls and old sheaths, sometimes dissociated into fibers. Culms 10–50 × 0.04–0.11 cm, trigonous, flexible, glabrous or pilose in the apical part, near the spikelets, and with a longitudinal groove. Leaves 7–20 × 0.1–0.3 cm, flattened, entirely green, pilose, rarely glabrous or antrorsely scabrous at the margins and abaxial midvein; sheath 0.5–4 cm long. Synflorescence formed by a terminal paniculodium and 2–3 axillary paniculodia, all contracted (rarely loose to subcontracted) and composed of partial paniculodia, and these by fascicles of spikelets; axes above second order, usually pilose at the angles, especially the ones closest to the spikelets; apical paniculodium with 0.9–2 (–2.5) × 0.8–2 cm and the axillary with 0.6–1.5 × 0.6–1.5 cm. Spikelets 4–5 mm long, oblong-lanceoloid. Glumes ovate to lanceolate, stramineous, membranaceous, with a hyaline margin, apex obtuse, acute, or in some cases shortly bilobed, short-mucronate, mucron glabrous, the two lower glumes are sterile, the following hermaphrodites, and usually only the first three flowers develop achene. Stylus bifid. Stamens 3, anthers yellowish 2 mm long. Achene 0.8–1.1 × 0.8–1 mm, lenticular-biconvex, orbicular, apex obtuse, brownish when young to black when mature, surface

transversely undulate-rugose; bristles absent. Stylopodium 0.2–0.4 mm long, depressed, semilunate, decurrent on margins of achene, greyish to blackish.

Geographical distribution and habitat:—Brasil e Uruguai (Kükenthal 1950). In Brazil, in the states of Paraná, Rio Grande do Sul and Santa Catarina. Found in humid grasslands of the Atlantic Rainforest and Pampa.

Flowering/fruiting:—October to December.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Bom Jesus**, 28°40'16"S 50°34'32"W, 13 November 2004, *I. Boldrini et al.* 1396 (ICN); **Cambará do Sul**, Itaimbezinho, 13 December 1972, *J. C. Lindeman s.n.* (ICN 20864); **Cristal**, BR 116, 27 November 2003, *I. Boldrini* 1218 (ICN); **Encruzilhada do Sul**, BR 471, 26 November 2003, *I. Boldrini* 1213 (ICN), RS 471, 30°46'0.48"S 52°35'09.0"W, 26 November 2003, *I. Boldrini et al.* 1213 (ICN); **Piratini**, Fazenda Santa Fé, 19 December 2005, *A. Guglieri et al.* 779 (ICN); **São Francisco de Paula**, CPCN Pró-Mata, 04 November 2002, *F. Caporal s. n.* (MPUC 11289), estrada para Tainhas, 29°24'29,4"S 50°27'29,3"W, 28 November 2008, *R. Trevisan* 1029 (ICN), RS 020, 29°24'29,0"S 50°27'29,9"W, 24 November 2006, *R. Trevisan et al.* 725 (ICN); **São José dos Ausentes**, estrada para Bom Jesus, 28°44'35,5"S 50°05'55,3"W, 20 November 2007, *R. Trevisan* 879 (ICN), Serra da Rocinha, campo na margem do planalto, 04 December 1971, *J. C. et al. s.n.* (ICN 9398), Serra da Rocinha, 2 km após posto policial, 11 December 1996, *A. C. Araujo* 410a (ICN); **São Lourenço do Sul**, BR 116, km 167, entre o Arroio Isabel e Rio Camaquã, 02 December 1979, *T. M. Pedersen* 12607 (MBM); **Vacaria**, Parque das Cachoeiras, 28°39'47,0" S 50°54'48,3"W, 17 November 2012, *C. Vogel-Ely & G. E. Ferreira* 12 (ICN); **s. m.**, Cambará do Sul para São Francisco de Paula, February 1948, *B. Rambo* 36667 (PACA); **s. m.**, Canguçu para Encruzilhada do Sul, 31°00'0,45"S, 52°41'23,3"W, 09 October 2008, *H. Longhi-Wagner & G. Silveira* 10597 (ICN).

Additional examined material:—BRAZIL. PARANÁ: **Guarapuava**, estrada de terra próxima à Polícia Rodoviária Federal, 27 September 2012, *E. L. Siqueira & D. S. Gonçalves* 605 (FLOR); **São José dos Pinhais**, Rio Pequeno, 05 November 1969, *G. Hatschbach* 22849 (MBM); **Tijucas do Sul**, 15 October 1961, *G. H. Hatschbach* 8510 (MBM). SANTA CATARINA: **Água Doce**, 6 km ao sul de Horizonte (Paraná), ca. 26°38' S, 51°37' W, 04 December 1964, *L. B. Smith & R. M. Klein* 13507 (HBR), 20 km a oeste de Horizonte (Paraná), 05 December 1964 *R. M. Klein* 13654 (HBR); **Caçador**, Fazenda Esperança, 15 km a nordeste da cidade, 21 December 1956, *L. B. Smith & R.*

Reitz 8978 (HBR); **São Joaquim**, 30 January 2003, *H. Longhi-Wagner 8774a* (ICN); **Urubici**, Campo dos Padres, Fazenda do Sr. Arno Philippe, campo entre a casa da Fazenda e o Morro Boa Vista, 05 December 2006, *A. Zanin et al. 1227* (ICN), Morro da Igreja, 28°07'39,3"S 49°28'54,6"S, 13 December 2007, *R. Trevisan 945* (ICN); **s. m.**, Bom Jardim da Serra para São Joaquim, Serra do Oratório, 09 December 1958, *Reitz e Klein 7680* (HBR). URUGUAY. SAN JOSÉ: Barra de Santa Lucia, 19 December 1918, *C. Osten 14679* (MVM photo), 29 November 1929, *C. Osten 21773* (MVM photo), 10 January 1930, *C. Osten 21773b* (MVM photo), 16 January 1932, *C. Osten 21773c* (MVM photo).

It is a smaller plant, with max. 50 cm, having most herbaceous aspect than the other species of sect. *Luzuliformes*. Always found in humid grasslands, especially in the region of Campos de Cima da Serra. It differs from all other species by presenting longer spikelet and glumes, glumes always stramineous, and leaves and inflorescences axis usually pilose (Fig. 15). Practically all the material of *R. crinigera* examined was misidentified as *R. megapotamica*. We could not obtain and analyze the *opus princeps*, but the holotype, *J. Arechavaleta 2522* (MVM), was labeled by Boecker as *sp. nov.* In a note of C. Osten, attached to the material *C. Osten 21773* (MVM), there is the information that *J. Arechavaleta 2522* was borrowed by Arechavaleta to Boeckeler, which described the new species. In addition to what was observed in the holotype, the recognition of the species was aided by the personal note from C. Osten *exsiccatae*, who also presents a key to the species of the sect. *Luzuliformes*, and the characters presented in the work of Kükenthal (1950).

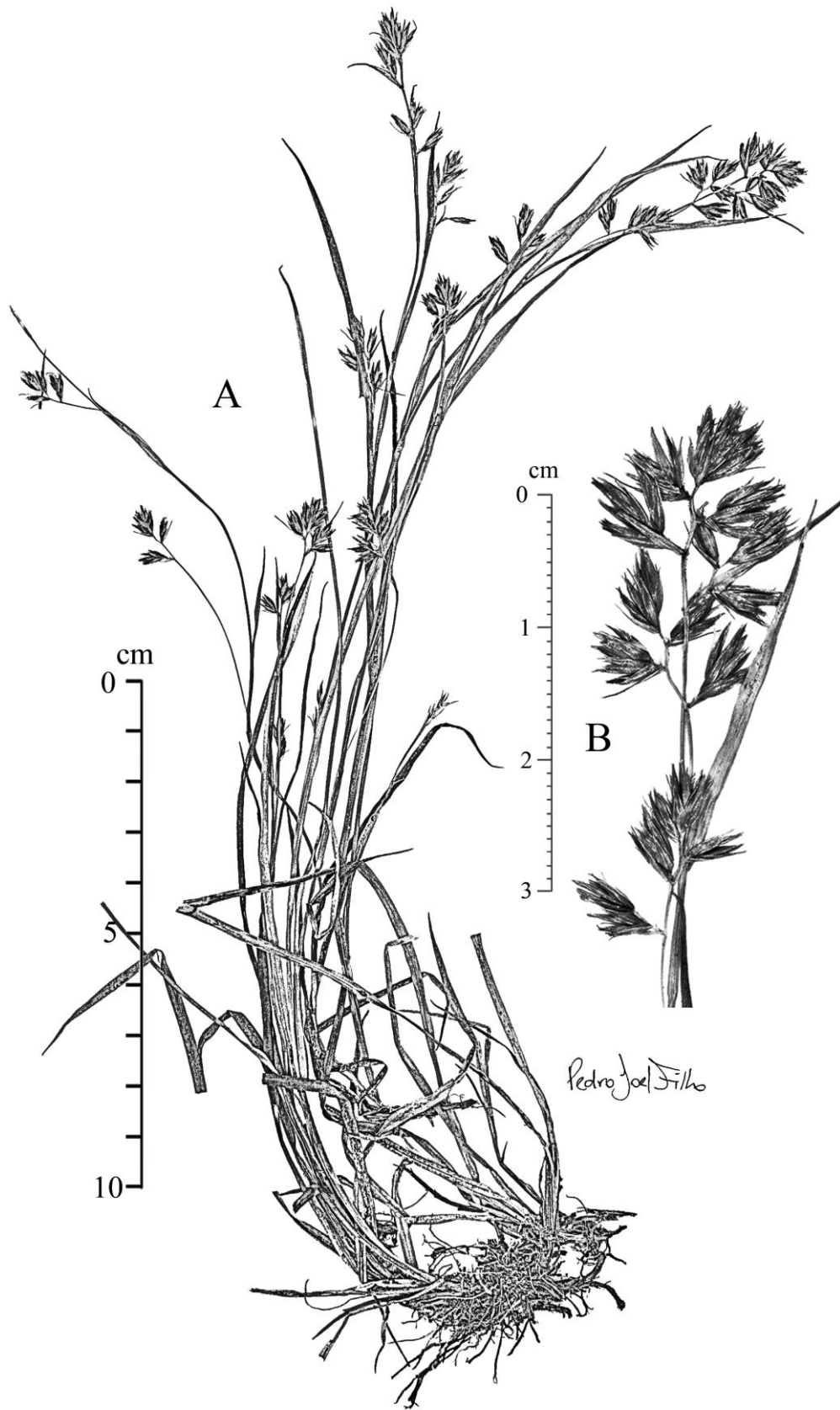


Figure 1. *Rhynchospora crinigera* Boeckeler: A, habit; B, sinflorescence (R. Trevisan 725).

***Rhynchospora megapotamica* (Spreng.) H. Pfeiff. (1943:129).** *Scirpus megapotamicus* Spreng. (1828:4). Type:—BRAZIL, RIO GRANDE DO SUL: **Rio Grande**, *Sello* (B†). Neotype (here designated):—BRAZIL, RIO GRANDE DO SUL: Pantano Grande, 30°13'44.75"S 52°21'46.08"W, 20 December 2011, *P. J. S. Silva Filho 1463* (ICN). *Rhynchospora maculata* Maury ex Micheli (1890:146). Type:—PARAGUAY: Plaine de Pirajubi, 1 September 1874, *Balansa 457* (P photo!).

Figs. 2 (habit), 15B (spikelet), 15I (sinfl. detail), 15K (leaf detail), 17B (achene) and 20 (distribution map).

Perennial plants, caespitose-rhizomatous. Rhizomes 0.8–2.1 mm diameter, flexible and elongated, covered by cataphylls and old sheaths, often dissociated into fibers. Culms 17–57 × 0.04–0.1 cm, trigonous, flexible, glabrous or scabrous in the apical part, near the spikelets, and with a longitudinal groove. Leaves 11–46 × 0.08–0.3 cm, flattened, usually with two longitudinal vinaceous lines near the margin, and with punctuations between them, most evident on the abaxial surface, especially in older leaves, glabrous or antrorsely scabrous at the margins and abaxial midvein; sheath 0.5–4 cm long. Synflorescence formed by a terminal paniculodium and 1–3 axillary paniculodia, all loose, rare subcontracted, and composed of partial paniculodia, and these by fascicles of spikelets; axes above second order, usually scabrous at the angles, especially the ones closest to the spikelets; apical paniculodium with 1.8–3.5 (–4.7) × 1.2–3.7 cm and the axillary with 1.2–3.5 × 1.2–3.3 cm. Spikelets 2.8–4 mm long, ovoid-lanceoloid. Glumes ovate to lanceolate, stramineous to brownish, membranaceous, with an hyaline margin, apex obtuse, acute, or in some cases shortly bilobed, short-mucronate, mucron glabrous, the two lower glumes are sterile, the following hermaphrodites, and usually only the first three flowers develop achene. Stylus bifid. Stamens 3, anthers yellowish 1–2 mm long. Achene 0.8–1 × 0.8–1 mm, lenticular-biconvex, orbicular, apex obtuse, stramineous when young to dark brown when mature, surface transversely undulate-rugose; bristles absent. Stylopodium 0.2–0.4 mm long, depressed, semilunate, decurrent on margins of achene, greyish to dark brown.

Geographical distribution and habitat:—Argentina, Brazil and Uruguay. In Brazil, in the states of Rio Grande do Sul and Santa Catarina. Strongly related to dry and rocky grasslands of Pampa, and rarely found in Campos de Cima da Serra (altitude grasslands of south Brazilian mountain ranges).

Flowering/fruiting:—Mainly September to December, with two records outside this period, one in April and another in July.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Aceguá**, BR 473, 31°38'10,4"S 54°08'57,9"W, 22 November 2003, *R. Trevisan et al.* 208 (ICN); **Alegrete**, Salso, 05 October 1960, *C. W. Fischer* 20 (HAS); **Bagé**, BR 153, 31 29'0,2"S, 54 08'1,6"W, 18 November 2006, *A. C. Araujo & I. Boldrini* 1653 (ICN), BR 153, ca. 40 km S de Bagé, 10 November 1976, *T. M. Pedersen* 11433 (CTES), Faculdade de Agronomia (FUNBA), 30 September 1982, *J. Mattos* 25662 (HAS); **Capão do Leão**, BR 116, km 550, 31°51'42,8"S 52°36'03,1"W, 31 October 2006, *R. Trevisan et al.* 684 (ICN); 30°21'43.63"S 53°20'23.63"W, 15 December 2011, *Silva Filho P. J. S.* 1462 (ICN); **Cachoeira do Sul**, 25 September 1983, *D. B. Falkenberg* 788 (ICN); **Canoas**, 06 November 1943, *Augusto* 203 (MPUC); **Caxias do Sul**, distrito de Santa Justina, 07 September 2004, *F. Marchett* 34 (HUCS); **Farroupilha**, 10 October 1957, *Camargo* 1905 (PACA), 25 October 1958, *Camargo s.n.* (PACA 63681) **Guaíba**, Fazenda São Maximiniano, BR 116, km 307, 08 November 2005, *R. Trevisan* 444 (ICN); **Jaquirana**, ponte sobre o Rio Tainhas em direção à Caxias do Sul, 06 October 2006, *A. C. Araujo et al.* 1639 (ICN); **Lavras do Sul**, 17 October 1971, *J. C. Lindeman & B. E. Irgang* (ICN 8701); **Pedro Osório**, BR 116, km 565, 31°55'47,9"S 52°44'05,3"W, 31 October 2006, *R. Trevisan et al.* 686 (ICN); **Pinheiro Machado**, Coxilha Pedras Altas, 11 November 2976, *T. M. Pedersen* 11438 (CTES); **Piratini**, gruta Iemanjá, próximo de arroio com ponte, S 31°26'58.9", W 053°07'24.2", 16 November 2003, *S. M. Hefler et al.* 166 (ICN); **Porto Alegre**, 25 October 1945, *B. Rambo* 29039 (PACA), Morro da Polícia, 01 October 1996, *H. Longhi-Wagner* 3371 (ICN), Morro São Pedro, 27 September 2008, *R. Setubal & M. Grings* 653 (ICN), Morro das Abertas, 14 October 1979, *J. Mariath* 742 (HAS); **Quaraí**, Fazenda Cantagalo, 29 October 2008, *R. Setubal & I. Boldrini* 720 (ICN), S30 25.140 W56 22.704, 02 November 2010, *P. J. Silva Filho & M. Grings* 1038 (ICN); **Rio Pardo**, à 6 km do Rio Irapuá, 11 November 1980, *J. Mattos* 21852 (HAS); **Santa Vitória do Palmar**, BR 471, 26 November 2004, *I. Boldrini* 1290 (ICN), 32°54'42.40"S 52°44'14.70"W, 07 November 2012, *P. J. S. Silva Filho* 1811 (ICN); **Santana do Livramento**, BR 293, km 384, sentido Quaraí, entrada da Fazenda Sta. Gertrudes, 30°42'26.2"S, 055°49'03,1"W, 18 November 2003, *S. M. Hefler et al.* 200 (ICN), Cerro Palomas, 15 October 1971, *J. C. Lindeman et al. s.n.* (ICN 8538); **São Marcos**, no km 138 da rodovia Porto Alegre para Vacaria, 13 November 1978, *J. Mattos* 20343 (HAS); **São Sepé**, 26 September 1983, *D. B. Falkenberg* 839 (ICN),

cerca de 1 km do trevo para Caçapava do Sul, na rodovia Porto Alegre para Uruguaiana, 1 September 1986, *J. Mattos & N. Mattos 29871* (HAS); **Uruguaiana**, 30 03.384S, 56 11.418W, 01 November 2010, *P. J. S. Silva Filho & M. Grings 1838* (ICN); **Viamão**, Parque Estadual de Itapuã, Morro do Araçá 30°21'10,0"S 51°02'16,1"W, 22 December 2005, *R. Trevisan 572* (ICN); **s. m.**, Caibaté para São Luiz Gonzaga, 24 November 1952, *B. Rambo 53439* (PACA); **s. m.**, Amaral Ferrador para Encruzilhada do Sul, September 1985, *M. Sobral et al. 4181* (ICN); **s. m.**, Canguçu para Encruzilhada do Sul, 31°00'0,45" S, 52°41'23,3" W, 09 October 2008, *H. Longhi-Wagner & G. H. Silveira 10598* (ICN); **s. m.**, entre Bagé e Caçapava do Sul, 02 April 1985, *J. Mattos, N. Mattos & N. Silveira 28880*; **s. m.**, entre Santa Maria e São Sepé, 3 October 1971, *J. C. Lindeman et al. s.n.* (ICN 8273); **s. m.**, Granja Neugebauer para Itapoan, 27 September 1950, *B. Rambo 48856* (PACA); **s. m.**, perto de Bagé, 02 April 1985, *J. Mattos, N. Mattos & N. Silveira 28904* (HAS).

Additional examined material:—ARGENTINA, CHACO: **Colonia Benites**, October 1932, *A. G. Schulz 650* (CTES); CORRIENTES: **Monte Caseros**, Campo Gral. Avalos, Paso de la Barca, sobre el Río Miriñay, 11 September 1979, *A. Schinini et al.* (ICN 48669). JUJUY: **Zapla**, 09 November 1974, *A. Burkart 30400* (CTES). MISSIONES: **Iguazú**, Arroyo aguaray, a pocos km de desembocadura en Rio Paraná, 11 September 2002, *H. Keller 1956* (ICN). SANTA FÉ: **Reconquista**, EEA Reconquista, 20 September 1985, *G. Blanchoud 2151* (CTES). BRAZIL, SANTA CATARINA: **Marcelino Ramos**, Rio Uruguai, Estreito, 16 September 1994, *G. Hatschbach & J. M. Silva 61069* (FLOR); **São Joaquim**, July 1963, *J. Mattos 11187* (HAS). URUGUAY: **Florida**, Estancia Rincón de Santa Elena, Estancia A. Gallinal, 13 November 1948, *R. Gallinal 6017* (CTES); **Itapúa**, Arroio San Rafael, Rotal, 15 km SE de General Delgado, 16 November 1978, *M. M. Arbo et al. 2008* (CTES).

In herbarium, many exsiccatae identified as *Rhynchospora megapotamica* actually belong to the species *R. boeckeleriana* or *R. crinigera*. For that reason, to estimate the geographical distribution of this species, we considered only the materials personally reviewed in this study. The type of this species was not found, it is a collection of Sellow without number, from Rio Grande do Sul, Brazil. This type probably was in B herbarium and was destroyed during World War II. The herbarium was contacted and they have not found this specimen in their collections, therefore a neotype was designated.

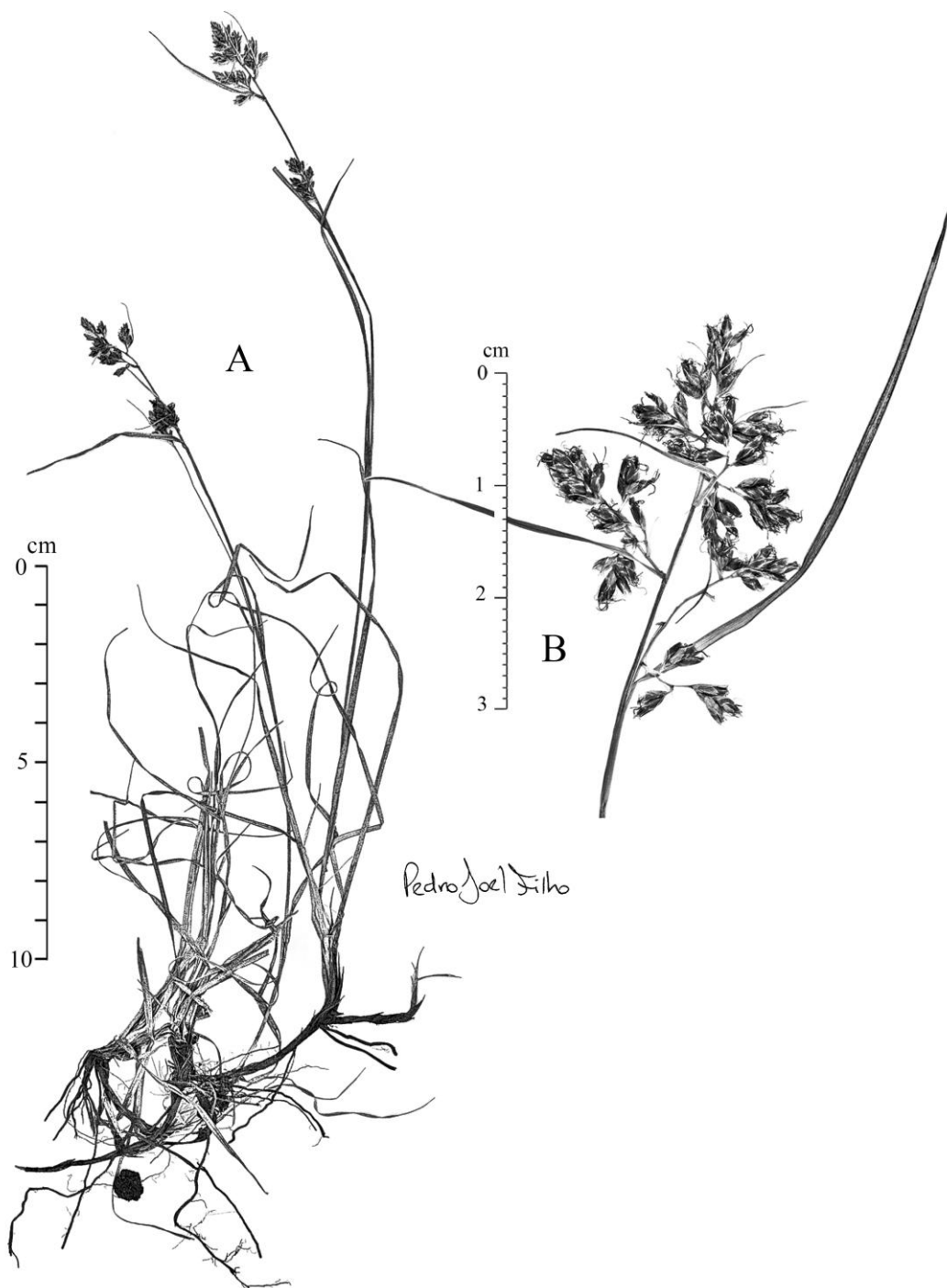


Figure 2. *Rhynchospora megapotamica* (Spreng.) H. Pfeiff.: A, habit; B, sinflorescence detail (P. J. S. Silva Filho 1463).

***Rhynchospora praecincta* Maury ex Micheli (1890:146).** Type:—PARAGUAY: *in viis*, 24 August 1974, *Balansa 453* (holotype: P photo!); *in pascuis*, 28 October 1876, *Balansa 2553* (remaining syntype, K photo!).

Figs. 3 (habit), 15C (spikelet), 15L (leaf detail), 17C (achene) and 20 (distribution map).

Perennial plants, caespitose-rhizomatous. Rhizomes 6–10 mm diameter, ligenous and short, covered by cataphylls and old sheaths often dissociated into fibers. Culms 9–35 × 0.06–0.11 cm, trigonous, flexible, glabrous or scabrous in the apical part, near the spikelets, and with a longitudinal groove. Leaves 6–24 × 0.09–0.3 cm, flattened, usually with two longitudinal vinaceous lines near the margin, and sometimes with punctuations between them, most evident on the abaxial surface, glabrous or antrorsely scabrous at the margins and abaxial midvein; sheath 1–4 cm long. Synflorescence formed by a terminal paniculodium and 1–3 axillary paniculodia, all densely contracted and composed of partial paniculodia, and these by fascicles of spikelets; axes above second order, usually scabrous at the angles, especially the ones closest to the spikelets; apical paniculodium with 0.9–2.3 × 1–2.4 cm and the axillary with 0.5–1.6 × 0.5–1.5 cm. Spikelets 2.9–3.1 mm long, ovate to ovate-lanceoloid. Glumes ovate to lanceolate, stramineous, membranaceous, with evident hyaline margin, apex obtuse, acute, or in some cases shortly bilobed, short-mucronate, mucron glabrous, the two lower glumes are sterile, the following hermaphrodites, and usually only the first three flowers develop achene. Stylus bifid. Stamens 3, anthers yellowish 1.6–1.8 mm long. Achene 0.8–1 × 0.7–1 mm, lenticular-biconvex, orbicular, apex obtuse, stramineous when young to brown when mature, surface transversely undulate-rugose; bristles absent. Stylopodium 0.2–0.3 mm long, depressed, semilunate, decurrent on margins of achene, greyish to brownish.

Geographical distribution and habitat:—Argentina, Brazil and Paraguay. In Brazil, only found in dry and rocky grasslands of Pampa, Rio Grande do Sul.

Flowering/fruiting:—August to December.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Barra do Quaraí**, 14 October 1971, *J. C. Lindeman et al. s. n.* (ICN 8456), 30°12'14.27"S 57°29'36.14"W, 17 December 2011, *P. J. S. Silva Filho 1461* (ICN); **São Lourenço do Sul**, Fazenda Cordilheira, 27 October 2011, *C. L. Bonilha 335* (ICN); **Quaraí**, Cerro do Jarau, 28

September 1984, *B. Irgang et al. s. n.* (ICN 92807); **Uruguiana**, ponte sobre o Rio Ibicuí, na divisa com Itaqui, 13 November 1984, *M. Sobral 3290* (ICN).

Additional examined material:—ARGENTINA. CORRIENTES: **Concepción**, 17 September 1986, *T. M. Pedersen 14582* (MBM); **Empedrado**, Estância Três Marias, 13 October 1982, *T. M. Pedersen 13433* (MBM); **Mercedes**, Ea. Dionísio, Ruta 40, 32 km SW de Colonia Pellegrini, Colonia Uruguay, 57°28'W, 28°40'S, September 1999, *A. Schinini 35083* (MBM). PARAGUAY. DEPARTAMENTO CENTRAL: **s. m.**, próximo a Villeta, 16 November 1969, *T. M. Pedersen 9320* (MBM).

It is an uncommon species, exclusive from Pampa, which dwells mainly in dry grasslands with shallow soils. It is recognized mainly by presenting rhizomes short, thickened, densely covered by cataphylls and aged sheaths often dissociated into fibers. For both *Rhynchospora praecincta* and *R. luzuliformis* var. *pusilla* we had two syntypes, therefore we have designated the lectotypes.

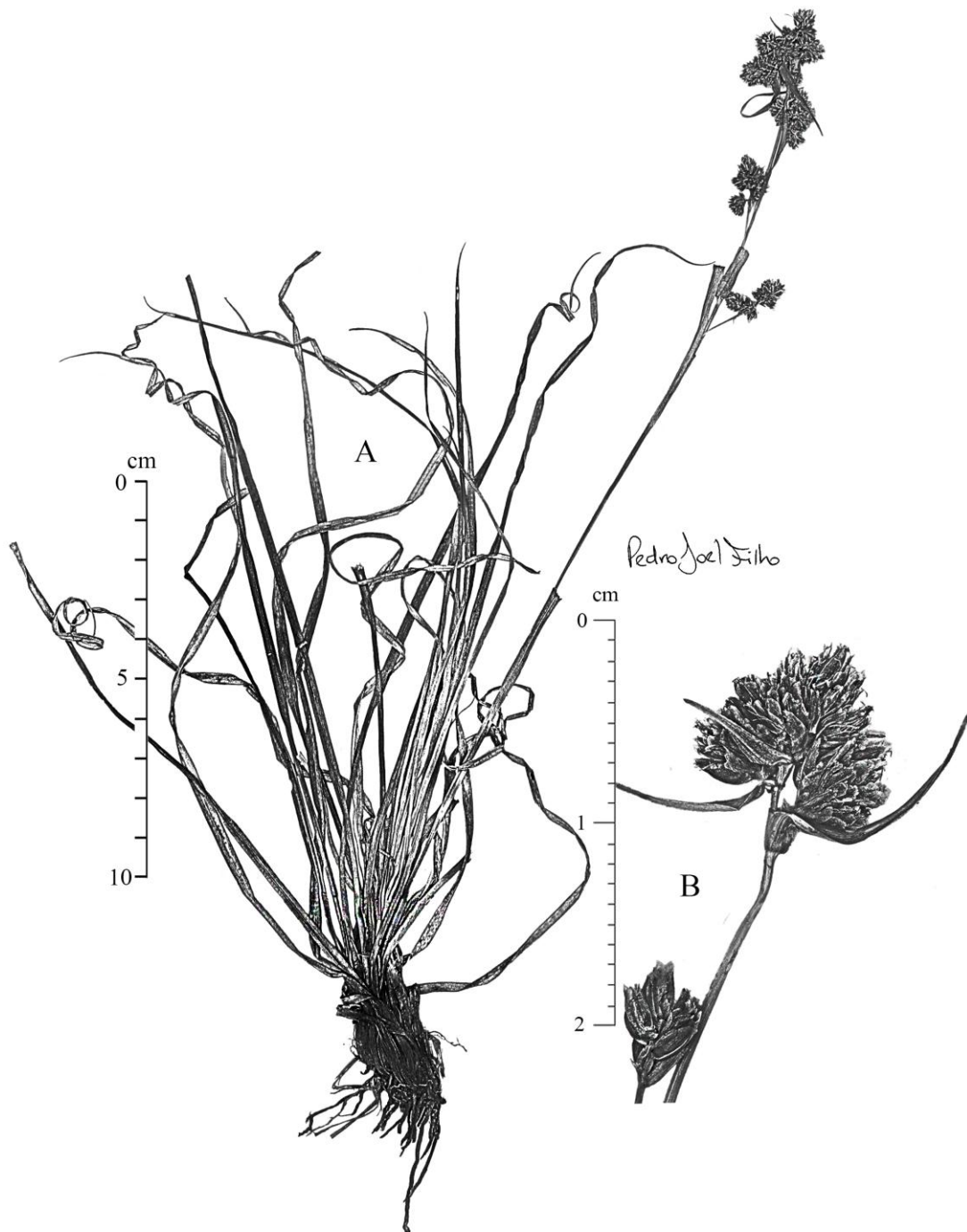


Figure 3. *Rhynchospora praecincta* Maury ex Micheli: A, habit; B, sinflorescence detail (J. C. Lindeman et al. s. n.).

***Rhynchospora boeckeleriana* Silva Filho & Boldrini nom. nov. and stat. nov.**

Basionym: *Rhynchospora megapotamica* var. *spicata* Kük. in Pfeiff. (1943:130).
Type:—BRASIL. Santa Catarina: im Sumpf auf dem Campo der Serra do Oratorio, Feb 1890, *Ule 1611* (holotype B†; lectotype (designated by Silva Filho 2013): F (F0BN012156, photo! from B† holotype)). Epitype (designated by Silva Filho 2013):—
BRAZIL: Santa Catarina: Bom Retiro, BR 282, km 136, 27°49'29,9"S, 49°34'27,0"W, 29 November 2006, *R. Trevisan et al. 765* (ICN!).

Figs. 4 (habit), 15D (spikelet), 15M (leaf detail), 17D (achene) and 20 (distribution map).

Perennial plants, caespitose-rhizomatous. Rhizomes 2–6 mm diameter, ligenous and short, covered by cataphylls and old sheaths often dissociated into fibers. Culms 30–77 × 0.08–0.2 cm, trigonous, flexible, glabrous or scabrous in the apical part, near the spikelets, and with a longitudinal groove. Leaves 17–66 × 0.15–0.5 cm, flattened, glabrous or antrorsely scabrous at the margins and abaxial midvein, entirely green; sheath 1–5 cm long. Synflorescence formed by a terminal paniculodium and 1–3 axillary paniculodia, all contracted to subcontracted and composed of partial paniculodia, and these by fascicles of spikelets; axes above second order, usually scabrous at the angles, especially the ones closest to the spikelets; apical paniculodium with 2–4 (–5.5) × 1–3 cm and the axillary with 1–3 × 0.6–3 cm. Spikelets 2.8–3.8 mm long, ovate to ovate-lanceoloid. Glumes ovate to lanceolate, dark brown, membranaceous, apex obtuse, acute, or in some cases shortly bilobed, short-mucronate, mucron glabrous, the two lower glumes are sterile, the following hermaphrodites, and usually only the first two flowers develop achene. Stylus bifid. Stamens 3, anthers yellowish 1.3–1.5 mm long. Achene 0.8–0.9 × 0.7–1 mm, lenticular-biconvex, orbicular, apex obtuse, stramineous when young to brown when mature, surface transversely undulate-rugose; bristles absent. Stylopodium 0.4–0.6 mm long, depressed, semilunate-subulate, decurrent on margins of achene, brown.

Geographical distribution and habitat:— Brazil. In the states of Paraná, Santa Catarina and Rio Grande do Sul. Found in wetlands and fens of Atlantic Rainforest and Pampa.

Flowering/fruiting:—September to December.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Cambará do Sul**, Faxinal, December 1983, *M. Sobral & J. R. Stehmann 2693* (ICN); **Caxias do Sul**, 29 05.085S, 51 02.783W, November 2010, *P. J. S. Silva Filho et al. 1905* (ICN); **Encruzilhada do Sul**, estrada para Amaral Ferrador, 30°51'15"S, 52°32'20,2"W, 09 October 2008, *H. Longhi-Wagner & G. H. Silveira 10603* (ICN); **Giruá**, Granja Sobral, October 1963, *K. Hagelund 1096* (ICN); **Nova Prata**, Estação Experimental Fitotecnia, 15 November 1982, *J. Mattos & R. Frosi 31111* (HAS); **Pelotas**, Cascatinha, 20 November 1986, *J. R. Mattos & N. Mattos 32279* (FLOR); **São Francisco de Paula**, Lajeado Grande, RS 476, 29°06'33,2"S 50°38'22,5"W, 26 November 2010, *I. Boldrini 1659* (ICN); **Soledade**, BR 386, km 242, 28°47'32.4"S, 052°31'22.8"W, 20 November 2003, *S. M. Hefler et al. 249* (ICN).

Additional examined material:—BRAZIL. PARANÁ: **General Carneiro**, Faxinal dos Souzas, 07 December 1971, *G. Hatschbach, L. B. Smith & Klein 28333* (MBM); **Guaíra**, Parque Nacional Sete Quedas, 02 September 1981, *E. Buttura 701* (MBM); **Palmas**, Rio Chopim, 20 October 1966, *G. Hatschbach 15050* (MBM); **Piên**, Boa Vista, Pedreira, 20 October 2006, *E. F. Costa & Cordeiro 65* (MBM). SANTA CATARINA: **Água Doce**, 04 December 1964, *L. B. Smith & R. Klein 13511* (HBR); **Bom Jardim da Serra**, acesso Vacas Gordas para Ubirici, 28 19'39,3S, 49 37'18,5W, 23 November 2006, *A. C. Araujo & G. 1679* (ICN); **Bom Retiro**, BR 282, km 136, 27°49'29,9"S, 49°34'27,0"W, 29 November 2006, *R. Trevisan et al. 765* (ICN), Campo dos Padres para Bom Retiro, 17 December 1948, *R. Reitz 3493* (PACA); **Caçador**, Fazenda Carneiros, 21 December 1956, *L. B. Smith & Reitz 9007* (HBR); **Catanduvas**, 17-19km Oeste de Joaçaba, ca. 27°03'S 51°45'W, 15 December 1964, *L. B. Smith & R. M. Klein 13953* (FLOR); **Florianópolis**, Morro da Lagoa, 14 September 1990, *M. H. Queiroz 286* (ICN); **Lages**, em beira de estrada no portal norte da cidade, saída para Curitiba, 27°45,008'S, 50°20,014'W, 21 October 2005, *R. Trevisan 397* (ICN); **Lebon Régis**, Rio dos Patos, 06 December 1962, *R. Klein 3400* (FLOR); **Urubici**, caminho entre a Pousada Rio Canoas Refúgio de Montanhas e a Fazenda do Sr. Arno Philippe, 04 December 2006, *A. Zanin et al. 1125* (ICN), Campo dos Padres, Fazenda do Sr. Arno Philippe, 07 December 2006, *A. Zanin et al. 1274* (ICN).

R. boeckeleriana was recently recognized as a distinct species of *R. megapotamica*, being formerly considered a variety of it, *R. megapotamica* var. *spicata*. Differentiated by its copious sinflorescences, formed by longer than wider paniculodia, with densely

aggregate spikelets, spikelets narrower and dark brown, and for being taller plants which inhabit humid or waterlogged environments, especially in region of Campos de Cima da Serra, while *R. megapotamica* is characteristic of dry and rocky grasslands of Pampa.

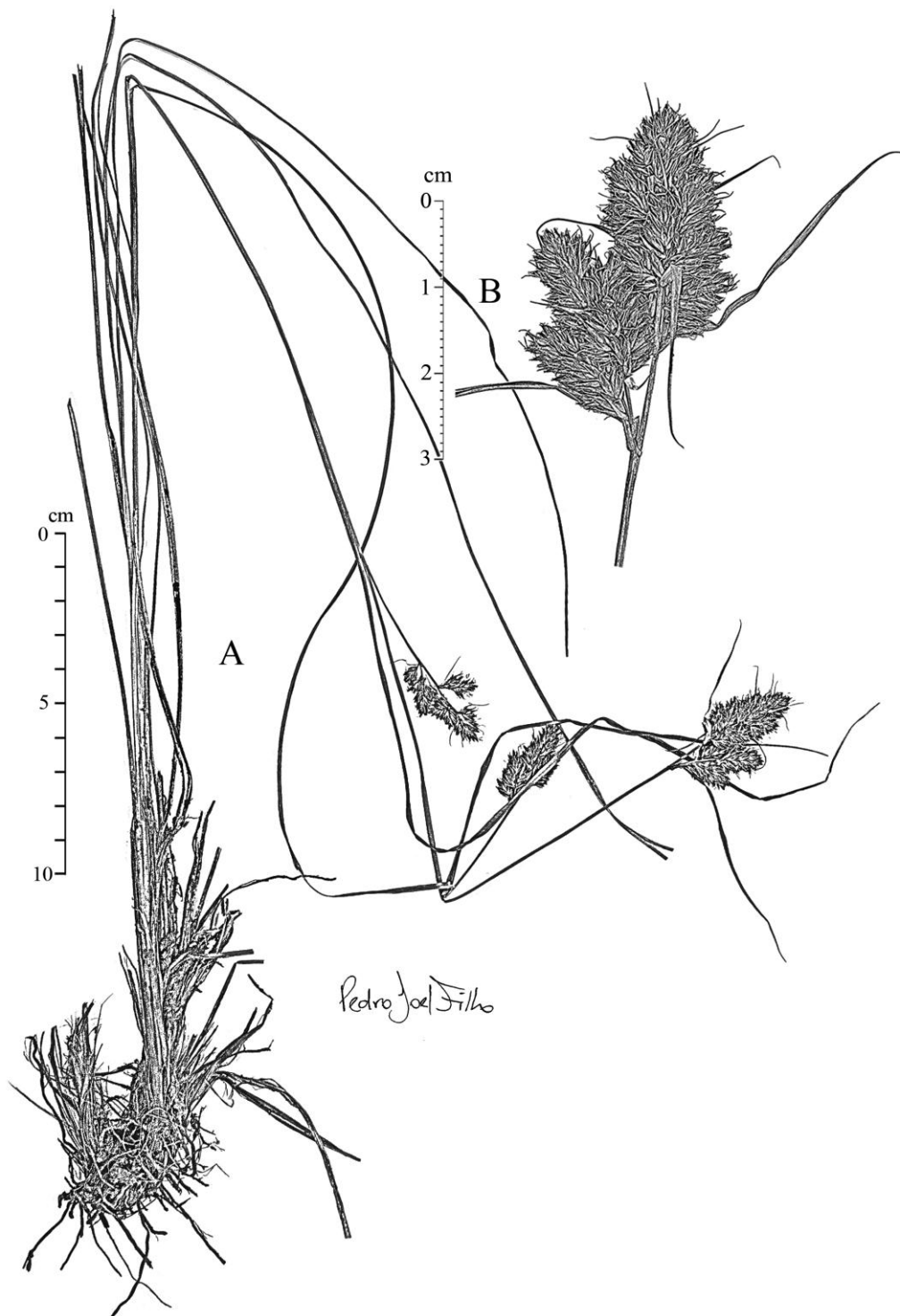


Figure 4. *Rhynchospora boeckeleriana* Silva Filho & Boldrini: A, habit; B, sinflorescence detail (P. J. S. Silva Filho et al. 1905).

Sect. *Paniculatae* Boeckeler (1873:630)

Culms rigid. Leaves flat, wide and rigid. Sinflorescences formed by several paniculodia, loose to contracted. Spikelets solitary or grouped in fascicles, all flowers hermaphrodite. Rachilla among flowers developed, often flexuous. Glumes membranaceous, stramineous to brown, mucronate to aristate. Hypogynous bristles 1–6, rigid, antrorsely scabrous, often deciduous. Achene ovate to obovate, turgid-biconvex, scalariform, rare scrobiculate. Stylopodium conical-subulate or pyramidal, green to grayish.

***Rhynchospora hieronymi* subsp. *montevidensis* Guagl. (1981:449).** *Rhynchospora hieronymii* var. *montevidensis* Barros (1945:398). Type:—URUGUAY. Depto. Canelones: Carrasco, 22 Jan 1938, *Lombardi & Legrand 1372* (holotype, SI photo!).

Figs. 5 (habit), 16E (spikelet), 18D (achene) and 20 (distribution map). *R. hieronymii* form. *compacta* Kük. (1949:347).

Perennial plants, caespitose-rhizomatous. Rhizomes 5–10 mm diameter, ligneous and short, covered by chartaceous cataphylls. Culms 85–161 × 0.05–0.8 cm, trigonous, erect, glabrous or scabrous in the apical part, near the spikelets. Leaves 38–85 × 0.5–1.5 cm, flattened, glabrous or antrorsely scabrous at the margins and abaxial midvein; sheath 2–13 cm long. Synflorescence formed by a terminal paniculodium and 2–6 axillary paniculodia, all contracted to subcontracted and composed of partial paniculodia, and these by fascicles of spikelets; axes above second order, usually scabrous at the angles, especially the ones closest to the spikelets; apical paniculodium with 3–6 × 2.5–5 cm and the axillary with 3.5–6 × 3.5–6 cm. Spikelets 0.9–1.2 mm long, lanceoloid. Glumes ovate to lanceolate, brown, membranaceous, apex acute, aristate, arista glabrous to antrorsely scabrous, the three lower glumes are sterile, the following hermaphrodites, and usually only the first two flowers develop achene. Stylus entire or shortly bifid. Stamens 3, anthers yellowish 3–3.6 mm long. Achene 1.5–2 × 1.3–1.8 mm, lenticular-biconvex, orbicular, apex truncate, stramineous when young to brown when mature, surface scalariform; bristles shorter than the achene, generally 1–3,

occasionally absent, deciduous. Stylopodium 1.5–2 mm long, conic-subulate, grayish to brownish.

Geographical distribution and habitat:—Argentina, Brazil e Uruguay (Guaglianone 1981, Tropicos.org 2013). In Brasil, in the states of Paraná, Rio Grande do Sul and Santa Catarina. Found in fens and herbaceous layer of Atlantic Rainforest and Pampa, always in humid or waterlogged soils.

Flowering/fruiting:—September to March.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Cambará do Sul**, 20 January 1948, *B. Rambo 16650* (PACA), Faxinal, December 1983, *M. Sobral & Stehmann 2695a* (ICN), Itaimbezinho, March 1977, *H. H. Dornelles s. n.* (ICN 42696); **Esmeralda**, Estação Ecológica de Aracuri, 03 December 2002, *J. Mauhs s. n.* (PACA 87022); **Nova Prata**, Estação Experimental Fitotécnica, 15 November 1982, *J. Mattos & R. Frosi 25982* (HAS); **Porto Alegre**, Morro São Pedro, 10 September 2011, *M. Grings & R. M. Rabelo 1471* (ICN), Morro São Pedro, 12 October 2006, *R. Setubal, M. Grings & A. Mello 451* (ICN), Morro São Pedro, 21 October 2011, *P. J. S. Silva Filho & M. Grings 1880* (ICN); **Torres**, Morro Azul, March 1997, *M. Sobral et al. 8342* (ICN); **s. m.**, Cambará do Sul para São Francisco de Paula, February 1948, *B. Rambo 36644* (PACA); **s. m.**, Esteio para Canoas, 11 November 1955, *B. Rambo 57311* (PACA).

Additional examined material:—BRAZIL. PARANÁ: **Boa Ventura de São Roque**, PRT 460, 5 km antes do acesso à cidade, 24°56'09,9"S, 51°37'41,5"W, 20 December 2006, *R. Trevisan et al. 800* (ICN); **Curitiba**, Capão da Imbuia, 29 September 1964, *L. T. Dombrowski 412* (MBM). SANTA CATARINA: **Água Doce**, Campos de Palmas, 3 km a noroeste de Herciliópolis, ca. 26°47'S, 51°32'W, 5 December 1964, *L. B. Smith & R. M. Klein 13636* (FLOR); **São Joaquim**, 18 February 1958, *Mattos s. n.* (PACA 63454).



Figure 5. *Rhynchospora hieronymi* subsp. *montevidensis* Guagl.: A, habit; B, sinflorescence detail (*J. Mauhs s. n.* PACA 87022).

Sect. *Polycephalae* C. B. Clarke (1900:118)

Culms rigid. Leaves flat, wide and rigid. Sinflorescence formed by 2–9 antelodia or corimbodia, loose to contracted. Spikelets grouped into capitate heads or fascicles, basal flowers hermaphrodite and the superior male. Rachilla among the flowers rigid and short. Glumes membranaceous, brown, rarely olivaceous, mucronate. Hypogynous bristles 6, flexible, antrorsely scabrous, longer than the achene, or absent. Stylus entire or shortly bifid. Achene obovate, rarely oblong, turgid-biconvex, transversely undulate-rugose, rarely densely punctate or smooth. Stylopodium long, conical-subulate, narrower than the achene.

***Rhynchospora glaziovii* Boeckeler (1874:405).** Type:—BRAZIL. Rio de Janeiro: Haut des Orgues, 22 October 1872, A. Glaziou 6427 (holotype: B†, F (F0BN011135, photo! from B† holotype); lectotype (designated by Silva Filho 2013) P (P00265355 photo!); isoelectotypes: P (P00265354 photo!), K photo!, SI (fragment from K, photo!)).
Rhynchospora floribunda Boeckeler (1890:27) *sin.nov.* Type:—ARGENTINA. Misiones: G. Niederlein 2144 (B†). Neotype (designated by Silva Filho 2013):—BRAZIL. Rio Grande do Sul: São Francisco de Paula. -29.30892, -50.192113, 03 November 2011, P. J. S. Silva Filho 1399 (ICN!; isoneotype: K!).

Figs. 6 (habit), 16F (spikelet), 18C (achene) and 20 (distribution map).

Perennial plants, caespitose-rhizomatous. Rhizomes 3–13 mm diameter, ligneous and short, covered by chartaceous cataphylls. Culms 60–195 × 0.1–0.9 cm, trigonous, erect, glabrous or scabrous at apex. Leaves 40–128 × 0.4–1.4 cm, flattened, glabrous or antrorsely scabrous at the margins and abaxial midvein; sheath 2.3–15 cm long. Synflorescence formed by a terminal antelodium or corymbodium and 5–11 axillary antelodia or corimbodia, all subcontracted to loose and composed of partial paniculodia, and these by fascicles of spikelets; axes above second order, usually glabrous at the angles; apical antelodium with 3–6 × 3–8.5 cm and the axillary with 2–6 × 2.5–8 cm. Spikelets 7–9 mm long, lanceoloid. Glumes ovate to lanceolate, stramineous to light brown, membranaceous, apex acute, mucronate, mucron glabrous, the three or four

lower glumes are sterile, the following hermaphrodites, and only the first flower develop achene. Stylus entire. Stamens 3, anthers yellowish 2.5–4 mm long. Achene 2–2.9 × 1.3–2.3 mm, turgid-biconvex, orbicular, ovate or elliptical, apex truncated, stramineous to olive-green or light brown, surface faintly transverse rugose; bristles absent. Stylopodium 3–5 mm long, cylindrical-spatulate, greyish to brownish.

Geographical distribution and habitat:—Argentina and Brazil (Guaglianone 1981, Tropicos.org 2013). In Brasil, in the states of Minas Gerais, Paraná, Rio Grande do Sul, Santa Catarina and São Paulo. Found in the herbaceous layer of the Atlantic Rainforest and Cerrado, mainly in Araucaria Forest.

Flowering/fruiting:—All the year.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Bom Jesus**, coord. 532564, 6866166, 13 June 2009, *M. Molz, R. Trevisan & T. C. De Marchi s. n.* (ICN 163710); **Cambará do Sul**, -29.053919, -50.085425, 03 November 2011, *P. J. S. Silva Filho 1406* (ICN), Cânion Fortaleza, 17 July 1990, *N. Silveira 8946* (HAS), Fazenda Velha: Celulose Cambará, 19 October 1994, *N. Silveira 12813* (HAS), Itaimbezinho, 01 December 1981, *H. M. Longhi-Wagner et al. 948* (ICN), Itaimbezinho, 03 December 1971, *J. C. Lindeman et al. s. n.* (ICN 9328), Itaimbezinho, 11 March 1988, *N. Silveira 7385* (HAS), Itaimbezinho, 28 April 1974, *B. Irgang et al. s. n.* (ICN 30670), Parque Nacional dos Aparatos da Serra, 23 June 1980, *J. L. Waechter 1626* (ICN), Pedra do Segredo, February 1987, *R. Wasum et al. s. n.* (HAS 2278); **Canela**, February 1986, *M. Sobral e R. Silva 4991* (ICN), Cascata do Caracol, 08 December 1990, *L. Garcés s. n.* (ICN 89368), Sítio Garcés, 09 December 1990, *L. Garcés s. n.* (ICN 89363), -29.3208799883724,-50.7391978986562, 04 March 2012, *P. J. S. Silva Filho 1883* (ICN); **Caxias do Sul**, Ana Rech, 10 December 1999, *L. Scur 269* (MBM), Ana Rech, Faxinal, 10 December 1999, *L. Scur 269* (MBM), Vila Oliva, 02 June 2002, *A. Kegler 1504* (HUCS), Vila Oliva, 10 February 2002, *A. Kegler 1589* (HUCS), Vila Oliva, 28 October 1949, *B. Rambo 43132* (PACA); **Farroupilha**, 12 April 1957, *Camargo 1285* (PACA), 25 May 1956, *Camargo 688* (PACA), 28 May 1956, *Camargo 721* (PACA), Parque dos Pinheiros, 30 May 1978, *O. Bueno 717* (HAS); **Jaquirana**, Fazenda Boa Vista, 24 April 1988, *G. Grazziotin et al. s. n.* (HUCS 3973) RS 110, entrada para a sede de Jaquirana, 05 October 2006, *A. C. Araujo, H. M. Longhi-Wagner & R. Guazuma 1635* (ICN); **São Francisco de Paula**, -29.311034, -50.181229, 03 November 2011, *P. J. S. Silva Filho 1401* (ICN), -29.311034, -50.181229, 03 November 2011, *P. J. S. Silva Filho 1402* (ICN), -29.311034, -50.181229, 03 November 2011, *P. J. S. Silva*

Filho 1403 (ICN), -29.30892, -50.192113, 03 November 2011, *P. J. S. Silva Filho 1397* (ICN), -29.30892, -50.192113, 03 November 2011, *P. J. S. Silva Filho 1398* (ICN), -29.30892, -50.192113, 03 November 2011, *P. J. S. Silva Filho 1399* (ICN), 27 April 1985, *J. R. Stehmann 623* (ICN), Boca da Serra, 24 May 1984, *N. Silveira, R. Frosi & N. Model 1295* (HAS), Colinas de São Francisco, 01 September 2007, *H. M. Longhi-Wagner 10319* (ICN), Colinas de São Francisco, 01 September 2007, *H. M. Longhi-Wagner 10320* (ICN), CPCN Pró-Mata, July 2001, *L. Eggers s. n.* (MPUC 11296), CPCN Pró-Mata, April 2005, *P. M. A. Ferreira s. n.* (MPUC 11296), Fazenda 3 Cachoeiras, Passo do Inferno, 09 November 2000, *V. Caetano 297* (HAS), FLONA, 31 October 1997, *N. Bittencourt et al. s. n.* (PACA 96888), RS 235, 20 April 2001, *R. Wasum 1079* (HUCS); **São José dos Ausentes**, 3 km após Posto Policial, 04 October 2006, *A. C. Araujo, H. M. Longhi-Wagner & R. Guazuma 1620* (ICN), Morro Negro, 12 December 1996, *A. C. Araujo 421* (ICN), Pico do Monte Negro. -28.617264,-49.79903, 04 March 2012, *P. J. S. Silva Filho et al. 1884* (ICN); Silveira, September 2002, *L. S. Pontes s. n.* (ICN 124871), Silveira, 31 December 2006, *R. Trevisan et al. 811* (ICN).

Additional examined material:—BRAZIL. MINAS GERAIS: **Camanducaia**, Vila Monte Verde, 18 July 1994, *H. M. Longhi-Wagner 2625* (ICN), Vila Monte Verde, Serra da Mantiqueira, ca. 22°48'S 45°55'W, 16 October 1996, *P. G. Windisch et al. 8651* (ICN). PARANÁ: **Antonina**, Abrigo I, Trilha para o Pico Paraná, 04 July 2010, *R. Ristow 692* (MBM) **Antônio Olindo**, Rio Água Amarela, 01 July 1971, *G. Hatschbach 26827* (MBM); **Campina Grande do Sul**, Pico Paraná, 17 July 1968, *G. Hatschbach 19508* (MBM); **Colombo**, 25°17'53,00"S 49°08'47,00"W, 26 October 2010, *M. Verdi, E. M. Martins & O. N. Veiga 5553* (FLOR); **Curitiba**, Umbara, Rio Iguacú, 31 September 1972, *G. Hatschbach 30382* (MBM); **Guarapuava**, estrada de terra próxima a Polícia Rodoviária Federal, 25°22'06,3"S 51°15'141,6"W, 27 September 2012, *E. L. Siqueira & D. S. Gonçalves 583* (FLOR); **Palmeira**, Fazenda Santa Rita, 20 June 1989, *L. T. Dombrowski 13878* (HUCS); **Piraquara**, Fazenda Experimental de Agronomia, 24 June 1970, *N. Imaguire 2397* (MBM); **Rio Negro**, 20 September 1960, *G. Hatschbach 7249* (MBM); **São João do Triunfo**, 22 July 1966, *J. Lindeman e H. Haas 1935* (MBM); **São José dos Pinhais**, 03 November 1972, *Y. S. Kuniyoshi 3319* (MBM); **São Mateus Sul**, 25 June 1969, *G. Hatschbach 21667* (MBM); **Tijucas do Sul**, Associação dos Professores do UFPR, 29°50'13,8"S 49°03'05,2"W, 09 November 2012, *M. G. Caxambu et al. 3570* (FLOR). SANTA CATARINA: **Alfredo Wagner**, Lomba Alta, 27°43'20,00"S 49°24'33,00"W, 21 April 2009, *S. Devreck & F. E. Carneiro 831*

(ICN); **Bela Vista do Toldo**, 26°16'42,00"S 50°29'42,00"W, 19 October 2010, *M. Verdi, E. M. Martins & O. N. Veiga 5444* (FLOR); **Caçador**, 22 December 1956, *B. Smith e Reitz 9080* (HBR); **Itaiópolis**, Moema, 26°32'58,00"S 49°46'10,00"W, 18 October 2010, *M. Verdi, E. M. Martins & O. N. Veiga 5422* (FLOR); **Orleans**, Rio Hipólito, 28°15'37,00"S 49°29'58,00"W, 22 May 2009, *M. Verdi & A. L. Gasper 2193* (ICN); **Otacílio Costa**, 603547S, 6943294W, 06 May 2008, *M. Verdi e F. E. Carneiro 661* (MBM); **Porto União**, 22 April 1962, *Reitz & Klein 12778* (MBM); **Santa Cecília**, Timbó Grande, 28 July 1978, *R. M. Klein, O. S. Lima & J. M. Campos 12199* (HBR); **São Domingos**, Parque Estadual das Araucárias, 26°27'55,00"S 52°33'51,00"W, 20 April 2009, *A. Stival-Santos & S. Silveira 761* (ICN); **São Francisco do Sul**, Morro do Iquererim, 05 September 1957, *Reitz e Klein 4762* (HBR); **São José**, Serra da Boa Vista, 13 April 1961, *Reitz & Klein 10994* (HBR); **Três Barras**, 26°14'50,1"S 50°13'44,0"W, 08 October 2008, *A. L. Gasper & E. Brogni 1890* (ICN), Área do Exército, lat. 26°14'50," S long. 50°13'44,0 W, 08 October 2008, *A. L. Gasper & E. Brogni 1890* (ICN), BR 280, 26°10.285'S, 50°16.035'W, 21 October 2005, *R. Trevisan 413* (ICN); **Ubirici**, Santa Terezinha, 28°00'47,00"S 49°29'31,00"W, 07 April 2009, *M. Verdi, R. P. Hasckel & G. Klemz 1957* (ICN). SÃO PAULO: **Campos do Jordão**, Santa Cruz, 27 October 1992, *A. Jasper et al. s. n.* (HAS 8708).

Rhynchospora glaziovii Boeckeler is a tall herb, reaching almost two meters, forming dense clumps, and found in large populations in Araucaria Forest, and even in subdossel of *Pinus* sp. monoculture in the same region.



Figure 6. *Rhynchospora glaziovii* Boeckeler: habit (G. Hatschbach 30.382).

Rhynchospora holoschoenoides (Rich.) Herter (1953:157). *Schoenus holoschoenoides* L. C. Richard (1792:106). Type:—FRENCH GUIANA: Cayenne, 1792, *J. B. Leblond 36* (isotypes: P, P00265907 and P00265908 photos!).

Figs. 7 (habit), 15G (spikelet), 17F (achene) and 20 (distribution map).

Perennial plants, caespitose-rhizomatous, which may also present stolons. Rhizomes, ligneous and short, covered by coriaceous cataphylls and old sheaths. Stolons, up to 11 cm long and 0.1–0.2 cm diameter, with cataphylls shorter than the entrenodes. Culms 12–91 × 0.08–0.3 cm, trigonous, generally erect, glabrous or scabrous in the apical part. Leaves 7–100 × 0.1–0.7 cm, flattened, glabrous; sheath 1.5–26 cm long. Synflorescence formed by a terminal antelodia of capitate heads or a single capitate head, rarely with an axillary capitate head; capitate heads 1–14, 0.7–1.8 cm diameter, formed by fascicles of spikelets densely aggregated. Spikelets 4–6.5 mm long, ovoid-lanceoloid. Glumes suborbiculate to lanceolate, stramineous to brownish, membranaceous, apex obtuse to acute, shortly mucronated, mucron glabrous, the two lower glumes are sterile, the following hermaphrodites, and usually only the first flower develop achene. Stylus entire. Stamens 3, anthers yellowish 2–3 mm long. Achene 1.3–1.9 × 0.9–1.4 mm, lenticular-biconvex, obovate to oblong-obovate, apex obtuse, often with antrorse scabrosities, stramineous when young to blackish when mature, surface slightly undulate-rugose; hypogynous bristles 6, antrorsely scabrous, slightly surpassing the size of the achene. Stylopodium 0.9–2.5 mm long, subulate, falcate, with antrorse scabrosities, grayish.

Geographical distribution and habitat:— From the United States to Uruguay and Argentina, on the coast of the Atlantic Ocean and Madagascar (Kükenthal 1949, Guaglianone 1981, Tropicos.org 2013). In Brazil occurs in all States. Found in swamps and soggy lowlands of the Amazon, Caatinga, Cerrado, Atlantic Rainforest and Pampa. Often related to sandy soils associated with rivers, lakes and the sea.

Flowering/fruiting:—September to March.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Arroio do Sal**, 26 November 1989, *A. Bellans s. n.* (MPUC 6519), entrada para Rondinha, 16 October 2003, *R. Trevisan & I. Boldrini 25* (ICN), 15 May 2006, *G. H. Silveira 493a* (ICN); **Capão da Canoa**, 15 December 2005, *R. Trevisan 555* (ICN); **Capão do Leão**, EMBRAPA, CNPATB, 02 October 1986, *J. A. Jarenkow 482* (ICN); **Capivari do Sul**,

Fazenda dos Touros, 09 January 2004, *E. N. Garcia & J. Paz 1006* (ICN), RS 040, km 70, 16 October 2003, *R. Trevisan & I. Boldrini 43b* (ICN); **Cristal**, BR 116, km 473, 31°0,4'31,1"S - 52°0,2'17"W, 20 January 2005, *G. H. Silveira & S. M Hefler 143* (ICN); **Guaíba**, BR 116, Fazenda São Maximiano, 18 May 1996, *A. C. Araujo 263* (ICN), Fazenda São Maximiniano, BR 116, km 307, sem data, *R. Trevisan 611* (ICN), Fazenda São Maximiniano, BR 116, km 308, 03 December 2005, *L. F. Lima 167* (ICN); **Mostardas**, Lagoa dos Moleques, 14 January 2008, *E. Pasini 237* (HUCS); **Osório**, Atlântida Sul, Estrada do Mar, km 17, 21 January 1997, *H. M. Longhi-Wagner 3566* (ICN), RS 389, Estrada do Mar (a 3km da entrada) 29°54'20.3"S 50°14'44"W, 28 January 2004, *H. Longhi-Wagner & S. Hefler 9058* (ICN); **Palmares do Sul**, 11 January 2012, *F. Gonzatti 366* (FLOR), Lagoa Capão Alto, 26 November 2011, *F. Gonzatti 247* (FLOR); **Parobé**, Sta. Cristina do Pinhal, Sítio de M. L. Porto, 27 March 1984, *Mauro 45* (ICN); **Pelotas**, Granja União de Ângelo Hadler & Cia, 09 March 1957, *J. C. Sacco 603* (PACA); **Pinhal**, Lagoa da Porteira, 23 March 2004, *M. S. Marchioretto & J. Mauhs s. n.* (PACA 103228), 13 February 1996, *V. L. Caetano 112* (ICN); **Porto Alegre**, Morro São Pedro, Econsciência, Espaço de Conservação, 07 December 2008, *R. Setubal & L. Lima 783* (ICN); **Rio Grande**, estrada para a balsa para Santa Isabel, 4km da BR 471, 25 November 2004, *I. Boldrini, R. Trevisan & E. N. Garcia 1255* (ICN); **Santa Vitória do Palmar**, 26 November 2004, *I. Boldrini 1297* (ICN), 32°59'59.1"S 52°49'26.1"W, 07 November 2012, *P. J. S. Silva Filho 1841* (ICN); **Santo Antônio da Patrulha**, 17 November 2005, *I. Boldrini & R. Trevisan 1441* (ICN); **São Jerônimo**, 20 December 1973, *K. Hagelund 7400* (ICN); **São José do Norte**, 31°57'45,3"S - 51°59'36,4"W, 23 October 2003, *R. Trevisan, I. Boldrini & E. N. Garcia 112* (ICN), 31°54'56.60"S 51°56'29.20"W, 07 November 2012, *P. J. S. Silva Filho 1788* (ICN); **São Lourenço do Sul**, Fazenda Cordilheira, 01 February 2012, *C. L. Bonilha 381* (ICN); **Tapes**, 30°31'24.20"S 51°25'10.1"W, 07 November 2012, *P. J. S. Silva Filho 1773* (ICN); **Tavares**, RS 101, 31°32'36,1"S - 51°19'33,7"W, 23 October 2003, *R. Trevisan, I. Boldrini & E. N. Garcia 104* (ICN); **Torres**, 29°25'32.24"S, 49°49'21.40"W, 18 November 2010, *P. J. S. Silva Filho 1388* (ICN), Parque Estadual de Itapeva, 16 January 1987, *N. Silveira 4160* (HAS), Parque Estadual de Itapeva, 17 February 1992, *H. Longhi-Wagner & A. C. Araujo 2503* (ICN), Parque Estadual de Itapeva, 17 February 1992, *H. Longhi-Wagner & A. C. Araujo 2504* (ICN), Parque de Torres, 14 July 1972, *B. Irgang, J. Lindman & A. Giraldo s. n.* (ICN 28212), Praia Real, 29°25'39.2"S, 49°48'16,4W, 28 January 2004, *H. Longhi-Wagner & S. Hefler 9083*

(ICN), 10 November 1976, *K. Hagelund 9912* (ICN); **Viamão**, Assentamento Filhos de Sepé, -30.109939,-50.89473, January 2012, *P. J. S. Silva Filho 1482* (ICN), Morro da Grota, acesso pelo Leprosário, 10 June 1980, *O. Bueno 2620* (HAS), Parque Estadual de Itapuã, 30°23'00,5"S, 51°01'06,00"W, 15 December 2005, *P. M. A. Ferreira 118* (ICN), Parque Estadual de Itapuã, April 1983, *M. Sobral 2048* (PACA), Parque Estadual de Itapuã, April 1984, *M. Sobral 2933* (ICN), Parque Estadual de Itapuã, Praia de Fora, 28 February 2002, *V. L. Caetano 356* (HAS), Quinta da Estância Grande, -30.028673,-50.941975, January 2013, *P. J. S. Silva Filho 1866* (ICN); **Xangri-Lá**, RS 389, km 26, 29°48'43,9"S, 50°03'42,5"W, 28 January 2004, *Hilda Longhi-Wagner & S. Hefler 9070* (ICN).

Additional examined material:—BRAZIL. BAHIA: **Conde**, Mata do Bu, 22 June 2003, *G. Hatschbach et al. 75619* (HUCS); **Jacobina**, 11°20'4"S, 40°28'19"W, 04 April 1999, *R. M. & A. M. Giuliatti 53706* (FLOR), **Olivença**, Canabrava, 3 a 5 km O, 14 June 2003, *G. Hatschbach et al. 75329* (HUCS). ESPIRITO SANTO: **Linhares**, Cia Vale do Rio Doce, July 1985, *M. Sobral 4077* (ICN). PARANÁ: **Antonina**, Jardim Barigui. 25°25'49,3S, 48°44'36,2"W, 10 May 2008, *C. R. M. Silva, R. Trevisan & S. González-Elizondo 366* (ICN); **Guraqueçaba**, Picada Praia Deserta, Rio Paciência, 20 November 1974, *G. Hatschbach 35506* (FLOR); **Paranaguá**, Ilha do Mel, 03 December 1982, *G. Hatschbach 45781* (FLOR), **s. m.**, matas entre Paranagua e a Praia de Leste, 02 October 1929, *F. C. Hoehne s. n.* (ICN 112082); **s. m.**, Rio Pereleue, à 121km de Curitiba, 04 March 1970, *T. Koyama et al. 13827* (ICN). RIO DE JANEIRO: **Rio de Janeiro**, estrada Rio–Santos km 5, 24 October 1964, *W. Hoehne 5864* (ICN). SANTA CATARINA: **Biguaçu**, propriedade de Luiz Carlos Bastos, 17 January 2006, *R. Trevisan 590* (ICN); **Enseada do Brito**, BR 101 para Laguna, logo após a ponte sobre o Rio Maciambú, 27° 49'27,4S - 48° 37'48,4W, 24 December 2006, *A. C. Araujo & G. H. Silveira 1688* (ICN); **Florianópolis**, Av. Virgílio C., Saco Grande, 28 May 1997, *M. Y. Meruvia 11* (ICN), Cachoeira do Bom Jesus, 09 December 1983, *M. L. Souza 174* (ICN), Dunas da Praia da Joaquina, 2m alt., 30 May 1997, *D. B. Falkenberg, M. J. Costa et al. 5944* (FLOR), Jurerê, 14 September 1965, *Klein & Bresolin 6185* (ICN), Pântano do Sul, 25 November 1965, *R. M. Klein & A. Bresolin 6359* (ICN) Parque Municipal das Dunas Altas da Lagoa da Conceição, 22 August 2004, *T. B. Guimarães & D. B. Falkenberg 622* (FLOR), Parque Municipal das Dunas Altas da Lagoa da Conceição, próximo da região do Rio Tavares, 27 July 2004, *T. B. Guimarães & D. B. Falkenberg 583* (FLOR), Parque Municipal das Dunas Altas da Lagoa da Conceição,

próximo ao estacionamento da Joaquina, 23 October 2004, *T. B. Guimarães & D. B. Falkenberg* 732 (FLOR), Parque Municipal das Dunas Altas da Lagoa da Conceição, próximo da duna frontal e do estacionamento da Joaquina, 22 December 2004, *T. B. Guimarães & D. B. Falkenberg* 861 (FLOR), Pontal da Daniela, 27°26'45,5"S, 48°31'39,4"W, 31 January 2005, *G. H. Silveira & S. M Hefler* 241 (ICN), Praia dos Ingleses, 28 April 2011, *R. Trevisan* 1070 (FLOR), próximo aos Departamentos de Física e Química da UFSC, 27°35'55,87"S, 48°31'22,47"W, 11 December 2011, *R. A. M. Franke* 36 (FLOR), Rio Vermelho, 05 October 1984, *L. Souza et al.* 359 (ICN), Rio Vermelho, 05 October 1984, *M. L. Souza et al.* 359 (FLOR), Rio Vermelho, 17 January 1966, *Klein e Bresolin* 6513 (ICN), Rio Vermelho, 22 December 1965, *Klein, Souza & Bresolin* 6452 (ICN), Rio Vermelho, 26 October 1984, *M. L. Souza & D. B. Falkenberg* 368 (FLOR); **Garopaba**, beira da estrada, 28°02'19,5"S, 48°37'23,3"W, 28 January 2005, *G. H. Silveira & S. M Hefler* 171 (ICN), próximo ao centro da cidade, 28°02'19,5"S, 48°37'23,3"W, 28 January 2005, *S. M. Hefler & G. H. Silveira* 708 (ICN); **Palhoça**, 27°39'02,3"S, 48°40'12,7"W, 28 January 2005, *G. H. Silveira & S. M. Hefler* 224 (ICN). **Pantano do Sul**, 25 November 1965, *Klein & Bresolin* 6359 (ICN);

Rhynchospora holoschoenoides, classified in the section *Polycephalae* C. B. Clarke (Kükenthal 1949, Guaglianone 1981), when compared to other species of the same section that we examined (*R. coriifolia*, *R. exaltata*, *R. glaziovii*, *R. splendens* and *R. subsetosa*), proved to be very different morphologically. The habitat of *R. holoschoenoides* is also quite different from the other, that occupy generally shady places, such as forest edges and interiors. In the study of Thomas *et al.* (2008), where they tried to evaluate the phylogenetic consistency of the infrageneric classification presented by Kükenthal, *R. holoschoenoides* is one of the 41 species used in the analysis. In the cladogram, it is one of the exceptions that do not match with the proposed groups, being related to the group *Capitatae*.

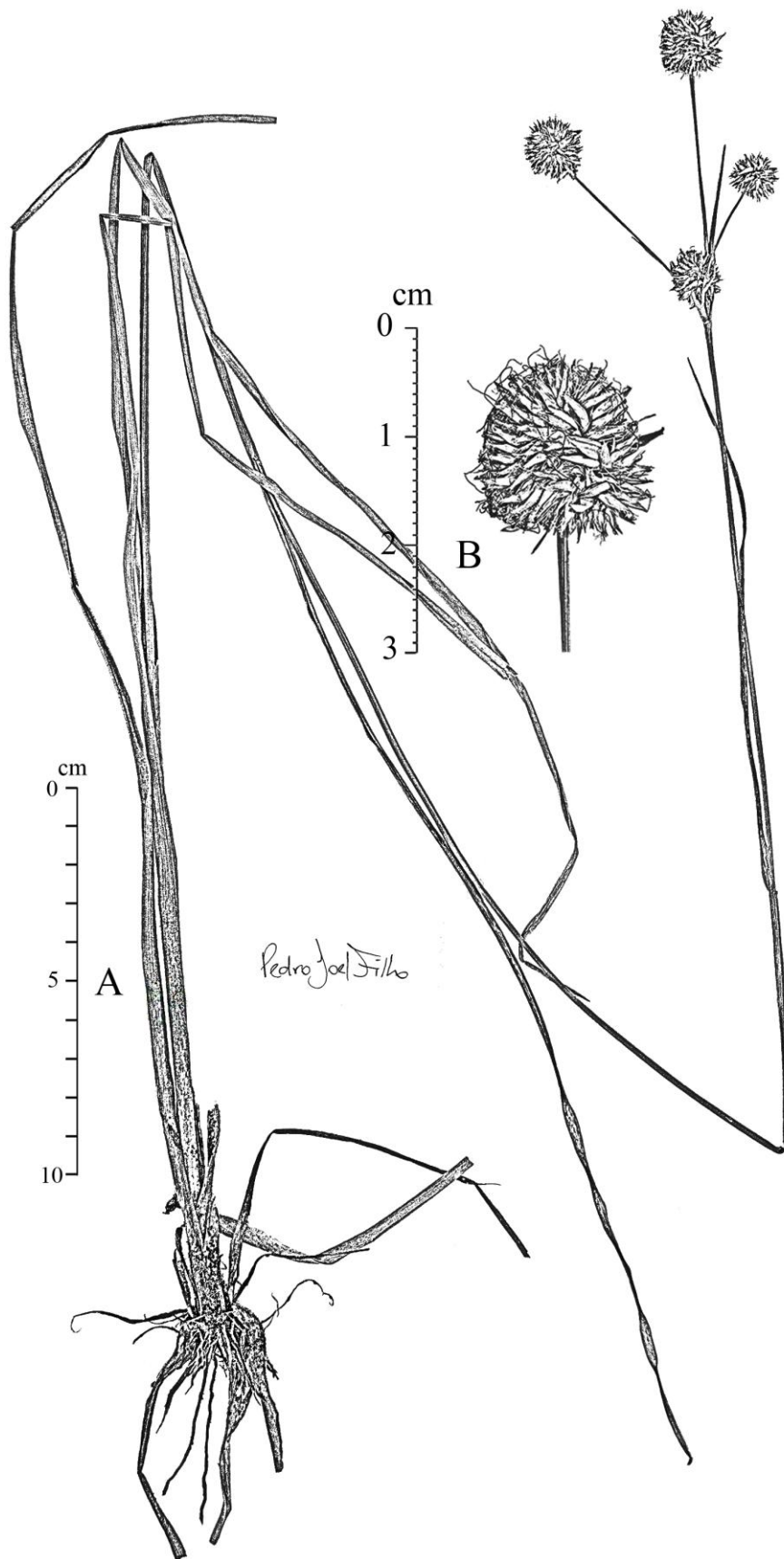


Figure 7. *Rhynchospora holoschoenoides* (Rich.) Herter: A, habit; B, sinflorescence detail (P. J. S. Silva Filho 1866).

***Rhynchospora splendens* Lindm. (1900:26).** Type:—BRAZIL. Rio de Janeiro: near Rio de Janeiro, 1878, *M. Glaziou 11650* (holotype: K, photo!).

Figs. 8 (habit), 17G (spikelet), 18B (achene) and 20 (distribution map).

Perennial plants, caespitose-rhizomatous. Rhizomes 5–13 mm diameter, ligneous and short, covered by leathery cataphylls. Culms 101–198 × 0.05–1 cm, trigonous, erect, glabrous or scabrous at angles. Leaves 49–110 × 0.6–1.3 cm, flattened, glabrous or antrorsely scabrous at the margins and abaxial midvein; sheath 1.6–8 cm long. Synflorescence formed by a terminal anthelodium and 4–11 axillary anthelodia, all contracted and composed of partial capitate heads, rarely reduced to a single capitate head; capitate heads turbinate to subspherical; axes above second order, usually scabrous at the angles; apical anthelodium with 2.3–4 × 2.3–4 cm and the axillary with 1.7–4 × 1.8–4 cm. Spikelets 8–14 mm long, lanceoloid. Glumes oblong-lanceoloid, stramineous, leathery, apex acute, mucronate, glabrous mucron, the four or five lower glumes are sterile, the following hermaphrodites, and only the first flower develop achene. Stylus entire or shortly-bifid. Stamens 3, anthers yellowish 3.5 mm long. Achene 2.8–3.5 × 1.8–2.6 mm, turgid-biconvex, ovate to elliptical, apex truncated, stramineous to light brown, surface faintly transverse rugose; bristles absent. Stylopodium 3–5 mm long, cylindrical-spatulate, greyish.

Geographical distribution and habitat:—Bolivia, Brazil, Guyana, Venezuela (Kükenthal 1949, Tropicos.org 2013). In Brasil, in the states of Espírito Santo, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina and São Paulo. Found in the herbaceous layer of Atlantic Rainforest.

Flowering/fruitletting:—All the year.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Veranópolis**, 2 km ao norte do centro urbano, na rodovia para Nova Prata, 21 July 1982, *N. Silveira 308* (HAS), Estação Experimental Fitotécnica, 17 August 1985, *J. Mattos 28808* (HAS), Parque da FEMACÃ, 20 December 1985, *N. Silveira & M. Guadagnim 3109* (HAS), próximo ao trevo de acesso à Cidade, 22 June 1984, *N. Silveira 1126* (HAS), próximo ao trevo de acesso à Cidade, 29 December 1981, *N. Silveira 137* (HAS).

Additional examined material:—BRAZIL. ESPÍRITO SANTO: **Santa Teresa**, Reserva Biológica de Santa Lúcia, January 1997, *M. Sobral et al. 8278* (ICN). PARANÁ: **Bocaiúva do Sul**, BR 476, 25°10'44.9"S, 49°06'45.3"W, 09 January 2007,

R. Lüdtke & F. Lima 716 (ICN); **Colombo**, Hotel Estância Betânia, 25°18'43,00"S, 49°07'33,00"W, 26 August 2010, *M. Verdi, E. M. Martins & O. N. Veiga 5534* (FLOR); **Colombo**, 25°17'44"S, 49°07'49"W, 26 August 2010, *M. Verdi, E. M. Martins & O. N. Veiga 5538* (FLOR); **Palmeiras**, Colônia Quero-Quero, 12 June 2010, *A. C. Cervi, J. M. Silva & J. Cordeiro 9907* (MBM); **Quatro Barras**, Estrada da Graciosa, Volta Grande, km 40, June 1943, *R. Hertel 1* (MBM). SANTA CATARINA: **Anitápolis**, 27°54'00,00S 49°13'48,00"W, 17 June 2009, *M. Verdi, R. P. Hasckel & G. Klemz s. n.* (ICN 163045); **Florianoópolis**, Santo Antônio de Lisboa, 08 June 1990, *M. H. Queiroz 239* (FLOR); **Mafra**, 26°05'58,00"S, 49°56'58,00"W, 20 August 2010, *M. Verdi, E. M. Martins & O. N. Veiga 5459* (FLOR); **Orleans**, SC 446, em direção à Urussanga, 09 March 2012, *P. J. S. Silva Filho 1528* (ICN); **Palma Sola**, Prigo, 26°25'58,00"S, 53°18'06,00"W, 12 May 2009, *A. Stival-Santos, J. Schmitt & S. Silveira 693* (ICN); **Santo Amaro da Imperatriz**, Hotel Plaza Caldas da Imperatriz, Trilha da Cascata, 27°44'29"S, 48°48'58"W, 06 November 2010, *S. Venturi 67* (FLOR); **São Bonifácio**, Rio Sete, 27°59'21"S, 49°02'56"W, 30 May 2010, *M. Verdi 480* (ICN); **Três Barras**, BR 280, 26°10.285'S, 50°16.035'W, 21 October 2005, *R. Trevisan 412* (ICN); **Vidal Ramos**, Mulungu, 27°27'00.00"S 49°19'12,00"W, 14 September 2009, *A. Korte & A. Kruger 119* (ICN). SÃO PAULO: **s. m.**, ca. 10 km S.W. of Jundiaí, Serra do Japí, 08 October 1976, *H. F. Leitão Filho, L. S. Kinoshita & N. Taroda s. n.* (MBM 49252).

Rhynchospora exaltata is a similar species, but differs by having spikelets 5–6 mm long., with capitate heads spherical and having spikelets densely aggregate. The identification of material with immature synflorescences is very complicated, because they are extremely similar in these stages.

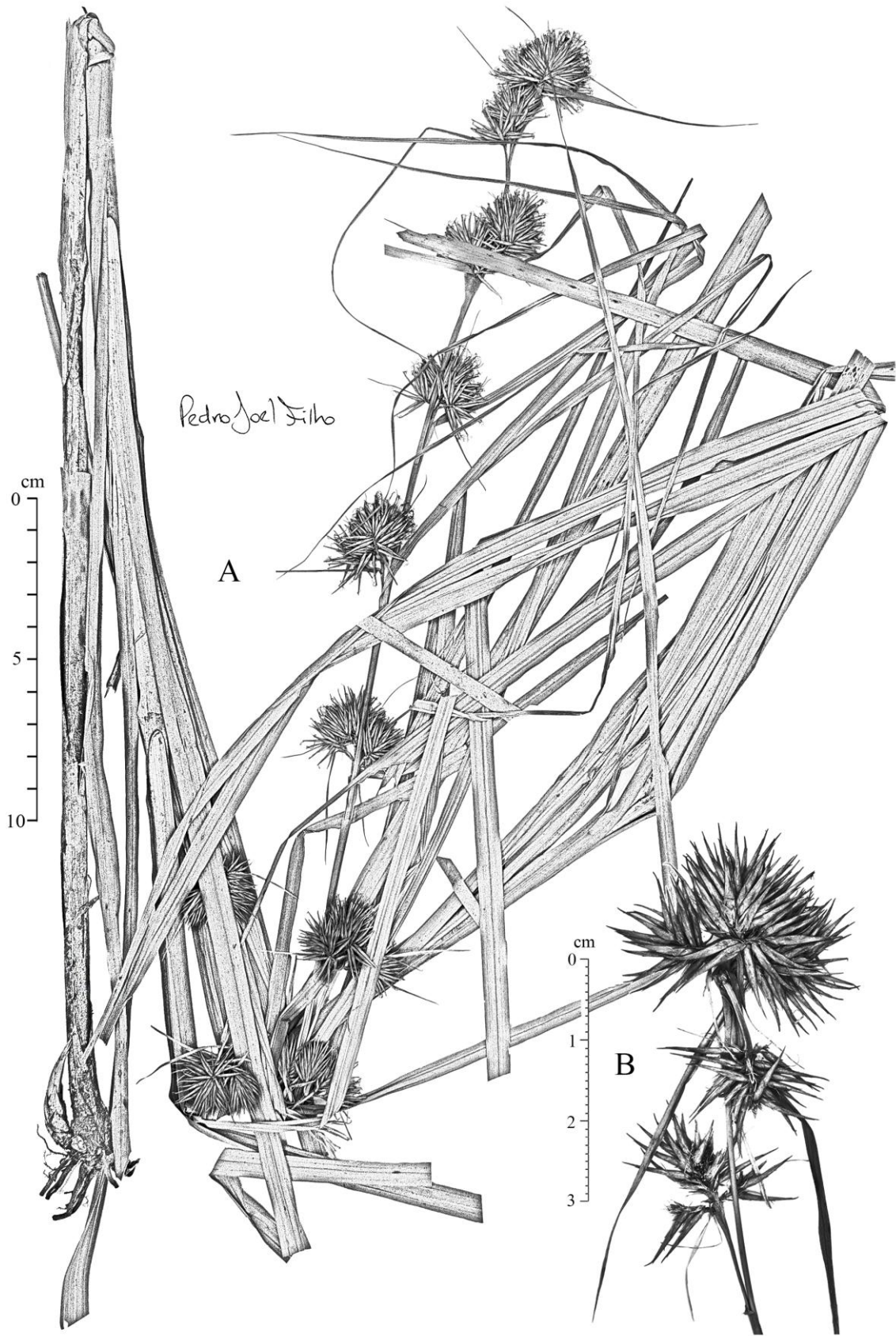


Figure 8. *Rhynchospora splendens* Lindm.: A, habit; B, sinflorescence detail (A. Stival-Santos, J. Schmitt & S. Silveira 693).

Sect. *Psilocaryae* Benth. & Hook (1883:1048).

Culms rigid, rarely flexuous. Leaves flat and rigid, 2–8 mm wide, usually pilose. Inflorescence formed by lax, rarely dense, corimbodia or antelodia. Spikelets ovate to oblong-cylindrical, apex obtuse, all flowers hermaphrodite, most fertile. Rachilla among flowers short and rigid. Glumes membranaceous, subacute, densely imbricated. Stamens 2–3. Stylus long, deeply divided. Achene orbiculate-obovate, biconvex-lenticular, transversely undulate-rugose. Stylopodium triangular, campanulate, to depressed-semilunate, generally the same width as the achene, base bilobed and decurrent on the edges of achene.

***Rhynchospora conferta* (Nees) Boeckeler (1873:615).** *Psilocarya conferta* Nees (1842:116). Type:—BRAZIL: Goiás: *in serra dos Cristaes et in montibus Claris*, Pohl 73 and 1179 (syntypes: W†); *in Brasilia meridionali*, Sellow (syntype: B†). Neotype (designated by Silva Filho 2013):—BRAZIL: Rio Grande do Sul: **Quaraí**, Cerro do Jarau, 30°12'2.06"S, 56°30'38.13"W, 17 December 2011, *P. J. S. Silva Filho 1880* (ICN!; isoneotypes: K!, MO!, SI!).

Figs. 9 (habit), 16B (spikelet), 18F (achene) and 20 (distribution map).

Perennial plants, caespitose-rhizomatous. Rhizomes 2–7 mm diameter, ligneous and short, covered by chartaceous cataphylls and old sheaths. Culms 62–102 × 0.08–0.25 cm, trigonous, often arching, glabrous and sometimes with a longitudinal groove. Leaves 24–59 × (0.17–) 0.3–0.5 cm, flattened, glabrous to pilose; sheath 1.5–8 cm long. Synflorescence formed by a terminal antelodium or corymbodium and 1–3 axillary antelodia or corimbodia, all subcontracted to loose and composed of partial antelodia or corymbodia, and these by fascicles of spikelets; axes above second order, glabrous to pilose at the angles; apical antelodium or corymbodium with 2–8 × 3–7 cm and the axillary with 1.5–4 × 1.5–4 cm. Spikelets 7.5–9 mm long, ovoid to cylindrical. Glumes ovate to lanceolate, brown, membranaceous, with conspicuous and whitish hyaline margin, apex acute to acuminate, mucronate, mucron glabrous or hirsute, the four lower glumes are sterile, the following hermaphrodites, and more than five flowers develop achene. Stylus bifid. Stamens 3, anthers yellowish 1.7–3 mm long. Achene 1.5–1.8 ×

1.6–1.9 mm, lenticular, orbicular, apex obtuse, stramineous to dark-brown when mature, surface transversely rugose; bristles absent. Stylopodium 0.8–1.2 mm long, triangular, bilobed at the base, greyish to brownish.

Geographical distribution and habitat:—Brazil. In the states of Goiás, Paraná, Rio Grande do Sul and Santa Catarina (Kükenthal 1950). Found in wetlands and fens of Cerrado, Atlantic Rainforest and Pampa.

Flowering/fruiting:—November to February.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Alegrete**, beira da BR 290, cerca de 21 km após trevo de Alegrete, em direção à Rosário do Sul, 12 February 1990, *D. B. Falkenberg 5252* (FLOR); **Lagoa Vermelha**, January 1943, *E. Friderichs s. n.* (PACA 10876); **Quaraí**, Cerro do Jarau, 30°12'2.06"S, 56°30'38.13"W, 17 December 2011, *P. J. S. Silva Filho 1880* (ICN); **Santana do Livramento**, Assentamento Recanto, 30°41'49.0"S, 55°20'29.1"W, 14 November 2005, *R. Trevisan 504* (ICN); **s. m.**, Cerro Largo para São Luiz, 20 November 1952, *B. Rambo 53066* (PACA), **s. m.**, Cerro Largo para São Luiz, 20 December 1952, *B. Rambo 53065* (PACA).

Additional examined material:—BRAZIL. PARANÁ: **Piraquara**, Maria Antonieta, 13 December 1971, *G. Hatschbach 28481* (MBM); **São José dos Pinhais**, Rincão, 22 January 1950, *G. Hatschbach 1781* (MBM). SANTA CATARINA: **Lages**, Morro do Pinheiro Seco, 15 January 1957, *L. B. Smith e Reitz 10013* (HAS).

Rhynchospora conferta is related to *R. robusta*, but is recognized by having reduced rhizome, thin and flexible stems, narrower leaves, sheaths stramineous and opaque and smaller spikelets and stylopodium. When immature, the spikelets are very similar, however, the vegetative characteristics separate them clearly.

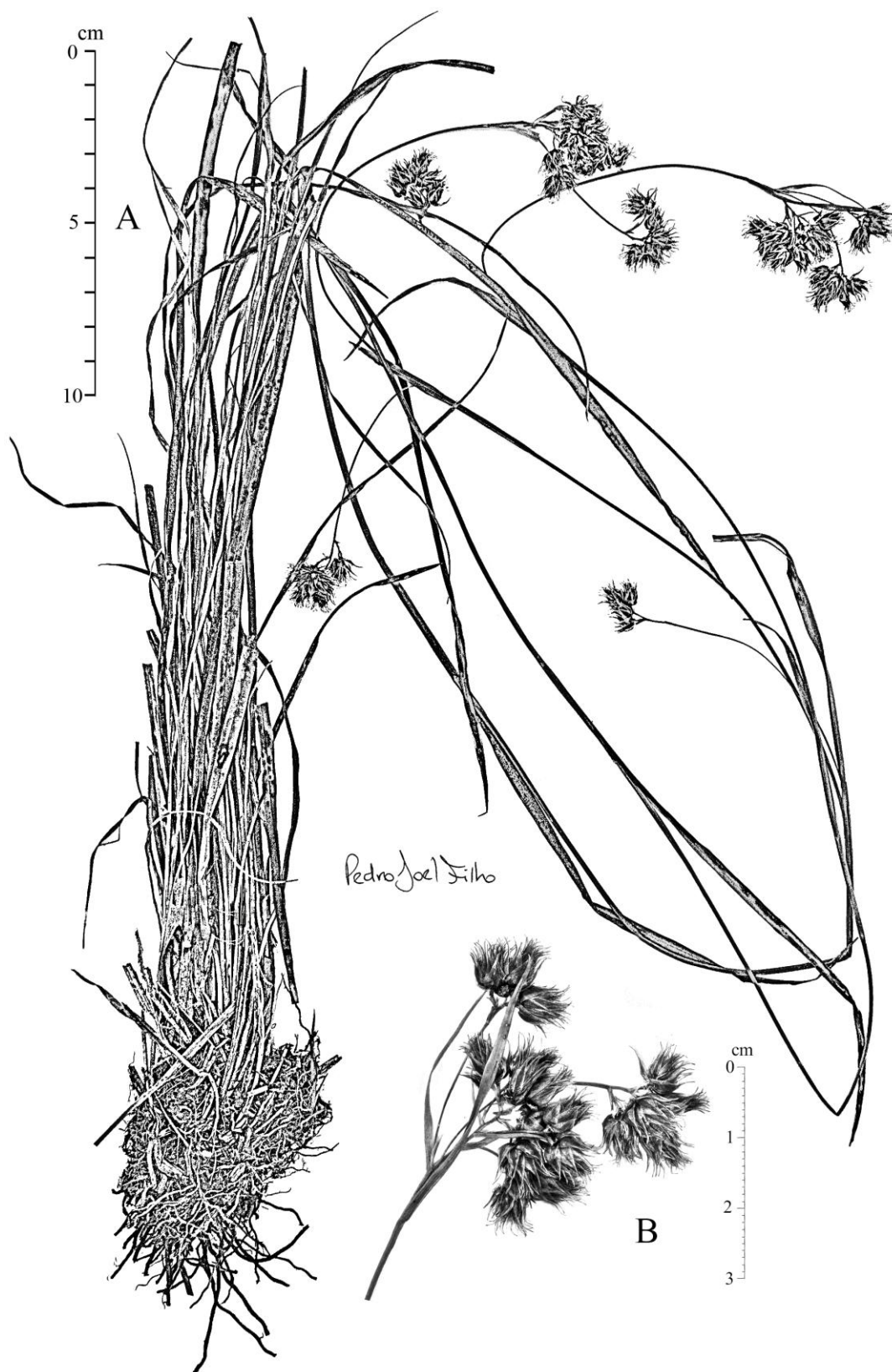


Figure 9. *Rhynchospora conferta* (Nees) Boeckeler: A, habit; B, sinflorescence (*P. J. S. Silva Filho* 1880).

***Rhynchospora robusta* (Kunth) Boeckeler (1873:616).** *Dichromena robusta* Kunth (1837:283). Type:—BRAZIL: *Sellow* (holotype: B†; lectotype (designated by Silva Filho 2013): K (K000632434 photo!); isotype: GH (GH00027977, fragment, photo!)).
Rhynchospora semihirsuta Boeckeler (1873:614) *sin.nov.* Type:—BRASIL: *Sellow* (holotype B†, F (F0BN011153, photo! from B† holotype); lectotype (designated by Silva Filho 2013): K (K000632429 photo!)).

Figs. 10 (habit), 16C (spikelet), 18G (achene) and 20 (distribution map).

Perennial plants, caespitose-rhizomatous. Rhizomes 5–12 mm diameter, ligneous and short, covered by coriaceous cataphylls and aged sheaths. Culms 55–108 × 0.15–0.6 cm, trigonous, erect, glabrous and sometimes with a longitudinal groove. Leaves 42–58 × 0.5–0.7 cm, flattened, glabrous to pilose; sheath 3–13 cm long. Synflorescence formed by a terminal antelodium or corymbodium and sometimes presenting an reduced axillary corimbodia, all contracted composed of partial corymbodia, and these by fascicles of spikelets; axes above second order, generally pilose at the angles; apical antelodium or corymbodium with 4–7 × 4.5–7.5 cm and the axillary with 1.5–2.5 × 1.5–4 cm. Spikelets 9–12 mm long, ovoid to cylindrical. Glumes ovate to lanceoloid, stramineous to brown, membranaceous, with an hyaline margin, apex obtuse to acute, mucronate, mucron hirsute, the four lower glumes are sterile, the following hermaphrodites, and more than five flowers develop achene. Stylus bifid. Stamens 3, anthers yellowish 3–4 mm long. Achene 1.3–1.5 × 1.5–2 mm, lenticular, orbicular, apex obtuse, stramineous to dark-brown when mature, surface transversely rugose; bristles absent. Stylopodium 2.6–3.5 mm long, triangular, bilobed at the base, decurrent on the achene, greyish to brownish.

Distribution and habitat:—From México and West Indies to Argentina and extreme south of Brazil (Kükenthal 1950, Thomas 1992, Tropicos.org 2013). In Brazil, in the states of Mato Grosso do Sul, Paraná, Rio de Janeiro, Rio Grande do Sul, Roraima and Santa Catarina. Found in wetlands and fens of Cerrado, Atlantic Rainforest and Pampa.

Flowering/fruiting:—September to March.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Capão do Leão**, Horto Botânico Pelotas, 29 October 1955, *E. Vianna s. n.* (ICN 1205); **Júlio de**

Castilhos, 29°22'23,7"S 53°40'16,0"W, 03 October 2007, *R. Trevisan* 848 (ICN); **s. m.**, Portão para São Leopoldo, 25 October 1937, *B. Rambo* 2860 (PACA).

Additional examined material:—BRAZIL. MATO GROSSO DO SUL: **Mundo Novo**, Rio Paraná, Porto Frangeli, 29 September 2008, *J. M. Silva et al.* 7005 (MBM). PARANÁ: **Balsa Nova**, Ponte dos Arcos, 13 October 2005, *C. Kozera & A. Sanches* 2420 (ICN); **Campina Grande do Sul**, estrada Rio Taquari ao Rio Divisa, 13 November 1960, *G. Hatschbach* 7475 (MBM); **Colombo**, Rio Palmital, 01 November 1973, *G. Hatschbach* 32996 (MBM); **Contenda**, 04 November 1966, *G. Hatschbach* 15243 (MBM); **Curitiba**, Capão da Imbuia, 05 November 1976, *L. T. Dombrowski* 6669 (MBM), Jardim Natalia, 30 November 1973, *G. Hatschbach* 33446 (MBM), Pinhais, 18 September 1966, *G. Hatschbach* 14731 (MBM); **Marmeleiro**, estrada para Campo Erê, 03 March 1970, *G. Hatschbach* 22666 (MBM); **Piraquera**, estrada para Roça Nova, October 1964, *Y. Saito & M. L. Camargo* 289 (MBM); **São José dos Pinhais**, Rio Pequeno, 05 November 1969, *G. Hatschbach* 22821 (MBM). RIO DE JANEIRO: **Rio de Janeiro**, próximo ao Recreio dos Bandeirantes, 16 December 1964, *W. Hoehne* 5794 (ICN). SANTA CATARINA: **Campo Erê**, Fazenda Campo São Vicente, 26–28 December 1956, *L. B. Smith, R. Reitz & L. Caldoto* 9509 (HBR); **Curitibanos**, Ponte Alta do Norte, 24 October 1962, *Reitz & Klein* 13379 (FLOR); **Campo Alegre**, Farm of Ernesto Scheide, 09 November 1956, *L. B. Smith & Klein* 7466 (HBR).

Differentiated by being robust plants with coriaceous, brown and glossy cataphylls and basal leaf sheaths, leaves in most cases surpassing the sinflorescence culm, culm always ligneous, stylopodium greater than the achene and with lobes decurrent and reaching more than half its length .

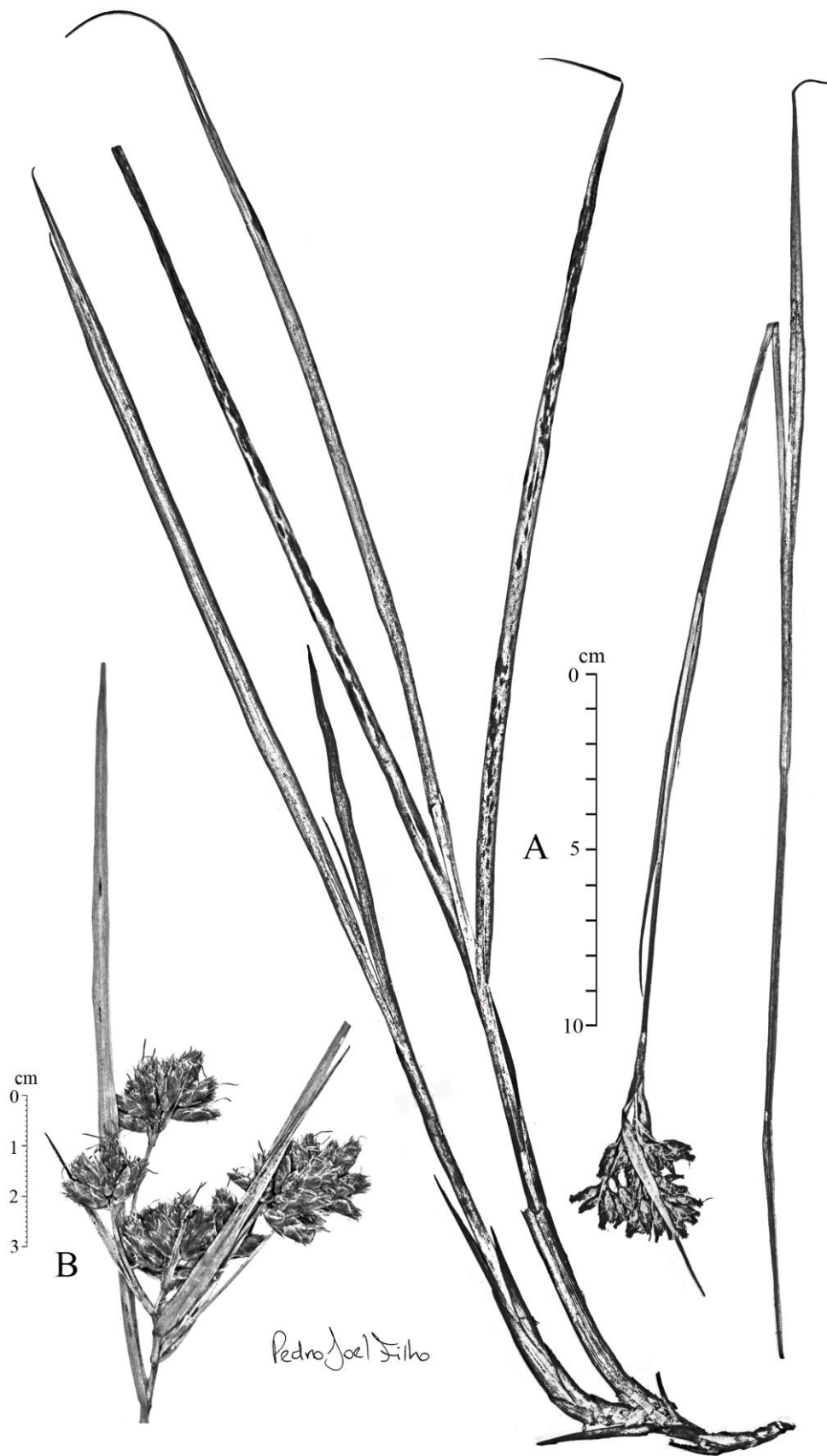


Figure 10. *Rhynchospora robusta* (Kunth) Boeckeler: A, habit (*G. Hatschbach 22821*); B, inflorescence detail (*G. Hatschbach 15243*).

***Rhynchospora velutina* (Kunth) Boeckeler (1869:149).** *Dichromena velutina* Kunth (1837:282). Tipo:—BRASIL: *Brasilia meridionalis*, Sellow (B†). Neotype (here designated):—BRASIL. Paraná: Balsa Nova, Ponte dos Arcos, 31 January 2006, C. Kozera & O. P. Kozera 2978 (ICN!).

Figs. 11 (habit), 16A (spikelet), 18E (achene) and 20 (distribution map)

Perennial plants, caespitose-rhizomatous. Rhizomes (1–) 2–9 mm diameter, ligneous and short, covered by chartaceous cataphylls and old sheaths. Culms 40–83 (–125) × 0.05–0.3 (–0.5) cm, trigonous, often arching, glabrous to pilose and sometimes with a longitudinal groove. Leaves 16–47 × (0.1–) 0.16–0.3 (–0.5) cm, flattened, glabrous to pilose; sheath 1–9 (–13) cm long. Synflorescence formed by a terminal antelodium and 1–3 axillary antelodia, all subcontracted to loose and composed of partial antelodia or corymbodia, and these by fascicles of spikelets; axes above second order, glabrous to pilose at the angles; apical antelodium with 2–12 (–16) × 3–11 (–16) cm and the axillary with 1.5–7 (–10) × (0.9–) 2–8 (–15) cm. Spikelets 6–9 mm long, cylindrical-lanceoloid. Glumes ovate to lanceolate, brown, membranaceous, with discrete whitish hyaline margin, apex obtuse to acute, mucronate, mucron glabrous, rarely hirsute, the three or four lower glumes are sterile, the following hermaphrodites, and more than five flowers develop achene. Stylus bifid. Stamens 3, anthers yellowish 2.5–3.5 mm long. Achene 1–1.5 × 1–1.5 mm, lenticular, orbicular, apex obtuse, stramineous to dark-brown when mature, surface transversely rugose; bristles absent. Stylopodium 0.5–0.9 mm long, triangular to subulate, obscurely bilobed at the base, greyish to brownish.

Geographical distribution and habitat:—From Mexico and the Caribbean islands to Argentina and southern Brazil (Kükenthal 1950, Thomas 1992 Tropicos.org 2013). In Brazil, in the states of Amazonas, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Rio Grande do Sul, Santa Catarina and São Paulo. Found in wetlands and fens of Amazon, Cerrado and Atlantic Rainforest.

Flowering/fruiting:—October to April.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Cambará do Sul**, Canion Fortaleza, -29.0678682178259, -49.9646148271859, 06 March 2012, P. J. S. Silva Filho 1503 (ICN); **Santo Ângelo**, RS 344, km 92, 28°16'33.5"S 054°17'34.8"W, 11 January 2005, S. M. Hefler et al. 537 (ICN); **São Francisco de Paula**, CPCN Pró-

Mata, April 2005, *P. M. A. Ferreira s. n.* (MPUC 11288); **São Sebastião do Caí**, Conceição para Caí, 13 February 1948, *B. Rambo 38821* (PACA).

Additional examined material:—BRAZIL. AMAZONAS: **Humaitá**, 07°31' Lat. 63°10' Long., 26 October 1981, *A. Janssen 723* (MBM). GOIÁS: **São Domingos**, 15 May 2000, *G. Hatschbach, A. Schinini & E. Barbosa 71123* (MBM). MATO GROSSO: **São Félix do Araguaia**, Fazenda do Buritizal, 11°30'05,8"S, 50°56'32,7"W, 20 March 1997, *V. C. Souza et al. 14675* (MBM). MATO GROSSO DO SUL: **Chapadão do Sul**, Fazenda Sucuriú, 18°21'55,7"S, 52°45'53,5"W, 31 March 2004, *V. J. Pott et al. s. n.* (ICN 155427); **Costa Rica**, Fazenda Potreiro do Sucuriú, 18°58'55,0"S, 53°09'53,2"W, 05 April 2004, *V. J. Pott et al. 6978* (ICN); **Ponta Porã**, Fazenda Itamarati, 23 October 2003, *G. Hatschbach, M. Hatschbach & E. Barbosa 76687* (MBM); **Rio Brillhante**, 27 October 1972, *G. Hatschbach 26154* (MBM). MINAS GERAIS: **Diamantina**, Córrego Soberbo, 22 July 1998, *G. Hatschbach, M. Hatschbach & E. Barbosa 71908a* (MBM); **Francisco Dumont**, descida para a passagem do Rio Preto, 22 September 2005, *G. Hatschbach & E. Barbosa 79446* (MBM); **Joaquim Felício**, Serra do Cabral, próximo do Rio Preto, 23 August 2002, *G. Hatschbach, M. Hatschbach & J. M. Silva 73751* (MBM). PARANÁ: **Curitiba**, Rio Atuba, 30 October 1973, *G. Hatschbach 32779* (MBM); **Guarapuava**, Entre Rios, 21 October 1969, *G. Hatschbach 22556* (MBM); **Jaguaraíva**, 24°11'33,1"S 049°41'39,9"W, 15 January 2004, *H. M. Longhi-Wagner et al. 8969* (ICN); **Palmas**, 04 December 1971, *L. B. Smith, R. M. Klein & G. Hatschbach 15653* (HBR); **Ponta Grossa**, Passo do Pupo, 03 March 1970, *G. Hatschbach 17402* (MBM); **s. m.**, Serrinha para Lapa, 02 November 1946, *G. Hatschbach 539* (PACA); **São Mateus do Sul**, 17 December 1969, *G. Hatschbach 23268* (MBM). SANTA CATARINA: **Lages**, Fazenda Pai Querê, 28°21'15,1"S, 50°37'06,0"W, 28 June 2009, *R. Trevisan s. n.* (ICN 164766). SÃO PAULO: **Itararé**, Rio Verde, ponte na divisa de Itapeva com Itararé, 20 September 1999, *A. P. Prata et al. 635* (MBM).

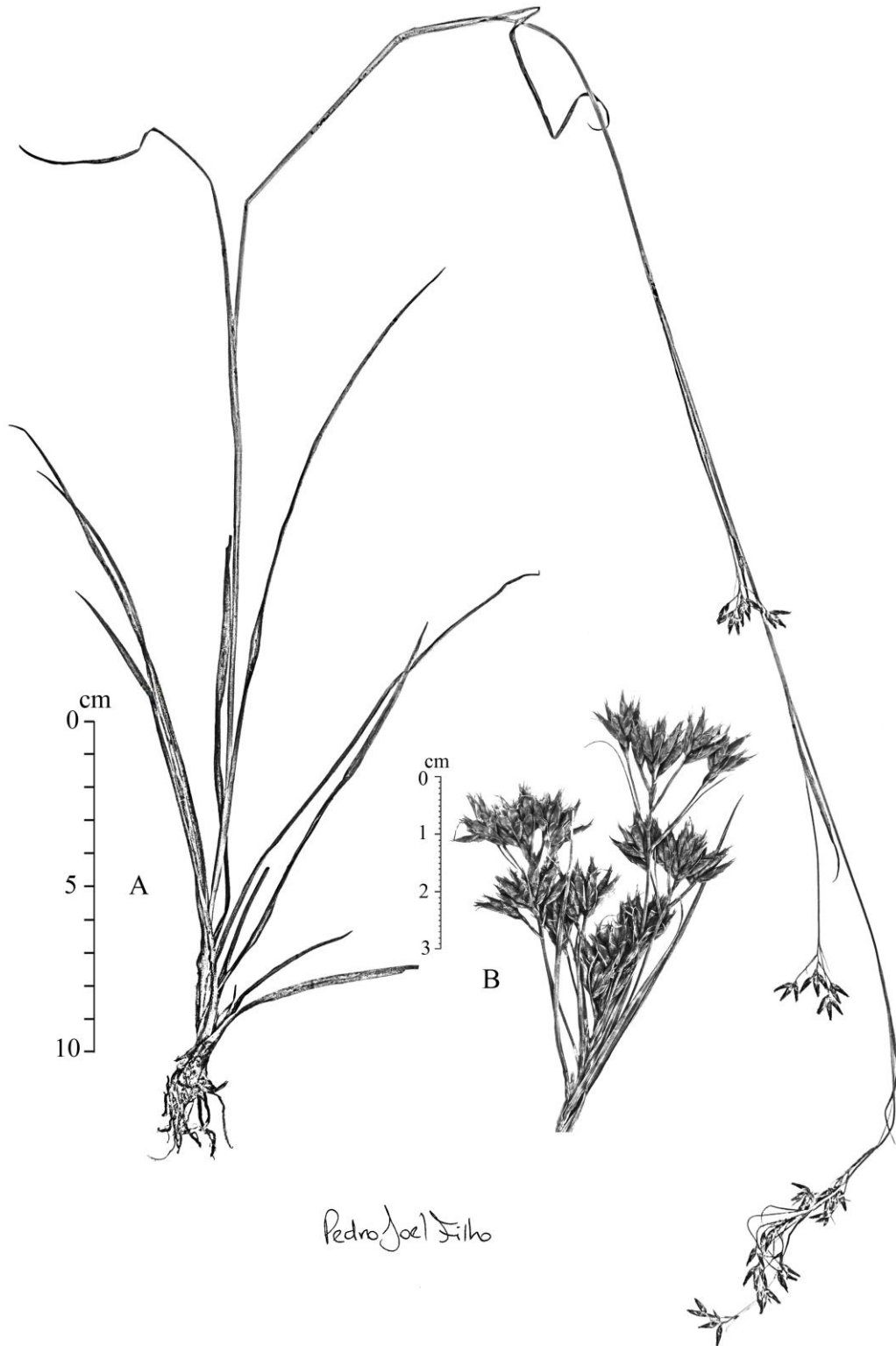


Figure 11. *Rhynchospora velutina* (Kunth) Boeckeler: A, habit (*B. Rambo* 38821); B, sinflorescence detail (*G. Hatschbach* 17402).

Sect. *Racemosae* C. B. Clarke (1908:118)

Rhizomes short, lignified and nodulose. Culms flexuous, subaphyllous at base, covered by old sheaths. Leaves flat and narrow. Inflorescences narrow, formed by short spikes or racemes, with long capillary peduncles. Rachilla among flowers short and rigid. Glumes membranaceous and mucronate. Hypogynous bristles usually absent or inconspicuous. Stylus entire or shortly bifid. Achene obovate, turgid-biconvex, transversely undulate-rugose. Stylopodium conical, grayish to green, narrower than the achene.

Rhynchospora biflora Boeckeler (1871:156). Type:—BRAZIL: Rio de Janeiro: Serra des Orgues, sur le grand plateau, 11 December 1869, A. Glaziou 4289 (holotype B†; lectotype (designated by Silva Filho 2013) P (P00264347 photo!); isoelectotype P (P00264346 photo!)). *Rhynchospora uniflora* Boeckeler (1880:439) *sin. nov.* Type:—BRAZIL, Rio de Janeiro: Petrópolis, au sommet du Palatinato Superior, 21 January 1878, A. Glaziou 9336 (holotype B†; lectotype (designated by Silva Filho 2013) P (P00585030 photo!); isoelectotypes: F (F0BN011166 photo! from B), K (K000632446 photo!), P (P00585028, P00585029 photos!)).

Figs. 12 (habit), 15E (spikelet), 18A (achene) and 20 (distribution map).

Perennial plants, caespitose-rhizomatous. Rhizomes 1–3 mm diameter, ligneous and short, covered by chartaceous cataphylls. Culms 38–124 × 0.03–0.14 cm, trigonous, thin and arching, glabrous or scabrous at the apex, sometimes with a longitudinal groove. Leaves 7–33 × 0.1–0.24 cm, flattened, glabrous or antrorsely scabrous at the margins of the apex; sheath 0.5–6 cm long. Synflorescence formed by a terminal spike and 3–5 axillary spikes, and the last axillary spike reaches or exceeds the terminal, all contracted and formed by fascicles of spikelets, with few spikelets; axes above second order, generally antrorsely scabrous at the angles; apical spikes with 0.9–1.5 × 0.6–1 cm and the axillary with 0.6–1.1 × 0.4–0.9 cm. Spikelets 4–7 mm long, lanceoloid. Glumes lanceolate, stramineous to brown, membranaceous, apex acute, shortly mucronate, mucron glabrous, the three lower glumes are sterile, the following hermaphrodites, and

only the first flower develop achene. Stylus bifid. Stamens 3, anthers yellowish 2 mm long. Achene 1.4–2.2 × 1.2–1.6 mm, biconvex, obovate to cylindrical, apex obtuse, stramineous to light brown when mature, surface transversely rugose; bristles absent. Stylopodium 0.8–1.5 mm long, subulate, greyish, brownish or blackish.

Distribution and habitat: Venezuela and Brasil (Kükenthal 1949, Tropicos.org 2013). In Brasil, in the states of Bahia, Espírito Santo, Mato Grosso do Sul, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina and São Paulo. Found in the herbaceous layer of the Amazon, Cerrado and Mata Atlântica, common in the Araucaria Forest and Brazilian Cloud Forests.

Flowering/fruiting:—December to April.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Cambará do Sul**, Cânion Fortaleza, -29.066054, -29.066054, 03 November 2011, *P. J. S. Silva Filho 1404* (ICN), Cânion Fortaleza, -28.617264, -49.79903, 04 March 2012, *P. J. S. Silva Filho 1872* (ICN), Faxinal, December 1983, *M. Sobral & J. R. Stehmann 2640* (ICN), Faxinal, December 1983, *M. Sobral & J. R. Stehmann 2672* (ICN), Itaimbezinho, 20 February 1953, *B. Rambo 54023* (PACA), Itaimbezinho, 28 April 1985, *J. R. Stehmann 612* (ICN); **São Francisco de Paula**, Banhado Amarelo, 16 December 2005, *C. Scherer s. n.* (ICN 141956), Josafá, April 1984, *M. Sobral 2966* (FLOR), Pró-mata, -29.475499, -50.166111, 04 March 2012, *P. J. S. Silva Filho 1873* (ICN), Pró-mata, 04 March 2012, *P. J. S. Silva Filho 1874* (ICN), caminho para o Pró-mata. -29.450767, -50.23609, March 2012, *P. J. S. Silva Filho 1875* (ICN), Pró-mata. -29.475499, -50.166111, 04 March 2012, *P. J. S. Silva Filho 1876* (ICN), caminho para o Pró-mata. -29.450767, -50.23609, 04 March 2012, *P. J. S. Silva Filho 1877* (ICN), caminho para o Pró-mata. -29.450767, -50.23609, 04 March 2012, *P. J. S. Silva Filho 1878* (ICN); **São José dos Ausentes**, Pico do Monte Negro, 28°37'06.2"S, 49°47'59,6"W, 15 January 2009, *H. M. Longhi-Wagner & G. H. Silveira 10712* (ICN), Pico do Monte Negro. -28.617264, -49.79903, 07 March 2012, *P. J. S. Silva Filho 1870* (ICN), Pico do Monte Negro. -28.617264, -49.79903, 07 March 2012, *P. J. S. Silva Filho 1871* (ICN), Serra da Rocinha, 14 February 1947, *B. Rambo 35200* (PACA), Serra da Rocinha, 15 January 1942, *B. Rambo 8743* (PACA); **s. m.**, Itaimbezinho para São Francisco de Paula, 12 February 1956, *B. Rambo 58556* (PACA).

Additional examined material:—BRAZIL. BAHIA: **Abaíra**, Catolés de Cima, na trilha para a Serra do Barbado, 16 October 2012, *R. M. Harley et al. 53425* (ICN); SANTA CATARINA: **Bom Jardim da Serra**, Desfiladeiro do Funil, February 1989,

M. Sobral et al. 6455 (ICN); **Cunha**, Reserva Florestal, 12 February 1981, *C. F. S. Muniz et al.* 243 (ICN); **Ilhota**, Parque Botânico Morro do Baú, 31 October 1987, *D. B. Falkenberg* 4523 (FLOR); **São Francisco do Sul**, Morro do Campo Alegre, 03 September 1960, *R. Reitz & R. M. Klein* 9778 (FLOR); **São José**, Serra da Boa Vista, 11 August 1960, *Reitz & Klein* 9701 (MBM); **Urubici**, Serra do Rio dos Bugres, 20 January 2003, *H. Longhi-Wagner* 8721 (ICN); **s. m.**, Cambajuva (Bom Jardim da Serra) para São Joaquim, 29 January 1950, *R. Reitz* 5182 (PACA).

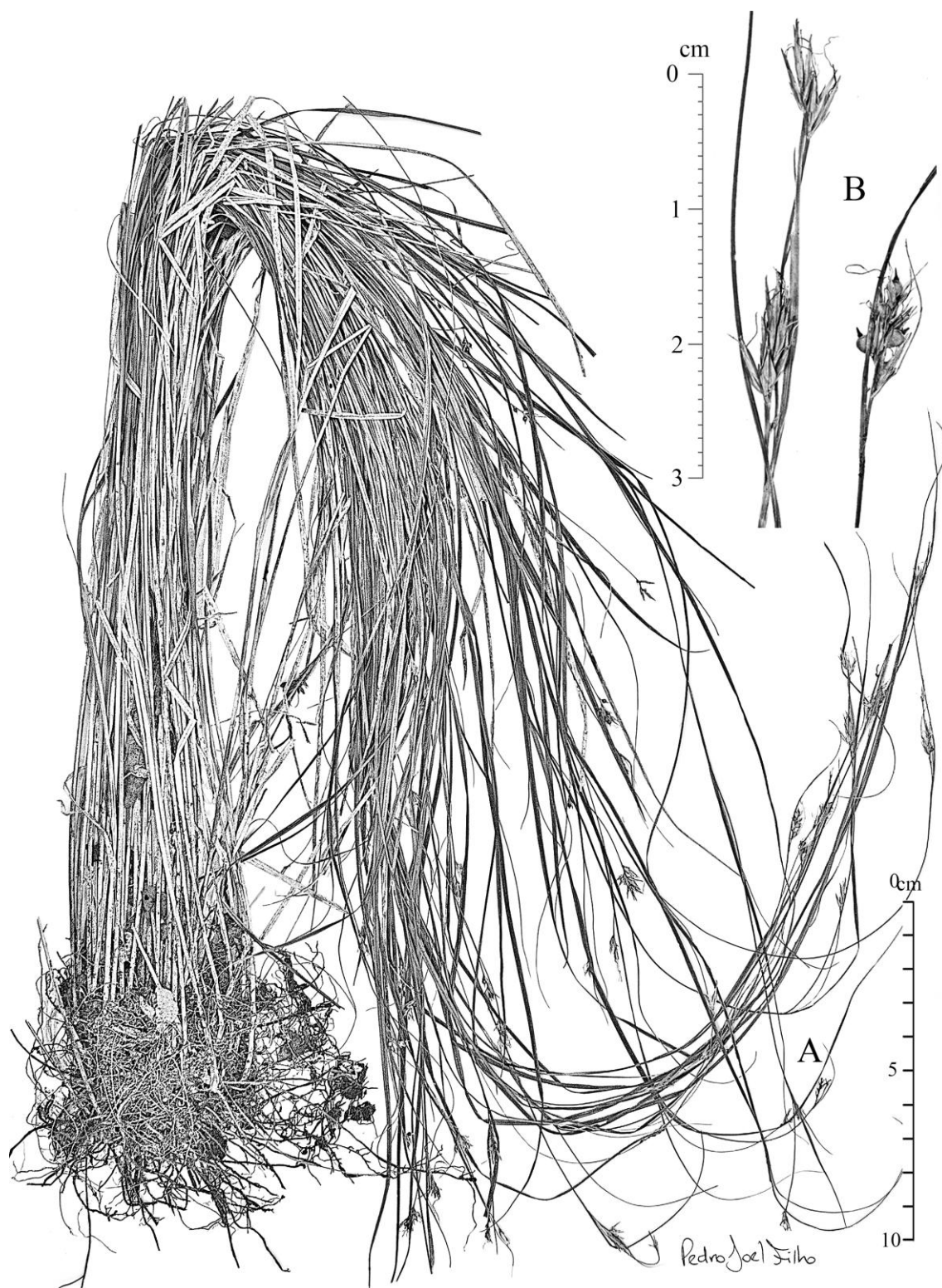


Figure 12. *Rhynchospora biflora* Boeckeler: A, habit; B, sinflorescence detail (P. J. S. Silva Filho 1873).

Sect. *Spermodontes* Kük. (1951:283).

Culms flexuous. Leaves canaliculated. Sinflorescences formed by 1-3 corimbodia, loose to contracted. Coflorescence axes capillaries. Spikelets solitary or in fascicles, acute, all flowers hermaphrodite or the basal hermaphrodite and the superior male. Rachilla among flowers rigid. Glumes aristate to mucronate, loosely imbricated. Stamens 2 or 3. Stylus long, deeply divided. Hypogynous bristles absent. Achene orbiculate-obovate, with a crown or tooth like projection at the apex, surrounding the stylopodium, smooth to undulate-rugose. Stylopodium shortly pyramidal, ligulate, apex obtuse, narrower than the achene.

***Rhynchospora confinis* (Nees) C.B. Clarke (1908:40).** *Spermodon confinis* Nees (1842:119). Tipo:—BRASIL: *Brasilia centrali*, Pohl (holotype W†). Neotype (here designated):—BRASIL. Rio Grande do Sul: Osório, RS 030, km 73, 21 January 2010, *R. Trevisan 1042* (ICN!).

Figs. 13 (habit), 16D (spikelet), 17G (achene) and 20 (distribution map).

Perennial plants, caespitose-rhizomatous. Rhizomes 1–2.5 mm diameter, elongated, covered by cataphylls, sometimes dissociated into fibers. Culms 32–65 × 0.05–0.2 cm, trigonous, often arching, glabrous. Leaves 13–44 × 0.08–0.23 cm, canaliculate, glabrous, with margins scabrous at the apex; sheath 1–5 cm long. Synflorescence formed by a terminal corymbodium and 1–3 axillary corymbodia, all subcontracted and composed by fascicles of spikelets; axes above second order, generally antrorsely scabrous at the angles; apical corymbodium with 1–1.3 × 1–2.7 cm and the axillary with 1–1.2 × 0.8–1.4 cm. Spikelets 6–9 mm long, fusiform-lanceoloid. Glumes ovate to oblong-lanceolate, stramineous, the external chartaceous and glossy, and the internal membranaceous and opaque, apex acute, aristate, arista glabrous, the three lower glumes are sterile, the following hermaphrodites, and generally the three first flowers develop achene. Stylus bifid. Stamens 3, anthers yellowish 2–2.5 mm long. Achene 1.1–1.8 × 0.9–1.2 mm, biconvex, obovoid, apex truncated, with a crown or tooth like projection at the apex, surrounding the stylopodium, stramineous to brown when mature, surface smooth to faintly undulate-rugose; bristles absent. Stylopodium 0.4–0.8 mm long, ligulate, shortly bilobed at the apex, greyish to stramineous.

Geographical distribution and habitat:— Argentina, Bolivia, Brazil, Paraguay and Venezuela (Kükenthal 1951, Guaglianone 1980, Tropicos.org 2013). In Brazil, in the states of Goiás, Mato Grosso, Minas Gerais, Paraná, Rio Grande do Sul, Santa Catarina and São Paulo. Found in humid grasslands and waterlogged lowlands of Cerrado, Atlantic Rainforest and Pampa.

Flowering/fruiting:—December to May.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Cachoeira do Sul**, December 1986, *M. Sobral, B. Dehgan & G. Webster* 5368 (ICN); **Guaíba**, BR 116, km 307, Fazenda São Maximiano, 18 May 1996, *A. C. Araujo* 262 (ICN), BR 116, km 307, Fazenda São Maximiano, 18 May 1996, *A. C. Araujo* 264 (ICN), BR 116, km 307, Fazenda São Maximiano, 30 March 2006, *R. Trevisan* 616 (ICN); **Montenegro**, III Polo Petroquímico, 22 February 1977, *T. Buselato s. n.* (HAS 13569); **Osório**, RS 030, km 73, 21 January 2010, *R. Trevisan* 1042 (ICN); **Rosário do Sul**, BR 290, 50 km após São Gabriel, 06 January 1991, *H. Longhi-Wagner et al.* 2376 (ICN); **São Leopoldo**, 08 April 1934, *C. Orth s. n.* (PACA 1032); **Torres**, no lado norte da Lagoa do Jacaré, 23 January 1987, *N. Silveira* 4536 (HAS); **Viamão**, Hospital Colônia de Itapuã, 30°21'32,7"S, 50°59'43,4"W, 09 April 2007, *R. Trevisan & I. Boldrini* 826 (ICN), Parque Estadual de Itapuã, Praia da Fora, 30°23'32,7"S, 50°58'02,3"W, 27 April 2006, *R. Trevisan et al.* 636 (ICN).

Additional examined material:—ARGENTINA, CORRIENTES: **Concepción**, Paso Crucecita, 07 March 1967, *T. M. Pedersen* 8078 (MBM). BRAZIL. GOIÁS: **Mineiros**, 5 km ao leste do centro urbano, 01 February 1978, *T. M. Pedersen* 12155 (MBM), **Santa Rita do Araguaia**, Rio Babilônia, 15 February 1974, *G. Hatschbach* 34219 (MBM). MATO GROSSO: **Sidrelândia**, Santa Fé, 23 January 1971, *G. Hatschbach* 26062 (MBM). MINAS GERAIS: **Diamantina**, Serra do Espinhaço, 16 February 1973, *G. Hatschbach & L. Z. Ahumada* 31641 (MBM); **Jaboticatubas**, Serra do Cipó, 06 August 1972, *G. Hatschbach* 29993 (MBM); **Três Corações**, Rodovia de Três Corações para São José das Letras, 04 February 1973, *G. Hatschbach & L. Z. Ahumada* 31219 (MBM). PARANÁ: **Altônia**, Fazenda Pontal II, 26 January 2003, *C. Kozera* 1862 (MBM); **Castro**, 10 March 1977, *L. T. Dombrowski* 7207 (MBM); **Curitiba**, Capão da Imbuia, 04 March 1975, *L. T. Dombrowski* 5965 (MBM). **Jaguaraíva**, estrada para o Parque Estadual do Cerrado, 24°12'32.1"S, 0 49°41'W, 15 January 2004, *H. M. Longhi-Wagner et al.* 8975 (HBR); **Palmeira**, Cercado, 14 February 2006, *E. Barbosa et al.* 1205 (MBM), Rio dos Papagaios, 21 January 1982, *P.*

I. Oliveira 306 (MBM); **Piraquara**, 06 February 1971, *G. Hatschbach* 26302 (MBM). **Senges**, Fda. Morungava, 27 February 1972, *G. Hatschbach* 29401 (MBM). SANTA CATARINA: **Mafra**, 26 January 1953, *R. Reitz* 5349 (HBR), 26 January 1956, *R. Reitz* 6715 (PACA).

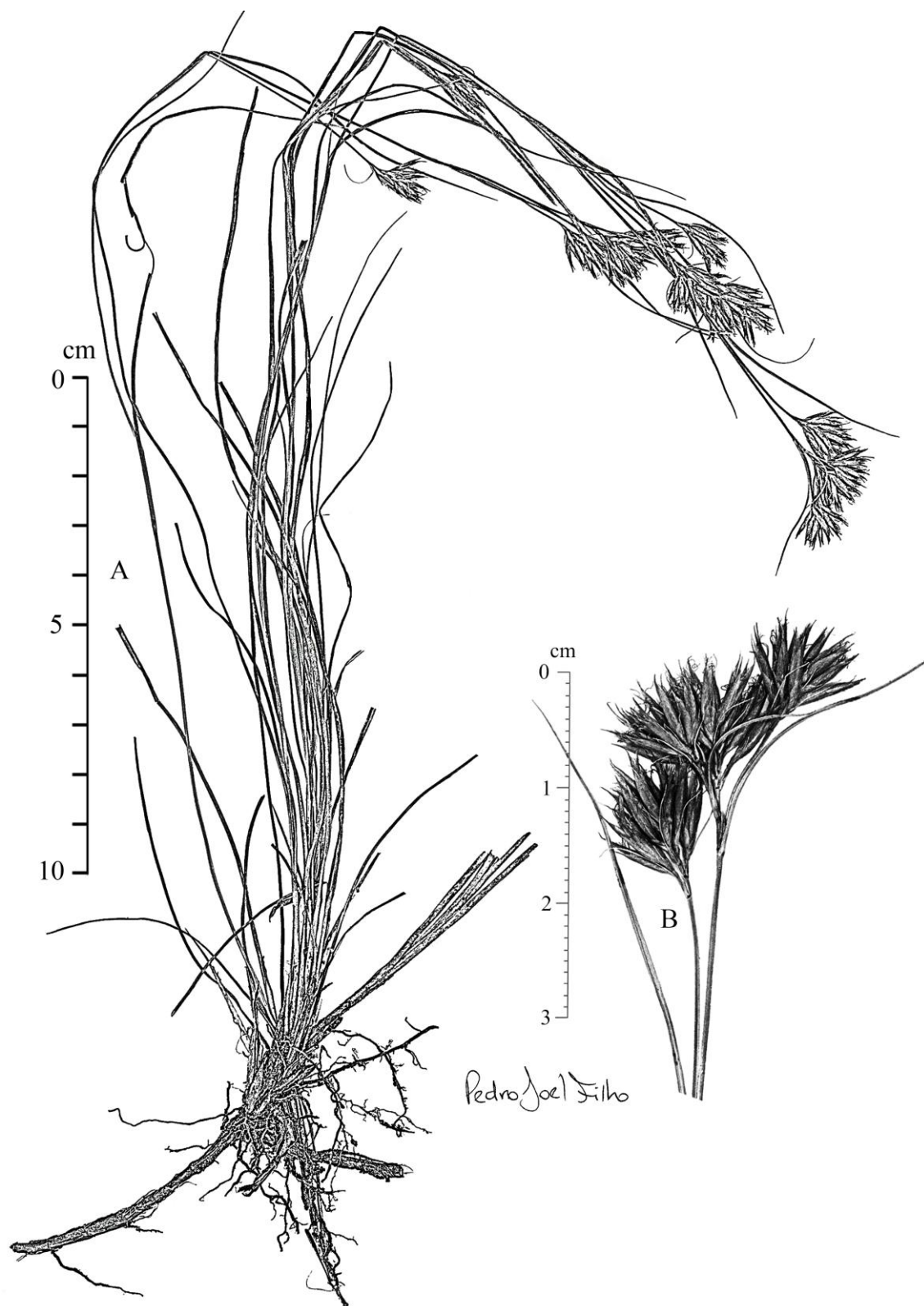


Figure 13. *Rhynchospora confinis* (Nees) C.B. Clarke: A, habit; B, sinflorescence detail (R. Trevisan 1042).

Sect. *Valderugosae* Kük. (1950:127).

Culm flexuous. Leaves flat and narrow. Sinflorescences numerous, of unequal size, formed by 2–3 corimbodia. Spikelets grouped in fascicles, ovate, all flowers hermaphrodite. Rachilla among flowers short, rigid to flexuous. Glumes broadly ovate, obtuse, shortly mucronate. Hypogynous bristles flexible, antrorsely scabrous. Stamens 3. Stylus deeply divided. Achene broadly oval, compressed-lenticular, surface undulate-rugose, with few ridges. Stylopodium pyramidal, generally the same width as the achene.

***Rhynchospora brittonii* Gale (1944:241).** Type:—CUBA: Pinar del Rio, 8–15 Mar 1911, *E. G. Britton 10023* (holotype NY photo!; isotype US photo!).

Figs. 14 (habit), 15F (spikelet), 17E (achene) and 20 (distribution map).

Annual or biannual plants, caespitose. Culms 8–43 × 0.03–0.2 cm, trigonous, flexible, glabrous and sometimes with a longitudinal groove. Leaves 5–31 × 0.06–0.25 cm, flattened, glabrous, with margins scabrous at the apex; sheath 0.5–2.7 cm long. Synflorescence formed by a terminal corymbodium and 2–4 axillary corymbodia, all contracted to subcontracted and composed by fascicles of spikelets; axes above second order, generally antrorsely scabrous at the angles; apical corymbodium with 0.5–3 × 0.6–2.5 cm and the axillary with 0.5–3 × 0.6–2.5 cm. Spikelets 2–2.8 mm long, ovoid. Glumes orbicular-ovate, brown, membranaceous, apex obtuse, sometimes bilobed, shortly mucronate, mucron glabrous, the two lower glumes are sterile, the following hermaphrodites, and generally the four first flowers develop achene. Stylus bifid. Stamens 2–3, anthers yellowish 0.2–1 mm long. Achene 0.9–1.1 × 0.8–1 mm, biconvex, orbicular to obovate, apex obtuse, brown to reddish-brown, surface strongly undulate-rugose, with generally 7 ridges, foveate; hypogynous bristles 2–5, of equal length or slightly longer than the achene, reaching the apex of the stylopodium. Stylopodium 0.2–0.5 mm long, triangular, greyish.

Geographical distribution and habitat:— Mexico, Cuba, Uruguay, Argentina (Corrientes) and southern Brazil (Guaglianone 1980, Tropicos.org 2013). In Brazil, in

the states of Paraná, Rio Grande do Sul and Santa Catarina. Typically found in moist, and sandy soils of the coastal grasslands of the Atlantic Rainforest and Pampa.

Flowering/fruiting:—October to April.

Examined material:—BRAZIL. RIO GRANDE DO SUL: **Capivari do Sul**, Fazenda dos Touros, 07 January 2003, *E. N. Garcia* 885 (ICN); **Eldorado do Sul**, Estação Experimental Agronômica da UFRGS, 27 January 1985, *N. Silveira* 2527 (HAS); **Guaíba**, BR 116, km 307, Fazenda São Maximiano, 18 May 1996, *A.C. Araujo* 265 (ICN), BR 116, km 307, Fazenda São Maximiano, 18 May 1996, *A.C. Araujo* 268 (ICN), BR 116, km 307, Fazenda São Maximiano, 30 March 2006, *R. Trevisan* 614 (ICN); **Mostardas**, Lagoa São Simão, 07 January 2008, *A. Butzke* 1055 (MBM); **Osório**, km 73, RS 030, 21 January 2010, *R. Trevisan* 1044 (ICN), Camping Park Osório, 29°59'01"S, 50°12'03"W, 16 March 2010, *R. Trevisan* 1055 (ICN), RS 389, junto à ponte antiga, 29°52'25,5"S, 50°06'14,3"W, 28 January 2004, *H. Longhi-Wagner & S. Hefler* 9068 (ICN); **Porto Alegre**, 10 January 1933, *B. Rambo* 696 (PACA), Beira-Rio, 21 October 1977, *A. N. Kampf & H. H. Dornelles* 945 (ICN), Morro da Polícia, 27 December 1948, *B. Rambo* 39205 (PACA), Morro Santana, 10 December 1979, *O. Bueno* 1986 (HAS); **Rio Grande**, Corredor dos Senandes, 5 km da entrada, 32°10'50.0"S, 52°13'59.7"W, 25 November 2004, *I. Boldrini, R. Trevisan & E. Garcia* 1238 (ICN), Ilha dos Marinheiros, 24 May 1985, *G. Pedralli et al. s. n.* (HURG 1078); **São Lourenço do Sul**, -31.326626, -51.957614, August 2012, *P. J. S. Silva Filho* 1764 (ICN); **Torres**, Parque Estadual de Itapeva, 22 May 2010, *P. J. S. Silva Filho* 1614 (MPUC); **Viamão**, Gruta, 31 January 1968, *B. Irgang et al. s. n.* (ICN 31075), Parque Estadual de Itapuã, Praia de Fora, 30°23'33,8"S, 50°57'57,9"W, 27 April 2006, *R. Trevisan et al.* 633a (ICN); **s. m.**, Belém Novo para Porto Alegre, 31 December 1948, *B. Rambo* 39335 (PACA); **s. m.**, Chácara Weber para Itapoan, 18 December 1948, *B. Rambo* 38934 (PACA); **s. m.**, entre Noiva do Mar e Atlântida, February 1978, *Fadenhauer* 187 (ICN); **s. m.**, Esteio para Porto Alegre, 24 November 1948, *B. Rambo* 38276 (PACA); **s. m.**, estrada de Porto Alegre para Pântano Grande, km 17, 14 December 1972, *J. C. Lindeman & B. E. Irgang s. n.* (HAS 84008); **s. m.**, Teresópolis para Porto Alegre, 04 January 1949, *B. Rambo* 39459 (PACA).

Additional examined material:—BRAZIL. PARANÁ: **Paranaguá**, Praia do Leste, 03 October 1966, *J. Lindeman & H. Haas* 2608 (MBM). SANTA CATARINA: **Araranguá**, Morro dos Conventos, 27 November 2006, *R. Trevisan et al.* 733 (ICN); **Balneário Gaivota**, 29°09'17,9"S 49°34'21,9"W, 01 February 2005, *G. H. Silveira & S.*

M. Hefler 258 (ICN); **Florianópolis**, Jurerê, 17 January 1966, *Klein & Bresolin* 6548 (ICN), Rio Vermelho, 22 December 1965, *Klein et al.* 6454 (ICN); **Palhoça**, Campo do Massiambú, 02 February 1953, *R. Reitz* 5538 (HBR).

Species similar to *Rhynchospora Barrosiana* Guagl., a perennial species with spikelets 4–5mm long., achenes 1.8–2mm long., and achene with surface strongly undulate-rugose, with 9–12 transverse ridges.

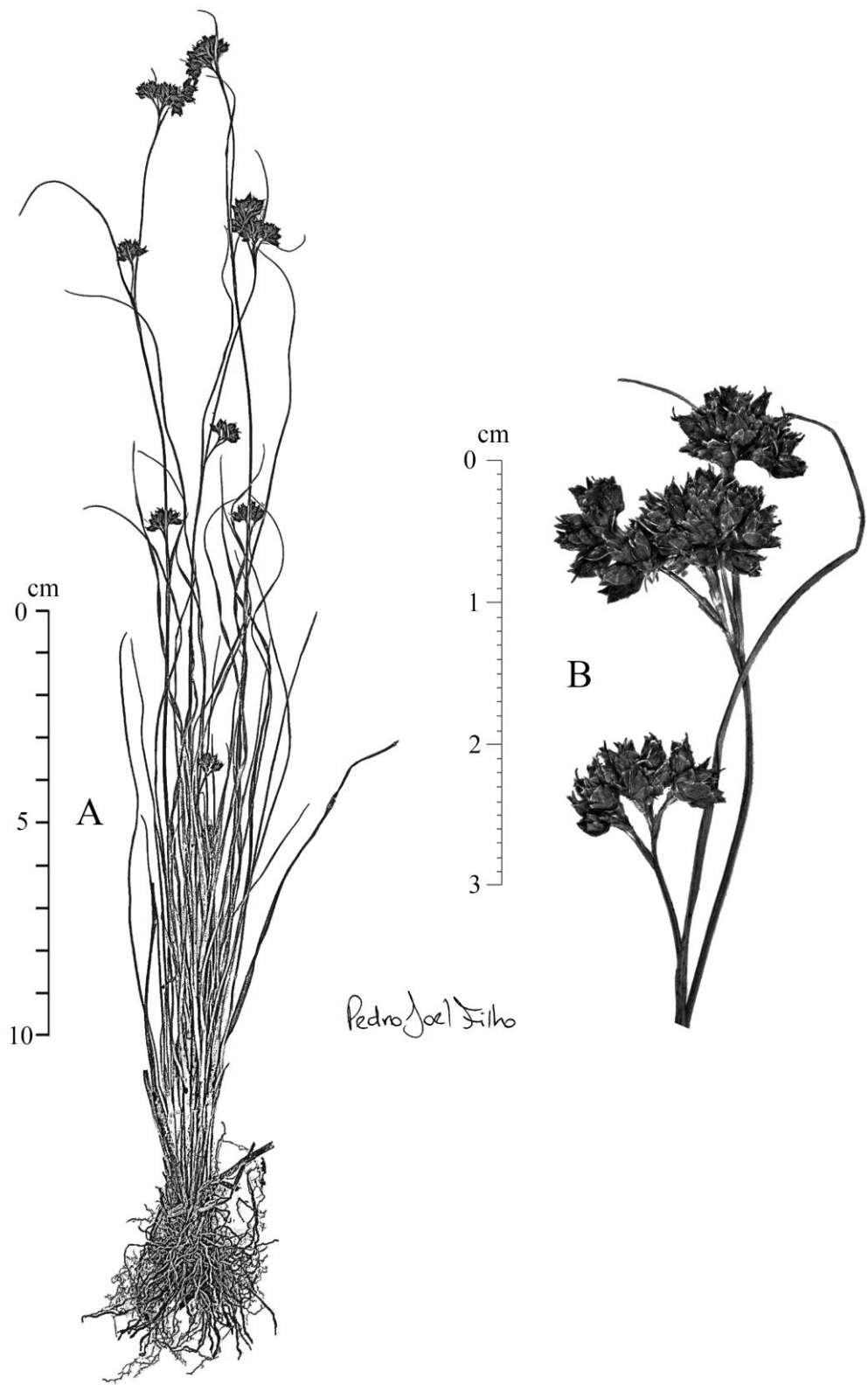


Figure 14. *Rhynchospora brittonii* Gale: A, habit; B, sinflorescence detail (*R. Trevisan 633a*).

SPECIES NOT CONFIRMED

Two species of the studied sections have not been confirmed in the State. They are *Rhynchospora exaltata* Kunth and *R. subsetosa* B. Clarke (= *R. selloiana* Boeckeler). They were misidentified in herbaria, mostly ICN.

Rhynchospora exaltata is very similar to *R. splendens*, however, has noticeably smaller spikelets of 5–6 mm long., capitate heads spherical, contracted, with more spikelets, and achenes 2 mm long. *Rhynchospora splendens* has larger spikelets and achenes, respectively, 8–14mm and 2.8–3.5 mm long., capitate heads generally turbinate and subcontracted, with fewer spikelets. When these species have immature sinflorescences, they are very similar, making it difficult to identify.

Rhynchospora subsetosa were also found in herbaria, but were in most cases misidentified immature individuals of *R. glaziovii*. Observing photographs of both types specimens, we noted that they are very similar and no character than the achene may separate them, however, no achene is separated in the photo of the type (F, FOBN011152 photo!), and the type (B†) is lost. The achene of *R. glaziovii* has no bristles, whereas *R. subsetosa* has short bristles as described in *opus princeps*.

ACKNOWLEDGEMENTS

We would like to thank all herbaria who borrowed us exsiccatae, mainly the Herbarium ICN and its employees, Camila Carneiro, Márcia Pinheiros and Mateus Negreiros, who have received all the material from other herbaria. Gratitude is also extended to Manuel Garcia de la Peña, that has photographed some exsiccatae from MVM herbarium and has sent to us. Finally, we would like to thank CAPES and CNPq ("Coordenação de Aperfeiçoamento de Pessoal de Nível Superior" and "Conselho Nacional de Desenvolvimento Científico e Tecnológico") for funding part of this study.

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Figure 15. Photos of the spikelets: A, *Rhynchospora crinigera* (R. Trevisan 725); B, *R. megapotamica* (P. J. S. Silva Filho 1811); C, *R. praecincta* (P. J. S. Silva Filho 1461); D, *R. boeckeleriana* (R. Trevisan 765); E, *R. biflora* (P. J. S. Silva Filho 1873); F, *R. brittonii* (R. Trevisan 1055); G, *R. holoschoenoides* (P. J. S. Silva Filho 1866). Details of sinflorescence axes: H, pilosity found in axes near the spikelets of *R. crinigera* (R. Trevisan 725); I, scabrous axes of *R. megapotamica* (P. J. S. Silva Filho 1811), same pattern presented by *R. praecincta* and *R. boeckeleriana*. Abaxial surface of leaves of the species of the section *Luzuliformes*: J, *R. crinigera* (R. Trevisan 725); K, *R. megapotamica* (P. J. S. Silva Filho 1811); L, *R. praecincta* (P. J. S. Silva Filho 1461); M, *R. boeckeleriana* (S. M. Hefler 249).



Figure 16. Photos of the spikelets: A, *Rhynchospora velutina* (C. Kozera & O. P. Kozera 2978); B, *R. conferta* (P. J. S. Silva Filho 1880); C, *R. robusta* (L. T. Dombrowski 6669); D, *R. confinis* (R. Trevisan 1042); E, *R. hieronymi* subsp. *montevidensis* (P. J. S. Silva Filho 1879); F, *R. glaziovii* (P. J. S. Silva Filho 1401); G, *R. splendens* (N. Silveira 137).

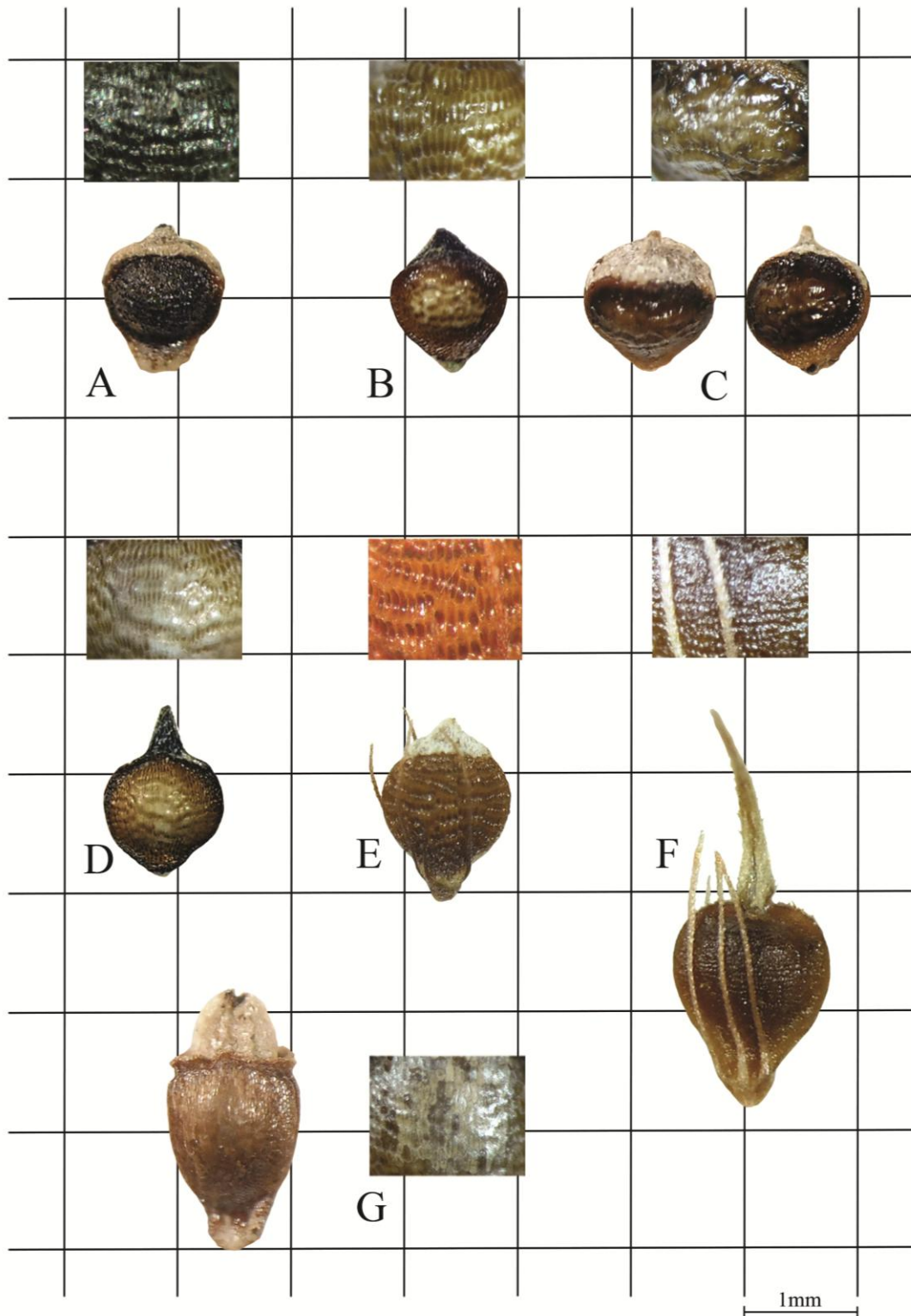


Figure 17. Photos of the achenes and their surfaces: A, *Rhynchospora crinigera* (A. Guglieri et al. 779); B, *R. megapotamica* (P. J. S. Silva Filho 1880); C, *R. praecincta* (P. J. S. Silva Filho 1461); D, *R. boeckeleriana* (R. Trevisan 765); E, *R. brittonii* (P. J. S. Silva Filho 1614); F, *R. holoschoenoides* (R. Trevisan 555); G, *R. confinis* (A. C. Araujo 262).

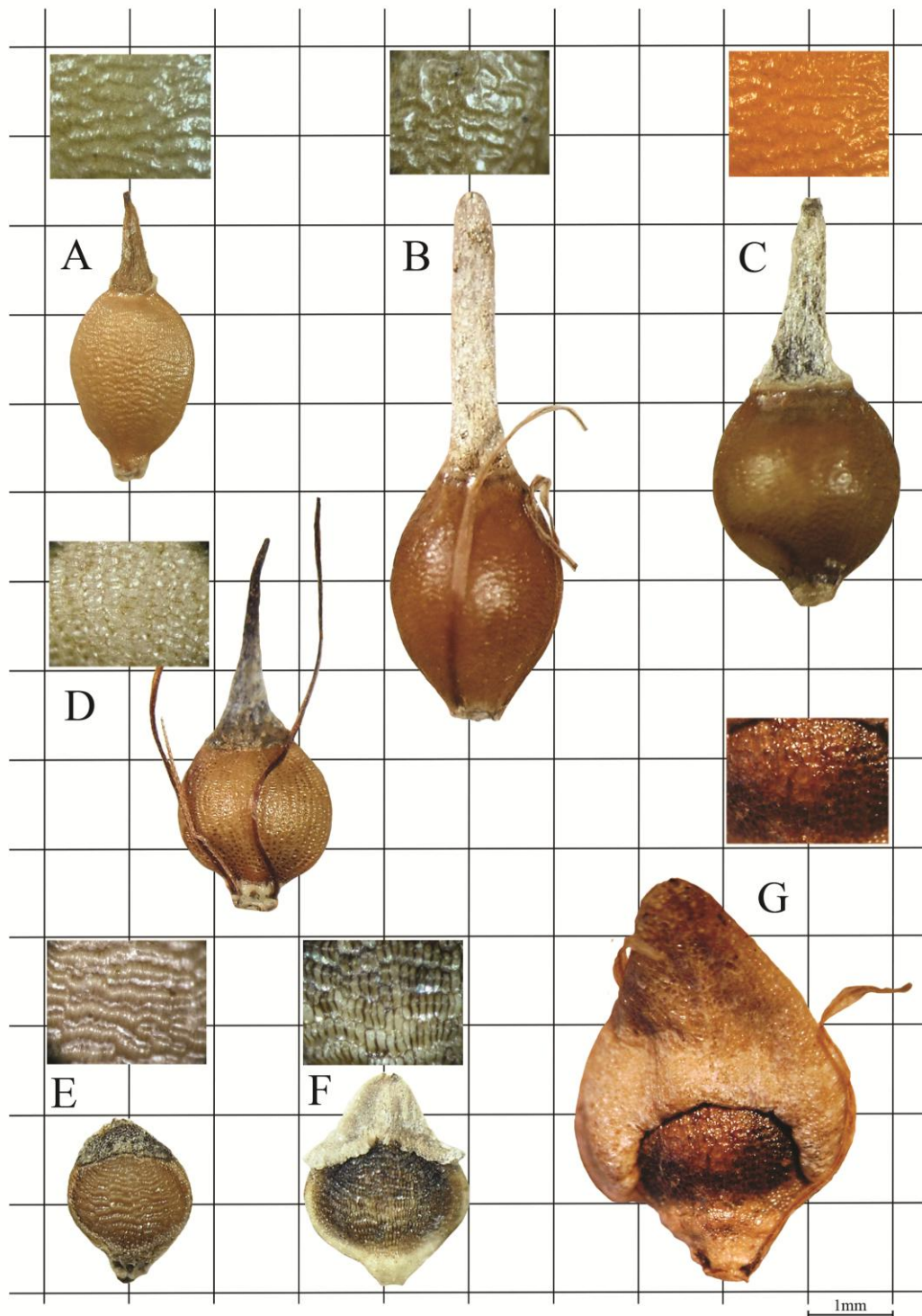


Figure 18. Photos of the achenes and their surfaces: A, *R. biflora* (P. J. S. Silva Filho 1873); B, *R. splendens* (N. Silveira 137); C, *R. glaziovii* (P. J. S. Silva Filho 1401); D, *R. hieronymi* subsp. *montevidensis* (J. Mahus 14290); E, *R. velutina* (C. Kozera & O. P. Kozera 2978); F, *R. conferta* (P. J. S. Silva Filho 1880); G, *R. robusta* (L. B. Smith, R. Reitz & L. Caldoto 9509).

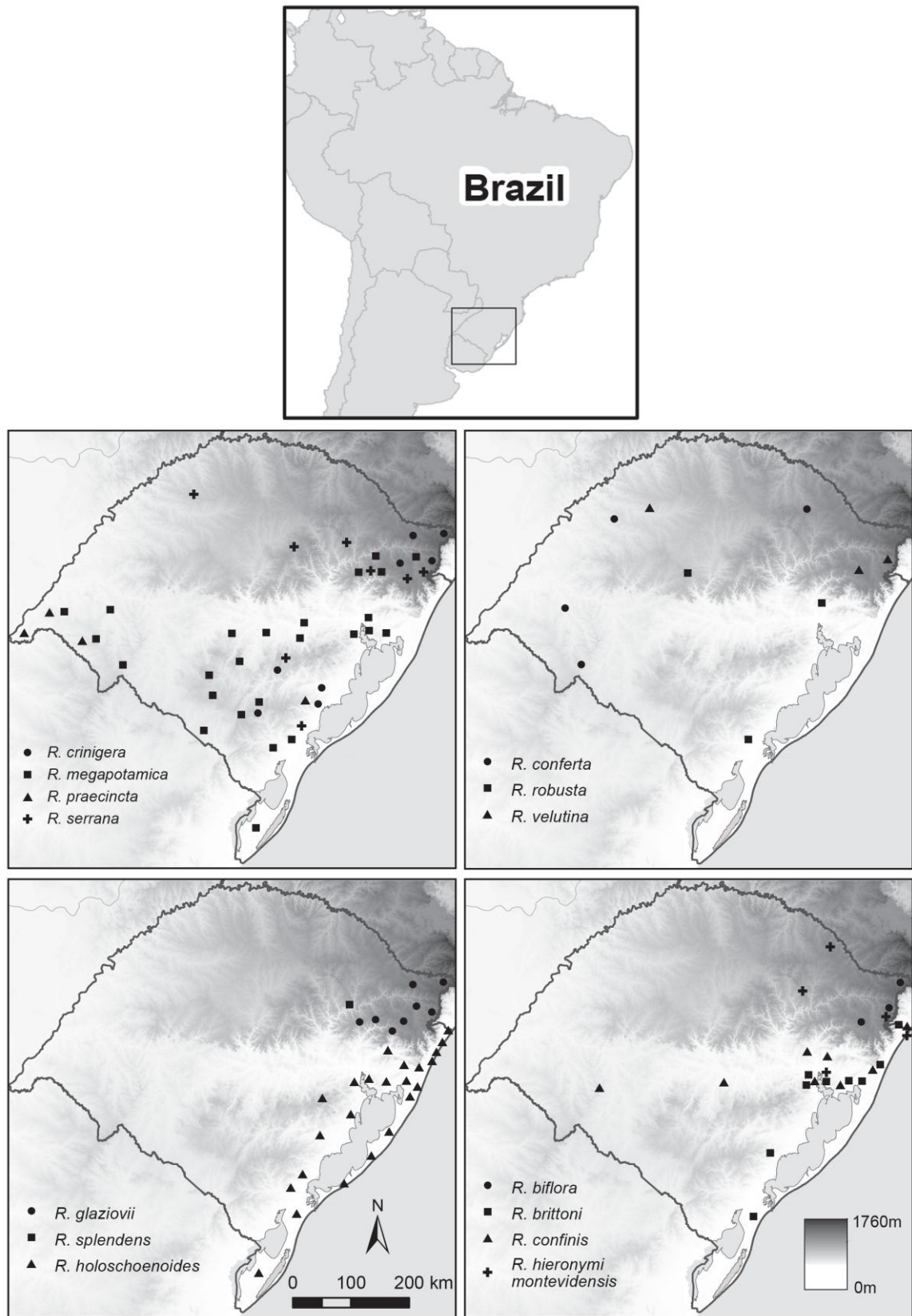


Figure 19. Geographical distribution of the studied species in the state of Rio Grande do Sul, Brazil.

Capítulo 2

Taxonomic novelties in *Rhynchospora*, and a key to the species of sect. *Luzuliformes* Kük.

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ABSTRACT

The genus *Rhynchospora* Vahl has about 250 species with concentration in tropical America. In Brazil, *Rhynchospora* is the most abundant genus of the family, with 157 species, of which 40 are considered endemic. With the knowledge obtained in field trips, literature and herbaria reviewed, this work aims to contribute to the taxonomy of the genus *Rhynchospora*. As main results we highlight the new status and new name *Rhynchospora boeckeleriana*, the synonymization of *Rhynchospora glaziovii* and *R. floribunda*, *R. robusta* and *R. semihirsuta*, and *R. uniflora* and *R. biflora*. A new description for *R. conferta*, which is a valid species and has been considered as a synonym of *R. robusta* is also presented. During the review, we found two new records, *R. praecineta* to Brazil and *R. splendens* to Rio Grande do Sul. A full description of all these species are provided, as well as a key to the species of section *Luzuliformes* and new lectotypes and neotypes designations.

INTRODUCTION

The last revision of the genus *Rhynchospora* Vahl (1805:229) was made by Kükenthal (1949, 1950, 1951), who divided *Rhynchospora* into two subgenera and 28 sections, and describes most of the sections and species we know today.

According to Goetghebeur (1998), this genus has about 250 species with concentration in tropical America. In Brazil, *Rhynchospora* is the most abundant genus of the family, with 157 species, of which 40 are endemic. Twenty-three species occurring in Brazil have wide distribution and are mostly ruderal or invasive species (Alves et al. 2009).

In the delimitation of sect. *Luzuliformes* (1950:183), Kükenthal recognized three species, *Rhynchospora crinigera* Boeckeler (1888:28), *R. luzuliformis* Boeckeler (1873:632) (= *R. megapotamica* (Spreng. 1828:4) H. Pfeiff. 1943:129) and *R. praecincta* Maury (1889:146). He also presented two varieties for *Rhynchospora luzuliformis*: *Rhynchospora luzuliformis* var. *spicata* Kük in Pfeiff. (1943:130) and *R. luzuliformis* var. *pusilla* Osten (1931:219).

Guaglianone (1981), in her contributions to the study of *Rhynchospora* considered *R. floribunda* Boeckeler (1890:27) as a distinct species from *R. hieronymi* Boeckeler (1888:30), and cites *R. glaziovii* Boeckeler (1874:405) as a related species, distinguishing them by a few characteristics that are presented in a brief description. She also searched by the type of *R. floribunda* but only discovered that it is a collection of G. Niederlein in the province of Misiones, Argentina.

Kükenthal (1950), in his monograph, treated *Rhynchospora robusta* (Kunth 1837:283) Boeckeler (1873:616), *R. semihirsuta* Boeckeler (1873:614) and *R. conferta* (Nees 1842:116) Boeckeler (1873:615) all as distinct species. Barros (1960), just like in "Ciperáceas Argentinas IV" (Barros 1945) synonymized *R. conferta* into *R. robusta*, and did not comment anything about *R. semihirsuta*. Currently, *R. conferta* has been considered as a synonym of *R. robusta*, and *R. semihirsuta* considered a distinct species (Zuloaga 2008, Alves et al. 2013).

Rhynchospora uniflora and *R. biflora* were always been considered as distinct species (Kükenthal 1949, Barros 1960, Zuloaga 2008, Alves et al. 2013).

Much of these species seems to have problems in their circumscription. In this paper they were reviewed, along with related species, to try to solve these issues and thus facilitate the correct identification of these taxa.

MATERIAL & METHODS

Six field trips were conducted to collect in South Brazil. The collected material was deposited in the collection of herbarium ICN (UFRGS).

To analyze the circumscription of species, describe them and estimate their distribution, we analyzed a large number of exsiccatae from the following herbaria: CTES, FLOR, HAS, HBR, HUICS, HURG, ICN, MBM, MPUC, PACA, PEL and SMDB. Part of these herbaria were visited (ICN, HAS, MPUC, HBR, FLOR and MBM) and the other part had its material revised through loans. In exception of the Herbarium of the University of Caxias do Sul (HUICS), which is not registered in Index Herbarium, the acronyms follow Thiers (2013).

The *opera principia* and *typi* were observed mainly through JSTOR.org 2013 (<http://plants.jstor.org/>), Biodiversity Heritage Library 2007 (<http://www.biodiversitylibrary.org/>) and Botanicus.org 2013 (<http://www.botanicus.org/>) websites.

To describe the leaves, we considered only the basal ones. All measurements were based only on developed structures. The measures of achenes do not include stylopodium, which was measured separately. The terminology used in the descriptions is based on Stearn (1983), Kukkonen (1994) and Lucero & Vegetti (2012).

The geographical distribution of the species was mainly obtained using data from the examined material, the Lista de Espécies da Flora do Brasil (Alves et al. 2013), references from Tropicos.org (2013), the monograph of Kükenthal (1949, 1950 and 1951), and other auxiliary bibliographies, such as Guaglianone (1980 and 1981).

The geographic coordinates from the exsiccatae were kept in the same way as they were written for no loss of information.

The illustrations of the habit of species and sinflorescence details (Fig. 1: "A", "b", "E" and "f") were made from photographs taken with camera NIKON 5000, and later edited in Adobe Photoshop to acquire the aspect presented in this paper. The details of leaves (Fig. 1, "c" and "g") and achenes (Fig. 1, "d" and "h") were obtained through the stereoscopic microscope and also edited with the same program.

RESULTS

The sect. *Luzuliformes*, which the new name *Rhynchospora boeckeleriana* Silva Filho & Boldrini (here designated) belongs, have now four species and differs from the other sections by presenting flexuous culm, leaves flattened of 1 to 3 cm wide, paniculodium inflorescence formed by coflorescences of 3-4 paniculodia, several-flowered spikelets with loosely imbricated scales, hypogynous bristles absent, achene surface transversely undulate-rugose and bifid style. *Rhynchospora megapotamica* is mainly found in dry and rocky grasslands of Pampa, rarely found in the altitude fields of Atlantic Rainforest of Rio Grande do Sul and Santa Catarina. *Rhynchospora crinigera* have a similar distribution of *R. boeckeleriana*, but it reaches Uruguay, and lives mainly in humid grasslands. *Rhynchospora praecineta* is exclusively found in dry and rocky grasslands of Brazil, Paraguay and Argentina, and in Brazil it's only found in Pampa biome. A key for the section is provided and we present a new record for Brazil: *R. praecineta*.

The section *Polycephalae*, the one which *R. floribunda*, *R. glaziovii* and *Rhynchospora splendens* belong, is not easy to classify, since it presents a wide morphological variation and is only recognized when using a set of characteristics, such as, erect culms, wide leaves, hypogynous bristles 5–6 (rare absent), synflorescences formed by corymbodia, antelodia or capitate heads, spikelets clustered in capitate heads or fascicles, hypogynous bristles flexible or absent, achene surface transversely rugose, (rare pitted to smooth). Here we consider *R. floribunda* as a synonym of *R. glaziovii*, and present *R. splendens* as a new record for Rio Grande do Sul state, Brazil. These species are typically from the herbaceous layer of Atlantic Rainforest, where *R. splendens* prefers the low lands near the plateau, and *R. glaziovii*, the highlands in the Araucaria Forest.

Rhynchospora conferta and *R. robusta* belong to the section *Psilocaryae*, which is easily recognized by its densely imbricated spikelet scales and for producing many achenes (generally more than 5) in a single spikelet. Both are found in wet or waterlogged environments, such as wetlands and fens. Here we consider *R. conferta* as a distinct species from *R. robusta* and also present *Rhynchospora semihirsuta* as a new synonym for *Rhynchospora robusta*.

The section *Racemosae* comprises species that live in the herbaceous layer of forests, with culms arching, with very few leaves at the base, leaves narrow, reduced synflorescences, hypogynous bristles absent, stylopodium subulate and narrower than the achene and style entire or shortly bifid. In Brazil, we have only two species,

Rhynchospora biflora and *R. uniflora*, both are found mainly in altitude environments such as the Araucaria Forest. They are synonymized in this paper.

Key to sect. *Luzuliformes* Kük. species

- 1 Spikelet scales no longer than 4 mm, generally ovate, stramineous to brown.....2
 - Spikelet scales 4–5 mm long, oblong to lanceoloid, always stramineous.....***R. crinigera***
- 2. Rhizomes 0,6–6mm wide, leaves with or without two parallel vinaceous lines at the margins of abaxial leaf surface.....3
 - Rhizomes 6–10 mm wide, leaves generally having two parallel vinaceous lines at the margins of abaxial leaf surface.....***R. praecincta***
- 3. Rhizomes 0,8–3 mm wide, elongated, leaves with two parallel vinaceous lines at the margin of abaxial leaf surface, stylopodium 0.2–0.4 mm long.....***R. megapotamica***
 - Rhizomes 2–6mm wide, short, leaves entirely green, stylopodium 0.4–0.6 mm long.....***R. boeckeleriana***

TAXONOMY

Rhynchospora boeckeleriana* Silva Filho & Boldrini *nom. nov. and stat. nov.

Basionym: *Rhynchospora megapotamica* var. *spicata* Kük. in Pfeiff. (1943:130).
 Type:—BRASIL. Santa Catarina: im Sumpf auf dem Campo der Serra do Oratorio, Feb 1890, *Ule 1611* (holotype B†; lectotype (here designated): F (F0BN012156, photo! from B† holotype)). Epitype (here designated):—BRAZIL: Santa Catarina: Bom Retiro, BR 282, km 136, 27°49'29,9"S, 49°34'27,0"W, 29 November 2006, *R. Trevisan et al. 765* (ICN!).

Perennial plants, caespitose-rhizomatous. Rhizomes 2–6 mm diameter, ligenous and short, covered by cataphylls and old sheaths often dissociated into fibers. Culms 30–77 × 0.08–0.2 cm, trigonous, flexible, glabrous or scabrous in the apical part, near the spikelets, and with a longitudinal groove. Leaves 17–66 × 0.15–0.5 cm, flattened, glabrous or antrorsely scabrous at the margins and abaxial midvein, entirely green; sheath 1–5 cm long. Synflorescence formed by a terminal paniculodium and 1-3 axillary paniculodia, all contracted to subcontracted and composed of partial paniculodia, and these by fascicles of spikelets; axes above second order, usually scabrous at the angles,

especially the ones closest to the spikelets; apical paniculodium with 2–4 (–5.5) × 1–3 cm and the axillary with 1–3 × 0.6–3 cm. Spikelets 2.8–3.8 mm long, ovate to ovate-lanceoloid. Glumes ovate to lanceolate, dark brown, membranaceous, apex obtuse, acute, or in some cases shortly bilobed, short-mucronate, mucron glabrous, the two lower glumes are sterile, the following hermaphrodites, and usually only the first two flowers develop achene. Stylus bifid. Stamens 3, anthers yellowish 1.3–1.5 mm long. Achene 0.8–0.9 × 0.7–1 mm, lenticular-biconvex, orbicular, apex obtuse, stramineous when young to brown when mature, surface transversely undulate-rugose; bristles absent. Stylopodium 0.4–0.6 mm long, depressed, semilunate-subulate, decurrent on margins of achene, brown.

Distribution and habitat:—Brazil. In the states of Paraná, Santa Catarina and Rio Grande do Sul. Found in wetlands and fens.

Etymology:—The name was given in honor to the cyperologist Johann Otto Boeckeler, who had noticed the new species, however, he did not validate the new taxon.

Examined material:—BRASIL. PARANÁ: **General Carneiro**, Faxinal dos Souzas, 07 December 1971, *G. Hatschbach, L. B. Smith & Klein 28333* (MBM); **Guaíra**, Parque Nacional Sete Quedas, 02 September 1981, *E. Buttura 701* (MBM); **Palmas**, Rio Chopim, 20 October 1966, *G. Hatschbach 15050* (MBM); **Piên**, Boa Vista, Pedreira, 20 October 2006, *E. F. Costa & Cordeiro 65* (MBM). RIO GRANDE DO SUL: **Cambará do Sul**, Faxinal, December 1983, *M. Sobral & J. R. Stehmann 2693* (ICN); **Caxias do Sul**, 29° 05.085' S, 51° 02.783' W, November 2010, *P. J. S. Silva Filho et al. 1905* (ICN); **Encruzilhada do Sul**, estrada para Amaral Ferrador, 30° 51' 15" S, 52° 32' 20.2" W, 09 October 2008, *H. Longhi-Wagner & G. H. Silveira 10603* (ICN); **Giruá**, Granja Sobral, October 1963, *K. Hagelund 1096* (ICN); **Nova Prata**, Estação Experimental Fitotecnia, 15 November 1982, *J. Mattos & R. Frosi 31111* (HAS); **Pelotas**, Cascatinha, 20 November 1986, *J. R. Mattos & N. Mattos 32279* (FLOR); **São Francisco de Paula**, Lajeado Grande, RS 476, 29° 06' 33.2" S 50° 38' 22.5" W, 26 November 2010, *I. Boldrini 1659* (ICN); **Soledade**, BR 386, km 242, 28° 47' 32.4" S, 052° 31' 22.8" W, 20 November 2003, *S. M. Hefler et al. 249* (ICN). SANTA CATARINA: **Água Doce**, 04 December 1964, *L. B. Smith & R. Klein 13511* (HBR); **Bom Jardim da Serra**, acesso Vacas Gordas para Ubirici, 28° 19' 39.3" S, 49° 37' 18.5" W, 23 November 2006, *A. C. Araujo & G. 1679* (ICN); **Bom Retiro**, BR 282, km 136, 27° 49' 29.9" S, 49° 34' 27.0" W, 29 November 2006, *R. Trevisan et al. 765*

(ICN), Campo dos Padres para Bom Retiro, 17 December 1948, *R. Reitz 3493* (PACA); **Caçador**, Fazenda Carneiros, 21 December 1956, *L. B. Smith & Reitz 9007* (HBR); **Catanduvas**, 17-19km Oeste de Joaçaba, ca. 27° 03' S, 51° 45' W, 15 December 1964, *L. B. Smith & R. M. Klein 13953* (FLOR); **Florianópolis**, Morro da Lagoa, 14 September 1990, *M. H. Queiroz 286* (ICN); **Lages**, em beira de estrada no portal norte da cidade, saída para Curitiba, 27° 45.008' S, 50° 20.014' W, 21 October 2005, *R. Trevisan 397* (ICN); **Lebon Régis**, Rio dos Patos, 06 December 1962, *R. Klein 3400* (FLOR); **Urubici**, caminho entre a Pousada Rio Canoas Refúgio de Montanhas e a Fazenda do Sr. Arno Philippe, 04 December 2006, *A. Zanin et al. 1125* (ICN), Campo dos Padres, Fazenda do Sr. Arno Philippe, 07 December 2006, *A. Zanin et al. 1274* (ICN).

During the review of material from several herbaria from Rio Grande do Sul, Santa Catarina and Paraná, we noticed that *Rhynchospora megapotamica* var. *spicata* has to many different and consistent characteristics to be considered as just a variety of *R. megapotamica* (Fig. 1). These differences include not only morphological characteristics, but also ecological aspects as habitat and distribution. Besides the characteristics mentioned in the key to species, *R. boeckeleriana* is generally more robust, the paniculodia are longer than wide, with densely aggregated spikelets, which have a dark brown color. The habitat and distribution are also different, *R. boeckeleriana* is mainly found in wetlands and fens of Campos de Cima da Serra region (altitude grasslands of the southern portion of the Atlantic Rainforest), and *R. megapotamica* in dry and rocky grasslands of Pampa.

Rhynchospora spicata Boeckeler (1896:95), the name which Kükenthal (1943) used as basionym for *R. megapotamica* var. *spicata* is a *nomen nudum*. Besides, this name had already been given by Spreng (1825:194) for other species with spikelets solitary, later considered as *Scleria spicata* (Spreng.) J.F. Macbr. (1929:168) [= *Rhynchospora spicata* Spreng. (1825:194)]. *Rhynchospora spicata* Boeckeler is a name found within the description of *R. maculata* Maury (1889:146) (= *R. megapotamica*), made by Boeckeler (1896), which was based on a different material from that used by Maury, and Boeckeler probably suspected it was a different species. However, citing only the name within this description, he did not validate the publication of the new species, which was only done by Kükenthal (1943) as a new variety of *Rhynchospora megapotamica*.



Figure 1. *Rhynchospora boeckeleriana* Silva Filho & Boldrini: A, habit; b, synflorescence detail; c, abaxial leaf surface; d, achene. *R. megapotamica* (Spreng.) H. Pfeiff.: E, habit; f, synflorescence detail; g, abaxial leaf surface; h, achene (A, b, *Silva Filho et al.* 1905; c, *Hefler* 249; d, *Trevisan* 765; E, f, *Silva Filho* 1463; g, *Silva Filho* 1811; h, *Silva Filho* 1880).

***Rhynchospora praecincta* Maury (1889:146).**Type:—PARAGUAY: *in viis*, 24 August 1974, *Balansa* 453 (lectotype (here designated): P, photo!); *in pascuis*, 28 Oct 1876, *Balansa* 2553 (remaining syntype: K, photo!). *Rhynchospora luzuliformis* var. *pusilla* Osten (1931:219) *sin.nov.* Type:—URUGUAY: Dep. Durazno: Cuchilla de Molles, 12 September 1899, *C. Osten* 3785 (lectotype (here designed): MVM, photo!); Florida: Santa Clara, 28 September 1928, *Herter* (remaining syntype: MVM 19265, photo!).

Perennial plants, caespitose-rhizomatous. Rhizomes 6–10 mm diameter, ligneous and short, covered by cataphylls and old sheaths often dissociated into fibers. Culms 9–35 × 0.06–0.11 cm, trigonous, flexible, glabrous or scabrous in the apical part, near the spikelets, and with a longitudinal groove. Leaves 6–24 × 0.09–0.3 cm, flattened, usually with two longitudinal vinaceous lines near the margin, and sometimes with punctuations between them, most evident on the abaxial surface, glabrous or antrorsely scabrous at the margins and abaxial midvein; sheath 1–4 cm long. Synflorescence formed by a terminal paniculodium and 1–3 axillary paniculodia, all densely contracted and composed of partial paniculodia, and these by fascicles of spikelets; axes above second order, usually scabrous at the angles, especially the ones closest to the spikelets; apical paniculodium with 0.9–2.3 × 1–2.4 cm and the axillary with 0.5–1.6 × 0.5–1.5 cm. Spikelets 2.9–3.1 mm long, ovate to ovate-lanceoloid. Glumes ovate to lanceolate, stramineous, membranaceous, with evident hyaline margin, apex obtuse, acute, or in some cases shortly bilobed, short-mucronate, mucron glabrous, the two lower glumes are sterile, the following hermaphrodites, and usually only the first three flowers develop achene. Stylus bifid. Stamens 3, anthers yellowish 1.6–1.8 mm long. Achene 0.8–1 × 0.7–1 mm, lenticular-biconvex, orbicular, apex obtuse, stramineous when young to brown when mature, surface transversely undulate-rugose; bristles absent. Stylopodium 0.2–0.3 mm long, depressed, semilunate, decurrent on margins of achene, greyish to brownish.

Distribution and habitat:—Argentina, Brazil and Paraguay. In Brazil, only in Rio Grande do Sul. Found only in dry and rocky grasslands of Pampa.

Examined material:—ARGENTINA. CORRIENTES: **Concepción**, 17 September 1986, *T. M. Pedersen* 14582 (MBM); **Empedrado**, Estância Três Marias, 13 October 1982, *T. M. Pedersen* 13433 (MBM); **Mercedes**, Ea. Dionísio, Ruta 40, 32 km SW de Colonia Pellegrini, Colonia Uruguay, 57° 28' W, 28° 40' S, September 1999, *A. Schinini* 35083 (MBM). BRASIL. RIO GRANDE DO SUL: **Barra do Quaraí**, 14

October 1971, *J. C. Lindeman et al. s. n.* (ICN 8456), 30° 12' 14.27" S, 57° 29' 36.14" W, 17 December 2011, *P. J. S. Silva Filho 1461* (ICN); **São Lourenço do Sul**, Fazenda Cordilheira, 27 October 2011, *C. L. Bonilha 335* (ICN); **Quaraí**, Cerro do Jarau, 28 September 1984, *B. Irgang et al. s. n.* (ICN 92807); **Uruguaiana**, ponte sobre o Rio Ibicuí, na divisa com Itaquí, 13 November 1984, *M. Sobral 3290* (ICN). PARAGUAY. DEPARTAMENTO CENTRAL: **no municipality defined**, próximo a Viletta, 16 November 1969, *T. M. Pedersen 9320* (MBM).

It is an uncommon species, exclusive from Pampa, which dwells mainly in dry grasslands with shallow soils. It is recognized mainly by presenting rhizomes short, thickened, densely covered by cataphylls and aged sheaths often dissociated into fibers. For both *Rhynchospora praecincta* and *R. luzuliformis* var. *pusilla* we had two syntypes, therefore we have designated the lectotypes.

***Rhynchospora splendens* Lindm. (1900:26).** Type:—BRAZIL. Rio de Janeiro: near Rio de Janeiro, 1878, *M. Glaziou 11650* (holotype: K, photo!).

Perennial plants, caespitose-rhizomatous. Rhizomes 5–13 mm diameter, ligneous and short, covered by leathery cataphylls. Culms 101–198 × 0.05–1 cm, trigonous, erect, glabrous or scabrous at angles. Leaves 49–110 × 0.6–1.3 cm, flattened, glabrous or antrorsely scabrous at the margins and abaxial midvein; sheath 1.6–8 cm long. Synflorescence formed by a terminal anthelodium and 4–11 axillary anthelodia, all contracted and composed of partial capitate heads, rarely reduced to a single capitate head; capitate heads turbinate to subspherical; axes above second order, usually scabrous at the angles; apical anthelodium with 2.3–4 × 2.3–4 cm and the axillary with 1.7–4 × 1.8–4 cm. Spikelets 8–14 mm long, lanceoloid. Glumes oblong-lanceoloid, stramineous, leathery, apex acute, mucronate, glabrous mucron, the four or five lower glumes are sterile, the following hermaphrodites, and only the first flower develop achene. Stylus entire or shortly-bifid. Stamens 3, anthers yellowish 3.5 mm long. Achene 2.8–3.5 × 1.8–2.6 mm, turgid-biconvex, ovate to elliptical, apex truncated, stramineous to light brown, surface faintly transverse rugose; bristles absent. Stylopodium 3–5 mm long, cylindrical-spatulate, greyish.

Distribution and habitat:—Bolivia, Brazil, Guyana, Venezuela (Kükenthal 1949, Tropicos.org 2013). In Brasil, in the states of Espírito Santo, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina and São Paulo. Found in the herbaceous layer of Atlantic Rainforest.

Examined material:—BRASIL. ESPÍRITO SANTO: **Santa Teresa**, Reserva Biológica de Santa Lúcia, January 1997, *M. Sobral et al.* 8278 (ICN). PARANÁ: **Bocaiúva do Sul**, BR 476, 25° 10' 44.9" S, 49° 06' 45.3" W, 09 January 2007, *R. Lüdtke & F. Lima* 716 (ICN); **Colombo**, Hotel Estância Betânia, 25° 18' 43.00" S, 49° 07' 33.00" W, 26 August 2010, *M. Verdi, E. M. Martins & O. N. Veiga* 5534 (FLOR); **Colombo**, 25° 17' 44" S, 49° 07' 49" W, 26 August 2010, *M. Verdi, E. M. Martins & O. N. Veiga* 5538 (FLOR); **Palmeiras**, Colônia Quero-Quero, 12 June 2010, *A. C. Cervi, J. M. Silva & J. Cordeiro* 9907 (MBM); **Quatro Barras**, Estrada da Graciosa, Volta Grande, km 40, June 1943, *R. Hertel* 1 (MBM). RIO GRANDE DO SUL: **Veranópolis**, 2 km ao norte do centro urbano, na rodovia para Nova Prata, 21 July 1982, *N. Silveira* 308 (HAS), Estação Experimental Fitotécnica, 17 August 1985, *J. Mattos* 28808 (HAS), Parque da FEMACÇÃ, 20 December 1985, *N. Silveira & M. Guadagnim* 3109 (HAS), próximo ao trevo de acesso à Cidade, 22 June 1984, *N. Silveira* 1126 (HAS), próximo ao trevo de acesso à Cidade, 29 December 1981, *N. Silveira* 137 (HAS). SANTA CATARINA: **Anitápolis**, 27° 54' 00.00 S, 49° 13' 48.00" W, 17 June 2009, *M. Verdi, R. P. Hasckel & G. Klemz s. n.* (ICN 163045); **Florianópolis**, Santo Antônio de Lisboa, 08 June 1990, *M. H. Queiroz* 239 (FLOR); **Mafra**, 26° 05' 58.00" S, 49° 56' 58.00" W, 20 August 2010, *M. Verdi, E. M. Martins & O. N. Veiga* 5459 (FLOR); **Orleans**, SC 446, em direção à Urussanga, 09 March 2012, *P. J. S. Silva Filho* 1528 (ICN); **Palma Sola**, Prigo, 26° 25' 58.00" S, 53° 18' 06.00" W, 12 May 2009, *A. Stival-Santos, J. Schmitt & S. Silveira* 693 (ICN); **Santo Amaro da Imperatriz**, Hotel Plaza Caldas da Imperatriz, Trilha da Cascata, 27° 44' 29" S, 48° 48' 58" W, 06 November 2010, *S. Venturi* 67 (FLOR); **São Bonifácio**, Rio Sete, 27° 59' 21" S, 49° 02' 56" W, 30 May 2010, *M. Verdi* 480 (ICN); **Três Barras**, BR 280, 26° 10.285' S, 50° 16.035' W, 21 October 2005, *R. Trevisan* 412 (ICN); **Vidal Ramos**, Mulungu, 27° 27' 00.00" S, 49° 19' 12.00" W, 14 September 2009, *A. Korte & A. Kruger* 119 (ICN). SÃO PAULO: **no municipality defined**, ca. 10 km S.W. of Jundiá, Serra do Japí, 08 October 1976, *H. F. Leitão Filho, L. S. Kinoshita & N. Taroda s. n.* (MBM 49252).

During the review of the Herbarium HAS, we found several exsiccatae of *Rhynchospora splendens*, all from the municipality of Veranópolis and misidentified as *R. exaltata*. *Rhynchospora exaltata* is a similar species, but differs by having spikelets 5-6 mm long., with capitate heads spherical and having spikelets densely aggregate. The identification of material with immature synflorescences is very complicated, because they are extremely similar in these stages. The southernmost record for this species was in Santa Catarina, and this work is the first occurrence of this species in the Rio Grande do Sul.

***Rhynchospora glaziovii* Boeckeler (1874:405).** Type:—BRAZIL. Rio de Janeiro: Haut des Orgues, 22 October 1872, A. Glaziou 6427 (holotype: B†, F (FOBN011135, photo! from B† holotype); lectotype (here designated) P (P00265355 photo!); isoelectotypes: P (P00265354 photo!), K photo!, SI (fragment from K, photo!)). *Rhynchospora floribunda* Boeckeler (1890:27) *sin.nov.* Type:—ARGENTINA. Missiones: G. Niederlein 2144 (B†). Neotype (here designated):—BRAZIL. Rio Grande do Sul: São Francisco de Paula. -29.30892, -50.192113, 03 November 2011, P. J. S. Silva Filho 1399 (ICN!; isoneotype: K!).

Perennial plants, caespitose-rhizomatous. Rhizomes 3–13 mm diameter, ligneous and short, covered by chartaceous cataphylls. Culms 60–195 × 0.1–0.9 cm, trigonous, erect, glabrous or scabrous at apex. Leaves 40–128 × 0.4–1.4 cm, flattened, glabrous or antrorsely scabrous at the margins and abaxial midvein; sheath 2.3–15 cm long. Synflorescence formed by a terminal antelodium or corymbodium and 5–11 axillary antelodia or corimbodia, all subcontracted to loose and composed of partial paniculodia, and these by fascicles of spikelets; axes above second order, usually glabrous at the angles; apical antelodium with 3–6 × 3–8.5 cm and the axillary with 2–6 × 2.5–8 cm. Spikelets 7–9 mm long, lanceoloid. Glumes ovate to lanceolate, stramineous to light brown, membranaceous, apex acute, mucronate, mucron glabrous, the three or four lower glumes are sterile, the following hermaphrodites, and only the first flower develop achene. Stylus entire. Stamens 3, anthers yellowish 2.5–4 mm long. Achene 2–2.9 × 1.3–2.3 mm, turgid-biconvex, orbicular, ovate or elliptical, apex truncated, stramineous to olive-green or light brown, surface faintly transverse rugose; bristles absent. Stylopodium 3–5 mm long, cylindrical-spatulate, greyish to brownish.

Distribution and habitat:—Argentina and Brazil (Guaglianone 1981, Tropicos.org 2013). In Brasil, in the states of Minas Gerais, Paraná, Rio Grande do Sul, Santa Catarina and São Paulo. Found in the herbaceous layer of the Atlantic Rainforest and Cerrado, mainly in Araucaria Forest.

Selected examined material:—BRASIL. MINAS GERAIS: **Camanducaia**, Vila Monte Verde, 18 July 1994, *H. M. Longhi-Wagner* 2625 (ICN), Vila Monte Verde, Serra da Mantiqueira, ca. 22° 48' S, 45° 55' W, 16 October 1996, *P. G. Windisch et al.* 8651 (ICN). PARANÁ: **Antonina**, Abrigo I, Trilha para o Pico Paraná, 04 July 2010, *R. Ristow* 692 (MBM) **Antônio Olindo**, Rio Água Amarela, 01 July 1971, *G. Hatschbach* 26827 (MBM); **Campina Grande do Sul**, Pico Paraná, 17 July 1968, *G. Hatschbach* 19508 (MBM); **Colombo**, 25° 17' 53.00" S, 49° 08' 47.00" W, 26 October 2010, *M. Verdi, E. M. Martins & O. N. Veiga* 5553 (FLOR); **Curitiba**, Umbara, Rio Iguacú, 31 September 1972, *G. Hatschbach* 30382 (MBM); **Guarapuava**, estrada de terra próxima a Polícia Rodoviária Federal, 25° 22' 06.3" S, 51° 15' 41.6" W, 27 September 2012, *E. L. Siqueira & D. S. Gonçalves* 583 (FLOR); **Palmeira**, Fazenda Santa Rita, 20 June 1989, *L. T. Dombrowski* 13878 (HUCS); **Piraquara**, Fazenda Experimental de Agronomia, 24 June 1970, *N. Imaguire* 2397 (MBM); **Rio Negro**, 20 September 1960, *G. Hatschbach* 7249 (MBM); **São João do Triunfo**, 22 July 1966, *J. Lindeman & H. Haas* 1935 (MBM); **São José dos Pinhais**, 03 November 1972, *Y. S. Kuniyoshi* 3319 (MBM); **São Mateus Sul**, 25 June 1969, *G. Hatschbach* 21667 (MBM); **Tijucas do Sul**, Associação dos Professores do UFPR, 29° 50' 13.8" S, 49° 03' 05.2" W, 09 November 2012, *M. G. Caxambu et al.* 3570 (FLOR). RIO GRANDE DO SUL: **Bom Jesus**, 532564, 6866166, 13 June 2009, *M. Molz, R. Trevisan & T. C. De Marchi* s. n. (ICN 163710); **Cambará do Sul**, -29.053919, -50.085425, 03 November 2011, *P. J. S. Silva Filho* 1406 (ICN), Cânion Fortaleza, 17 July 1990, *N. Silveira* 8946 (HAS), Fazenda Velha: Celulose Cambará, 19 October 1994, *N. Silveira* 12813 (HAS), Itaimbezinho, 01 December 1981, *H. M. Longhi-Wagner et al.* 948 (ICN), Itaimbezinho, 03 December 1971, *J. C. Lindeman et al.* s. n. (ICN 9328), Itaimbezinho, 11 March 1988, *N. Silveira* 7385 (HAS), Itaimbezinho, 28 April 1974, *B. Irgang et al.* s. n. (ICN 30670), Parque Nacional dos Aparados da Serra, 23 June 1980, *J. L. Waechter* 1626 (ICN), Pedra do Segredo, February 1987, *R. Wasum et al.* s. n. (HAS 2278); **Canela**, February 1986, *M. Sobral & R. Silva* 4991 (ICN), Cascata do Caracol, 08 December 1990, *L. Garcés* s. n. (ICN 89368), Sítio Garcés, 09 December 1990, *L. Garcés* s. n. (ICN 89363), -29.3208799883724, -50.7391978986562, 04 March 2012, *P.*

J. S. Silva Filho 1883 (ICN); **Caxias do Sul**, Ana Rech, 10 December 1999, *L. Scur 269* (MBM), Ana Rech, Faxinal, 10 December 1999, *L. Scur 269* (MBM), Vila Oliva, 02 June 2002, *A. Kegler 1504* (HUCS), Vila Oliva, 10 February 2002, *A. Kegler 1589* (HUCS), Vila Oliva, 28 October 1949, *B. Rambo 43132* (PACA); **Farroupilha**, 12 April 1957, *Camargo 1285* (PACA), 25 May 1956, *Camargo 688* (PACA), 28 May 1956, *Camargo 721* (PACA), Parque dos Pinheiros, 30 May 1978, *O. Bueno 717* (HAS); **Jaquirana**, Fazenda Boa Vista, 24 April 1988, *G. Grazziotin et al. s. n.* (HUCS 3973) RS 110, entrada para a sede de Jaquirana, 05 October 2006, *A. C. Araujo, H. M. Longhi-Wagner & R. Guazuma 1635* (ICN); **São Francisco de Paula**, -29.311034, -50.181229, 03 November 2011, *P. J. S. Silva Filho 1401* (ICN), -29.311034, -50.181229, 03 November 2011, *P. J. S. Silva Filho 1402* (ICN), -29.311034, -50.181229, 03 November 2011, *P. J. S. Silva Filho 1403* (ICN), -29.30892, -50.192113, 03 November 2011, *P. J. S. Silva Filho 1397* (ICN), -29.30892, -50.192113, 03 November 2011, *P. J. S. Silva Filho 1398* (ICN), -29.30892, -50.192113, 03 November 2011, *P. J. S. Silva Filho 1399* (ICN), 27 April 1985, *J. R. Stehmann 623* (ICN), Boca da Serra, 24 May 1984, *N. Silveira, R. Frosi & N. Model 1295* (HAS), Colinas de São Francisco, 01 September 2007, *H. M. Longhi-Wagner 10319* (ICN), Colinas de São Francisco, 01 September 2007, *H. M. Longhi-Wagner 10320* (ICN), CPCN Pró-Mata, July 2001, *L. Eggers s. n.* (MPUC 11296), CPCN Pró-Mata, April 2005, *P. M. A. Ferreira s. n.* (MPUC 11296), Fazenda 3 Cachoeiras, Passo do Inferno, 09 November 2000, *V. Caetano 297* (HAS), FLONA, 31 October 1997, *N. Bittencourt et al. s. n.* (PACA 96888), RS 235, 20 April 2001, *R. Wasum 1079* (HUCS); **São José dos Ausentes**, 3 km após Posto Policial, 04 October 2006, *A. C. Araujo, H. M. Longhi-Wagner & R. Guazuma 1620* (ICN), Morro Negro, 12 December 1996, *A. C. Araujo 421* (ICN), Pico do Monte Negro. -28.617264, -49.79903, 04 March 2012, *P. J. S. Silva Filho et al. 1884* (ICN); Silveira, September 2002, *L. S. Pontes s. n.* (ICN 124871), Silveira, 31 December 2006, *R. Trevisan et al. 811* (ICN). SANTA CATARINA: **Alfredo Wagner**, Lomba Alta, 27° 43' 20.00" S, 49° 24' 33.00" W, 21 April 2009, *S. Devreck & F. E. Carneiro 831* (ICN); **Bela Vista do Toldo**, 26° 16' 42.00" S 50° 29' 42.00" W, 19 October 2010, *M. Verdi, E. M. Martins & O. N. Veiga 5444* (FLOR); **Caçador**, 22 December 1956, *B. Smith & Reitz 9080* (HBR); **Itaiópolis**, Moema, 26° 32' 58.00" S, 49° 46' 10.00" W, 18 October 2010, *M. Verdi, E. M. Martins & O. N. Veiga 5422* (FLOR); **Orleans**, Rio Hipólito, 28° 15' 37.00" S, 49° 29' 58.00" W, 22 May 2009, *M. Verdi & A. L. Gasper 2193* (ICN); **Otacílio Costa**, 603547S, 6943294W, 06

May 2008, *M. Verdi & F. E. Carneiro 661* (MBM); **Porto União**, 22 April 1962, *Reitz & Klein 12778* (MBM); **Santa Cecília**, Timbó Grande, 28 July 1978, *R. M. Klein, O. S. Lima & J. M. Campos 12199* (HBR); **São Domingos**, Parque Estadual das Araucárias, 26° 27' 55.00" S, 52° 33' 51.00" W, 20 April 2009, *A. Stival-Santos & S. Silveira 761* (ICN); **São Francisco do Sul**, Morro do Iquererim, 05 September 1957, *Reitz & Klein 4762* (HBR); **São José**, Serra da Boa Vista, 13 April 1961, *Reitz & Klein 10994* (HBR); **Três Barras**, 26° 14' 50.1" S, 50° 13' 44.0" W, 08 October 2008, *A. L. Gasper & E. Brogni 1890* (ICN), Área do Exército, lat. 26° 14' 50.00" S, 50° 13' 44.0" W, 08 October 2008, *A. L. Gasper & E. Brogni 1890* (ICN), BR 280, 26° 10.285' S, 50° 16.035' W, 21 October 2005, *R. Trevisan 413* (ICN); **Urubici**, Santa Terezinha, 28° 00' 47.00" S, 49° 29' 31.00" W, 07 April 2009, *M. Verdi, R. P. Hasckel & G. Klemz 1957* (ICN). SÃO PAULO: **Campos do Jordão**, Santa Cruz, 27 October 1992, *A. Jasper et al. s. n.* (HAS 8708).

Rhynchospora glaziovii Boeckeler is a tall herb, reaching almost two meters, forming dense clumps, and found in large populations in Araucaria Forest, and even in subdossel of *Pinus* sp. monoculture in the same region. Although *Rhynchospora glaziovii* have been considered by several authors as a distinct species from *R. floribunda* (Boeckeler 1873, 1874, Barros 1960, Zuloaga 2008, Alves et al. 2013), here we synonymize them because they have a very similar protologue, with very subtle differences. What differentiates *R. glaziovii* from *R. floribunda*, according the *opera principia*, Barros (1960) and Guaglianone (1981), is that *R. glaziovii* is smaller, have less copious, narrower and condensed synflorescences, with 4–5 partial synflorescences, of 2–3 cm wide and lateral axis of 1–2 cm in length. These differences were observed along the gradient of variation of *R. glaziovii*, both on the field and in the extensive material examined. Only the types of *R. glaziovii* was observed, whereas *R. floribunda* was not found.

All we known about the type of *R. floribunda* is that it is a collection of G. Niederlein in the province of Misiones, Argentina, and was exhaustively searched by Guaglianone (1981), and also not found. In this work we contacted the herbaria B, NY, E, PH, and SI, which have most of the collections of G. Niederlein, and none of them have this material.

***Rhynchospora conferta* (Nees) Boeckeler (1873:615).** *Psilocarya conferta* Nees (1842:116). Type:—BRAZIL: Goiás: *in serra dos Cristaes et in montibus Claris*, Pohl 73 and 1179 (syntypes: W†); *in Brasilia meridionali*, Sellow (syntype: B†). Neotype (here designated):—BRAZIL: Rio Grande do Sul: **Quaraí**, Cerro do Jarau, 30°12'2.06"S, 56°30'38.13"W, 17 December 2011, *P. J. S. Silva Filho 1880* (ICN!; isoneotypes: K!, MO!, SI!).

Perennial plants, caespitose-rhizomatous. Rhizomes 2–7 mm diameter, ligneous and short, covered by chartaceous cataphylls and old sheaths. Culms 62–102 × 0.08–0.25 cm, trigonous, often arching, glabrous and sometimes with a longitudinal groove. Leaves 24–59 × (0.17–) 0.3–0.5 cm, flattened, glabrous to pilose; sheath 1.5–8 cm long. Synflorescence formed by a terminal antelodium or corymbodium and 1–3 axillary antelodia or corimbodia, all subcontracted to loose and composed of partial antelodia or corymbodia, and these by fascicles of spikelets; axes above second order, glabrous to pilose at the angles; apical antelodium or corymbodium with 2–8 × 3–7 cm and the axillary with 1.5–4 × 1.5–4 cm. Spikelets 7.5–9 mm long, ovoid to cylindrical. Glumes ovate to lanceolate, brown, membranaceous, with conspicuous and whitish hyaline margin, apex acute to acuminate, mucronate, mucron glabrous or hirsute, the four lower glumes are sterile, the following hermaphrodites, and more than five flowers develop achene. Stylus bifid. Stamens 3, anthers yellowish 1.7–3 mm long. Achene 1.5–1.8 × 1.6–1.9 mm, lenticular, orbicular, apex obtuse, stramineous to dark-brown when mature, surface transversely rugose; bristles absent. Stylopodium 0.8–1.2 mm long, triangular, bilobed at the base, greyish to brownish.

Distribution and habitat:—Brazil. In the states of Goiás, Paraná, Rio Grande do Sul and Santa Catarina (Kükenthal 1950). Found in wetlands and fens of Cerrado, Atlantic Rainforest and Pampa.

Material examined:—BRAZIL. PARANÁ: **Piraquara**, Maria Antonieta, 13 December 1971, *G. Hatschbach 28481* (MBM); **São José dos Pinhais**, Rincão, 22 January 1950, *G. Hatschbach 1781* (MBM). RIO GRANDE DO SUL: **Alegrete**, beira da BR 290, cerca de 21 km após trevo de Alegrete, em direção à Rosário do Sul, 12 February 1990, *D. B. Falkenberg 5252* (FLOR); **Lagoa Vermelha**, January 1943, *E. Friderichs s. n.* (PACA 10876); **Quaraí**, Cerro do Jarau, 30° 12' 02.06" S, 56° 30' 38.13" W, 17 December 2011, *P. J. S. Silva Filho 1880* (ICN); **Santana do Livramento**, Assentamento Recanto, 30° 41' 49.0" S, 55° 20' 29.1" W, 14 November

2005, *R. Trevisan 504* (ICN); **no municipality defined**, Cerro Largo para São Luiz, 20 November 1952, *B. Rambo 53066* (PACA), **no municipality defined**, Cerro Largo para São Luiz, 20 December 1952, *B. Rambo 53065* (PACA). SANTA CATARINA: **Lages**, Morro do Pinheiro Seco, 15 January 1957, *L. B. Smith & Reitz 10013* (HAS).

Rhynchospora conferta has been considered as a synonym of *R. robusta* in Lista de Espécies da Flora do Brasil (Alves et al. 2013) and Zuloaga (2008). However, when trying to identify a specimen collected and subsequently analyzing the specimens identified as *R. robusta* in herbaria, it was noted that there was a significantly different morphotype from that described in the *opus princeps*. When reviewing the monograph of Kükenthal (1950), and subsequently the *opera principia* of the two species (Kunth 1837, Nees 1842), it was found that the species are quite different, with clear characteristics that separate them, as rhizome reduced, thin and flexible stems, narrower leaves, sheaths stramineous and opaque, smaller spikelets and stylopodium. Perhaps the confusion is due to the fact that many specimens identified by other experts are immature, which complicates the correct identification of these two species. When young, the spikelets are very similar, however, there are vegetative characteristics that separate them clearly. The herbaria B, W, WU were contacted, but none of them have any type specimens, what we know is that the Pohl types were in the *Herbarium Caesareum Vindobonense*, and probably were sent to W herbarium and lost during the WORLD WAR II.

***Rhynchospora robusta* (Kunth) Boeckeler (1873:616).** *Dichromena robusta* Kunth (1837:283). Type:—BRAZIL: *Sellow* (holotype: B†; lectotype (here designated): K (K000632434 photo!); isotype: GH (GH00027977, fragment, photo!)). *Rhynchospora semihirsuta* Boeckeler (1873:614) *sin.nov.* Type:—BRASIL: *Sellow* (holotype B†, F (F0BN011153, photo! from B† holotype); lectotype (here designated): K (K000632429 photo!)).

Perennial plants, caespitose-rhizomatous. Rhizomes 5–12 mm diameter, ligneous and short, covered by coriaceous cataphylls and aged sheaths. Culms 55–108 × 0.15–0.6 cm, trigonous, erect, glabrous and sometimes with a longitudinal groove. Leaves 42–58 × 0.5–0.7 cm, flattened, glabrous to pilose; sheath 3–13 cm long. Synflorescence formed

by a terminal antelodium or corymbodium and sometimes presenting an reduced axillary corimbodia, all contracted composed of partial corymbodia, and these by fascicles of spikelets; axes above second order, generally pilose at the angles; apical antelodium or corymbodium with $4-7 \times 4.5-7.5$ cm and the axillary with $1.5-2.5 \times 1.5-4$ cm. Spikelets 9–12 mm long, ovoid to cylindrical. Glumes ovate to lanceoloid, stramineous to brown, membranaceous, with an hyaline margin, apex obtuse to acute, mucronate, mucron hirsute, the four lower glumes are sterile, the following hermaphrodites, and more than five flowers develop achene. Stylus bifid. Stamens 3, anthers yellowish 3–4 mm long. Achene $1.3-1.5 \times 1.5-2$ mm, lenticular, orbicular, apex obtuse, stramineous to dark-brown when mature, surface transversely rugose; bristles absent. Stylopodium 2.6–3.5 mm long, triangular, bilobed at the base, decurrent on the achene, greyish to brownish.

Distribution and habitat:—From México and West Indies to Argentina and extreme south of Brazil (Kükenthal 1950, Thomas 1992, Tropicos.org 2013). In Brazil, in the states of Mato Grosso do Sul, Paraná, Rio de Janeiro, Rio Grande do Sul, Roraima and Santa Catarina. Found in wetlands and fens of Cerrado, Atlantic Rainforest and Pampa.

Examined material:—BRAZIL. MATO GROSSO DO SUL: **Mundo Novo**, Rio Paraná, Porto Frangeli, 29 September 2008, *J. M. Silva et al.* 7005 (MBM). PARANÁ: **Balsa Nova**, Ponte dos Arcos, 13 October 2005, *C. Kozera & A. Sanches* 2420 (ICN); **Campina Grande do Sul**, estrada Rio Taquari ao Rio Divisa, 13 November 1960, *G. Hatschbach* 7475 (MBM); **Colombo**, Rio Palmital, 01 November 1973, *G. Hatschbach* 32996 (MBM); **Contenda**, 04 November 1966, *G. Hatschbach* 15243 (MBM); **Curitiba**, Capão da Imbuia, 05 November 1976, *L. T. Dombrowski* 6669 (MBM), Jardim Natalia, 30 November 1973, *G. Hatschbach* 33446 (MBM), Pinhais, 18 September 1966, *G. Hatschbach* 14731 (MBM); **Marmeleiro**, estrada para Campo Erê, 03 March 1970, *G. Hatschbach* 22666 (MBM); **Piraquera**, estrada para Roça Nova, October 1964, *Y. Saito & M. L. Camargo* 289 (MBM); **São José dos Pinhais**, Rio Pequeno, 05 November 1969, *G. Hatschbach* 22821 (MBM). RIO DE JANEIRO: **Rio de Janeiro**, próximo ao Recreio dos Bandeirantes, 16 December 1964, *W. Hoehne* 5794 (ICN). RIO GRANDE DO SUL: **Capão do Leão**, Horto Botânico Pelotas, 29 October 1955, *E. Vianna s. n.* (ICN 1205); **Júlio de Castilhos**, 29° 22' 23.7" S, 53° 40' 16.0" W, 03 October 2007, *R. Trevisan* 848 (ICN); **no municipality defined**, Portão para São Leopoldo, 25 October 1937, *B. Rambo* 2860 (PACA).SANTA

CATARINA:**Campo Erê**, Fazenda Campo São Vicente, 26–28 December 1956, *L. B. Smith, R. Reitz & L. Caldoto* 9509 (HBR);**Curitibanos**, Ponte Alta do Norte, 24 October 1962, *Reitz & Klein* 13379 (FLOR); **Campo Alegre**, Farm of Ernesto Scheide, 09 November 1956, *L. B. Smith & Klein* 7466 (HBR).

Differentiated by being robust plants with coriaceous, brown and glossy cataphylls and basal leaf sheaths, leaves in most cases surpassing the sinflorescence culm, culm always ligneous, stylopodium greater than the achene and with lobes decurrent and reaching more than half its length. *Rhynchospora semihirsuta* cited in Flora do Brasil (Alves *et al.* 2013), is in fact *R. robusta*. The type specimens of both were analyzed through photographs and compared with the *opera principia*. In the type of *R. semihirsuta*, we can observe typical characteristics of *R. robusta*, as an erect stem, basal sheaths brown, somewhat glossy, rigid, and with axillary sinflorescences reduced. What could separate the two species are the characteristics of the achene and stylopodium, however, in *R. semihirsuta opus princeps* there is no information on these structures, and there is no separate achene in the type. The indications suggest that the description was actually based on an individual of *R. robusta* with immature sinflorescences, which is supported by the fact that the only characteristic separating them consistently, is the size of the spikelets. The herbarium B was contacted, but they have none of the type specimens, they were probably lost during WORLD WAR II.

***Rhynchospora biflora* Boeckeler (1871:156).**Type:—BRAZIL: Rio de Janeiro: Serra des Orgues, sur le grand plateau, 11 December 1869, *A. Glaziou* 4289 (holotype B†; lectotype (here designated) P (P00264347 photo!); isolectotype P (P00264346 photo!)). *Rhynchospora uniflora* Boeckeler (1880:439) *sin. nov.* Type:—BRAZIL, Rio de Janeiro: Petrópolis, au sommet du Palatinato Superior, 21 January 1878, *A. Glaziou* 9336 (holotype B†; lectotype (here designated): P (P00585030 photo!); isolectotypes: F (F0BN011166 photo! from B), K (K000632446 photo!), P (P00585028, P00585029 photos!)).

Perennial plants, caespitose-rhizomatous. Rhizomes 1–3 mm diameter, ligneous and short, covered by chartaceous cataphylls. Culms 38–124 × 0.03–0.14 cm, trigonous, thin

and arching, glabrous or scabrous at the apex, sometimes with a longitudinal groove. Leaves 7–33 × 0.1–0.24 cm, flattened, glabrous or antrorsely scabrous at the margins of the apex; sheath 0.5–6 cm long. Synflorescence formed by a terminal spike and 3–5 axillary spikes, and the last axillary spike reaches or exceeds the terminal, all contracted and formed by fascicles of spikelets, with few spikelets; axes above second order, generally antrorse-scabrous at the angles; apical spikes with 0.9–1.5 × 0.6–1 cm and the axillary with 0.6–1.1 × 0.4–0.9 cm. Spikelets 4–7 mm long, lanceoloid. Glumes lanceolate, stramineous to brown, membranaceous, apex acute, shortly mucronate, mucron glabrous, the three lower glumes are sterile, the following hermaphrodites, and only the first flower develop achene. Stylus bifid. Stamens 3, anthers yellowish 2 mm long. Achene 1.4–2.2 × 1.2–1.6 mm, biconvex, obovate to cylindrical, apex obtuse, stramineous to light brown when mature, surface transversely rugose; bristles absent. Stylopodium 0.8–1.5 mm long, subulate, greyish, brownish or blackish.

Distribution and habitat: Venezuela and Brasil (Kükenthal 1949, Tropicos.org 2013). In Brasil, in the states of Bahia, Espírito Santo, Mato Grosso do Sul, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina and São Paulo. Found in the herbaceous layer of the Amazon, Cerrado and Mata Atlântica, common in the Araucaria Forest and Brazilian Cloud Forests.

Examined material:—BRAZIL. BAHIA: **Abaíra**, Catolés de Cima, na trilha para a Serra do Barbado, 16 October 2012, *R. M. Harley et al.* 53425 (ICN). RIO GRANDE DO SUL: **Cambará do Sul**, Cânion Fortaleza, -29.066054, -29.066054, 03 November 2011, *P. J. S. Silva Filho* 1404 (ICN), Cânion Fortaleza, -28.617264,-49.79903, 04 March 2012, *P. J. S. Silva Filho* 1872 (ICN), Faxinal, December 1983, *M. Sobral & J. R. Stehmann* 2640 (ICN), Faxinal, December 1983, *M. Sobral & J. R. Stehmann* 2672 (ICN), Itaimbezinho, 20 February 1953, *B. Rambo* 54023 (PACA), Itaimbezinho, 28 April 1985, *J. R. Stehmann* 612 (ICN); **São Francisco de Paula**, Banhado Amarelo, 16 December 2005, *C. Scherer s. n.* (ICN 141956), Josafá, April 1984, *M. Sobral* 2966 (FLOR), Pró-mata, -29.475499,-50.166111, 04 March 2012, *P. J. S. Silva Filho* 1873 (ICN), Pró-mata, 04 March 2012, *P. J. S. Silva Filho* 1874 (ICN), caminho para o Pró-mata. -29.450767, -50.23609, March 2012, *P. J. S. Silva Filho* 1875 (ICN), Pró-mata. -29.475499,-50.166111, 04 March 2012, *P. J. S. Silva Filho* 1876 (ICN), aminho para o Pró-mata. -29.450767, -50.23609, 04 March 2012, *P. J. S. Silva Filho* 1877 (ICN), caminho para o Pró-mata. -29.450767, -50.23609, 04 March 2012, *P. J. S. Silva Filho* 1878 (ICN); **São José dos Ausentes**, Pico do Monte Negro, 28° 37'

06.2" S, 49° 47' 59.6" W, 15 January 2009, *H. M. Longhi-Wagner & G. H. Silveira 10712* (ICN), Pico do Monte Negro. -28.617264,-49.79903, 07 March 2012, *P. J. S. Silva Filho 1870* (ICN), Pico do Monte Negro. -28.617264,-49.79903, 07 March 2012, *P. J. S. Silva Filho 1871* (ICN), Serra da Rocinha, 14 February 1947, *B. Rambo 35200* (PACA), Serra da Rocinha, 15 January 1942, *B. Rambo 8743* (PACA); **no municipality defined**, Itaimbezinho para São Francisco de Paula, 12 February 1956, *B. Rambo 58556* (PACA). SANTA CATARINA: **Bom Jardim da Serra**, Desfiladeiro do Funil, February 1989, *M. Sobral et al. 6455* (ICN); **Cunha**, Reserva Florestal, 12 February 1981, *C. F. S. Muniz et al. 243* (ICN); **Ilhota**, Parque Botânico Morro do Baú, 31 October 1987, *D. B. Falkenberg 4523* (FLOR); **São Francisco do Sul**, Morro do Campo Alegre, 03 September 1960, *R. Reitz & R. M. Klein 9778* (FLOR); **São José**, Serra da Boa Vista, 11 August 1960, *Reitz & Klein 9701* (MBM); **Urubici**, Serra do Rio

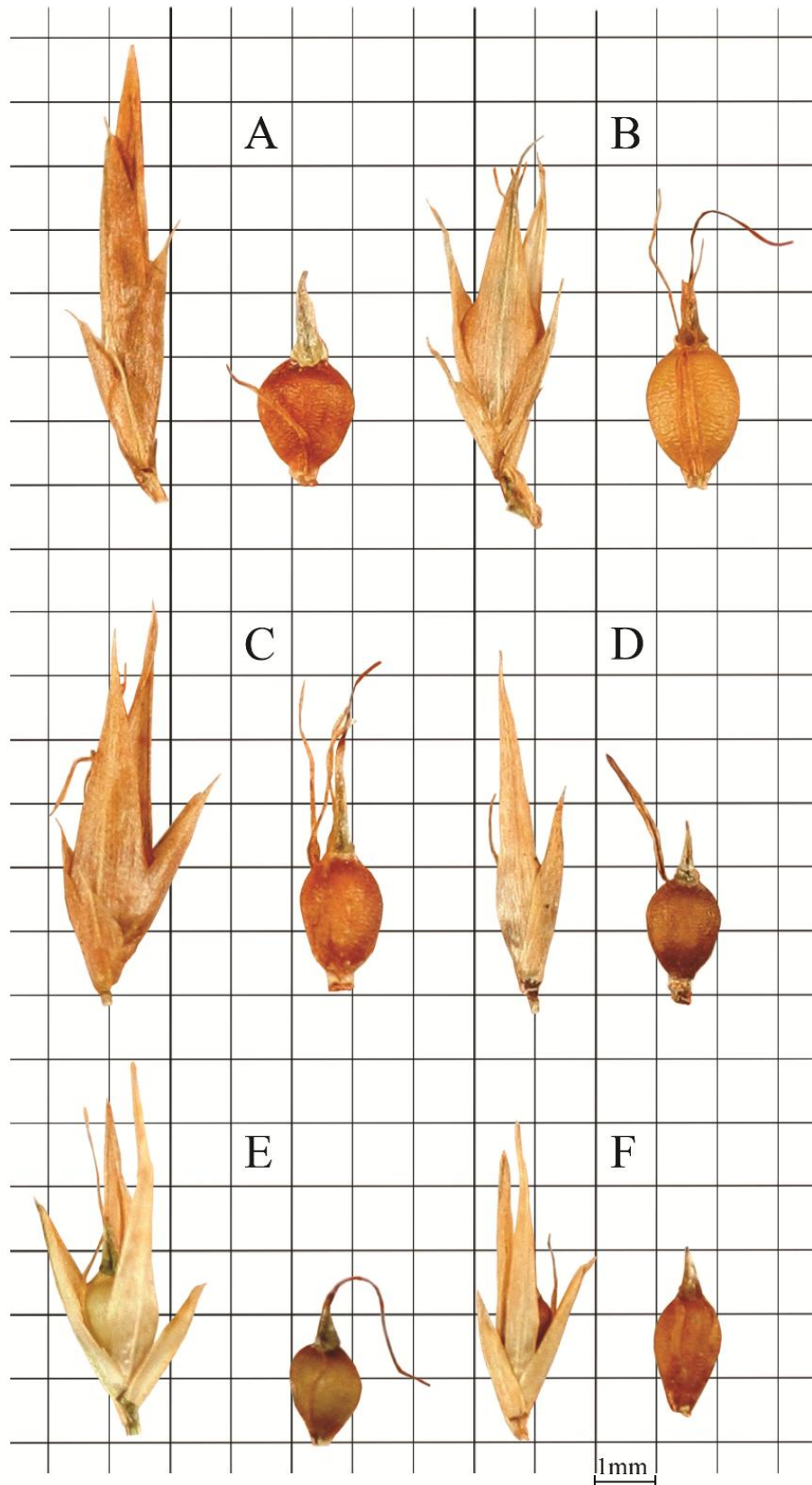


Figure 2. *Rhynchospora biflora* spikelets and achene variations. (A, Reitz & Klein 9701; B, Silva Filho 1876; C, Sobral 2966; D, Falkenberg 4523; E, Silva Filho 1871; F, Reitz 5182).

dos Bugres, 20 January 2003, *H. Longhi-Wagner 8721* (ICN); **no municipality defined**, Cambajuva (Bom Jardim da Serra) para São Joaquim, 29 January 1950, *R. Reitz 5182* (PACA).

Rhynchospora uniflora is considered in this paper as a synonym of *R. biflora*, since the characteristics that separate them (Kükenthal 1949, Barros 1960), as length of spikelets, glumes color, base of stylopodium width and the dimensions of the achene are very variable, having no strong correlations (Fig. 2). In the field, we also observed variations within populations. Types were observed through images and the *opera principia* of both names were analyzed. According to the revised material, the differences that appear to separate them are in fact the extremes of variation of a single species, which is *R. biflora*, the oldest name. The lectotypifications were made from isotypes, since the types of Berlin were lost.

ACKNOWLEDGEMENTS

We would like to thank all herbaria who borrowed us exsicatae, mainly the Herbarium ICN and its employees, Camila Carneiro, Márcia Pinheiros and Mateus Negreiros, who have received all the material from other herbaria. Gratitude is also extended to Manuel Garcia de la Peña, that has photographed some exsicatae from MVM herbarium and have sent to us. Finally, we would like to thank CAPES and CNPq ("Coordenação de Aperfeiçoamento de Pessoal de Nível Superior" and "Conselho Nacional de Desenvolvimento Científico e Tecnológico") for funding part of this study.

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APPENDIX

Additional material studied:

Rhynchospora crinigera:—BRAZIL. PARANÁ: **Guarapuava**, estrada de terra próxima à Polícia Rodoviária Federal, 27 September 2012, *E. L. Siqueira & D. S. Gonçalves 605* (FLOR); **São José dos Pinhais**, Rio Pequeno, 05 November 1969, *G. Hatschbach 22849* (MBM); **Tijucas do Sul**, 15 October 1961, *G. H. Hatschbach 8510* (MBM). RIO GRANDE DO SUL: **Bom Jesus**, 28°40'16"S 50°34'32"W, 13 November 2004, *I. Boldrini et al. 1396* (ICN); **Cambará do Sul**, Itaimbezinho, 13 December 1972, *J. C. Lindeman s.n.* (ICN 20864); **Cristal**, BR 116, 27 November 2003, *I. Boldrini 1218* (ICN); **Encruzilhada do Sul**, BR 471, 26 November 2003, *I. Boldrini 1213* (ICN), RS 471, 30°46'0.48"S 52°35'09.0"W, 26 November 2003, *I. Boldrini et al. 1213* (ICN); **Piratini**, Fazenda Santa Fé, 19 December 2005, *A. Guglieri et al. 779* (ICN); **São Francisco de Paula**, CPCN Pró-Mata, 04 November 2002, *F. Caporal s. n.* (MPUC 11289), estrada para Tainhas, 29°24'29,4"S 50°27'29,3"W, 28 November 2008, *R. Trevisan 1029* (ICN), RS 020, 29°24'29,0"S 50°27'29,9"W, 24 November 2006, *R. Trevisan et al. 725* (ICN); **São José dos Ausentes**, estrada para Bom Jesus, 28°44'35,5"S 50°05'55,3"W, 20 November 2007, *R. Trevisan 879* (ICN), Serra da Rocinha, campo na margem do planalto, 04 December 1971, *J. C. et al. s.n.* (ICN 9398), Serra da Rocinha, 2 km após posto policial, 11 December 1996, *A. C. Araujo 410a* (ICN); **São Lourenço do Sul**, BR 116, km 167, entre o Arroio Isabel e Rio Camaquã, 02 December 1979, *T. M. Pedersen 12607* (MBM); **Vacaria**, Parque das Cachoeiras, 28°39'47,0"S 50°54'48,3"W, 17 November 2012, *C. Vogel-Ely & G. E. Ferreira 12* (ICN); **no municipality defined**, Cambará do Sul para São Francisco de

Paula, February 1948, *B. Rambo 36667* (PACA); **no municipality defined**, Canguçu para Encruzilhada do Sul, 31°00'0,45"S, 52°41'23,3"W, 09 October 2008, *H. Longhi-Wagner & G. Silveira 10597* (ICN). SANTA CATARINA: **Água Doce**, 6 km ao sul de Horizonte (Paraná), ca. 26°38' S, 51°37' W, 04 December 1964, *L. B. Smith & R. M. Klein 13507* (HBR), 20 km a oeste de Horizonte (Paraná), 05 December 1964 *R. M. Klein 13654* (HBR); **Caçador**, Fazenda Esperança, 15 km a nordeste da cidade, 21 December 1956, *L. B. Smith & R. Reitz 8978* (HBR); **São Joaquim**, 30 January 2003, *H. Longhi-Wagner 8774a* (ICN); **Urubici**, Campo dos Padres, Fazenda do Sr. Arno Philippe, campo entre a casa da Fazenda e o Morro Boa Vista, 05 December 2006, *A. Zanin et al. 1227* (ICN), Morro da Igreja, 28°07'39,3"S 49°28'54,6"S, 13 December 2007, *R. Trevisan 945* (ICN); **no municipality defined**, Bom Jardim da Serra para São Joaquim, Serra do Oratório, 09 December 1958, *Reitz & Klein 7680* (HBR). URUGUAY. SAN JOSÉ: Barra de Santa Lucia, 19 December 1918, *C. Osten 14679* (MVM photo), 29 November 1929, *C. Osten 21773* (MVM photo), 10 January 1930, *C. Osten 21773b* (MVM photo), 16 January 1932, *C. Osten 21773c* (MVM photo).

R. megapotamica:—ARGENTINA, CHACO: **Colonia Benites**, October 1932, *A. G. Schulz 650* (CTES); CORRIENTES: **Monte Caseros**, Campo Gral. Avalos, Paso de la Barca, sobre el Río Miriñay, 11 September 1979, *A. Schinini et al.* (ICN 48669). JUJUY: **Zapla**, 09 November 1974, *A. Burkart 30400* (CTES). MISSIONES: **Iguazú**, Arroyo Aguaray, a pocos km de desembocadura en Rio Paraná, 11 September 2002, *H. Keller 1956* (ICN). SANTA FÉ: **Reconquista**, EEA Reconquista, 20 September 1985, *G. Blanchoud 2151* (CTES). BRAZIL: RIO GRANDE DO SUL: **Aceguá**, BR 473, 31°38'10,4"S 54°08'57,9"W, 22 November 2003, *R. Trevisan et al. 208* (ICN); **Alegrete**, Salso, 05 October 1960, *C. W. Fischer 20* (HAS); **Bagé**, BR 153, 31° 29' 0.2" S, 54° 08' 1.6" W, 18 November 2006, *A. C. Araujo & I. Boldrini 1653* (ICN), BR 153, ca. 40 km S de Bagé, 10 November 1976, *T. M. Pedersen 11433* (CTES), Faculdade de Agronomia (FUNBA), 30 September 1982, *J. Mattos 25662* (HAS); **Capão do Leão**, BR 116, km 550, 31°51'42,8"S 52°36'03,1"W, 31 October 2006, *R. Trevisan et al. 684* (ICN); 30°21'43.63"S 53°20'23.63"W, 15 December 2011, *Silva Filho P. J. S. 1462* (ICN); **Cachoeira do Sul**, 25 September 1983, *D. B. Falkenberg 788* (ICN); **Canoas**, 06 November 1943, *Augusto 203* (MPUC); **Caxias do Sul**, distrito de Santa Justina, 07 September 2004, *F. Marchett 34* (HUCS); **Farroupilha**, 10 October 1957, *Camargo 1905* (PACA), 25 October 1958, *Camargo s.n.* (PACA 63681) **Guaíba**, Fazenda São

Maximiniano, BR 116, km 307, 08 November 2005, *R. Trevisan 444* (ICN); **Jaquirana**, ponte sobre o Rio Tainhas em direção à Caxias do Sul, 06 October 2006, *A. C. Araujo et al. 1639* (ICN); **Lavras do Sul**, 17 October 1971, *J. C. Lindeman & B. E. Irgang* (ICN 8701); **Pantano Grande**, 30°13'44.75"S 52°21'46.08"W, 20 December 2011, *P. J. S. Silva Filho 1463* (ICN); **Pedro Osório**, BR 116, km 565, 31°55'47,9"S 52°44'05,3"W, 31 October 2006, *R. Trevisan et al. 686* (ICN); **Pinheiro Machado**, Coxilha Pedras Altas, 11 November 2976, *T. M. Pedersen 11438* (CTES); **Piratini**, gruta Iemanjá, próximo de arroio com ponte, S 31°26'58.9", W 053°07'24.2", 16 November 2003, *S. M. Hefler et al. 166* (ICN); **Porto Alegre**, 25 October 1945, *B. Rambo 29039* (PACA), Morro da Polícia, 01 October 1996, *H. Longhi-Wagner 3371* (ICN), Morro São Pedro, 27 September 2008, *R. Setubal & M. Grings 653* (ICN), Morro das Abertas, 14 October 1979, *J. Mariath 742* (HAS); **Quaraí**, Fazenda Cantagalo, 29 October 2008, *R. Setubal & I. Boldrini 720* (ICN), 30 25.140 S, 56 22.704 W, 02 November 2010, *P. J. Silva Filho & M. Grings 1038* (ICN); **Rio Pardo**, à 6 km do Rio Irapuá, 11 November 1980, *J. Mattos 21852* (HAS); **Santa Vitória do Palmar**, BR 471, 26 November 2004, *I. Boldrini 1290* (ICN), 32°54'42.40"S 52°44'14.70"W, 07 November 2012, *P. J. S. Silva Filho 1811* (ICN); **Santana do Livramento**, BR 293, km 384, sentido Quaraí, entrada da Fazenda Sta. Gertrudes, 30°42'26.2"S, 055°49'03,1"W, 18 November 2003, *S. M. Hefler et al. 200* (ICN), Cerro Palomas, 15 October 1971, *J. C. Lindeman et al. s.n.* (ICN 8538); **São Marcos**, no km 138 da rodovia Porto Alegre para Vacaria, 13 November 1978, *J. Mattos 20343* (HAS); **São Sepé**, 26 September 1983, *D. B. Falkenberg 839* (ICN), cerca de 1 km do trevo para Caçapava do Sul, na rodovia Porto Alegre para Uruguaiana, 1 September 1986, *J. Mattos & N. Mattos 29871* (HAS); **Uruguaiana**, 30 03.384S, 56 11.418W, 01 November 2010, *P. J. S. Silva Filho & M. Grings 1838* (ICN); **Viamão**, Parque Estadual de Itapuã, Morro do Araçá 30°21'10,0"S 51°02'16,1"W, 22 December 2005, *R. Trevisan 572* (ICN); **no municipality defined**, Caibaté para São Luiz Gonzaga, 24 November 1952, *B. Rambo 53439* (PACA); **no municipality defined**, Amaral Ferrador para Encruzilhada do Sul, September 1985, *M. Sobral et al. 4181* (ICN); **no municipality defined**, Canguçu para Encruzilhada do Sul, 31°00'0,45" S, 52°41'23,3" W, 09 October 2008, *H. Longhi-Wagner & G. H. Silveira 10598* (ICN); **no municipality defined**, entre Bagé e Caçapava do Sul, 02 April 1985, *J. Mattos, N. Mattos & N. Silveira 28880*; **no municipality defined**, entre Santa Maria e São Sepé, 3 October 1971, *J. C. Lindeman et al. s.n.* (ICN 8273); **no municipality defined**, Granja Neugebauer para Itapoan, 27 September 1950, *B. Rambo 48856*

(PACA); **no municipality defined**, perto de Bagé, 02 April 1985, *J. Mattos, N. Mattos & N. Silveira 28904* (HAS). SANTA CATARINA: **Marcelino Ramos**, Rio Uruguai, Estreito, 16 September 1994, *G. Hatschbach & J. M. Silva 61069* (FLOR); **São Joaquim**, July 1963, *J. Mattos 11187* (HAS). URUGUAY: FLORIDA: Estancia Rincón de Santa Elena, Estancia A. Gallinal, 13 November 1948, *R. Gallinal 6017* (CTES); ITAPÚA: Arroio San Rafael, Rutal, 15 km SE de General Delgado, 16 November 1978, *M. M. Arbo et al. 2008* (CTES).

Considerações finais

Durante as seis expedições de coleta foram coletados cerca de 100 espécimes do gênero *Rhynchospora*. Onze das quatorze espécies trabalhadas foram observadas em campo e tiveram material coletado e incorporado no Herbário ICN.

Tanto a delimitação das seções como de espécies, não só das estudadas neste trabalho, ainda merecem estudos mais aprofundados, com enfoque não só morfológico, mas sim com base genética e anatômica. Essas abordagens ainda são muito escassas na família Cyperaceae quando comparados com a sua ampla riqueza, e vêm se mostrando muito informativas para a classificação de grupos.