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Original Paper

Cyperaceae in Serra dos Martírios-Andorinhas, Pará, Brazil

Karina de Nazaré Lima Alves[1,2,4,7], *Layla Jamylle Costa Schneider*[1,2,5], *Kauê Nicolas Lindoso Dias*[1,3] & *André dos Santos Bragança Gil*[1,6]

Abstract

This study focuses on the Cyperaceae occurring in the Serra dos Martírios-Andorinhas (Serra dos Martírios-Andorinhas State Park, and São Geraldo do Araguaia Environmental Protection Area), in the São Geraldo do Araguaia municipality, state of Pará, Brazil. The Serra is in the "Deforestation Arc", an environmentally vulnerable area with the highest deforestation rates in the Amazon Forest. The predominant phytophysiognomy is the Amazonian savanna, characterized by open environments dominated by herbaceous plants, such as Cyperaceae, represented by only four species in a previous floristic inventory. Studying the diversity of Cyperaceae allows us to a better understanding of the herbaceous layer's dynamics and assisting in the conservation, monitoring, and management of these fascinating and peculiar environments. Therefore, 276 field and herbarium samples of Cyperaceae from Serra dos Martírios-Andorinhas were examined. Now, Cyperaceae are represented by 12 genera and 72 species in the study area, of which seven represent new records for the State of Pará. A taxonomic identification key, short descriptions with main diagnostic characters, geographic distribution, habitat data, and illustrations for all species and genera are provided.
Key words: Amazon Forest, Cerrado, Cyperoideae, savannas, taxonomy.

Resumo

Este estudo trata das Cyperaceae ocorrentes na Serra dos Martírios-Andorinhas (Parque Estadual Serra dos Martírios Andorinhas e Área de Proteção Ambiental de São Geraldo do Araguaia), no município de São Geraldo do Araguaia, Pará, Brasil. A Serra está no "Arco do Desmatamento", uma área de elevada vulnerabilidade ambiental com os maiores índices de desmatamento da Amazônia. A fitofisionomia predominante é a de Savana Amazônica, caracterizada pelos ambientes abertos com o predomínio de herbáceas, como as Cyperaceae, representadas por apenas quatro espécies em inventário florístico prévio. Estudar a diversidade de Cyperaceae nos permite compreender melhor a dinâmica do estrato herbáceo, contribuindo para a conservação, monitoramento e manejo destes peculiares e fascinantes ambientes. Para tanto, foram analisadas 276 amostras de Cyperaceae da Serra das Andorinhas provenientes de coletas de campo e de acervos de herbários. Atualmente, Cyperaceae é representada por 12 gêneros e 72 espécies na área de estudos, das quais, sete são novos registros para o estado do Pará. São apresentadas chave de identificação, descrições sucintas com caracteres diagnósticos, distribuição geográfica, hábitat, ilustrações de espécies e gêneros.
Palavras-chave: Amazônia, Cerrado, Cyperoideae, savanas, taxonomia.

[1] Museu Paraense Emilio Goeldi - MPEG, Campus de Pesquisa, Coordenação de Botânica - COBOT, Terra Firme, Belém, PA, Brasil.

[2] Universidade Federal Rural da Amazônia - UFRA/MPEG, Prog. Pós-graduação em Ciências Biológicas - Botânica Tropical, Terra Firme, Belém, PA, Brasil.

[3] Museu Paraense Emilio Goeldi - MPEG, Prog. Pós-graduação em Biodiversidade e Evolução (MPEG), Belém, PA, Brasil. ORCID: <https://orcid.org/0000-0002-0321-4026>.

[4] ORCID: https://orcid.org/0000-0002-1360-735X

[5] ORCID: https://orcid.org/0000-0002-0373-454X

[6] ORCID: https://orcid.org/0000-0002-0833-9856

[7] Author for correspondence: karinalvesnl@gmail.com

Introduction

The Serra dos Martírios-Andorinhas (SMA) is located in a transitional area between the Amazon Forest and Cerrado phytogeographic domains. However, it belongs to the Amazon Forest domain (Amaral *et al.* 2008) and is located in the southeastern part of the state of Pará, Brazil, in the municipality of São Geraldo do Araguaia. It is included in the so-called "Deforestation Arc", a highly vulnerable area with the highest deforestation rates in the Brazilian Amazon. Illegal fires and land occupation for agriculture cause this deforestation (Silva 2009). Between 2001 and 2009, São Geraldo do Araguaia ranked second in Pará's deforestation ranking (Cabral & Gomes 2013). However, since 2010 the municipality has been part of the State's Green Municipalities program (*Programa Municípios Verdes do Governo do Estado do Pará*), resulting in the reduction of deforestation and the regularization of ruralist registries (Pará 2019).

The predominant phytophysiognomy in the SMA is the Amazonian savanna, locally called "cerrado", a term maintained by some authors in works in this area (Silva *et al*. 1974; Amaral *et al.* 2008). Amazonian savannas differ from the Cerrado domain by their moister soil and climate, with higher relative humidity and not well defined dry seasons (Pires & Prance 1985). These savannas are open environments, with sparse shrubs forming shrub islands, with a predominance of herbaceous plants, such as grasses and sedges (Huber 1987; Amaral *et al.* 2008). The diversity of genera and species occurring in these places allows us to understand the dynamics of the herbaceous layer in savanna environments (Magnusson *et al.* 2008), thus contributing to the monitoring and management of protected areas, further increasing the taxonomic knowledge in the Amazon.

Cyperaceae is the third-largest monocot family, with ca. 109 genera and 5.690 species, a cosmopolitan distribution and high representation in tropical regions of the globe, inhabiting almost all terrestrial and aquatic environments [Stevens (continuously updated); Gil & Bove 2004; Govaerts *et al.* 2019]. Its characteristic of flooded environments such as swamps, ponds, and river banks (Gil & Bove 2004; Simpson 2006; Ferreira & Eggers 2008), with essential species for the balance of these ecosystems, aiding in the control of eutrophication and water purification, a potential also explored in the creation of microhabitats by aquarists (Piedade *et al.* 2005).

Brazil has 33 genera and 688 species of Cyperaceae, of which one-third are endemic. The species occur in all Brazilian states and phytogeographic domains. The family is especially diverse in the Amazon Forest, where 296 species have been recorded, with approximately one-third of them inhabiting the savannas (Schneider *et al.* 2020).

In the state of Pará, although almost 200 species of Cyperaceae have been recorded (Flora do Brasil 2020, continuously updated), taxonomic studies focused on the family have only occurred recently. However, they have been productive, significantly increasing the taxonomic knowledge of Cyperaceae in the state. They also reinforce that a deeper understanding of Brazilian flora can only be reached with detailed local and regional taxonomic floristic studies. Recently, new records, nomenclatural novelties, new species, and detailed and illustrated local floras were published for the state of Pará (Maciel-Silva *et al.* 2018, 2019; Nunes *et al.* 2016a, b, 2017, 2019; Schneider *et al.* 2017, 2019; Schneider & Gil 2021; Braga-Silva *et al.* 2019; Maciel-Silva *et al.* 2022).

Amaral *et al.* (2008), in the only published floristic survey for the SMA, recorded 149 plant species present in different ecosystems, with only four belonging to Cyperaceae, in the genera *Bulbostylis* Kunth and *Cyperus* L. Thus, aiming to expand the taxonomic knowledge of Cyperaceae in the Amazon, this work aimed to carry out a taxonomic study of the sedges occurring in Serra dos Martírios-Andorinhas, presenting identification keys for the species, succinct descriptions with main diagnostic characteristics, geographic distribution data, habitat, and illustrations.

Material and Methods

The Serra dos Martírios-Andorinhas includes one of the first conservation units created in the state of Pará: 1) Serra dos Martírios-Andorinhas State Park (SMASP, an Integral Protection Unit, with ca. 250 km^2); and 2) São Geraldo do Araguaia Environmental Protection Area (EPA Araguaia, a conservation Unit for Sustainable Use, with ca. 297 km^2) (Pará 2006).

The SMASP and the EPA Araguaia are located in the municipality of São Geraldo do Araguaia, southeastern state of Pará, between the geographical coordinates 06º04' and 06º23'S, 48º23' and 48º35'W, forming the Serra dos Martírios-Andorinhas (Fig. 1). The climate is Aw5, according to the Köppen classification, where the

rainy season occurs from November to May, and the dry season from June to October, with an annual rainfall of 2,000 mm, an annual mean relative humidity of 78%, and temperature of 26.35 °C (Pará 2006).

The hydrography of the area consists of rivers, streams, and caves, of which the Araguaia and Sucupira rivers are the most important. The soil is formed mainly by neosols, with minerals and organic matter in its composition. These neosols present a sandy texture, which can be easily eroded if there is no vegetation cover (Pará 2006; MMA 2018). The SMASP has elevations of 102 to 594 m a.s.l. The EPA Araguaia has a topographical amplitude ranging from 250 to 300 m (MMA 2018).

The area has a transitional physiognomy between Cerrado and the Amazon Forest domains. For this reason, the classifications of Ribeiro & Walter (1998) were adopted for the Cerrado phytophysiognomies, including for savanna formations in this biome: *cerrado* s.str., *vereda*, *campo sujo*, *campo limpo*, riparian forest, and gallery forest (Fig. 2). The *cerrado* s.str. is characterized by spaced shrubs and subshrubs with twisted trunks, commonly associated with seasonal fires. The *vereda* is composed of herbaceous plants, shrubs, and *buriti* palms (*Mauritia flexuosa* L.f.) near watercourses formed by groundwater outflow. In the study area, *veredas* were commonly found at the bottom of valleys in flooded areas. The *campo sujo* vegetation is formed by herbaceous-shrubby vegetation, with sparse shrubs and subshrubs. The *campo limpo* vegetation has a predominance of herbaceous plants, with rare occurrences of shrubs surrounding the wet areas of the *veredas*. The gallery forests are commonly found at the bottom of valleys, bordering rivers and small streams, forming a closed canopy above the watercourse. The riparian forests consist of forest vegetation that borders medium and large-sized rivers. When the environments were significantly altered due to anthropic action, the term "anthropized environments" was used.

The plant specimens were collected during three field expeditions in July and August 2018, and May 2019 in the Serra dos Martírios-Andorinhas (SMASP and EPA Araguaia). The collection of the specimens followed the walking method for

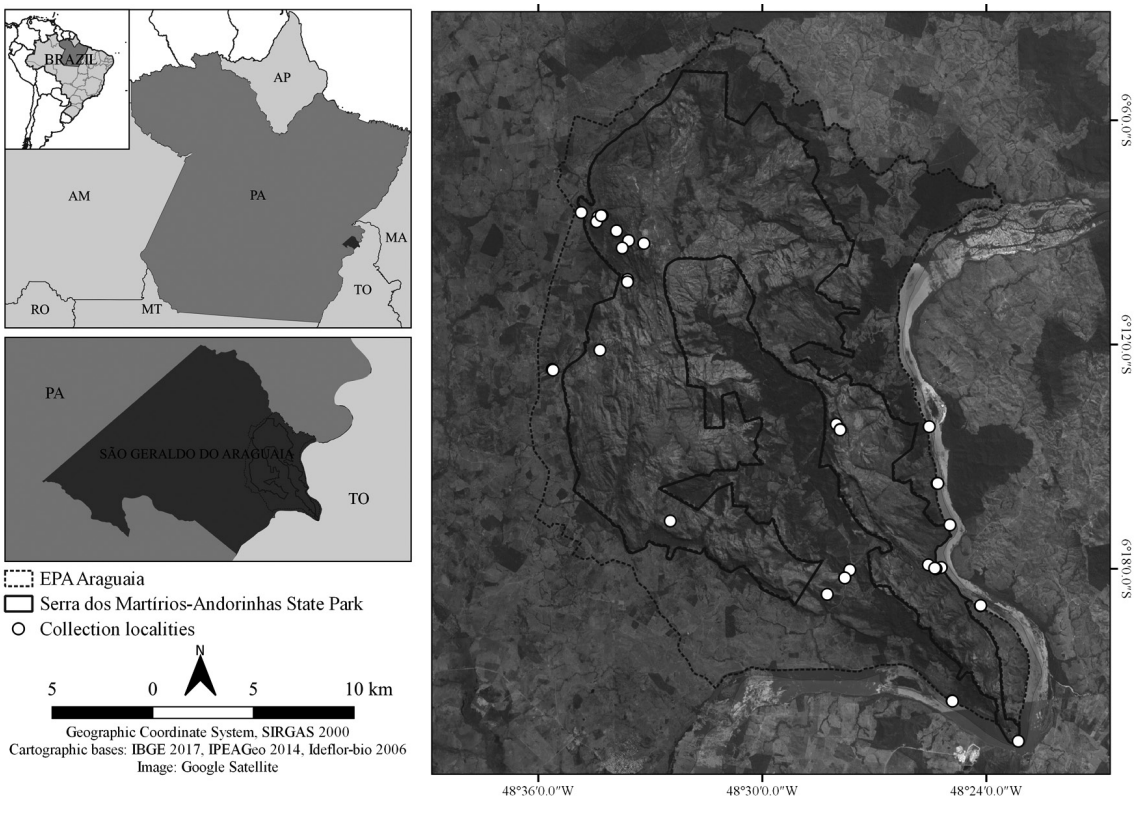

Figure 1 – Location of the study area.

qualitative floristic surveys (Filgueiras *et al.* 1994), while the preparation followed the traditional methods (Fidalgo & Bononi 1984). The collected specimens were deposited at the João Murça Pires herbarium (MG), and the duplicates were sent to the herbarium of the Jardim Botânico do Rio de Janeiro (RB). Furthermore, specimens deposited at CEN, FUEL, HBRA, HUTO, IAN, MBM, MFS, MG, and RB (acronyms according to Thiers, continuously updated) were analyzed in person or were studied online using "SpeciesLink" (<http://www.splink.org.br/>), and "Reflora" (<https://reflora.jbrj.gov.br/reflora/herbarioVirtual/>). International herbaria, such as K, MO, NY, P, and US were also studied online in search of specimens from the study area.

Species' determination and taxonomic and nomenclatural treatment were made

Figure 2 – a. *Cerrado* s.str. in SMASP; b. *Vereda* in Morro do Passat, SMASP; c. *Campo sujo* in Quarta Queda waterfall trail, SMASP; d. *Campo limpo* near Casa de Pedra, SMASP; e. Gallery forest at mouth Sucupira river, APA Araguaia; f. Riparian forest near Araguaia river, in EPA Araguaia.

using specialized literature (*e.g*., Affonso *et al.* 2015; Alves *et al*. 2015; Camelbeke *et al.* 2003; Diego-Pérez 1997; Faria 1998; Gil & Bove 2007; Goetghebeur & Borre 1989; Hefler & Longhi-Wagner 2010; Hennessy 1984; Koyama 1970; Kral 1971, 1978, 1993; Longhi-Wagner & Araújo 2014; López 2012; Lunkai *et al.* 2010; Maciel-Silva *et al.* 2018, 2019; Muniz & Shepherd 1987; Prata 2004; Nunes *et al*. 2016a; Ribeiro *et al.* 2015; Schneider *et al.* 2017; Simpson 2006; Trevisan 2005, 2009; Trevisan *et al*. 2007; Trevisan & Boldrini 2008, 2010; Vitta 2005; Vitta & Prata 2009; Wujek *et al.* 1994). We also consulted websites that provide digitalized original publications and type specimens of the studied species, such as: "JSTOR Global Plants" (<https://plants.jstor.org/>); "Biodiversity Heritage Library" (<http://www.biodiversitylibrary.org/>); "Botanicus Digital Library" (<http://www.botanicus.org/>); "Open Library" (<http://openlibrary.org/>); "Kew Royal Botanic Gardens" (<http://apps.kew.org/herbcat/gotoSearchPage.do>); and "NYBG - The New York Botanical Garden" (<http://www.nybg.org/>). When necessary, we consulted the "Taxonomic Literature" (<https://www.sil.si.edu/DigitalCollections/tl-2/>), in search of information on the location of type specimens, in addition to the Domingos Soares Ferreira Penna library at Museu Paraense Emílio Goeldi.

Updated species names and the abbreviation of original description, periodicals, and authors follows: "International Plant Name Index - IPNI" (<http://www.ipni.org>), "Tropicos" (<http://www.tropicos.org/>), "World Checklist of Selected Plant Families" (<http://apps.kew.org/>), and Flora do Brasil 2020, continuously updated (<http://floradobrasil.jbrj.gov.br/>). Species geographic distribution data were compiled from "World Checklist of Selected Plant Families", Flora do Brasil 2020, continuously updated, "Global Biodiversity Information Facility" (<https://www.gbif.org/>), and from specialized literature.

The selected material examined consists of collections from the study area that are representative of each species vegetative and reproductive features. The identification key and descriptions were based exclusively on the examined material. The descriptions of the species are based on diagnostic characters and/or characters of high taxonomic relevance.

Cyperaceae terminology follows Kearns *et al.* (1998). We followed Harris & Harris (1994) and Gonçalves & Lorenzi (2007) for the ornamentation and indumentum of the nutlets of all genera, except *Scleria*, in which we followed Hennessy (1985). We followed Reutemann *et al.* (2012) and Ahumada & Vegetti (2009) for the inflorescence architecture and terminology. The measurements for nutlet length include the stylopodium, hypogynium, and cupule, when present.

Results and Discussion

We examined 276 specimens from Serra dos Martírios-Andorinhas. Of these, 36 were analyzed in herbaria, and the 240 remaining were collected during intensive field expeditions. We recorded 72 species of Cyperaceae, distributed in 12 genera: *Cyperus* (18 species), *Rhynchospora* (18 spp.), *Bulbostylis* (9 spp.), *Scleria* (9 spp.), *Eleocharis* (7 spp.), *Fimbristylis* (4 spp.), *Calyptrocarya* (2 spp.), *Cryptangium* (1 spp.), *Exochogyne* (1 spp.), *Fuirena* (1 spp.), *Hypolytrum* (1 spp.), and *Lagenocarpus* (1 spp.).

Bulbostylis jacobinae (Steud.) Lindm., *B. loefgrenii* (Boeckeler) Prata & M.G.López, *B. vestita* (Kunth) C.B.Clarke, *Eleocharis capillacea* Kunth, *E. bicolor* Chapm., *R. junciformis* (Kunth) Boeckeler, and *R. tenella* (Nees) Boeckeler were recorded as new occurrences for the state of Pará. Alternatively, *Eleocharis braunii* H.E.Hess and *R. velutina* (Kunth) Boeckeler are here confirmed for the state (Schneider *et al.* 2020).

Cyperaceae Juss. Gen. Pl.: 26 (1789).

Herbs annual or perennial, caespitose, rhizomatous, stoloniferous, or with caudex. Sheaths with the margins smooth or scabrid, apex glabrous, ciliolate or ciliate. Ligule present or absent. Leaf-blades present or absent, papery, coriaceous, chartaceous or membranous, glabrous, pilose or hirsute, apex pseudopremorse or entire. Scapes circular, elliptic, triangular, subtriangular, quadrangular or pentagonal in cross-section; glabrous, pilose or hirsute, smooth or scabrid. Inflorescence simple or compound, fasciculate, capituliform, corymbiform, paniculiform, glomeruliform, spiciform or in anthela, lax to congested. Spikelets 1- to many-flowered, unisexual, bisexual, androgynous or subandrogynous (male glumes sterile); ovoid, lanceoloid, globose or subglobose. Glumes spiral, distichous or subdistichous, coriaceous or membranous. Flowers unisexual or bisexual, stamens 1–3 per flower, style bifid, trifid or undivided. Perianth present or absent, perigonial bristles 0–8, developed or rudimentary (*e.g*., *Eleocharis* and *Rhynchospora*), sometimes

with 3 membranous petaloid blades (*e.g.*, *Fuirena*) or 3 hypogynous scales (*e.g.*, *Cryptangium*). Nutlets biconvex, trigonous, subtrigonous, or globose, surface smooth, alveolate, foveolate, tuberculate, papillose, punctate, transversely rugose or rugulose. Perigynium (utricule) present or absent, glabrous, pubescent or pilose. Stylopodium deciduous or persistent at the apex of the mature nutlets; hypogynium present or absent; cupule persistent at the rachilla or at the nutlet, when present.

Identification key to the species of Cyperaceae in the Serra dos Martírios-Andorinhas, Pará, Brazil

1. Inflorescence with a solitary spikelet.
    2. Leaf-blades not developed.
        3. Spikelets 1-flowered; two glumes per spikelet..... 5.3. *Eleocharis capillacea*
        3’. Spikelets many-flowered; more than two glumes per spikelet.
            4. Spikelets with styles bifid and trifid mixed; nutlets both biconvex and trigonous in the same spikelet ..... 5.1. *Eleocharis bicolor*
            4’. Spikelets with styles exclusively bifid or trifid; nutlets biconvex or trigonous in the same spikelet.
                5. Scapes pentagonal in cross-section ..... 5.4. *Eleocharis filiculmis*
                5’. Scapes circular, elliptic or quadrangular in cross-section.
                    6. Spikelets globose; nutlet biconvex, dark..... 5.5. *Eleocharis geniculata*
                    6’. Spikelets ovoid, lanceoloid or terete; nutlets trigonous, white, olivaceous or yellow.
                        7. Spikelets terete; perigonal bristles 7–8..... 5.2. *Eleocharis braunii*
                        7’. Spikelets ovoid or lanceoloid; perigonal bristles 5–6.
                            8. Scapes quadrangular in cross-section; proliferous spikelets present ..... 5.7. *Eleocharis nana*
                            8’. Scapes elliptic in cross-section; proliferous spikelets absent..... ..... 5.6. *Eleocharis* cf. *microcarpa*
    2’. Leaf-blades developed.
        9. Leaf-sheaths ciliate at the apex, never lanuginose; glumes ciliate along the margins, never lanuginose ..... 1.1. *Bulbostylis conifera*
        9’. Leaf-sheaths lanuginose at the apex; glumes lanuginose along the margins..... ..... 1.6. *Bulbostylis paradoxa*
1’. Inflorescence with 2-many spikelets.
    10. Leaf-sheaths lanuginose or ciliolate on the apex.
        11. Inflorescences capituliform; glumes lanuginose along the margins .... 1.6. *Bulbostylis paradoxa*
        11’. Inflorescences in anthela; glumes ciliate or ciliolate on the margins, never lanuginose.
            12. Leaf-blades, scapes or rachis of the inflorescences hirsute, pubescent or pilose.
                13. Spikelets non-squarrose, glumes mucronate; nutlets 0.8–1 × 0.4–0.6 mm, surface reticulate ..... 1.9. *Bulbostylis vestita*
                13’. Spikelets squarrose, glumes awned; nutlet 0.3–0.5 × 0.2–0.3 mm, surface papillose ..... 1.7. *Bulbostylis paraensis*
            12’. Leaf-blades, scapes and rachis of the inflorescences glabrous.
                14. Caudex present, involucral bracts glumiform ..... 1.2. *Bulbostylis jacobinae*
                14’. Caudex absent, involucral bracts foliaceous.
                    15. Spikelets in congested fascicles (second order of inflorescence); glumes coriaceous..... 1.3. *Bulbostylis junciformis*
                    15’. Spikelets in a lax anthela (second order of inflorescence); glumes membranous.
                        16. Nutlets surface reticulate ..... 1.5. *Bulbostylis loefgrenii*
                        16’. Nutlets surface papillose ..... 1.4. *Bulbostylis lagoensis*
    10’. Leaf-sheaths glabrous on the apex.

17. Spikelets unisexual.
    18. Hypogynium present.
        19. Leaf-blades pseudopremorse on the apex; cupule persistent on the nutlet; stylopodium persistent or deciduous on the apex of mature nutlets.
            20. Contraligule cuneate on the apex; nutlets 4–7 × 3.5–5 mm...12.4. *Scleria macrophylla*
            20'. Contraligule acute on the apex; nutlets 2.2–3 × 1.7–2 mm..... 12.6. *Scleria microcarpa*
        19'. Leaf-blades with apex entire; cupule persistent on the rachilla; stylopodium always deciduous on the apex of mature nutlets.
            21. Membranous appendix on the apex of the contraligule absent; hypogynium lobes semicircular.
                22. Herbs climbing or scandent; stamens 3 per flower .... 12.2. *Scleria flagellum-nigrorum*
                22'. Herbs erect; stamen 1 per flower..... 12.3. *Scleria gaertneri*
            21'. Membranous appendix on the apex of the contraligule present; hypogynium lobes oblong or triangular.
                23. Nutlets foveolate; hypogynium lobes oblong..... 12.7. *Scleria reticularis*
                23'. Nutlets smooth or rugulose; hypogynium lobes triangular.
                    24. Ligule absent; hypogynium lobes laciniate on the apex .... 12.5. *Scleria martii*
                    24'. Ligule present; hypogynium lobes with the apex entire .... 12.9. *Scleria violacea*
    18'. Hypogynium absent.
        25. Nutlets covered by puberulent to pilose perigynium.
            26. Style bifid; nutlets biconvex..... 2.1. *Calyptrocarya glomerulata*
            26'. Style trifid; nutlets globose to subtrigonous.....2.2. *Calyptrocarya luzuliformis*
        25'. Nutlets not covered by perigynium or perigynium inconspicuous with glabrous surface.
            27. Inflorescences spiciform (first order), terminal; hypogynous scales absent at base of the nutlet..... 6.1. *Exochogyne amazonica*
            27'. Inflorescences paniculiform (first order), terminal and lateral; hypogynous scales present at base of the nutlet.
                28. Paracladia alternate; nutlets 3–3.3 mm long .....10.1. *Lagenocarpus rigidus*
                28'. Paracladia verticillate; nutlets 1.7–2.2 mm long....3.1. *Cryptangium verticillatum*
17'. Spikelets bisexual.
    29. Inflorescences spiciform (first order).
        30. Herb annual; rhizome absent; leaf-blades and scapes glabrous.....12.8. *Scleria tenella*
        30'. Herb perennial; rhizome present; leaf-blades and scapes pubescent to glabrescent..... ..... 12.1. *Scleria distans*
    29'. Inflorescences capituliform, corymbiform, paniculiform, umbelliform, fasciculate, glomeruliform or in anthela (first order).
        31. Scapes pentagonal in cross-section; perianth composed by membranous petaloid blades..... ..... 8.1. *Fuirena umbellata*
        31'. Scapes quadrangular or triangular in cross-section; perianth composed by bristles or absent.
            32. Perigonial bristles present.
                33. Perigonial bristles plumose throughout their extension.
                    34. Scapes quadrangular in cross-section; stylopodium spinulose along the margins..... 11.1. *Rhynchospora acanthoma*
                    34'. Scapes triangular in cross-section; stylopodium non-spinulose along the margins.
                        35. Leaf-blades papery, ascend; nutlets 2.2–2.7 mm long .... 11.10. *Rhynchospora globosa*
                        35'. Leaf-blades coriaceous, recurved; nutlets 4.2–4.1 mm long..... .....11.6. *Rhynchospora curvula*

33’. Perigonial bristles non-plumose, or plumose only on the base.
36. Inflorescence capituliform; nutlet winged along the margins; perigonial bristles 4 .... 11.2. *Rhynchospora barbata*
36’. Inflorescence paniculiform; nutlet not winged along the margins; perigonial bristles 6.
37. Leaf-blades with the midrib of the adaxial side puberulent, margins ciliate; glumes coriaceous..... 11.4. *Rhynchospora cephalotes*
37’. Leaf-blades with the midrib of the adaxial side glabrous, margins glabrous; glumes membranous ..... 11.15. *Rhynchospora rugosa*

32’. Perigonial bristles absent.
38. Androecium and gynoecium two laminar lateral floral bracts and one laminar central spicoid bract.....9.1. *Hypolytrum longifolium*
38’. Androecium and/or gynoecium a single laminar glume.
39. Glumes spiral.
40. Inflorescence capituliform or glomeruliform (first order).
41. Inflorescence glomeruliform, interspaced..... 11.8. *Rhynchospora exaltata*
41’. Inflorescence capituliform, not interspaced.
42. Glumes straw-colored, sometimes orange at the base, keel green; stylopodium at the apex of the mature nutlets absent .....7.4. *Fimbristylis vahlii*
42’. Glumes completely white or cream; stylopodium at the apex of the mature nutlets present.
43. Nutlets with the surface transversely rugose; the stylopodium lobed..... .....11.14 *Rhynchospora puber*
43’. Nutlets with the surface transversely rugulose; the stylopodium not lobed.
44. Rhizomes ca. 0.5 cm long, cespitose; nutlets 1–1.3 mm wide..... .....11.5. *Rhynchospora ciliata*
44’. Rhizomes 1–3 cm long, solitary; nutlets 1.6–1.8 mm wide .... 11.13. *Rhynchospora nervosa*
40’. Inflorescences paniculiform, corymbiform or in anthela (first order).
45. Inflorescences in anthela.
46. Leaf-sheaths and scapes scabrid; stylopodium at the apex of the mature nutlets present .....1.8. *Bulbostylis truncata*
46’. Leaf-sheaths and scapes smooth; stylopodium at the apex of the mature nutlets absent.
47. Styles bifid; nutlets biconvex.
48. Styles fimbriated; nutlets 1–1.3 mm long..... .....7.2. *Fimbristylis dichotoma*
48’. Styles not fimbriated; nutlets 0.4–0.5 mm long..... .....7.1. *Fimbristylis aestivalis*
47’. Styles trifid; nutlets trigonous to subtrigonous..... .....7.3. *Fimbristylis littoralis*
45’. Inflorescences paniculiform or corymbiform.
49. Perennial; rhizomes present.
50. Involucral bracts ciliate; glumes reddish-brown, apex mucronate or acute ..... 11.18 *Rhynchospora velutina*
50’. Involucral bracts non-ciliate; glumes brown, apex awned.
51. Leaf-sheaths with ligulate; nutlets with the surface reticulate in central region, papillose only along the margins, base long-stipitate; stylopodium not lobed.....11.9. *Rhynchospora filiformis*
51’. Leaf-sheaths not ligulate; nutlets with the surface transversely rugulose in the central region, papillose on the base and along the margins, base short-stipitate; stylopodium bilobed..... ..... 11.16.*Rhynchospora spruceana*

49’. Annual; rhizomes absent.
52. Leaves and/or scapes pilose or hirsute.
53. Inflorescence rachis retroflexed; nutlet surface transversely rugose; stylopodium lunate .....11.7. *Rhynchospora divaricata*
53’. Inflorescence rachis ascendent; nutlet surface foveolate; stylopodium deltoid ....11.11.*Rhynchospora hirsuta*
52’. Leaves and scapes glabrous.
54. Inflorescences paniculiform (first order); nutlets 0.6–0.8 × 0.6–0.7 mm..... ..... 11.17.*Rhynchospora tenella*
54’. Inflorescences corymbiform (first order); nutlets 1–4 × 0.7–1.1 mm.
55. Nutlets with weakly reticulated surface, base with papillose protuberances ....11.3. *Rhynchospora brevirostris*
55’. Nutlets with transversely rugose surface, base without papillose protuberances ... .11.12. *Rhynchospora junciformis*

39’. Glumes distichous.
56. Styles bifid.
57. Inflorescences glomeruliform (first order); nutlets 0.6–0.7 × ca. 0.2 mm ....4.16. *Cyperus subsquarrosus*
57’. Inflorescences capituliform or in anthela (first order); nutlets 0.9–1.4 × 0.4–0.7 mm.
58. Spikelets 1-flowered; glumes with scabrid keels .....4.7. *Cyperus hortensis*
58’. Spikelets many-flowered; glumes with smooth keels .....4.12. *Cyperus macrostachyos*
56’. Styles trifid.
59. Spikelets in spikes (second order).
60. Glumes with vinaceous striations and macules on the margins ....4.15. *Cyperus sphacelatus*
60’. Glumes without vinaceous striations and macules on the margins.
61. Mature spikelets deciduous, diaspores consisting of one glume, the nutlet, and the internode of the winged rachilla, which surrounds the nutlet.
62. Glumes 2–3 per spikelet; nutlets 0.7–1 mm wide, obovoid..... .....4.1. *Cyperus aggregatus*
62’. Glumes 4 or more per spikelet; nutlets 0.3–0.6 mm wide, ellipsoid..... .....4.13. *Cyperus odoratus*
61’. Mature spikelets persistent, not forming diaspores, the nutlets dispersing independent of the spikelet.
63. Inflorescence rachis absent or inconspicuous; inflorescences glomeruliform (first order).....4.5. *Cyperus gayi*
63’. Inflorescence rachis conspicuous; inflorescences in anthela (first order).
64. Spikes congested, covering the rachis; nutlets 0.5–0.7 mm long, obovoid .....4.8. *Cyperus imbricatus*
64’. Spikes lax, not covering the rachis; nutlets 1–2 mm long, narrowly ellipsoid.
65. Rachilla flexuose; glumes obtuse; nutlets 1.6–2 × 0.2–0.3 mm..... ..... 4.4. *Cyperus distans*
65’. Rachilla straight; glumes mucronate; nutlets 1–1.5 × 0.4–0.6 mm. .....4.3. *Cyperus digitatus*
59’. Spikelets in anthela, fascicles, glomeruliform or subdigitated (second order).
66. Spikelets in glomerules (second order).
67. Scapes scabrid; nutlets 0.7–0.9 mm long, obovoid.....4.17. *Cyperus surinamensis*
67’. Scapes smooth; nutlets 1–1.3 mm long, ellipsoid to narrowly ellipsoid..... ..... 4.11. *Cyperus luzulae*
66’. Spikelets in anthela, fascicles or subdigitated (second order).
68. Leaf-blades membranous when developed; nutlets 0.5–0.8 mm long.

69. Herbs 3–5 cm tall; spikelets squarrose; glumes awned; nutlets 0.7–0.9 × 0.3–0.4 mm, ellipsoid.. .....4.2. *Cyperus cuspidatus*
69'. Herbs 6–77 cm tall; spikelets not squarrose; glumes mucronate; nutlets 1–1.5 × 0.7–1.1 mm.
70. Perennial; scapes winged; stamens 3 per flower; nutlets ovoid to ellipsoid .... 4.6. *Cyperus haspan*
70'. Annual; scapes unwinged; stamens 2 per flower; nutlets obovoid .... 4.18. *Cyperus tenuispica*

68'. Leaf-blades chartaceous; nutlets 1–1.6 mm long.
71. Glumes with keels scabrid; nutlets 1–1.2 mm long, white to gray .....4.14. *Cyperus simplex*
71'. Glumes with keels smooth; nutlets 1.3–1.6 mm long, straw-colored to dark brown.
72. Rachis prophylls scabrid on the margins; glumes rhomboid, hyaline margins inconspicuous, apex awned; stamens 3 per flower ..... 4.10. *Cyperus laxus*
72'. Rachis prophylls smooth on the margins; glumes obovate to rotund, hyaline margins conspicuous, apex mucronate; stamens 2 per flower .....4.9. *Cyperus iria*

1. *Bulbostylis* Kunth, Enum. Pl. 2: 205 (1837).

The genus comprises about 200 species, occurring in the tropical and subtropical regions of the Americas and Asia (Govaerts *et al.* 2019). In Brazil, 56 species are recorded, 20 of which are endemic, and 14 occurring in the state of Pará (Schneider *et al.* 2020). Species of *Bulbostylis* have dry and other open areas as their main habitat, growing on rocky or sandy soils (Prata 2004). In the SMA, nine species of the genus were recorded.

1.1. *Bulbostylis conifera* (Kunth) C.B.Clarke, Urb., Symb. Antill. 2: 86 (1900). *Isolepis conifera* Kunth, Enum. Plant. Omn. Huc. Cognit. 2: 206 (1837). Figs. 3a; 4a

Leaf-blades basal, 1/3 to 1/5 of the scape length, canaliculate; inflorescences terminal, simple, spikelet unique, oblongoid to oblong-ovoid, glumes membranous, deciduous, basal glume sterile, persistent; nutlets 0.8–1.4 × 0.3–1 mm, obovoid, trigonous, apex cordate, gray to light brown, surface transversely rugose, lustrous, stylopodium discoid.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual das Andorinhas, margem esquerda do Rio Araguaia, 06°18'44"S, 48°24'33"W, 130 m, fl. and fr., 23.IV.2004, *Pereira-Silva G. 9029* (CEN).

It occurs in South America (Bolivia, Brazil, French Guiana, Guyana, Suriname, Venezuela, and Uruguai). In Brazil, it is recorded for the Northern (AM, AP, PA, RO, RR and TO), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (GO, MS, MT), Southeastern (ES, MG, RJ, SP), and Southern (PR) regions. In the SMA, it occurs in *cerrado* s.str., and seasonally flooded *campo limpo*.

1.2. *Bulbostylis jacobinae* (Steud.) Lindm., Bih. Kongl. Svenska Vetensk.-Akad. Handl. 26(9): 18 (1900). *Fimbristylis jacobinae* Steud., Syn. Pl. Glumac. 2: 111 (1855). Figs. 3b; 4b; 5a-b

Caudex horizontal, reptant; leaf-sheaths membranous, white; leaf-blades, scapes, and involucral bracts glabrous, lower involucral bracts never overcoming the inflorescence, inflorescences in anthela, glumes rusty to pink, deciduous; stamens 3 per flower; nutlets 0.6–0.8 × 0.3–0.6 mm, white to straw-colored, obovoid, trigonous, surface reticulated, stylopodium discoid to subpyramidal.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, campina ca. 500 m a leste da Casa de Pedra, 06°09'06"S, 48°32'47.5"W, fl. and fr., 500 m, 26.VIII.2018, *K.N.L. Alves et al. 146B* (MG).

It occurs in Bolivia and Brazil. In Brazil, it occurs in Northern (TO), Northeastern (BA, MA, PI), Central-Western (DF, GO, MS, MG), Southeastern (MG, SP), and Southern (PR) regions. It is a new record for the State of Pará. In the SMA, it occurs in *cerrado* s.str., *campo sujo*, and seasonally flooded *campo limpo*.

1.3. *Bulbostylis junciformis* (Kunth) C.B.Clarke, Trans. Linn. Soc. London, Bot. 4: 512 (1895). *Isolepis junciformis* Kunth, Nov. Genera et Spec. Plant. (4 ed.) 1: 222–223. (1815 [1816]). Figs. 3c; 4c; 5c

Leaf-sheaths apex ciliate, cilia white; leaf-blades, scapes and inflorescence rachis glabrous; inflorescences 2–3 orders, in anthela, lax to congested, spikelets in congested fascicles; glumes deciduous, coriaceous; nutlets 0.7–1.1 × 0.4–0.6 mm, obovoid, trigonous, white (immature), dark brown to gray (mature), surface papillose and/or reticulated, stylopodium discoid to subpyramidal.

Figure 3 – a-q. Nutlet and inflorescences – a. *Bulbostylis conifera* - inflorescence; b. *B. jacobinae* - anthelae; c. *B. junciformis* - anthelae; d. *B. lagoensis* - anthelae; e. *B. loefgrenii* - anthela; f. *B. paradoxa* - inflorescence; g. *B. paraensis* - nutlet; h. *B. paraensis* - anthelae; i. *B. truncata* - anthelae; j. *B. vestita* - anthela; k. *Calyptrocarya glomerulata* - inflorescence; l. *C. luzuliformis* - inflorescence; m. *Cryptangium verticillatum* - fascicles; n. *Cyperus aggregatus* - anthela; o. *C. cuspidatus* - fascicles; p. *C. digitatus* - anthelae; q. *C. gayi* - inflorescence. (a. *K.N.L. Alves et al. 25*; b. *K.N.L. Alves et al. 146B*; c. *K.N.L. Alves et al. 133*; d. *K.N.L. Alves et al. 43*; e. *A. Gil et al. 904*; f. *C.S. Nunes et al. 425*; g. *A. Gil et al. 835*; h. *A. Gil et al. 835*; i. *A.J. Fernandes-Júnior et al. 674*; j. *A.A. Oliveira et al. 4593*; k. *A. Gil et al. 934*; l. *A. Gil et al. 935*; m. *K.N.L. Alves et al. 196*; n. *K.N.L. Alves 207*; o. *Pereira-Silva G. 9042*; p. *A.S.B. Gil et al. 858*). Scale bar: g = 1 mm; a, b, c, d, e, f, h, i, j, k, l, m, n, o, p = 1 cm.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, trilha da Casa de Pedra, 06°10'21.7"S, 48°33'48.7"W, fl. and fr., 2.VII.2018, K.N.L. Alves *et al. 5* (MG).

Distributed in North America, Central America, and South America (Argentina, Bolivia, Brazil, Colombia, Equador, French Guiana, Guyana, Paraguai, Peru, Suriname, Venezuela, and Uruguai). In Brazil, it occurs in Northern (AC, AM, AP, PA, RO, RR, TO), Northeastern (AL, BA, CE, MA, PB, PE, PI, RS, SE), Central-Western (DF, GO, MS, MG), Southeastern (ES, MG, RJ, SP), and Southern regions (PR). In the SMA, occurs in *cerrado* s.str., *campo sujo*, *veredas* (*Mauritia flexuosa* L. f. palm swamps), and anthropized environments.

1.4. *Bulbostylis lagoensis* (Boeckeler) Prata & M.G.López, Kew Bull. 56: 1008 (2001). *Scirpus lagoensis* Boeckeler, Beitr. Cyper. 2: 15 (1890). Figs. 3d; 4d

Inflorescences up to 3 orders, in lax anthela; spikelets oblong-lanceoloid, 2.5–6(–7) mm long, glumes membranous, pubescent, deciduous; nutlets 0.6–0.8 × 0.4–0.6 mm, obovoid, trigonous, light brown to gray, surface papillose, stylopodium discoid to subpyramidal.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, 32 km na estrada sentido São Geraldo-Marabá, 06°8'41"S, 48°34'25"W, fl. and fr., 25.VIII.2018, *C.S. Nunes et al. 384* (MG).

Distributed in Bolivia and Brazil. In Brazil, it occurs in the Northernern (PA, TO), Northeastern (BA), Central-Western (DF, GO, MT), and Southeastern (MG, SP) regions. In the SMA, it occurs in *campo sujo*.

1.5. *Bulbostylis loefgrenii* (Boeckeler) Prata & M.G.López, Kew Bull. 56: 1008 (2001). Scirpus loefgrenii Boeckeler, Beitr. Cyper. 2: 16 (1890). Figs. 3e; 4e

Herbs slender, capillaceous scapes (0.1–0.3 mm diam.), unarmed; inflorescences up to 2 orders, in lax anthela; spikelets 2–3 per inflorescence, glumes rusty, membranous, deciduous; nutlets 0.4–0.7 × 0.3–0.5 mm, obovoid, subtrigonous, white to light brown, surface reticulated; stylopodium discoid to subpyramidal.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, trilha da Casa de Pedra, 06°09'17.7"S, 48°33'10.4"W, fl. and fr., 6.VII.2018, *L. Schneider et al. 258* (MG).

Distributed in Bolivia, Paraguay, and Brazil. In Brazil, it is distributed in the Northern (TO), Northeastern (BA, PI), Central-Western (GO, MT), Southeastern (MG, SP) and Southern (PR, RS) regions. It is a new record for the state of Pará. In the SMA, it occurs in *cerrado* s.str., anthropized environments, and riparian forests.

1.6. *Bulbostylis paradoxa* (Spreng.) Lindm., Bih. Kongl. Svenska Vetensk.-Akad. Handl. 26(9): 17 (1900). *Schoenus paradoxus* Spreng., Syst. Veg. 1: 190 [1825(1824)]. Figs. 3f; 4f; 5d

Caudex vertical, leaf-sheaths densely ciliated, lanuginose, cilia white; inflorescences capituliform, occasionally spiciform, spikelets 1–4(–6), glumes margins ciliate to densely ciliate, lanuginose; nutlets 1–1.8 × 1.2–1.3 mm, obovoid, trigonous, apex cordate, white, surface transversely rugulose; stylopodium discoid.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, APA Araguaia, 06°14'17.5"S, 48°27'54.8"W, fl. and fr., 27.VIII.2018, *L. Catarino & Freitas J.C. 2739* (IAN).

Distributed in North America (Mexico), Central America, and South Americas (Bolivia, Brazil, Colombia, French Guiana, Guyana, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AM, AP, PA, RO, RR, TO), Northeastern (BA, MA, PB, PI), Central-Western (DF, GO, MS, MT), Southeastern (MG, RJ, SP) and Southern (PR) regions. In the SMA, it occurs in *cerrado* s.str.

1.7. *Bulbostylis paraensis* C.B.Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 28 (1908). Fig. 3g-h

Leaf-sheaths pubescent, apex oblique, ciliate; scapes and leaf-blades filiform, blades abaxial surface hirtellous, margins scabrid, lower involucral bract equaling or longer than the inflorescence, inflorescences in 1–2 orders, spikelets squarrose, in anthela, glumes awned, persistent, styles trifid; nutlets 0.3–0.5 × 0.2–0.3 mm, obovoid, trigonous, white to straw-colored, surface papillose, lustrous; stylopodium subpyramidal.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual da Serra dos Martírios-Andorinhas, Margem do Rio Araguaia, ca. 25 km de São Geraldo do Araguaia, sentido norte, 06°18'58"S, 48°24'09.2"W, fl. and fr., 29.VIII.2018, *A. Gil et al. 835* (MG).

Distributed in Colombia, Venezuela, and Brazil. In Brazil, it is distributed in the Northern (PA, TO), Central-Western (GO, MS, MT), and Southeastern (MG) regions. In the SMA, it occurs in riparian forests.

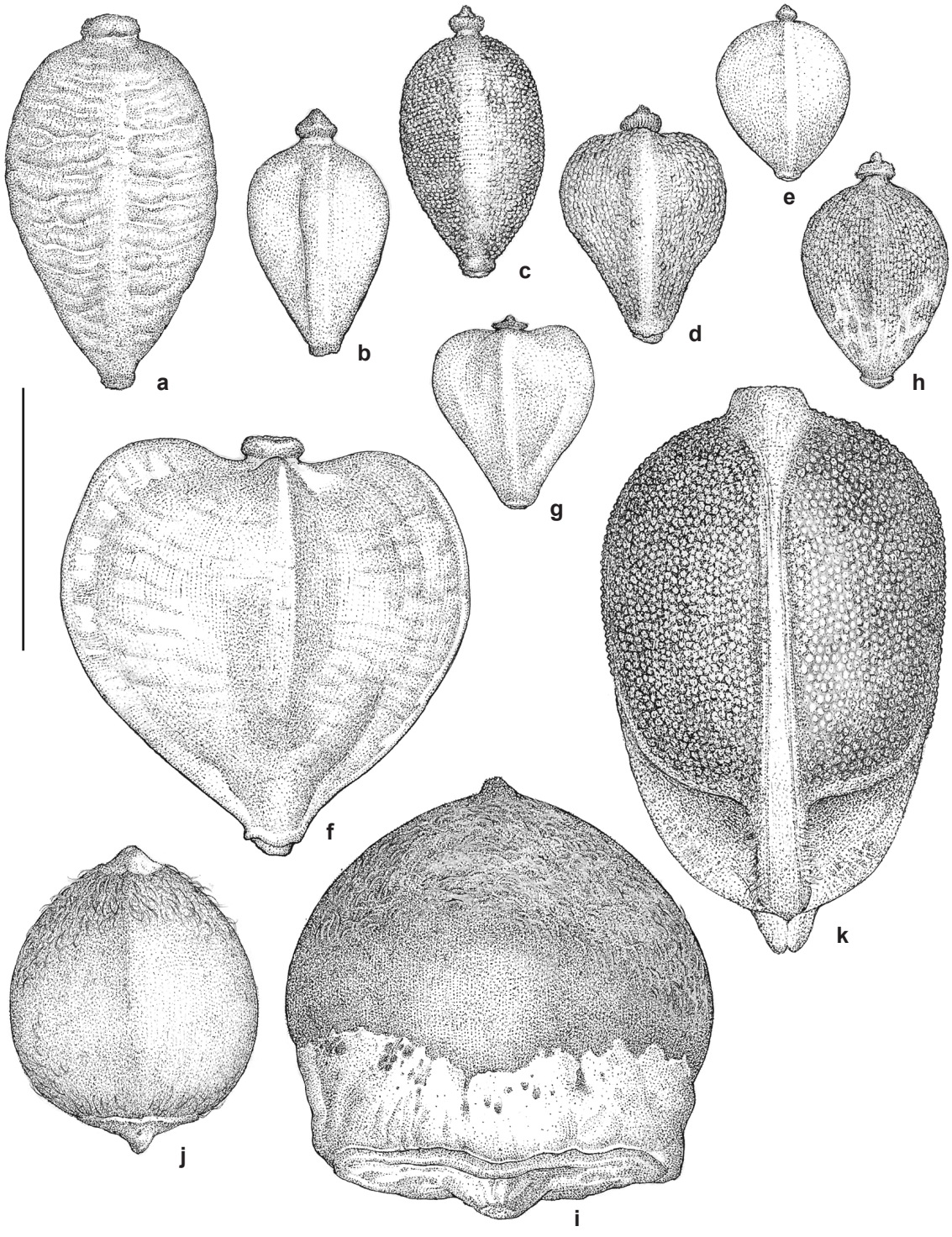

Figure 4 – a-k. Nutlets – a. *Bulbostylis conifera*; b. *B. jacobinae*; c. *B. junciformis*; d. *B. lagoensis*; e. *B. loefgrenii*; f. *B. paradoxa*; g. *B. truncata*; h. *B. vestita*; i. *C. glomerulata*; j. *C. luzuliformis*; k. *Cryptangyum verticillatum*. (a. *K.N.L. Alves et al. 25*; b. *K.N.L. Alves et al. 146B*; c. *K.N.L. Alves et al. 133*; d. *K.N.L. Alves et al. 43*; e. *A.S.B. Gil et al. 904*; f. *C.S. Nunes et al. 425*; g. *A.J. Fernandes-Júnior et al. 674*. h. *A.A. Oliveira et al. 4593*. i. *A. Gil et al. 934*. j. *A. Gil et al. 935*. k. K.N.L. Alves *et al.* 196). Scale bar = 1 mm.

1.8. *Bulbostylis truncata* (Nees) M.T.Strong, Brittonia 45: 165 (1993). *Oncostylis truncata* Nees in C.F.P. von Martius & auct. suc. (eds.), Fl. Bras. 2(1): 83 (1842). Figs. 3i, 4g

Herbs 7–14 cm long; leaf-sheaths scabrid, apex truncate, glabrous; scapes triangular in cross-section, capillaceous, scabrid, leaf-blades scabrid in adaxial surface; inflorescences in anthela, glumes deciduous; nutlets 0.6–0.8 × 0.4–0.6 mm, obovoid, trigonous, prominent angles, surface slightly reticulated, apex cordate, stylopodium discoid.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, Morro do Passat, 06°16'58.9"S, 48°32'33.0"W, fl. and fr., 29.VIII.2018, *A.J. Fernandes-Júnior et al. 674* (MG).

Distributed in South America (Bolivia, Brazil, Colombia, Guyana, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AM, AP, PA, RR, TO), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (DF, GO, MS, MT), Southeastern (ES, MG, RJ, SP), and Southern (PR) regions. In the SMA, it occurs in *cerrado* s.str.

1.9. *Bulbostylis vestita* (Kunth) C.B.Clarke in I.Urban, Symb. Antill. 2: 87 (1900). *Isolepis vestita* Kunth, Enum. Pl. 2: 210 (1837). Figs. 3j; 4h

Leaf-blades hirsute; scapes triangular in cross-section, hirsute; inflorescences in anthela, spikelets in congested fascicles, rachis hirsute, glumes membranous, pubescent, persistent; nutlets 0.8–1 × 0.4–0.6 mm, obovoid, trigonous, white, surface reticulated, stylopodium subpyramidal to discoid.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, trilha entre as Cachoeiras Três e Quatro Quedas, 06°10'51"S, 48°33'39"W, fl. and fr., 2.VI.2018, *A.A. Oliveira et al. 4593* (MG, IAN).

Distributed in the North America, Central America, and South America (Bolivia, Brazil, Colombia, Cuba, French Guiana, Paraguay, Peru, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (RR), Northeastern (AL, BA, CE, PB, PE, PI, SE), Central-Western (MS), Southeastern (ES, MG, RJ, SP) and Southern (PR, SC) regions. It is a new record for the state of Pará. In the SMA, it occurs in *cerrado* s.str.

2. *Calyptrocarya* Nees, Linnaea 9: 304 (1834).

Calyptrocarya comprises eight species, distributed in Central America, South America, and Mexico (Govaerts *et al.* 2019). Out of the eight species, seven occur in Brazil, and five are recorded for the state of Pará (Schneider *et al.* 2020). These species inhabit evergreen forests, seasonally flooded forests, and wet savannas, occurring next to rivers, streams and lagoons, growing on rocky substrates or sandy soils (Kearns *et al.* 1998). In the SMA two species were recorded.

2.1. *Calyptrocarya glomerulata* (Brongn.) Urb. Symb. Antill. 2: 169 (1900). *Becquerelia glomerulata* Brongn. in L.I. Duperrey, Voyage Autour du Monde 2: 163 (1829). Figs. 3k; 4i

Central scapes, inflorescences up to 3 orders, first and second orders paniculiform, spikelets in glomerules, styles bifid; nutlets 1.1–1.7 × 1–1.3 mm, biconvex, white to brown, base truncate-umbonate, apex apiculate; perigynium puberulent (mature) to pubescent (immature).

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, foz do Rio Sucupira, 06°18'01"S, 48°25'21"W, fl. and fr., 25.V.2019, A.S.B. *Gil et al. 934* (MG).

Distributed in North America (Mexico), Central America (Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Venezuela). In Brazil, it is recorded for all states. In the SMA, it occurs in gallery forests and *veredas*.

2.2. *Calyptrocarya luzuliformis* T.Koyama, Mem. New York Bot. Gard. 17(1): 44 (1967). Figs. 3l; 4j

Central scapes, inflorescences up to 3 orders, first and second orders paniculiform, third order glomeruliform, styles trifid; nutlets 1.2–1.4 × 0.8–1.2 mm, rotund to subtrigonous, white, base umbonate, apex apiculate, perigynium pilose.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, Foz do Rio Sucupira, 06°18'01"S, 48°25'21"W, fl. and fr., 25.V.2019, *A.S.B. Gil et al. 935* (MG).

Distributed in Central America (Costa Rica), and South America (Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AC, AM, AP, PA, RO, RR, TO), Northeastern (MA, PI), and Central-Western (MT) regions. In the SMA, it occurs in gallery forests.

3. *Cryptangium* Schrad. *ex* Nees. *in* C.F.P.von Martius & auct. suc. (eds.), *Fl. bras*. 2(1): 163 (1842).

The monospecifc genus was recently considered as monophyletic, morphologically recognizable, and accepted (Costa *et al.* 2021; Vitta *et al.* 2021). It occurs in non-Andean South America regions, from Guyana and Brazilian Shields to Colombia, and inhabits sandy soils areas (Costa *et al.* 2021).

Figure 5 – a-j. Field images – a. *Bulbostylis jacobinae* - inflorescence; b. *B. jacobinae*, caudex; c. *B. junciformis* - inflorescence; d. *B. paradoxa* - habit; e. *Cyperus imbricatus* - inflorescences; f. *Eleocharis capillacea* - stolon; g. *Exochogyne amazonica* - inflorescence; h. *Fimbristylis littoralis* - inflorescence; i. *Fuirena umbellata* - inflorescence; j. *Hypolytrum longifolium* - inflorescence.

3.1. *Cryptangium verticillatum* (Spreng.) Vitta, Phytotaxa 502(1): 88 (2021). *Fuirena verticillata* Spreng., Novi Provent.: 47 (1818). Figs. 3m, 4k

Inflorescences up to 2 orders, paniculiform, lax, terminal and axillary, spikelets in fascicles, paracladia verticillate, sterile in basal portion, female paracladia in distal portion, male paracladia in proximal portion; nutlets 1.7–2.2 × 1–1.4 mm, obovoid, reddish-brown to darkened, surface papillose, base with 3 grooves along the ciliolate margins.

Selected specimen examined: São Geraldo do Araguaia, Serra das Andorinhas, Área do Inventário Florístico, 06º13'S, 48º27'W, fl. and fr., 8.VII.1995, *I. Aragão & M.N. Bastos 84* (MG, IAN).

Distributed in South America (Bolivia, Brazil, Colombia, Guyana, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AM, AP, PA, RO, RR, TO), Northeastern (AL, BA, MA, PI, SE), Central-Western (DF, GO, MS, MT), and Southeastern (ES, MG, RJ, SP) regions. In the SMA, it occurs in rocky terrain, gallery forests, and *cerrado* s.str.

4. *Cyperus* L., Sp. Pl.: 44 (1753).

Cosmopolitan, with about 760 species, including the traditionally recognized *Kyllinga* Rottb., *Lipocarpha* R.Br., and *Pycreus* P.Beauv., among others (Larridon *et al.* 2013, Govaerts *et al*. 2019). In Brazil, it is confirmed the occurrence of 127 species, of which 23 are endemic, and 33 are recorded for the state of Pará (Schneider *et al.* 2020). The species of *Cyperus* occur in a wide variety of habitats, from humid and flooded environments to drier areas, as well as disturbed areas (Goetghebeur 1998). In the SMA, 18 species were recorded.

4.1. *Cyperus aggregatus* (Willd.) Endl., Cat. Horti Vindob. 1: 93 (1842). *Mariscus aggregatus* Willd., Enum. Pl.: 70 (1809). Figs. 3n; 6a

Leaf-sheaths membranous, leaf-blades chartaceous; inflorescences in 2–3 orders, in anthela, spikelets in spikes, often congested, rachis developed or undeveloped, prophylls apex biacuminate, spinulose margins; spikelets deciduous (mature), diaspores constituted by one glume, one nutlet, and one rachilla internode, rachilla winged, involving the nutlet, glumes 2–3 per spikelet; stamens 3 per flower; styles trifid; nutlets 1.7–2 × 0.7–1 mm, obovoid, trigonous, dark brown, slightly reticulated to papillose surface, apiculate apex.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, trilha para a Casa de Pedra, 06°09'48.8"S, 48°33'19"W, fl. and fr., 6.VII.2018, *L. Schneider et al. 260* (MG).

Distributed in North America, Central America, and South America (Argentina, Bolívia, Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Puerto Rico, Suriname, Uruguai, and Venezuela). In Brazil, it is recorded for all states. In the SMA, it occurs in anthropized environments and *campo sujo*.

4.2. *Cyperus cuspidatus* Kunth in F.W.H.von Humboldt, A.J.A.Bonpland & C.S.Kunth, Nov. Gen. Sp. 1: 204 (1816). Figs. 3o; 6b

Herbs 3–5 cm long; inflorescences simple, spikelets in fascicles; spikelets 6–15 × ca. 3 mm, squarrose; rachilla flexuous, articulated between the glumes; glumes deciduous, vinaceous, apex awned, 0.9–1.2 mm long; nutlets 0.7–0.9 × 0.3–0.4 mm, ellipsoid, trigonous, dark brown to black, papillose surface, apiculate apex.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual das Andorinhas, margem esquerda do Rio Araguaia, 06°18'44"S, 48°24'33"W, fl. and fr., 130 m, 23.IV.2004, *G. Pereira-Silva et al. 9042* (CEN, RB).

Distributed in the tropical and subtropical regions in Africa, Asia, North America, Central America, and South America (Bolivia, Brazil, Colombia, French Guiana, Guyana, Peru, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AC, AM, AP, PA, RO, RR, TO) and Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE) regions. In the SMA, it occurs in riparian forests.

4.3. *Cyperus digitatus* Roxb., Fl. Ind. 1: 209 (1820). Figs. 3p; 6c

Inflorescences in 3–4 orders, first and the second in anthela, spikelets in spikes; spikelets reflexed to patent, rachilla not apparent in anthesis, glumes densely imbricate, dorsal side and keels green, styles trifid; nutlets 1–1.5 × 0.4–0.6 mm, narrowly ellipsoid, trigonous, light brown to dark brown, surface papillose and lustrous.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, margem do Rio Araguaia, ca. 30 km de São Geraldo do Araguaia sentido norte, 06°16'49.6"S, 48°24'58.6"W, fl. and fr., 29.VII.2018, *A.S.B. Gil et al. 843* (MG).

Distributed in the tropical and subtropical regions in Africa, Asia, North America, Central America (Costa Rica Cuba, Dominican Republic, Guatemala, Haiti, Panama, Puerto Rico, Trinidad-Tobago), and South America (Brazil). In Brazil, it is distributed in the Northern (AC, AM, AP, PA,

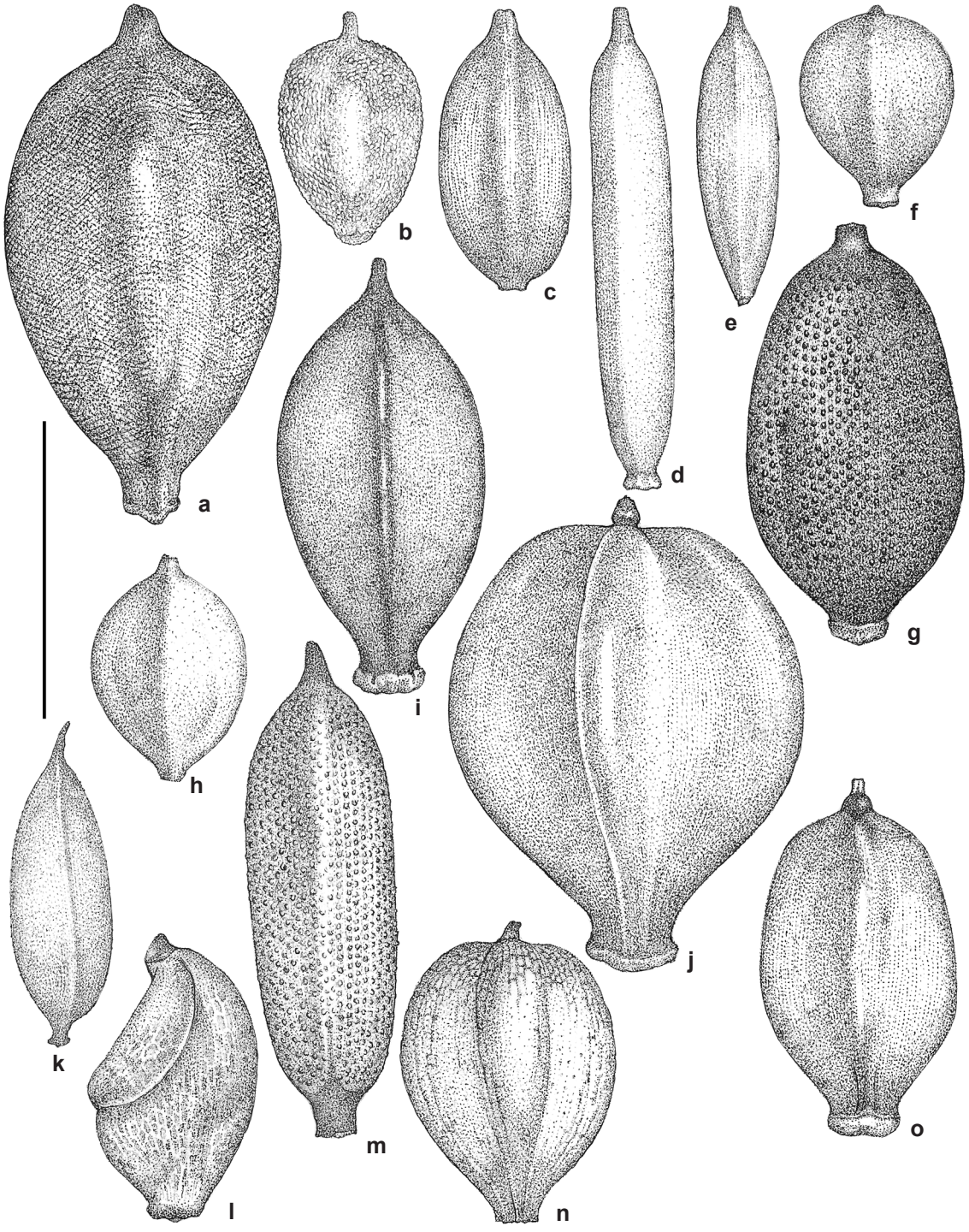

Figure 6 – a-o. Nutlets – a. *Cyperus aggregatus*; b. *C. cuspidatus*; c. *C. digitatus*; d. *C. distans*; e. *C. gayi*; f. *C. haspan*; g. *C. hortensis*; h. *C. imbricatus*; i. *C. iria*; j. *C. laxus*; k. *C. luzulae*; l. *C. macrostachyos*; m. *C. odoratus*; n. *C. simplex*; o. *C. sphacelatus*. (a. *K.N.L. Alves et al. 207*; b. *G. Pereira-Silva 9042*; c. *A. Gil et al. 843*; d. *A. Gil et al. 841*; e. *A. Gil et al. 858*; f. *K.N.L. Alves et al. 197*; g. *A. Gil et al. 863*; h. *A. Gil et al. 842*; i. *K.N.L. Alves et al. 204*; j. *K.N.L. Alves et al. 23*; k. *K.N.L. Alves et al. 213*; l. *A. Gil et al. 838*; m. *C.S. Nunes et al. 389*; n. *C.S. Nunes et al. 412*; o. *L. Schneider et al. 265*). Scale bar: 1 mm.

RO, RR, TO), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (DF, GO, MS, MT), Southeastern (ES, MG, RJ, SP) and Southern (RS) regions. In the SMA, it occurs in herbaceous vegetation in anthropized riparian forests, cooccurring with *C. imbricatus* Retz. and *C. distans* L. f.

4.4. *Cyperus distans* L. f., Suppl. Pl.: 103 (1782). Figs. 6d; 7a

Inflorescences in 3–4 orders, first and the second in anthela, spikelets in lax spikes; spikelets lineoid, reflexed to patent, rachilla apparent in anthesis, glumes 1.5–2 × 0.2–0.5 mm, narrowly linear, keels green; stamens 3 per flower; styles trifid; nutlets 1.6–2 × 0.2–0.3 mm, narrowly ellipsoid, trigonous, straw-colored to dark brown, papillose surface, short-stipitate.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, margem do Rio Araguaia, ca. 30 km de São Geraldo do Araguaia sentido norte, 06°16'49.6"S, 48°24'58.6"W, fl. and fr., *A.S.B. Gil et al. 841* (MG).

Distributed in the tropical and subtropical regions of the world: Africa, Asia, North America, Central America, and South America (Argentina, Brazil, Bolivia, Colombia, Ecuador, Peru, Venezuela, and Venezuelan Antilles). In Brazil, it is distributed in the Northern (AC, AM, AP, PA, RO, RR, TO), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (DF, GO, MS, MT), Southeastern (ES, MG, RJ, SP), and Southern (RS) regions. In the SMA, it occurs in anthropized riparian forests, with a predominance of herbaceous plants, cooccurring with *C. digitatus* and *C. surinamensis* Rottb.

4.5. *Cyperus gayi* (C.B.Clarke) Kük. in H.G.A.Engler (ed.), Pflanzenr., IV, 20(101): 484 (1936). *Mariscus gayi* C.B.Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 16 (1908). Figs. 3q; 6e

Inflorescences in 2–3 orders, glomeruliform, spikelets in densely clustered spikes, rachis absent or inconspicuous, spikelets ovoid 1.3–1.8 mm long, persistent; nutlets 0.8–1.1 × 0.2–0.3 mm, narrowly ellipsoid, subrotund, exceeding glumes at maturity, straw-colored to dark brown, punctuated surface, apex apiculate.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, margem do Rio Araguaia, ca. 30 km de São Geraldo do Araguaia no sentido norte, 06°15'42.9"S, 48°25'18.2"W, fl. and fr., 29.VIII.2018, *A.S.B. Gil et al. 858* (MG).

Distributed in French Guyana, and Brazil. In Brazil, it is distributed only in the Northern region, in the states of Amazonas, Roraima (*B.L. Stannard, 748*), and Pará. In the SMA, it occurs in herbaceous vegetation near riparian forests.

4.6. *Cyperus haspan* L., Sp. Pl.: 45 (1753). Figs. 6f; 7b

Leaves usually reduced to vinaceous leaf-sheaths, membranous, leaf-blades often poorly developed, scapes triangular in cross-section, angles winged; involucral bracts 2; inflorescences 2–3 orders, in anthela, spikelets in fascicles and/or subdigitate; nutlets 0.6–0.8 × 0.3–0.5 mm, ovoid to ellipsoid, trigonous, white to light brown, lustrous, surface reticulated.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual das Andorinhas, margem esquerda do Rio Araguaia, 06°18'44.0"S, 48°24'33.0"W, fl. and fr., 23.IV.2004, *G. Pereira-Silva 9014* (CEN).

Distributed in the tropical and subtropical regions of the world: Africa, Asia, North America, Central America, and South America (Bolivia, Brazil, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, and Venezuela). In Brazil, it is recorded for all states. In the SMA, it occurs in flooded and wet environments like *veredas* or near riparian and gallery forests.

4.7. *Cyperus hortensis* (Salzm. *ex* Steud.) Dorr, Smithsonian Contr. Bot. 100: 62 (2014). *Kyllinga hortensis* Salzm. *ex* Steud., Syn. Pl. Glumac. 2: 68 (1854). Figs. 6g; 7c

Involucral bracts hyaline proximally; inflorescences capituliform, spikelets 1-flowered, 1–3 spikes, glumes white to straw-colored, keels green, scabrid; nutlets 1–1.4 × 0.4–0.7 mm, oblongoid, biconvex, straw-colored to darkened, papillose surface, apex apiculate.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, 32 km na estrada sentido São Geraldo-Marabá, 06°08'32"S, 48°34'18"W, fl. and fr., 26.V.2019, *A.S.B. Gil et al. 863* (MG).

Distributed in Africa, USA, Brazil, and northern Argentina. In Brazil, it is recorded for all states. In the SMA, it occurs in riparian forests and *cerrado* s.str.

4.8. *Cyperus imbricatus* Retz., Observationes botanicae, 5: 12 (1788). Figs. 5e; 6h; 7d

Leaf-sheaths purple, leaf-blades papery; inflorescences up to 4 orders, first in anthela, second in fascicles, spikelets in cylindrical

Figure 7 – a-u. Inflorescences and spikelets – a. *Cyperus distans* - anthelae; b. *C. haspan* - anthelae; c. *C. hortensis* - inflorescence; d. *C. imbricatus* - anthelae; e. *C. iria* - fascicles; f. *C. laxus* - anthelae; g. *C. luzulae* - anthelae; h. *C. macrostachyos* - anthelae; i. *C. odoratus* - anthela; j. *C. simplex* - fascicle; k. *C. sphacelatus* - spike; l. *C. subsquarrosus* - inflorescence; m. *C. surinamensis* - anthelae; n. *C. tenuispica* - anthelae; o. *E. bicolor* - spikelet; p. *E. braunii* - spikelet; q. *E. capillacea* - spikelet; r. *E. filiculmis* - spikelet; s. *E. geniculata* - spikelet; t. *E.* cf. *microcarpa* - spikelet; u. *E. nana* - spikelet. (a. *A. Gil et al. 841*; b. *K.N.L. Alves et al. 197*; c. *A. Gil et al. 863*; d. *A. Gil et al. 842*; e. *K.N.L. Alves et al. 204*; f. *K.N.L. Alves et al. 23*; g. *K.N.L. Alves et al. 213*; h. *A. Gil et al. 838*; i. *C.S. Nunes et al. 389*; j. *C.S. Nunes et al. 412*; k. *L. Schneider et al. 265*; l. *A. Gil et al. 852*; m. *K.N.L. Alves et al. 82*; n. *K.N.L. Alves et al. 267*; o. *K.N.L. Alves et al. 122*; p. *A. Gil et al. 832A*; q. *K.N.L. Alves et al. 109B*; r. *A. Gil et al. 868*; s. *A. Gil. et al. 867A*; t. *A. Gil et al. 867B*; u. *A. Gil et al. 828*). Scale bar: a, b, c, d, e, f, g, h, i, j, k, l, m, n = 1 cm; o, p, q, r, s, t, u = 1 mm.

spikes, congested, hiding the rachis, inflorescence prophylls biacuminate (apex), rachis conspicuous; glumes strongly imbricate; nutlets 0.5–0.7 × 0.3–0.4 mm, obovoid, trigonous, light brown to dark brown, lustrous, slightly reticulated surface, apiculate apex.
Selected specimens examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, margem do Rio Araguaia, ca. 30 km de São Geraldo do Araguaia sentido norte, 06°16'49.6"S, 48°24'58.6"W, fl. and fr., *A.S.B. Gil et al. 842* (MG).

Distributed in the tropical and subtropical regions of the world: Africa, Asia, North America, Central America, and South America (Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, and Venezuela). In Brazil, it is distributed in the Northern (AM, PA, RO, RR), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (MS), Southeastern (ES, MG, RJ, SP), and Southern (PR, RS, SC) regions. In the SMA, it occurs in herbaceous vegetation near anthropized riparian forests.

4.9. ***Cyperus iria*** L., Sp. Pl.: 45 (1753). Figs. 6i; 7e

Inflorescences up to 3 orders, in anthela, spikelets in fascicles; glumes obovate to rotund, straw-colored, hyaline margins, keels green, apex mucronate; stamens 2 per flower; styles trifid; nutlets 1.3–1.6 × 0.5–0.7 mm, obovoid, trigonous, papillose surface, apiculate apex.
Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, estrada para a Vila Sucupira, 06°19'28.9"S, 08°29'29.4"W, fl. and fr., 24.V.2019, *K.N.L. Alves et al. 204* (MG).

Distributed in Africa, Asia, North America, Central America, and South America (Argentina, Bolivia, Brazil, Colombia, Ecuador, EUA, Honduras, Peru, Venezuela). In Brazil, it is recorded for all states. In the SMA, it occurs in anthropized environments like roadsides and pastures.

4.10. ***Cyperus laxus*** Lam., Tabl. Encycl. 1: 146 (1791). Figs. 6j; 7f

Leaf-blades, involucral bracts, and margins densely scabrid; inflorescence up to 3 orders, in anthela, spikelets in fascicles, rachis inflorescence prophylls scabrid; glumes rhomboid, awned, keels green; stamens 3 per flower; styles trifid; nutlets 1.3–1.5 × 0.7–1.1 mm, broadly obovoid, trigonous, straw-colored to dark brown, papillose surface; apiculate apex.
Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, margem do Rio Araguaia, na foz do Rio Sucupira, 06°17'57.9"S, 48°25'12.6"W, fl. and fr., 29.VIII.2018, *A.S.B. Gil et al. 862* (MG).

Distributed in North America, Central America, and South America (Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Venezuela, and Venezuelan Antilles). In Brazil, it is recorded for all states. In the SMA, it occurs in anthropized environments.

4.11. ***Cyperus luzulae*** (L.) Retz., Observ. Bot. 4: 11 (1786). *Scirpus luzulae* L., Syst. Nat. ed. 10, 2: 868 (1759). Figs. 6k; 7g

Scapes triangular in cross-section, unarmed; inflorescences up to 3 orders, in anthela, third order glomeruliform; spikelets 2.5–4.6 × 2–3 mm, ovoid; stamen 1 per flower; styles trifid; nutlets 1–1.3 × 0.3–0.4 mm, ellipsoid to narrowly ellipsoid, trigonous, light brown to dark brown, papillose surface, apiculate apex.
Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, estrada para a Vila Santa Cruz dos Martírios, 06°13'53.8"S, 48°28'57.1"W, fl. and fr., 24.V.2019, *K.N.L. Alves et al. 213* (MG).

Distributed in North America (Mexico), Central America, and South America (Argentina, Brazil, Nicaragua, Panama, Paraguay, Peru, and Uruguai). In Brazil, it is recorded for all states. In the SMA, it occurs in anthropized environments.

4.12. ***Cyperus macrostachyos*** Lam., Tabl. Encycl. 1: 147 (1791). Figs. 6l; 7h

Inflorescences in anthela, up to 3 orders, spikelets in spikes; glumes deciduous, brown, margins broad, hyaline, preceded by a conspicuous dark brown stripe; styles bifid; stamens 2 per flower; nutlets 0.9–1.2 × 0.4–0.6 mm, obovoid, twisted, biconvex, white to brown, lustrous, punctuated surface, apiculate apex.
Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, margem do Rio Araguaia, ca. 25 km de São Geraldo do Araguaia, sentido norte, 06°18'58.9"S, 48°24'09.2"W, fl. and fr., 29.VIII.2018, *A.S.B. Gil et al. 838* (MG).

Distributed in the tropical and subtropical regions of the world: Africa, Asia, North America, Central America, and South America (Argentina, Brazil, Bolivia, Ecuador, Paraguay, Peru, Venezuela). In Brazil, it is distributed in the Northern (PA), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), and Southeastern (ES, MG) regions. In the SMA, it occurs in riparian forests.

4.13. *Cyperus odoratus* L., Species Plantarum: 46 (1753). Figs. 6m; 7i

Inflorescences in anthela, up to 3 orders, spikelets in spikes, deciduous at maturity, dividing into diaspores composed by one winged rachilla internode, one glume, and one nutlet; glumes strongly imbricate; stamens 2 per flower; styles trifid; nutlets 1.4–1.8 × 0.3–0.6 mm, ellipsoid, trigonous, light brown to dark brown, surface papillose, apex apiculate.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, estrada para a Vila Sucupira, 06°19'28.9"S, 48°29'29.4"W, fl. and fr., 24.V.2019, *K.N.L. Alves et al. 205* (MG).

Distributed in Europe, Africa, Asia, North America, Central America, and South America (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguai, Venezuela, and Venezuelan Antilles). In Brazil, it is distributed in the Northern (AC, AM, AP, PA, RO, RR, TO), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (DF, GO, MS, MT), Southeastern (ES, MG, RJ, SP), and Southern (RS) regions. In the SMA, it occurs in herbaceous vegetation in anthropized riparian forests, cooccurring with *C. imbricatus* and *C. distans*.

4.14. *Cyperus simplex* Kunth, in F.W.H.von Humboldt, A.J.A.Bonpland & C.S.Kunth, Nov. Gen. Sp. 1: 207 (1815). Figs. 6n; 7j

Leaf-blades margins densely scabrid, involucral bracts margins densely scabrid, midvein antrorsely scabrid abaxially; inflorescences in anthela, up to 3 orders, spikelets in fascicles, rachis 2–20 cm long, glumes keels green, scabrid, apex awned, stamens 2 per flower; styles trifid, nutlets 1–1.2 × 0.8–0.9 mm, large-obovoid, trigonous, white to gray, lustrous, surface papillose.

Selected specimens examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, trilha da Biodiversidade, 06°13'36.9"S, 48°29'44.2"W, fl. and fr., 28.VIII.2018, *C.S. Nunes et al. 412* (MG).

Distributed in North America (Mexico), Central America, and South America (Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AC, AM, AP, PA, RO, RR, TO), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (DF, GO, MS, MT) and Southeastern (ES, MG, RJ, SP) regions. In the SMA, it occurs in riparian forests.

4.15. *Cyperus sphacelatus* Rottb., Descr. Pl. Rar.: 26 (1773). Figs. 6o; 7k

Inflorescences in anthela, up to 3 orders, spikelets linear, 1.5–2 mm long, in spikes; rachilla winged, apparent at maturity, flexuose, strongly articulated, "zig-zag" form; glumes deciduous, vinaceous medially; stamens 3 per flower; styles trifid; nutlets 1.2–1.4 × 0.6–0.8 mm, obovoid, trigonous, light brown to dark brown, papillose surface, apiculate apex.

Selected specimens examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, trilha da Casa de Pedra, rumo a cachoeira Quarta Queda, 06°09'48.8"S, 48°33'19"W, fl. and fr., 6.VII.2018, *L. Schneider et al. 265* (MG).

Distributed in Africa, North America, Central America, and South America (Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Puerto Rico, Suriname, and Venezuela). In Brazil, it is recorded for all states. In the SMA, it occurs in riparian forests and *campo sujo*.

4.16. *Cyperus subsquarrosus* (Muhl.) Bauters, Phytotaxa 166: 23 (2014). *Scirpus subsquarrosus* Muhl., Descr. Gram.: 3 (1817). Figs. 7l; 8a

Involucral bracts 2, one erect, simulating scape continuity; inflorescence pseudolateral, up to 3 orders, glomeruliform, spikelets in spikes, spikelets 1-flowered, flower subtended by an awned glumiform bract; glumes reduced or absent; stamen 1 per flower; styles bifid; nutlets 0.6–0.7 × ca. 0.2 mm, narrowly ellipsoid, curved in lateral view, rotund in cross-section, straw-colored to dark brown, surface papillose, apex slightly apiculate.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, margem do Rio Araguaia, ca. 25 km de São Geraldo do Araguaia, sentido norte, 06°18'58.9"S, 48°24'09.2"W, fl. and fr., 29.VIII.2018, *A.S.B. Gil et al. 834* (MG).

Distributed in Africa, North America, Central America, And South America (Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guianas, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela, and Venezuelan Antilles). In Brazil, it is distributed in the Northern (AM, PA, RO, RR, TO), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (DF, GO, MS, MT), and Southeastern (ES, MG, RJ) regions. In the SMA, it occurs in riparian forests.

4.17. *Cyperus surinamensis* Rottb., Descr. Icon. Rar. Pl.: 35 (1772). Figs. 7m; 8b

Scapes retrorsely scabrid; inflorescence congested, 3–4 orders, first and second in anthela,

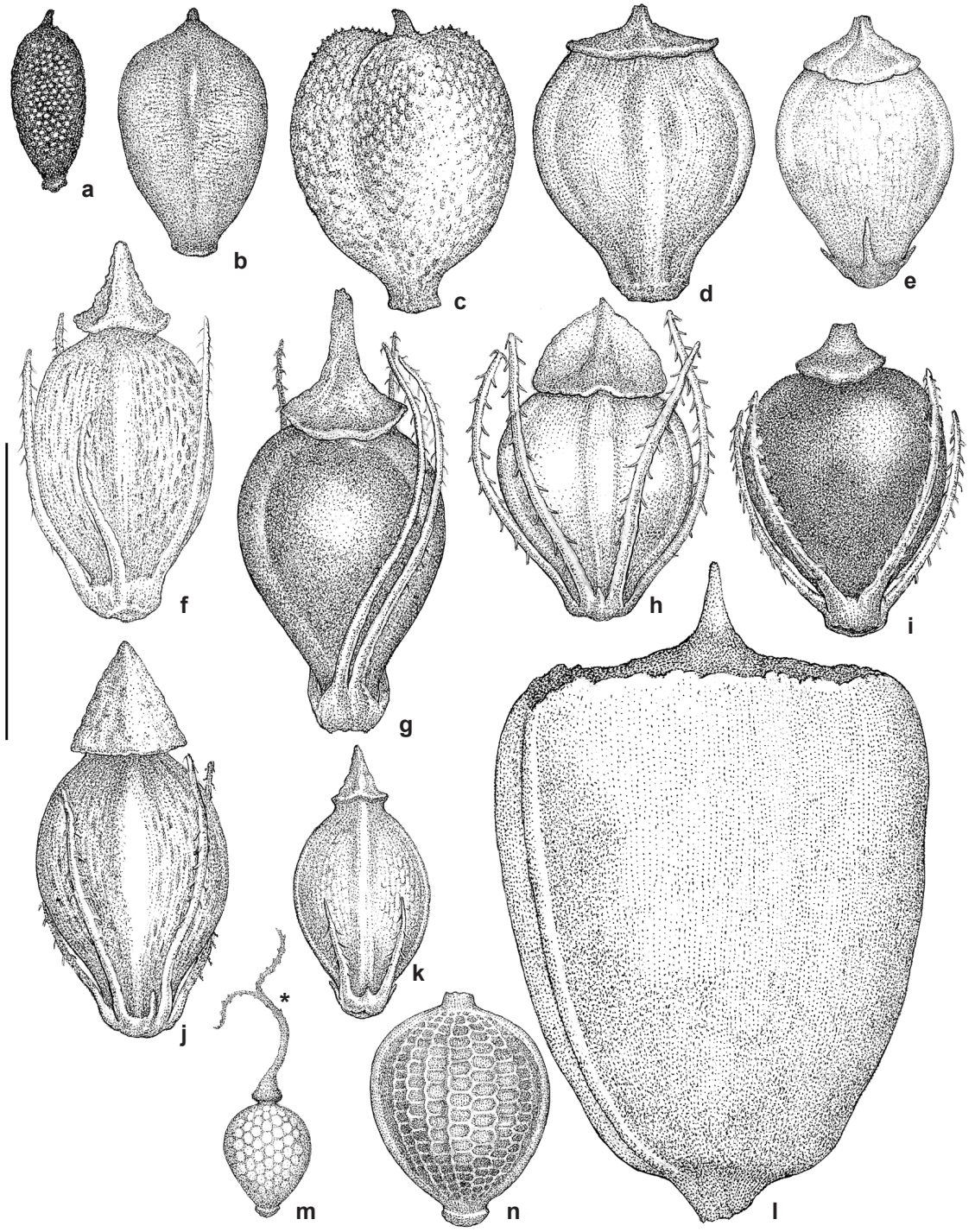

Figure 8 – a-n. Nutlets – a. *Cyperus subsquarrosus*; b. *C. surinamensis*; c. *C. tenuispica*; d-e. *E. bicolor*; f. *E. braunii*; g. *E. capillacea*; h. *E. filiculmis*; i. *E. geniculata*; j. *E.* cf. *microcarpa*; k. *E. nana*; l. *Exochogyne amazonica*; m. *Fimbristylis aestivalis* (the asterisk denotes a style); n. *F. dichotoma*. (a. *A. Gil et al. 852; b. K.N.L. Alves et al. 82*; c. *K.N.L. Alves et al. 267*; d-e. *K.N.L. Alves et al. 122*; f. *A. Gil et al. 832A*; g. *K.N.L. Alves et al. 109B*; h. *A. Gil et al. 868*; i. *A. Gil et al. 867A*; j. *A. Gil et al. 867B*; k. *A. Gil et al. 828*; l. *K.N.L. Alves et al. 189*; m. *A. Gil et al. 836*; n. *L. Schneider et al. 268*). Scale bar: 1 mm.

spikelets in fascicles, subtended by glumiform bracts, spikelets ovoid, stamen 1 per flower, styles trifid; nutlets 0.7–1 × 0.3–0.4 mm, obovoid, trigonous, dark brown, papillose surface, apiculate apex.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, Foz do Rio Sucupira, 06°17'57.9"S, 48°25'12.6"W, fl. and fr., 5.VII.2018, *K.N.L. Alves et al. 82* (MG).

Distributed in Tropical, and Subtropical North America, Central America, and South America (Argentina, Bahamas, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela). In Brazil, it is recorded for all states. In the SMA, it occurs in gallery forests.

4.18. ***Cyperus tenuispica*** Steud., Syn. Pl. Glumac. 2: 11 (1854). Figs. 7n; 8c

Herbs 6–12 cm long; inflorescences up to 2 orders, spikelets in anthela, lineoid, glumes brown, marginal macules vinaceous; stamens 2 per flower; styles trifid; nutlets 0.5–0.7 × 0.3–0.4 mm, obovoid, trigonous, white to brown, reticulated to papillose surface, apiculate apex.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, Foz do Rio Sucupira, 06°18'00"S, 48°25'21"W, fl. and fr., 25.V.2019, *A.S.B. Gil et al. 929* (MG).

Distributed in Asia, Europe, Africa, Australia, Central America (Costa Rica), and South America (Brazil, Guyana, and Venezuela). In Brazil, it is distributed in the Northern (PA), Northeastern (MA) and Central-Western (MT) regions. In the SMA, it occurs in gallery forests and flooded *campo limpo*, next to *veredas*.

5. ***Eleocharis*** R.Br., Prodr. Fl. Nov. Holland.: 223 (1810).

Cosmopolitan genus with about 250 species (Govaerts *et al*. 2019; Goetghebeur 1998). Currently, 84 species are recorded for Brazil, of which 21 are endemic, and 25 occur in the state of Pará (Schneider *et al.* 2020). *Eleocharis* occurs in aquatic or swampy environments, lakes, rivers, streams, and *restingas*, in wet or flooded soils, emerged or submerged (Maciel-Silva *et al.* 2018). In the SMA, seven species were recorded.

5.1. ***Eleocharis bicolor*** Chapm., Fl. Southern. U.S.: 517 (1860). Figs. 7o; 8d-e

Perigonial bristles rudimentary; styles bifid and trifid in the same spikelet; nutlets 0.8–1.1 × 0.5–0.7 mm, obovoid, both biconvex and trigonous in the same spikelet, white to straw-colored, reticulated surface, stylopodium conical, brown, apiculate apex.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, área de Proteção Ambiental de São Geraldo do Araguaia, balneário Três Quedas, em córrego no início do caminho para a Casa de Pedra, 06°10'23.7"S, 48°33'50.6"W, fl. and fr., 26.VIII.2018, *K.N.L. Alves et al. 122* (MG).

Distributed in North America (EUA), Central America, and South America (Argentina, Brazil, Guyana, Paraguay, and Venezuela). In Brazil, it is distributed in the Central-Western (DF, MS), Southeastern (SP), and Southern (PR, RS, SC) regions. It is a new record for the Northern region and the state of Pará. In the SMA, it occurs in anthropized riparian forests.

5.2. ***Eleocharis braunii*** H.E.Hess, Ber. Schweiz. Bot. Ges. 67: 91 (1957). Figs. 7p; 8f

Stolons elongated, leaf-sheaths apex obtuse, inflated, spikelets terete, (5–)8–10 × 1.5–2.1 mm; glumes apex emarginate, margins broad and hyaline, perigonial bristles 7–8, not exceeding the fruit; nutlets 1.2–1.3 × 0.5–0.6 mm, obovoid, trigonous, yellow to olivaceous, reticulated surface, stylopodium elongated pyramidal, not continuous with the fruit.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual da Serra dos Martírios-Andorinhas, margem do Rio Araguaia, ca. 25 km de São Geraldo do Araguaia, sentido norte, 06°18'58.9"S, 48°24'09.2"W, fl. and fr., 111 m, 29.VIII.2018, *A.S.B. Gil et al. 832A* (MG).

Distributed only in Brazil, in the Northern region (AM). It is a new record for the state of Pará. In the SMA, it occurs in riparian forests.

5.3. ***Eleocharis capillacea*** Kunth, Enum. Pl. 2: 139 (1837). Figs. 5f; 7q; 8g

Long internode stolons; scapes capillaceous, elliptic in cross-section; spikelets 1-flowered, glumes 2 per spikelet, distichous, basal sterile; basal spikelets sometimes without scapes, perigonial bristles 5–7; nutlets 1.2–1.5 × 0.5–0.8 mm, obovoid, biconvex, straw-colored to darkened, lustrous, surface smooth to slightly reticulated; stylopodium conical, apex elongated.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, Margem do Rio Araguaia, remanso dos Botos, ca. 20 km de São Geraldo do Araguaia, sentido Norte, 06°22'36.7"S, 48°23'08.8"W, fl. and fr., 26.VIII.2018, *K.N.L. Alves et al. 109B* (MG).

Distributed in South America (Argentina, Bolivia, Brazil, Colombia, Ecuador, Paraguay, and Venezuela). In Brazil, it is distributed in the Northern (AM, RO, RR), Northeastern (BA, MA), Central-Western (DF, GO, MS, MT), Southeastern (MG, RJ, SP), and Southern (PR, SC) regions. It is a new record for the state of Pará. In the SMA, it occurs in anthropized river streams, next to riparian forests.

5.4. *Eleocharis filiculmis* Kunth, Enum. Pl. 2: 144 (1837). Figs. 7r; 8h

Scapes pentagonal in cross-section; fertile glumes deciduous, emarginate apex; lower glume sterile, persistent, obtuse apex; perigonial bristles 6; nutlets 1–1.2 × 0.5–0.7 mm, obovoid, trigonous, white to straw-colored, surface smooth, lustrous; stylopodium pyramidal, yellow, compressed horizontally.

Selected specimen examined: São Geraldo do Araguaia, Serra das Andorinhas (Serra dos Martírios), fl. and fr., 17.VII.2009, *M.G.C. Souza 56* (HBRA).

Distributed in North America, Central America, and South America (Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela). In Brazil, it is distributed in all regions, lacking records only for the states of Alagoas, Amapá, and Espírito Santo. In the SMA, it occurs in riparian forests.

5.5. *Eleocharis geniculata* (L.) Roem. & Schult., Syst. Veg. 2: 150 (1817). *Scirpus geniculatus* L. Species Plantarum 1: 48 (1753). Figs. 7s; 8i

Leaf-blades apex acute, scapes rotund in cross-section; spikelets globose, vinaceous; glumes deciduous, apex obtuse; perigonial bristles 7, retrorsely scabrid; nutlets 1–1.3 × 0.6–0.9 mm, obovoid, biconvex, darkened, smooth surface; stylopodium pyramidal, yellow.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, Rio Araguaia, fl. and fr., 25.VIII.2018, *C.S. Nunes et al. 388* (MG).

Distributed in the tropical and subtropical regions of the world: Africa, Asia, Europe, Middle East, North America, Central America, and South America (Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Haiti, Peru, Suriname, Venezuela, and Venezuelan Antilles). In Brazil, it is distributed in all regions, lacking records only for the states of Amapá, Acre, and Rondônia. In the SMA, it occurs in riparian forests.

5.6. *Eleocharis* cf. ***microcarpa*** Torr., Ann. Lyceum Nat. Hist. New York 3: 312 (1836). Figs. 7t; 8j

Leaf-sheaths vinaceous, acute apex; scapes elliptic in cross-section, capillaceous; glumes subdistichous to spiral, sides vinaceous to ochraceous, apex acute to retuse, fertile glumes deciduous, lower sterile, persistent; perigonial bristles 6, retrorsely scabrid, not exceeding the fruit; nutlets 0.8–1.2 × 0.4–0.6 mm, obovoid, trigonous, prominent angles, olivaceous, reticulated surface; stylopodium pyramidal to narrowly pyramidal, not continuous with the fruit. For presenting capillaceous scapes, spikelets often proliferous, glumes brown to vinaceous on sides, deciduous, basal persistent, perigonial bristles shorter than the fruit length, and trigonous nutlets, we believe this specimen likely represent *E. microcarpa*. However, as it was not possible to analyze the type specimen, we refrain from asserting its identity. It is noteworthy that the fruit's morphology is fundamental for the differentiation of species in *Eleocharis*, which demands a thorough analysis.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, Foz do Rio Sucupira, 06°17'57.9"S, 48°25'12.6"W, fl. and fr., 29.VIII.2018, *A.S.B. Gil et al. 866B* (MG).

Eleocharis microcarpa occurs in the USA and from the Caribbean to Venezuela. In Brazil, Faria (1998) cites the species for the State of São Paulo and considers it an extremely rare species, locally endangered due to the existence of only one record from 1906 (*A. Usteri 14*, SP). In case the type analysis confirms it as *E. microcarpa*, it will represent a new record for northern Brazil and the state of Pará. In the SMA, it occurs in gallery forests.

5.7. *Eleocharis nana* Kunth, Enum. Pl. 2: 140 (1837). Figs. 7u; 8k

Rhizomes vertical; leaf-sheaths rigid, chartaceous, apex obtuse to acute, scapes quadrangular to subrotund in cross-section; spikelets proliferous, ellipsoid; glumes spiral to subdistichous, apex acute to retuse; perigonial bristles 5, the same length of the fruit or exceeding; nutlets 0.6–0.8 × 0.2–0.3 mm (immature), ellipsoid, trigonous, white, surface smooth to slightly reticulated; stylopodium pyramidal.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, margem do Rio Araguaia, ca. 25 km de São Geraldo do Araguaia, sentido norte, 06°18'58.9"S, 48°24'09.2"W, fl. and fr., 29.VIII.2018, *A.S.B. Gil et al. 828* (MG).

Distributed in North America (EUA), Central America (Cuba), and South America (Brazil, Guyana, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AM, PA, RR), Northeastern (BA, MA, PB), Central-Western (MS, MT), Southeastern (ES, MG, RJ, SP), and Southern (PR, RS, SC) regions. In the SMA, it occurs in riparian forests.

6. *Exochogyne* C.B.Clarke, Verh. Bot. Vereins Prov. Brandenburg 47: 101 (1905).

It is a monospecific genus occurring in Venezuela, Guyana, Suriname, and Brazil. Distributed in *campinaranas*, lowland fields, *campo limpo*, *cerrado* s.str., savannas, and *campos rupestres* (Schneider *et al.* 2020; Kearns *et al.* 1998).

6.1. *Exochogyne amazonica* C.B.Clarke, Verh. Bot. Vereins Prov. Brandenburg 47: 101 (1906). Figs. 5g; 8l; 9a

Rhizomes knotty, conspicuous; leaf-blades basal; involucral bracts cymbiform, foliaceous, green to reddish-brown, margins ciliate; inflorescence terminal, up to 2 orders, spiciform, spikelets in spikes, main rachis strongly articulated, flexuose; glumes distichous; nutlets 2–3 × 1.1–1.4 mm, ovoid, reddish-brown to dark brown, surface slightly reticulate, stipitate base; stylopodium pyramidal persistent, apex acuminate.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, margem do Rio Araguaia, ca. 25 km de São Geraldo do Araguaia, sentido norte, 06°18'58.9"S, 48°24'09.2"W, fl. and fr., 26.VIII.2018, *K.N.L. Alves et al. 113* (MG).

Distributed in South America (Brazil, Colombia, French Guiana, Guyana, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AM, PA, RO, RR), Central-Western (DF, GO, MT), and Southeastern (MG) regions. In the SMA, it occurs in riparian forests and *veredas*.

7. *Fimbristylis* Vahl, Enum. Pl. Obs. 2: 285 (1805).

Cosmopolitan genus, composed of ca. 310 species (Govaerts *et al.* 2019), 18 of these species occurring in Brazil (Schneider *et al*. 2020). Eight species occur in the state of Pará (Schneider *et al*. 2020). The species of *Fimbristylis* inhabit temperate to tropical regions (Kral 1971). In the SMA, four species were recorded.

7.1. *Fimbristylis aestivalis* (Retz.) Vahl, Enum. Pl. Obs. 2: 288 (1805). *Scirpus aestivalis* Retz., Observ. Bot. 4: 12 (1786). Figs. 8m; 9b; 10a

Herbs cespitose; leaf-sheaths glabrous, ligulated, leaf-blades glabrous; inflorescences in anthela, up to 4 orders, spikelets ovoid, glumes deciduous, apex mucronate, stamen 1 per flower, styles bifid, efimbriate; nutlets 0.4–0.5 × 0.3–0.4 mm, obovoid, biconvex, white to straw-colored, surface reticulated to verruculose.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, Rio Araguaia, fl. and fr., 25.VIII.2018, *C.S. Nunes et al. 391* (MG).

Distributed in Asia, Australia, Europe, North America (Hawaiian Islands), and South America (Brazil, Bolivia, Colombia, and Venezuela). In Brazil, it is distributed in the Northern (AM, PA, RR, TO) and Central-Western (MT) regions. In the SMA, it occurs in anthropized riparian forests.

7.2. *Fimbristylis dichotoma* (L.) Vahl, Enum. Pl. Obs. 2: 287 (1805). *Scirpus dichotomus* L., Sp. Pl.: 50 (1753). Figs. 8n; 9c; 10b

Involucral bracts with margins scabrid, lower one exceeding the inflorescence; inflorescences up to 3 orders, in anthela, spikelets ovoid; styles bifid, fimbriate; nutlets 0.9–1.3 × 0.5–0.9 mm, obovoid, biconvex, light-brown to darkened, lustrous, surface reticulated, cells horizontally compressed, apiculate apex.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, margem do Rio Araguaia, na foz do Rio Sucupira, 06°17'57.9"S, 48°25'12.6"W, fl. and fr., 24.V.2019, *A.S.B. Gil et al. 864* (MG).

Distributed in Africa, Asia, Australia, Europe, North America, Central America, and South America (Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Venezuela, and Uruguai). In Brazil, it is recorded for all states. In the SMA, it occurs in anthropized environments like trails and roadsides.

7.3. *Fimbristylis littoralis* Gaudich., Voy. Uranie: 413 (1826 [1829]). Figs. 5h; 9d

Leaf-sheaths flattened, ligules ciliate; scapes quadrangular in cross-section; involucral bracts shorter or equaling the inflorescences; inflorescences in anthela, up to 3 orders, lax, spikelets globose to subglobose; styles trifid, fimbriate; nutlets 0.5–0.7 × 0.3–0.4 mm, subtrigonous, obovoid, white to straw-colored, surface verruculose, reticulated, cells horizontally compressed, lustrous, apiculate apex.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas,

Figure 9 – a-q. Nutlet and inflorescences – a. *Exochogyne amazonica* - inflorescence; b. *Fimbristylis aestivalis* - anthelae; c. *F. dichotoma* - anthelae; d. *F. littoralis* - anthelae; e. *F. vahlii* - inflorescence; f. *Fuirena umbellata* - inflorescence; g. *Hypolytrum longifolium* - inflorescence; h. *Lagenocarpus rigidus* - inflorescence; i. *Rhynchospora acanthoma* - inflorescence; j. *R. barbata* - inflorescence; k. *R. brevirostris* - inflorescence; l. *R. cephalotes* - inflorescence; m. *R. ciliata* - nutlet; n. *R. ciliata* - inflorescence; o. *R. curvula* - inflorescence; p. *R. divaricata* - inflorescence; q. *R. exaltata* - glomerules. (a. *K.N.L. Alves et al. 189*; b. *A. Gil et al. 836*; c. *L. Schneider et al. 268*; d. *A. Gil et al. 834*; e. *A. Gil et al. 813*; f. *K.N.L. Alves et al. 258*; g. *A.S.B. Gil et al. 932*; h. *K.N.L. Alves et al. 136*; j. *C.S. Nunes et al. 399*; k. *A. Gil et al. 914*; l. *C.S. Nunes et al. 445*; m-n. *K.N.L. Nunes et al. 169*; o. *K.N.L. Alves et al. 145*; p. *K.N.L. Alves et al. 203*; q. *K.N.L. Alves et al. 47*). Scale bar: m = 1 mm; a, b, c, d, e, f, g, h, i, j, k, l, n, o, p, q = 1 cm.

margem do Rio Araguaia, ca. 25 km de São Geraldo do Araguaia, sentido norte, 06°18'58.9"S, 48°24'09.2"W, fl. and fr., 29.VIII.2018, *A.S.B. Gil et al. 837* (MG).

Distributed in Africa, Asia, Australia, Middle East, North America, Central America, and South America (Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, and Venezuela). In Brazil, it is recorded for all states. In the SMA, it occurs in anthropized environments like trails and anthropized riparian forests.

7.4. *Fimbristylis vahlii* (Lam.) Link, Hort. Berol. 1: 287 (1827). *Scirpus vahlii* Lam., Tabl. Encycl. 1: 139 (1791). Figs. 9e; 10c

Herbs cespitose; leaf-sheaths pubescent, leaf-blades filiform, scapes subtriangular in cross-section, filiform; involucral bracts 2–4, exceeding the inflorescence; inflorescences simple, capituliform, congested, spikelets ovoid to oblongoid, 3–7 mm long, glumes awned; stamen 1 per flower; styles bifid; nutlets 0.4–0.5 × 0.3–0.4 mm, obovoid, biconvex, white to straw-colored, reticulated surface, rectangular cells horizontally compressed, apiculate apex.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, Margem do Rio Araguaia, na foz do Rio Sucupira, 06°17'57.9"S, 48°25'12.6"W, fl. and fr., 29.VIII.2018, *A.S.B Gil et al. 813* (MG).

Distributed in North America, Central America, and South America (Argentina, Brazil, French Guiana, Guyana, Paraguay, Peru, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AM, PA, RR) and Northeastern (CE, PB, PE, PI, RN) regions. In the SMA, it occurs in anthropized riparian forests.

8. *Fuirena* Rottb., Descr. Icon. Rar. Pl.: 70 (1773).

Genus with a cosmopolitan distribution, composed of 55 species (Govaerts *et al.* 2019). In Brazil, six species are recorded, with *F. lainzii* Luceño & M.Alves being endemic. Currently, only *F. umbellata* Rottb. is confirmed for the State of Pará. These plants occur in wet areas, with most being heliophile, growing in anthropized and swampy environments, lowland fields, *cerrado* s.str., palm groves, savannas, and aquatic vegetation (Schneider *et al*. 2020; Kral 1978).

8.1. *Fuirena umbellata* Rottb., Descr. Icon. Rar. Pl.: 70 (1773). Figs. 5i; 9f; 10d

Rhizomes knotty, horizontal; leaf-sheaths hirsute, ligules ciliolate, leaf-blades hirsute, margins ciliolate; scapes pentagonal in cross-section; inflorescences corymbiform, up to 2 orders, terminal and axillary, congested, glumes dorsally trinerved; 3 perianth membranous and petaloid pieces; nutlets 1.2–1.4 × 0.5–0.8 mm, rhomboid, trigonous, straw-colored, surface smooth.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental Araguaia, caminho para o Morro do Passat, 06°17'33.6"S 48°32'40.5"W, fl. and fr., 24.V.2019, *K.N.L. Alves et al. 258* (MG).

Distributed in Africa, Asia, Australia, North America, Central America, and South America (Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Venezuela, and Venezuelan Antilles). In Brazil, it is recorded for all states. In the SMA, it occurs in anthropized environments, on pastures and roadsides, always flooded.

9. *Hypolytrum* Pers., Syn. Pl. 1: 70 (1805).

Currently, 62 species are recognized for the genus, distributed in Asia, tropical islands of Oceania, Africa, and Tropical America (Stevens, continuously updated). In Brazil, 27 species are confirmed, of which 11 are endemic. Of these 27 species, 13 are recorded for the state of Pará. Its species inhabit humid and shady environments in tropical forests, being rare in open vegetation and riparian forests (Alves *et al.* 2003; Schneider *et al.* 2020).

9.1. *Hypolytrum longifolium* (Rich.) Nees, Linnaea 9: 288 (1834). *Scirpus longifolius* Rich., Actes Soc. Hist. Nat. Paris 1: 106 (1792). Figs. 5j; 9g; 10e

Rhizomes ascending; leaf-blades trinerved; scapes triangular in cross-section; inflorescences up to 3 orders, corymbiform, lax, terminal, spikelets in glomerules, glumes 2 persistent at the fruit base, keels and sometimes margins spinulose; nutlets 2.8–3 × 1.7–2 mm, obovoid, gray, rugulose in the lower portion, brown, dark brown maculae, upper portion smooth.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, Foz do Rio Sucupira, 06°18'01"S, 48°25'16"W, fl. and fr., *A.S.B. Gil et al. 932* (MG).

Distributed in North America (Mexico), Central America, and South America (Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AC, AM, AP, PA,

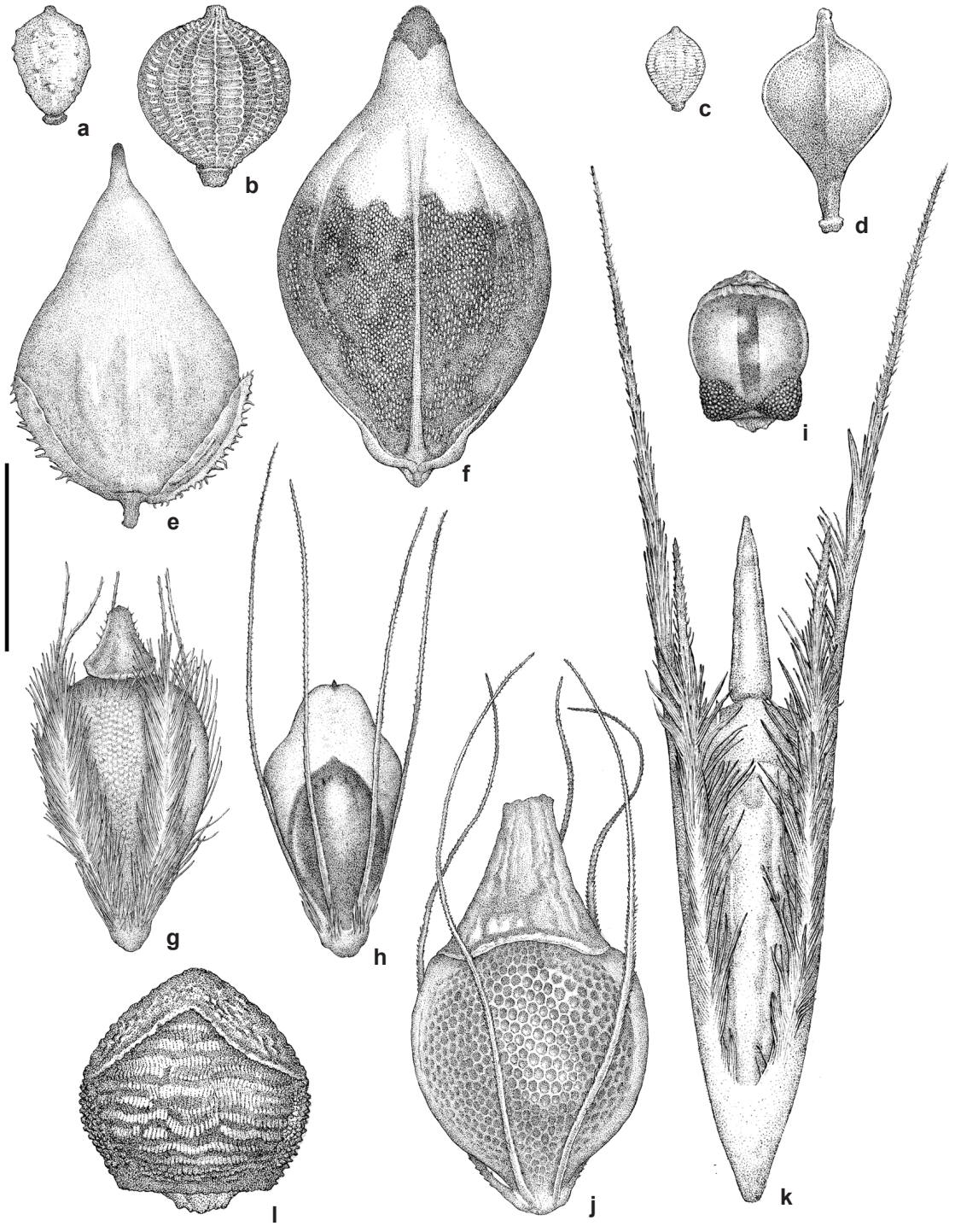

Figure 10 – a-l. Nutlets – a. *Fimbristylis aestivalis*; b. *F. dichotoma*; c. *F. vahlii*; d. *Fuirena umbellata*; e. *Hypolytrum longifolium*; f. *Lagenocarpus rigidus*; g. *Rhynchospora acanthoma*; h. *R. barbata*; i. *R. brevirostris*; j. *R. cephalotes*; k. *R. curvula*; l. *R. divaricata*. (a. *A. Gil et al. 836*; b. *L. Schneider et al. 268*; c. *A. Gil et al. 813*; d. *K.N.L. Alves et al. 258*; e. *A. Gil et al. 932*; f. *K.N.L. Alves et al. 136*; g. *K.N.L. Alves et al. 186*; h. *C.S. Nunes et al. 399*; i. *A. Gil et al. 914*; j. *C.S. Nunes et al. 445*; k. *K.N.L. Alves et al. 145*; l. *K.N.L. Alves et al. 203*). Scale bar: 1 mm.

RO, RR, TO), Northeastern (MA), and Central-Western (MG) regions. In the SMA, it occurs in gallery forests.

10. *Lagenocarpus* Nees, Linnaea 9: 304 (1834).

Genus with 30 species, occurring in Central and South America (Govaerts *et al.* 2019). In Brazil, 19 species are recorded, and 10 are endemic (Schneider *et al.* 2020). Four species are recorded for the state of Pará. The species of *Lagenocarpus* inhabit a wide variety of environments: *campinaranas*, fields (altitude, lowland, clean, rocky fields), *cerrado* s.str., gallery forests, *igapó* forests, *terra firme* forests, rainforests, palm groves, sandbanks, savannas, aquatic vegetation, and anthropized environments (Schneider *et al*. 2020). Its species are associated with drylands and rocky outcrops (Longhi-Wagner & Araújo 2014). In the SMA, one species were recorded.

10.1. *Lagenocarpus rigidus* (Kunth) Nees in C.F.P.von Martius & auct. suc. (eds.), *Fl. bras.* 2(1):167 (1842). *Scleria rigida* Kunth, Enum. Pl. 2: 355 (1837). Figs. 9h; 10f; 11a

Perennial, rhizomatous; scapes subtriangular to rotund in cross-section; inflorescences up to 2 orders, paniculiform, spikelets in fascicles or glomerules, terminal and axillary, male paracladia proximal and female paracladia distal, alternate; hypogynium scales 3, subtriangular, margins ciliolate, persistent on the fruit; nutlets 3–3.3 × (1.5–)1.7–2 mm, ovoid, dark brown, surface papillose, with 3 longitudinal grooves.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, acesso por fazenda ca. 32 km na estrada sentido São Geraldo-Marabá, 06°08’32”S, 48°34’18”W, fl. and fr., 25.VIII.2018, *C.S. Nunes et al. 382* (MG).

Distributed in North America (Cuba), Central America (Trinidad-Tobago), and South America (Bolivia, Brazil, Colombia, French Guiana, Guyana, Suriname, and Venezuela). In Brazil, it is recorded for all states. In the SMA, it occurs in clean wet fields and next to the *vereda* at the bottom of the valley.

11. *Rhynchospora* Vahl, Enum. Pl. Obs. 2: 229 (1805).

Cosmopolitan genus, composed of about 400 species worldwide (Silva-Filho *et al.* 2021; Strong 2006; Govaerts *et al.* 2019). Currently, 149 species are recorded for Brazil, 48 of them endemic. In the state of Pará, 40 species are recorded (Schneider *et al.* 2020). The species of the genus inhabit anthropized environments: Caatinga, *campinaranas*, fields, *cerrados* s.str., forests (riparian, gallery, *terra firme*, *várzea*, seasonal, and rain), palm groves, *restingas*, savannas, and aquatic vegetation (Schneider *et al.* 2020). In the SMA, 18 species were recorded.

11.1. *Rhynchospora acanthoma* A.C.Araújo & Longhi-Wagner, Kew Bull. 63: 303 (2008). Figs. 9i; 10g

Scapes quadrangular in cross-section; involucral bracts cymbiform, margins ciliate; inflorescences simple, capituliform, spikelets lanceoloid, 5–8 per inflorescence; perigonial bristles 5, antrorsely scabrid, exceeding the fruit length, plumose in all extension; nutlets (2.2–)2.6–2.7 × 1.1–1.3 mm, obovoid, biconvex, yellow, reticulated surface, spinulose at apex; stylopodium triangular, lobes at the base absent, margins spinulose.

Selected specimen examined: São Geraldo do Araguaia, Parque estadual da Serra dos Mártirios / andorinhas (PESAM), trilha entre as cachoeiras Três e Quatro Quedas, 06°06’07.2”S 48°20’03.8”W, 242 m, fl. and fr., 24.V.2019, *Oliveira A.A. 4595* (IAN).

Endemic to Brazil, distributed in the states of Pará and Tocantins. In the SMA, it occurs in *cerrado* s.str.

11.2. *Rhynchospora barbata* (Vahl) Kunth, Enum. Pl. 2: 290 (1837). *Schoenus barbatus* Vahl, Eclog. Amer. 2: 4 (1798). Figs. 9j; 10h; 11b

Inflorescences simple, capituliform, congested; perigonial bristles 4, antrorsely scabrid, plumose proximally; nutlets 1.4–1.8(–2) × 0.3–1 mm, obovoid, biconvex, dark brown, reticulated surface, margins winged, revolute, straw-colored; stylopodium pyramidal, margins winged.

Selected specimen examined: São Geraldo do Araguaia, Campo Cerrado, morro 3, 08°03’00.0”S, 50°10’12.0”W, fl. and fr., 10.II.1980, *M.NC. Bastos & M.R. Cordeiro 2084* (IAN).

Occurs in North America, Central America, and South America (Bolivia, Brazil, Colombia, French Guianas, Guyana, Suriname, Venezuela, and Venezuelan Antilles). In Brazil, it is distributed in the Northern (AM, AP, PA, RO, RR, TO), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (DF, GO, MT), and Southeastern (MG) regions. In the SMA, it occurs in *campo sujo*.

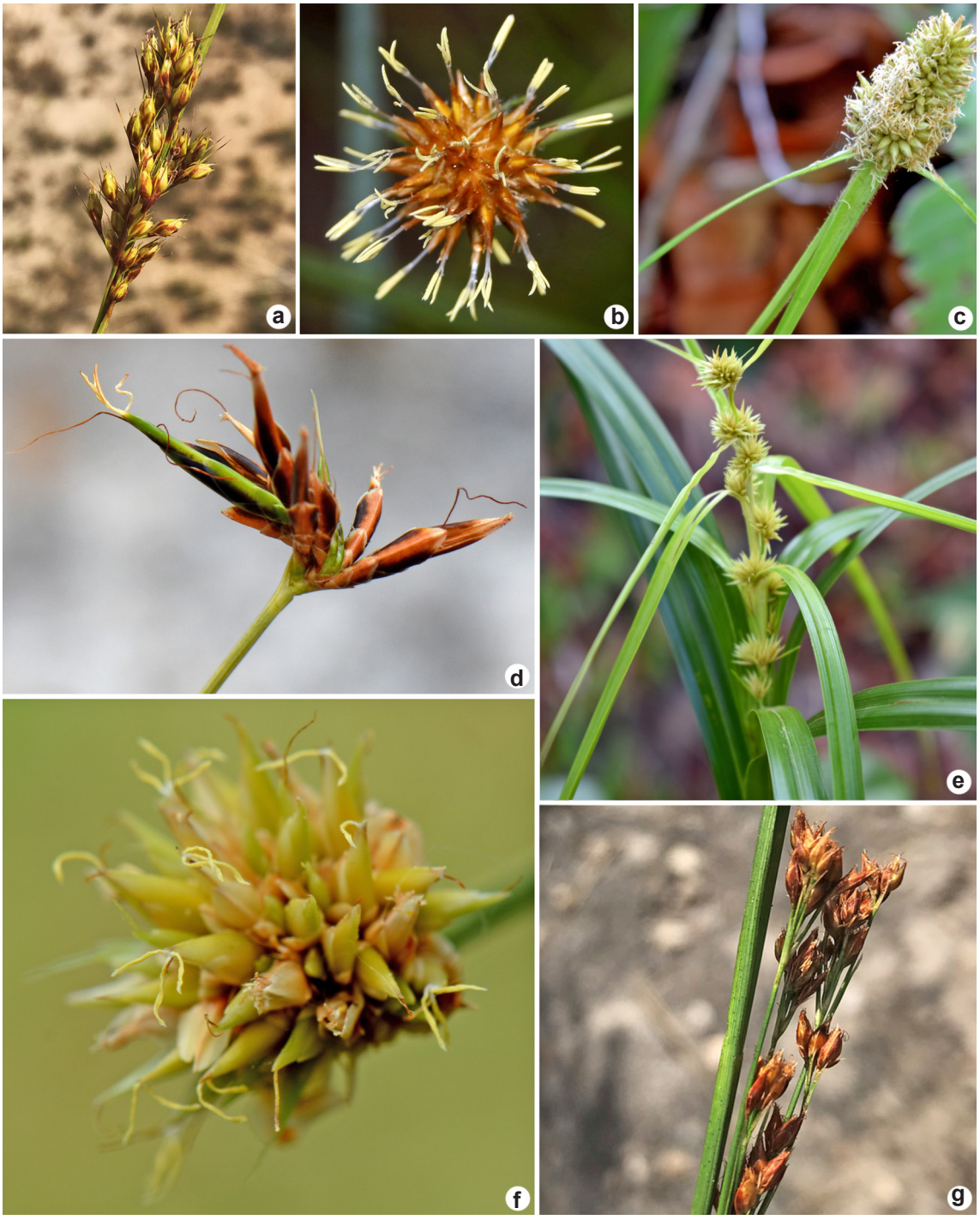

Figure 11 – a-g. Field images, inflorescences – a. *Lagenocarpus rigidus*; b. *Rhynchospora barbata*; c. *R. cephalotes*; d. *R. curvula*; e. *R. exaltata*; f. *R. globosa*; g. *R. rugosa*.

11.3. *Rhynchospora brevirostris* Griseb., Cat. Pl. Cub.: 246 (1866). Figs. 9k; 10i

Inflorescences up to 3 orders, corymbiform, spikelets in fascicles; nutlets 1.1–1.4 × 0.8–1.1 mm, biconvex, white to gray, often grey medially, slightly reticulated surface, base short-stipitate, 2 papery protuberances on sides; stylopodium pyramidal, not continuous with the fruit.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, estrada para a Vila Santa Cruz dos Martírios, Mirante, 06°14'17"S, 48°27'55"W, fl. and fr., 23.V.2019, *A.S.B. Gil et al. 914* (MG).

Distributed in Africa, North America, Central America, and South America (Bolivia, Brazil, Colombia, French Guiana, Guyana, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AM, PA, TO), Northeastern (BA, PE, PI, MA), Central-Western (DF, GO, MT, MS), and Southeastern (MG, SP) regions. In the SMA, it occurs in seasonally flooded *campo limpo*.

11.4. *Rhynchospora cephalotes* (L.) Vahl, Enum. Pl. Obs. 2: 237 (1805). *Scirpus cephalotes* L. Species Plantarum, Editio Secunda 1: 76 (1762). Figs. 9l; 10j; 11c

Inflorescences simple, paniculiform, congested, oblongoid to ovoid; glumes coriaceous; perigonial bristles 6, antrorsely scabrid, equaling or exceeding the fruit length; nutlets (1.3–)2.1–3.5(–4) × 1.5–2 mm, obovoid, biconvex, 2-sided, straw-colored, reticulated surface; stylopodium pyramidal, lanceolate.

Selected specimen examined: São Geraldo do Araguaia, Serra dos Martírios/Andorinhas, ramal para cachoeira 3 quedas, 06°15'24.0"S, 38°18'00.7"W, 24.V.2019, fl. and fr., *M.G.C. Souza 677* (HBRA).

Distributed in North America, Central America, and South America (Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AC, AM, AP, PA, RO, RR, TO), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (DF, GO, MS, MT), and Southeastern (MG) regions. In the SMA, it occurs in gallery forests and *campo sujo*.

11.5. *Rhynchospora ciliata* (Vahl) Kük., Bot. Jahrb. Syst., 56(125): 16 (1921). *Dichromena ciliata* Vahl., Enum. Pl. 2: 240 (1805). Fig. 9m-n

Herbs cespitose, rhizomes short (ca. 5 mm long); involucral bracts white basally (adaxial); inflorescences simple, capituliform, glumes white; perigonial bristles absent; nutlets 1.3–1.9 × 1–1.3 mm, biconvex, broadly obovoid to subglobose, brown to dark brown, rarelly dark in central, transversely rugulose surface, isodiametric cells, rarely visible along the margins; stylopodium pyramidal, base not lobed.

Selected specimen examined: Área de Proteção Ambiental de São Geraldo do Araguaia, estrada para a Cachoeira Três Quedas, 06°10'25.8"S, 48°35'23.7"W, fl. and fr., 24.V.2019, *K.N.L. Alves et al. 169* (MG).

Distributed in North America (Mexico), Central America, and South America (Argentina, Bolivia, Brazil, French Guiana, Guyana, Paraguay, Suriname, and Venezuela). In Brazil, it is recorded for all states. In the SMA, it occurs in anthropized environments with wet soils.

11.6. *Rhynchospora curvula* Griseb., Fl. Brit. W. I.: 574 (1864). Figs. 9o; 10k; 11d

Leaf-blades rigid, coriaceous, recurved; inflorescences simple, capituliform, spikelets lanceoloid, glumes 8–9, green, margins darkened to brown; perigonial bristles 5–6, plumose, two longer; nutlets 4.1–4.2 × 0.7–1.1 mm (immature), biconvex, punctuate surface, margins winged; stylopodium pyramidal elongated.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, campina ca. de 500 m a leste da Casa de Pedra, 06°09'05"S, 48°32'48"W, fl. and fr., *K.N.L. Alves et al. 145* (MG).

Distributed in Central America, and South America (Brazil, Colombia, French Guiana, Guyana, Suriname, and Venezuela). In Brazil, it is distributed only in the Piauí state. The species was first recorded for the state of Pará by Silva *et al.* (2021), growing in *campinas* and amazonian savannas in Cametá, northeastern Pará. In the SMA, it occurs in seasonally flooded *campo limpo*.

11.7. *Rhynchospora divaricata* (Ham.) M.T.Strong, Contr. U. S. Natl. Herb. 52: 343-344 (2005). *Fimbristylis divaricata* Ham., Prodr. Pl. Ind. Occid. 14 (1825). Figs. 9p; 10l

Scapes, leaf-blades and inflorescence rachis pilose; inflorescences terminal and axillary, up to 3 orders, paniculiform, spikelets corymbiform, ascending to retroflexed rachis; nutlets 1–1.5 × 1.1–1.6 mm, biconvex, yellow to darkened at the maturity, lustrous, surface transversely rugose, base short-stipitate; stylopodium lunate, bilobed base.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, trilha da Casa de Pedra, rumo a cachoeira quarta queda, 06°09'48"S, 48°33'19"W, fl. and fr., 6.VII.2018, *L. Schneider et al. 263* (MG).

Distributed in Central America, and South America (Bolivia, Brazil, Colombia, French Guiana, Guyana, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AM, AP, PA), Central-Western (GO, MT), and Southeastern (MT) regions. In the SMA, it occurs in gallery forests and anthropized environments (roadsides).

11.8. ***Rhynchospora exaltata*** Kunth, Enum. Pl. 2: 291 (1837). *Dichromena exaltata* (Kunth) J.F.Macbr., Publ. Field Columb. Mus., Bot. Ser. 8: 113 (1930). Figs. 9q; 11e; 12a

Rhizomes robust, scaly; scapes triangular in cross-section; inflorescences terminal and axillary, up to 2 orders, 3–11 series of subsessile spikelets glomerules, interspaced, sometimes twinned; spikelets linear-lanceoloid; nutlets 3–4.3 × 1–1.9 mm, obovoid, biconvex, straw-colored to brown, surface transversely rugulose to smooth; stylopodium triangular elongated, falciform, white, foveolate surface.

Selected specimen examined: São Geraldo do Araguaia, Serra das Andorinhas, margem do Rio Sucupira, fl., 13.VI.1995, 111 m, *M.N.C. Bastos & M.R. Cordeiro 1907* (IAN).

Distributed in North America (Cuba), Central America, and South America (Bolivia, Brazil, Colombia, Guyana, Paraguay, Peru, and Venezuela). In Brazil, it is recorded for almost all states, except for Rio Grande do Sul. In the SMA, it occurs in *campo sujo*.

11.9. ***Rhynchospora filiformis*** Vahl, Enum. Pl. Obs. 2: 232 (1805). Figs. 12b; 13a

Ligules hyaline; inflorescences terminal and axillary, up to 3 orders, paniculiform, third order corymbiform, spikelets lanceoloid, ochraceous; nutlets 1.6–2.7 × 1–1.5 mm, obovoid, biconvex, brown, sometimes median gray, surface reticulated at the central portion, papillose at the margins, stipitate base; stylopodium narrow pyramidal, not continuous with the fruit length.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental São Geraldo do Araguaia, balneário Três Quedas, no caminho para a Quarta Queda, 06°10’19.2”S, 48°33’39.6”W, fl. and fr., 24.V.2019, *K.N.L. Alves et al. 106* (MG).

Distributed in North America, Central America, and South America (Bolivia, Brazil, Colombia, French Guiana, Guyana, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (PA, RR, TO), Northeastern (AL, BA, PB, PE, PI, SE), Central-Western (GO, MT), and Southeastern (MG) regions. In the SMA, it occurs in *campo sujo*, seasonally flooded *campo limpo* next to *veredas*, and in anthropized environments along trails.

11.10. ***Rhynchospora globosa*** (Kunth) Roem. & Schult., Syst. Veg., ed. 15 bis 2: 89 (1817). *Chaetospora globosa* Kunth, Nov. Gen. Sp. 1: 135 (1816). Figs. 11f; 12c; 13b

Involucral bracts rigid, coriaceous to cartilaginous, yellowish; inflorescences simple, capituliform, congested, spikelets lanceoloid; perigonial bristles 5–6, densely plumose, not exceeding the fruit length; nutlets 2.2–3 × 0.8–1.3 mm, obovoid, biconvex, straw-colored to light brown, finely reticulated surface; stylopodium pyramidal, elongated.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, margem do Rio Araguaia, ca. 15 km de São Geraldo do Araguaia sentido norte, 06°21’32”S, 48°24’55”W, 26.VIII.2018, fl. and fr., *K.N.L. Alves et al. 102* (MG).

Distributed in North America, Central America, and South America (Bolivia, Brazil, Colombia, French Guiana, Guyana, Paraguay, Peru, Suriname, and Venezuela). In Brazil, it is recorded for all states. In the SMA, it occurs in *campo limpo*.

11.11. ***Rhynchospora hirsuta*** (Vahl) Vahl, Enum. Pl. Obs. 2: 231 (1805). *Schoenus hirsutus* Vahl, Eclog. Amer. 1: 6 (1797). Figs. 12d, 13c

Leaf-sheaths, scapes, leaf-blades and bracts hirsute; inflorescences terminal and axillary, up to 3 orders, paniculiform, third order corymbiform, hirsute rachis, glumes vinaceous, apex awned, ciliate; nutlets 0.7–1 × 0.5–0.7 mm, globose, 2-sided, light brown to gray, sometimes green, surface foveolate, with irregular depressions; stylopodium pyramidal horizontally compressed.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, Fazenda, 06°18’14.6”S, 48°27’47.6”W, fl. and fr., 27.VIII.2018, *C.S. Nunes et al. 397* (MG).

Distributed in North America, Central America, and South America (Brazil, Colombia, French Guiana, Guyana, Suriname, and Venezuela). In Brazil, it is distributed in the Northern region (AC, AM, AP, PA, RO, RR), Northeastern region (PI), and Central-Western regions (DF, MT). In the SMA, it occurs in *campo sujo*.

11.12. ***Rhynchospora junciformis*** (Kunth) Boeckeler, Flora 41: 646 (1858). *Dichromena junciformis* Kunth, Enum. Pl. 2: 279 (1837). Figs. 12e; 13d

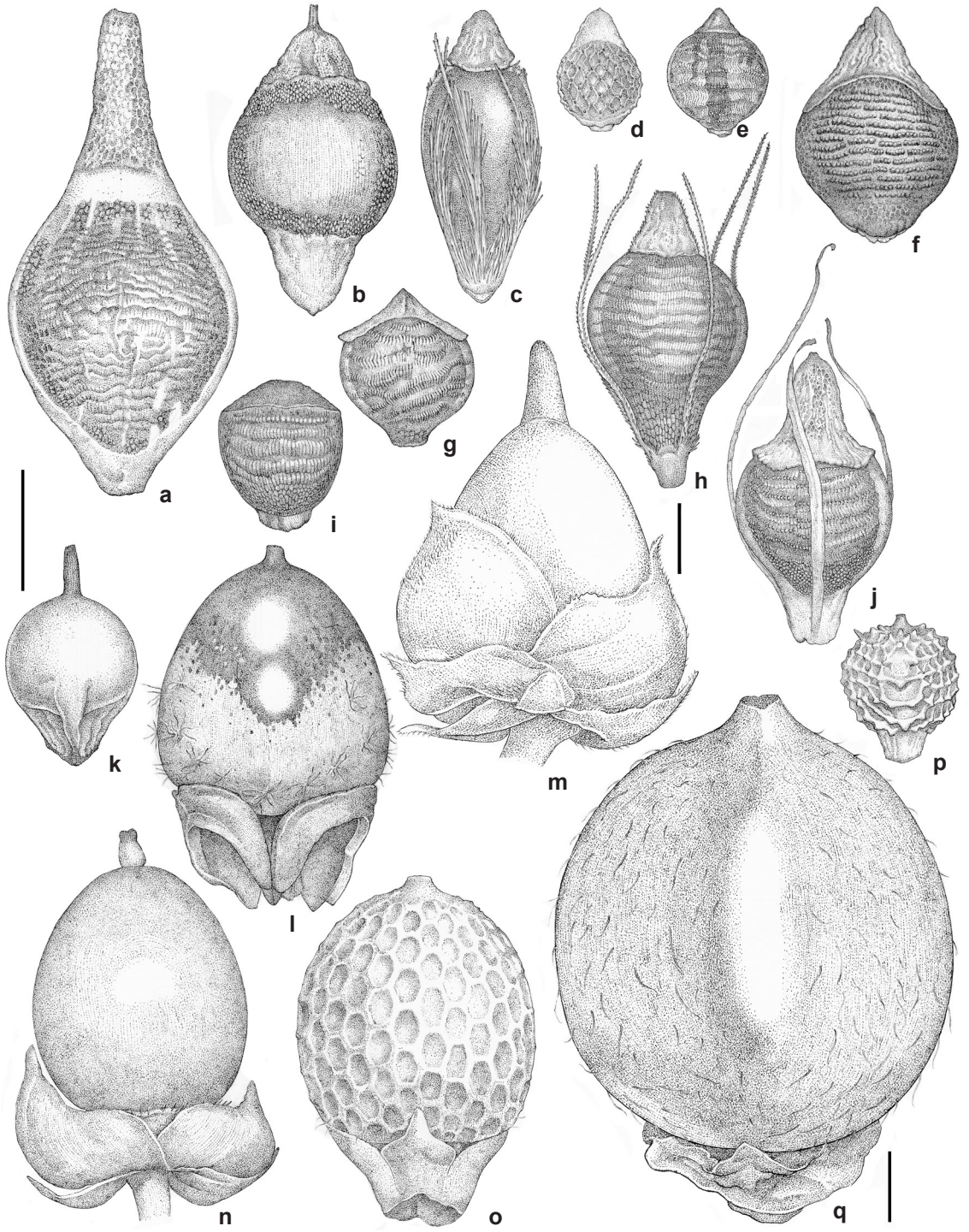

Figure 12 – a-q. Nutlets – a. *Rhynchospora exaltata*; b. *R. filiformis*; c. *R. globosa*; d. *R. hirsuta*; e. *R. junciformis*; f. *R. nervosa*; g. *R. puber*; h. *R. rugosa*; i. *R. spruceana*; j. *R. velutina* (the asterisk denotes the stamen filaments); k. *Scleria distans*; l. *S. gaertneri*; m. *S. macrophylla*; n. *S. microcarpa*; o. *S. reticularis*; p. *S. tenella*; q. *S. violacea*. (a. *K.N.L. Alves et al. 47*; b. *K.N.L. Alves et al. 190*; c. *C.S. Nunes et al. 380*; d. *A.S.B. Gil et al. 975*; e. *C.S. Nunes et al. 411*; f. *K.N.L. Alves et al. 219*; g. *A.S.B. Gil et al. 931*; h. *K.N.L. Alves et al. 224*; i. *A.J. Fernandes-Junior et al. 699*; j. *C.S. Nunes et al. 383*; k. *K.N.L. Alves et al. 221*; l. *K.N.L. Alves et al. 36*; m. *K.N.L. Alves et al. 211*; n. *N.P. Pinto et al. 19*; o. *A.J. Fernandes-Júnior et al. 696*; p. *A.S.B. Gil et al. 909*; q. *C.S.Nunes et al. 418*). Scale bar: 1 mm.

Herbs shorter (up to 10 cm long); leaf-blades canaliculate; inflorescences terminal and axillary, up to 3 orders, corymbiform, spikelets lanceoloid, in fascicles, glumes membranous, brown, deciduous; nutlets 1–1.4 × 0.7–0.9 mm, obovoid, biconvex, white to gray, often darkened in the central portion, transversely rugulose surface, base short-stipitate; stylopodium narrow pyramidal.
Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, Morro do Passat, 06°16'58.9"S, 48°32'32.9"W, fl. and fr., 24.V.2019, *K.N.L. Alves et al. 262* (MG).

Distributed in South America (Brazil, French Guiana, Guyana, Suriname, Venezuela). In Brazil, it is distributed in the Northeastern (BA, MA, PI), Central-Western (GO, MS, MT), Southeastern (MG, SP), and Southern (PR, RS, SC) regions. The species was first cited for the state of Pará and the Northern region by Silva *et al.* (2021), growing *campinas* and amazonian savannas of Cametá, northeastern Pará. In the SMA, it occurs in seasonally flooded *campo limpo*, next to *veredas*.

11.13. *Rhynchospora nervosa* (Vahl) Boeck., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn ser. 3, 1: 143 (1869). *Dichromena nervosa* Vahl, Enum. Pl. 2:241 (1805). Fig. 12f; 13e

Herbs solitary, long rhizomes (1–3 cm long), involucral bracts white (abaxial basal third); inflorescences simple, capituliform, glumes white; perigonial bristles absent; nutlets 1.9–2.2 × 1.3–1.8 mm, biconvex, broadly obovoid to subglobose, brown to darkened, transversely rugulose, cells often isodiametric or rectangular; stylopodium pyramidal, base whole, margins unarmed.
Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, Mirante, 06°14'17"S, 48°27'55"W, fl. and fr., 24.V.2019, *K.N.L. Alves et al. 219* (MG).

Occurs in North America, Central America, and South America (Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Venezuela, and Venezuelan Antilles). In Brazil, it is recorded for almost all states, except for Rio Grande do Sul. In the SMA, it occurs in flooded *campo limpo*, next to *veredas*.

11.14. *Rhynchospora puber* (Vahl) Boeckeler, Linnaea 37: 528 (1873). *Dichromena pubera* Vahl, Enum. Pl. Obs. 2: 241 (1805). Figs. 12g; 13f

Involucral bracts proximally white (adaxial and abaxial), often without white maculae; inflorescences simple, capituliform, spikelets ovoid, 3.5–6 mm long, glumes white or cream-colored; nutlets 1–1.3 × 0.8–1.2 mm, obovoid, biconvex, white to brown, surface transversely rugose; stylopodium depressed pyramidal, bilobed base.
Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, 32 km na estrada sentido São Geraldo-Marabá, trilha dos Romeiros, 06°8'42"S, 48°34'10"W, fl. and fr., 26.V.2019, *L. Schneider et al. 277* (MG).

Distributed in Central America, and South America (Bolivia, Brazil, Colombia, French Guiana, Guyana, Peru, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AC, AM, AP, PA, RO, RR, TO), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (DF, GO, MS, MT), Southeastern (ES, MG, RJ, SP), and Southern (PR) regions. In the SMA, it occurs in *campo sujo*.

11.15. *Rhynchospora rugosa* (Vahl) Gale, Rhodora 46: 275 (1944). *Schoenus rugosus* Vahl, Eclogae Americanae 2: 5 (1798). Figs. 11g; 12h; 13g

Inflorescences terminal and axillary, up to 3 orders, paniculiform, third order corymbiform; ochraceous glumes, membranous; perigonial bristles 6, retrorsely scabrid; nutlets 1.8–2.6 × 0.9–1.5 mm, ovoid, biconvex, straw-colored to brown, surface transversely rugulose, sometimes reticulate at the base; stylopodium 0.6–0.8 mm long, narrowly pyramidal, margins spinulose.
Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, trilha da Cachoeira Quarta Queda, 06°10'15.6"S, 48°33'36.7"W, fl. and fr., 24.V.2019, *K.N.L. Alves et al. 200* (MG).

Distributed in the tropical, and subtropical regions of the world: Africa, Asia, Australia, North America, Central America, and South America (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela, and Venezuelan Antilles). In Brazil, it is recorded for all states. In the SMA, it occurs in *campo sujo* next to gallery forests.

11.16. *Rhynchospora spruceana* C.B.Clarke, Bull. Misc. Inform. Kew, Addit. Ser. 8: 40 (1908). Figs. 12i; 13h

Longer rhizome internodes; scapes longer (50–67 cm long); inflorescences terminal and axillary, up to 3 orders, paniculiform, third order corymbiform, ovoid to lanceoloid, ochraceous,

Figure 13 – a-v. Nutlets and inflorescences – a. *Rhynchospora filiformis* - inflorescence; b. *R. globosa* - inflorescence; c. *R. hirsuta* - inflorescence; d. *R. junciformis* - fascicles; e. *R. nervosa* - inflorescence; f. *R. puber* - inflorescence; g. *R. rugosa* - inflorescence; h. *R. spruceana* - inflorescence; i. *R. tenella* - nutlet; j. *R. tenella* - inflorescence; k. *R. velutina* - inflorescence; l. *Scleria distans* - inflorescence; m. *S. flagellum-nigrorum* - nutlet; n. *S. flagellum-nigrorum* - inflorescence; o. *S. gaertneri* - inflorescence; p. *S. macrophylla* - inflorescence; q. *S. martii* - nutlet; r. *S. martii* - inflorescence; s. *S. microcarpa* - inflorescence; t. *S. reticularis* - inflorescence; u. *S. tenella* - inflorescence; v. *S. violacea* - inflorescence. (a. *K.N.L. Alves et al. 190*; b. *C.S. Nunes et al. 380*; c. *A.S.B. Gil et al. 975*; d. *C.S. Nunes et al. 411*; e. *K.N.L. Alves et al. 219*; f. *A.S.B. Gil et al. 931*; g. *K.N.L. Alves et al. 224*; h. *A.J. Fernandes-Júnior 699*; i-j. *K.N.L. Alves et al. 188*; k. *C.S. Nunes et al. 383*; l. *K.N.L. Alves et al. 221*; m-n. *N.P. Pinto et al. 45*; o. *K.N.L. Alves et al. 36*; p. *K.N.L. Alves et al. 211*; q-r. *C.S. Nunes et al. 442*; s. *N.P. Pinto et al. 19*; t. *A.J. Fernandes-Júnior et al. 969*; u. *K.N.L. Alves et al. 144*; v. *C.S. Nunes et al. 418*). Scale bar: i, m, q = 1 mm; a, b, c, d, e, f, g, h, j, k, l, n, o, p, r, s, t, u, v = 1 cm.

glumes awned; nutlets 1.3–1.7 × 1–1.2(–1.6) mm, obovoid, biconvex, straw-colored to dark brown, transversely rugulose surface, papillose at the base and along the margins, base short-stipitate; stylopodium depressed pyramidal, base bilobed.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, Morro do Passat, 06°16'58.9"S, 48°32'33.0"W, fl. and fr., 29.VIII.2018, *A.J. Fernandes-Júnior et al. 694* (MG).

Distributed in South America (Bolivia, Brazil, French Guiana, Guyana, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (PA, RR, PI e TO), Northeastern (BA), Central-Western (MT, MS, DF, GO), Southeastern (MG, SP), and Southern (PR) regions. In the SMA, it occurs in *veredas*.

11.17. ***Rhynchospora tenella*** (Nees) Boeckeler, Linnaea 37: 595 (1873). *Haloschoenus tenellus* Nees in C.F.P.von Martius & auct. suc. (eds.), *Fl. bras.* 2(1): 123 (1842). Fig. 13i-j

Inflorescences up to 3 orders, paniculiform, rachilla flexuose, strongly articulated between the glumes (in "zig-zag"); glumes translucent, brown to vinaceous, apex mucronate to awned, scabrid; styles undivided; nutlets 0.6–0.8 × 0.6–0.7 mm, globose, biconvex, straw-colored to light brown, gray to darkened longitudinal bands, transversely rugulose surface; stylopodium pyramidal, depressed to discoid.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, margem do Rio Araguaia, na foz do Rio Sucupira, 06°18'00"S, 48°25'21"W, fl. and fr., 25.V.2019, *A.S.B. Gil et al. 930* (MG).

Distributed in South America (Belize, Bolivia, Brazil, Colombia, French Guiana, Guyana, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (TO), Northeastern (PI), Central-Western (DF, MT), Southeastern (ES, MG, RJ), and Southern (PR, RS, SC) regions. This is the first record of *R. tenella* for the state of Pará. In the SMA, it occurs in *cerrado* s.str. and *campo sujo*.

11.18. ***Rhynchospora velutina*** (Kunth) Boeckeler, Vidensk. Meddel. Naturhist. Foren. Kjøbenhavn 1869: 149 (1869). *Dichromena velutina* Kunth, Enum. Pl. 2: 282 (1837). Figs. 12j; 13k

Inflorescences up to 3 orders, paniculiform, third order corymbiform, glumes reddish-brown; nutlets 2.3–2.7(–3) × 1.2–1.6 mm, obovoid, biconvex, straw-colored to dark brown, transversely rugose surface, base and margins reticulated, long-stipitate base; stylopodium pyramidal, lanceolate, elongated, white, bilobed base.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, Mirante, 06°14'17.3"S, 48°27'54.4"W, fl. and fr., 24.V.2019, *K.N.L. Alves et al. 228* (MG).

Distributed in North America, Central America, and South America (Argentina, Bolivia, Brazil, Colombia, French Guiana, Guyana, Paraguay, Suriname, Uruguay, and Venezuela). In Brazil, it is distributed in the Northern (AM, AP, RR, TO), Northeastern (BA, PE), Central-Western (DF, GO, MS, MT), Southeastern (ES, MG, RJ, SP), and Southern (PR, RS, SC) regions. This is the first record for the species in the state of Pará. In the SMA, it occurs in *veredas* and *campo sujo*.

12. ***Scleria*** P.J.Bergius, Kongl. Vetensk. Acad. Handl. 26: 142 (1765).

Genus composed of about 260 species, distributed from the tropical and subtropical regions of the world to Northern America (Goetghebeur 1998; Govaerts *et al.* 2019). In Brazil, 72 species are recorded, of which 18 are endemic. Currently, 26 species of Scleria are recorded for the State of Pará (Schneider *et al.* 2020). Its species inhabit shaded forests, open areas, and dry weather (Affonso *et al*. 2015). In the SMA, nine species were recorded.

12.1. ***Scleria distans*** Poir., in J.B.A.M.de Lamarck, Encycl. 7: 4 (1806). Figs. 12k; 13l

Rhizomes horizontal, long internodes; scapes, leaf-sheaths and leaf-blades pubescent to glabrescent; inflorescences up to 2 orders, spiciform, spikelets in retroflexed glomerules, androgynous; glumes pubescent; nutlets 1.5–1.8 × 1–1.5 mm, globose, white to gray, smooth surface, apiculate apex; hypogynium reduced.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, Mirante, 06°14'16.4"S, 48°27'55.0"W, fl. and fr., 24.V.2019, *K.N.L. Alves et al. 221* (MG).

Distributed in Africa, Madagascar, North America, Central America, and South America (Argentina, Brazil, Bolivia, Colombia, Ecuador, French Guiana, Guyana, Honduras, Paraguay, Peru, Suriname, Uruguay, Venezuela, and Venezuelan Islands). In Brazil, it is distributed in the Northern (AM, PA, RR, TO), Northeastern (AL, BA, CE, PB, PE, PI, RN, SE), Central-Western (DF, GO, MS, MT), Southeastern (ES, MG, RJ, SP), and

Southern (PR, RS, SC) regions. In the SMA, it occurs in wet *campo limpo*, next to *veredas* dominated by *Scleria reticularis* Michx. and *S. tenella* Kunth.

12.2. *Scleria flagellum-nigrorum* P.J.Bergius, Kongl. Vetensk. Acad. Handl.26: 144, pl. 4-5. 1765. Fig. 13m-n

Herbs climbing; scapes and leaf-blades strongly scabrid; inflorescences terminal and axillary, up to 2 orders, paniculiform; spikelets subandrogynous and staminate; nutlets 4–4.5 × 3–3.2 mm, globose, white to brown, darkened maculae, smooth surface, glabrescent; hypogynium developed, trilobed, semirotund lobes.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental São Geraldo do Araguaia, quintal florestal nas proximidades do rio, 06°21'30.5"S, 48°24'53.3"W, fl. and fr., 25.V.2019, *N.P. Pinto et al. 45* (MG).

Distributed in North America (Mexico), Central America, and South America (Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela). In Brazil, it is distributed in the Northern region (AC, AM, RR, AP, PA, RO). In the SMA, it occurs in anthropized environments, along trails, and in the vicinity of old houses.

12.3. *Scleria gaertneri* Raddi, Atti Reale Accad. Lucchese Sci. 2: 331 (1823). Figs. 12l; 13o

Leaf-sheaths winged, inflorescences terminal and axillary, up to 2 orders, paniculiform, spikelets subandrogynous and staminate; hypogynium developed, trilobed, semirotund lobes; nutlets 2–3.4 × 1.6–2.4 mm, globose, purple to darkened, sometimes white, smooth surface, pilose.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, trilha para a Casa de Pedra, 06°08'40.5"S, 48°34'39.2"W, fl. and fr., 4.VII.2018, *K.N.L. Alves et al. 36* (MG).

Distributed in Africa, North America, Central America, and South America (Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Venezuela, and Venezuelan Antilles). In Brazil, it is recorded for all states. In the SMA, it occurs in anthropized environments, like trails and near old houses.

12.4. *Scleria macrophylla* J.Presl & C.Presl, Reliq. Haenk. 1: 200 (1828). Figs. 12m; 13p; 14a-c

Rhizomes robust, knotty; leaf-sheaths winged, scabrid, leaf-blades apex pseudopremorse; inflorescences terminal and axillary, up to 3 orders, paniculiform, spikelets subandrogynous and staminate; nutlets 4–7 × 3.5–5 mm, globose, white, smooth surface; stylopodium persistent; hypogynium developed, trilobed, cupule persistent, ciliolate margins.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, estrada para a trilha da Biodiversidade (Ninho da Harpia), 06°18'01.8"S, 48°27'39.5"W, fl. and fr., 3.VII.2018, *L. Schneider et al. 226* (MG).

Distributed in North America, Central America, and South America (Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (PA, RO, RR, TO), Northeastern (BA, MA, PE, PI), Central-Western (DF, GO, MS, MT), and Southeastern (MG) regions. In the SMA, it occurs in anthropized environments, next to pastures and roadsides.

12.5. *Scleria martii* (Nees) Steud., Syn. Pl. Glumac. 2: 171 (1855). *Hymenolytrum martii* Nees in C.F.P.von Martius & auct. suc. (eds.), *Fl. bras.* 2(1): 176 (1842). Figs. 13q-r; 14d

Leaf-sheaths winged, contraligule apex cuneate to rounded, membranous appendix developed; scapes angles retrorsely scabrid; inflorescences terminal, up to 2 orders, paniculiform, pyramidal to subpyramidal, purplish-brown, spikelets pistillate and staminate; nutlets 2.4–3.8 × 1.8–2.4 mm, ovoid, purple, alveolated surface, pubescent, apex apiculate; hypogynium developed, trilobed.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, ca. 23 km sentido São Geraldo à Marabá, Parque das águas (Cachoeira do Paulinho), 06°12'41.1"S, 48°35'36.4"W, fl. and fr., 30.VIII.2018, *C.S. Nunes et al. 442* (MG).

Distributed in South America (Bolivia, Brazil, Colombia, Ecuador, French Guiana, Peru, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AM, AP, PA, RO, RR, TO), Northeastern (BA, MA, PI), Central-Western (GO, MS, MT), and Southeastern (MG) regions. In the SMA, it occurs in *campo sujo*, riparian forests, and gallery forests.

12.6. *Scleria microcarpa* Nees *ex* Kunth, Enum. Pl. 2: 341 (1837). Figs. 12n; 13s

Leaf-sheaths winged, scabrid, leaf-blades apex pseudopremorse; inflorescences terminal

Figure 14 – a-c. *Scleria macrophylla* – a. counter-ligule; b. pseudopremorse leaf apex; c. inflorescence. d. *S. martii* – inflorescence. e. *S. distans* – spiciform inflorescence.

and axillary, up to 2 orders, paniculiform, spikelets subandrogynous and staminate; nutlets 2.2–3 × 1.7–2 mm, ovoid, green *in vivo*, white when dehydrated, lustrous and smooth surface; stylopodium at the apex of the fruit; hypogynium developed, trilobed, cupule persistent, margins ciliate, cilia white.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, 06°20'49.2"S, 48°25'48"W, fl. and fr., 25.V.2019, *N.P. Pinto et al. 19* (MG).

Distributed in North America, Central America, and South America (Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AC, AM, AP, PA, RO, RR, TO), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (DF,

GO, MS, MT), Southeastern (ES, MG, RJ, SP), and Southern (PR, SC) regions. In the SMA, it occurs in anthropized riparian forests, dominating herbaceous plants.

12.7. *Scleria reticularis* Michx., Fl. Bor.-Amer. 2: 167 (1803). Figs. 12o; 13t

Leaf-sheaths winged, purple base; contraligules apex truncate to rounded, margins ciliate, membranous appendix inconspicuous; inflorescences terminal and axillary, simple, paniculiform, spikelets subandrogynous to staminate; nutlets 2.5–2.9 × 1.8–2.1 mm, ovoid, white, sometimes with gray median brands, surface foveolate; hypogynium developed, trilobed, oblong lobes.

Selected specimen examined: São Geraldo do Araguaia, Parque Estadual Serra dos Martírios-Andorinhas, estrada para a Vila Santa Cruz dos Martírios, Mirante, 06°09'05"S, 48°32'48"W, fl. and fr., 26.VIII.2018, *K.N.L. Alves et al. 143* (MG).

Distributed in Southern Africa, North America, Central America, and South America (Bolivia, Brazil, Ecuador, Guyana, and Venezuela). In Brazil, it is distributed in the Northern (PA, RR), Northeastern (AL, BA, CE, MA, PB, PE, PI, RN, SE), Central-Western (GO), and Southeastern (SP) regions. In the SMA, it occurs in *campo limpo* next to *veredas*.

12.8. *Scleria tenella* Kunth, Enum. Pl. 2: 353 (1837). Figs. 12p; 13u

Contraligules apex cuneate, membranous appendix inconspicuous; inflorescences terminal, up to 3 orders, spiciform, sometimes branched, spikelets in glomerules, ascending, androgynous; nutlets 1.2–1.5 × 1–1.5 mm, white, often with gray median brands, subtrigonous, surface crested-tuberculated, base with 4–5 pores on each side; hypogynium reduced.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental São Geraldo do Araguaia, margem do Rio Araguaia, ca. 30 km de São Geraldo do Araguaia sentido norte, 06°15'42.9"S, 48°25'18.2"W, fl. and fr., *K.N.L. Alves et al. 144* (MG).

Distributed in North America, Central America, and South America (Bolivia, Brazil, Colombia, French Guiana, Guyana, Suriname, and Venezuela). In Brazil, it is distributed in the Northern (AC, AM, AP, PA, RO, RR, TO), Northeastern (BA, MA, PI, SE), Central-Western (DF, GO, MT), Southeastern (MG, SP), and Southern (PR) regions. In the SMA, it occurs in *campo limpo* next to *veredas* and in *campo sujo*.

12.9. *Scleria violacea* Pilg., Bot. Jahrb. Syst. 30: 145 (1902). Figs. 12q; 13v

Perennial climbing habit, rhizomatous; leaf-sheaths winged, scabrid, contraligule apex cuneate to rounded, membranous appendix developed, ligule formed by bands of hyaline trichomes; inflorescences terminal and axillary, up to 3 orders, paniculiform, subpyramidal, spikelets pistillate and staminate; nutlets 2.8–4.1 × 2.6–3 mm, globose, subtrigonous, cream-colored to dark brown, or gray, lustrous, apparently smooth and pilose surface, apiculate apex; hypogynium developed, trilobed.

Selected specimen examined: São Geraldo do Araguaia, Área de Proteção Ambiental de São Geraldo do Araguaia, fazenda na estrada para a Vila Santa Cruz dos Martírios, 06°18'14.6"S, 48°27'47.6"W, fl. and fr., 27.VIII.2018, *C.S. Nunes et al. 418* (MG).

Distributed in French Guyana and Brazil. In Brazil, it is distributed in the Northern (PA, TO), Northeastern (BA, MA, PI), and Central-Western (MG) regions. In the SMA, it occurs in *campo sujo* and *veredas* at roadsides.

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List of taxa

1.1. *Bulbostylis conifera*; 1.2. *B. jacobinae*; 1.3. *B. junciformis*; 1.4. *B. lagoensis*; 1.5. *B. loefgrenii*; 1.6. *B. paradoxa*; 1.7. *B. paraensis*; 1.8. *B. truncata*; 1.9. *B. vestita*; 2.1. *Calyptrocarya glomerulata*; 2.2. *C. luzuliformis*; 3.1. *Cryptangium verticillatum*; 4.1. *Cyperus aggregatus*; 4.2. *C. cuspidatus*; 4.3. *C. digitatus*; 4.4. *C. distans*; 4.5. *C. gayi*; 4.6. *C. haspan*; 4.7. *C. hortensis*; 4.8. *C. imbricatus*; 4.9. *C. iria*; 4.10. *C. laxus*; 4.11. *C. luzulae*; 4.12. *C. macrostachyos*; 4.13. *C. odoratus*; 4.14. *C. simplex*; 4.15. *C. sphacelatus*; 4.16. *C. subsquarrosus*; 4.17. *C. surinamensis*; 4.18. *C. tenuispica*; 5.1. *Eleocharis bicolor*; 5.2. *E. braunii*; 5.3. *E. capillacea*; 5.4. *E. filiculmis*; 5.5. *E. geniculata*; 5.6. *E.* cf. *microcarpa*; 5.7. *E. nana*; 6.1. *Exochogyne amazonica*; 7.1. *Fimbristylis aestivalis*; 7.2. *F. dichotoma*; 7.3. *F. littoralis*; 7.4. *F. vahlii*; 8.1. *Fuirena umbellata*; 9.1. *Hypolytrum longifolium*; 10.1. *Lagenocarpus rigidus*; 11.1. *Rhynchospora acanthoma*; 11.2. *R. barbata*; 11.3. *R. brevirostris*; 11.4. *R. cephalotes*; 11.5. *R. ciliata*; 11.6. *R. curvula*; 11.7. *R. divaricata*; 11.8. *R. exaltata*; 11.9. *R. filiformis*; 11.10. *R. globosa*; 11.11. *R. hirsuta*; 11.12. *R. junciformis*; 11.13. *R. nervosa*; 11.14. *R. puber*; 11.15. *R. rugosa*; 11.16. *R. spruceana*; 11.17. *R. tenella*; 11.18. *R. velutina*; 12.1. *Scleria distans*; 12.2. *S. flagellum-nigrorum*; 12.3. *S. gaertneri*; 12.4. *S. macrophylla*; 12.5. *S. martii*; 12.6. *S. microcarpa*; 12.7. *S. reticularis*; 12.8. *S. tenella*; 12.9. *S. violacea*.

List of exsiccatae

Alves KNL 3 (11.9), 5 (1.3), 6 (3.1), 12 (11.9), 11 (6.1), 13 (11.9), 15 (4.6), 16 (2.1), 19 (12.5), 21 (12.5), 23 (4.10), 25 (1.1), 26 (12.8), 27 (4.11), 29 (2.1), 30 (12.3), 31 (12.3), 35 (8.1), 36 (12.3), 37 (7.2), 41 (11.9), 43 (1.4), 44 (12.5), 47 (11.8), 48 (4.6), 50 (4.1), 51 (4.11), 52 (12.5), 53 (3.1), 74 (1.1), 82 (4.17), 83 (4.6), 84 (12.8), 99 (11.15), 102 (11.10), 103 (11.4), 106 (11.2), 105A (11.4), 105B (1.1), 106 (11.9), 109A (5.1), 109B (5.3), 110A (5.3), 110B (5.1), 114 (10.2), 113 (6.1), 115 (11.9), 116 (12.5), 122 (5.1), 128 (4.15), 133 (1.3), 134 (11.9), 136 (10.1), 138 (10.1), 141 (11.2), 142 (1.1), 143A (12.7), 143B (1.5), 144 (12.8), 145 (11.6), 146A (6.1), 146B (1.2), 169 (11.5), 170 (4.14), 172 (11.7), 180 (5.6), 181 (11.3), 183 (7.2), 184 (12.3), 185 (4.11), 186 (11.1), 187 (11.4), 188 (11.17), 189 (6.1), 190 (11.9), 191 (12.8), 192 (11.4), 193 (4.18), 194 (11.9), 195 (1.1), 196 (3.1), 197 (4.6), 198 (12.5), 200 (11.15), 202 (11.2), 203 (11.7), 204 (4.9), 205A (4.13), 205B (4.3), 206 (7.3), 207 (4.1), 208 (8.1), 209 (7.2), 210 (12.4), 211 (12.4), 213 (4.11), 214 (4.15), 219 (11.13), 220A (11.16), 220B (11.3), 221 (12.1), 223 (1.3), 224 (11.15), 225 (12.7), 226 (6.1), 227 (2.1), 228 (11.18), 237 (11.9), 258 (8.1), 262 (11.12), 264 (12.1), 266 (11.3), 267 (4.18), 273A (11.3), 273B (4.6), 274 (11.7), 276 (12.8). **Amaral DD** 176 (1.6), 178 (1.8), 181 (1.1), 182 (1.3). **Aragão I** 84 (3.1). **Bastos MNC** 1907 (11.8), 1908 (5.4), 2083 (3.1), 2084 (11.2), 2111 (12.7). **Cordeiro MR** 1908 (5.4), 2083 (10.2), 2084 (11.2), 2111 (12.8). **Fernandes-Júnior AJ** 674 (1.8), 680 (11.10), 681 (11.2), 683 (11.12), 694 (11.16), 696 (12.7), 697 (1.3), 699 (11.16), 701 (11.2), 702 (11.10). **Gil A** 813 (7.4), 814 (7.1), 815 (4.16), 828 (5.7), 831 (7.4), 832A (5.2), 832B (5.6), 834 (4.16), 835 (1.7), 836 (7.1), 837 (7.3), 838 (4.12), 841 (4.4), 842 (4.8), 843 (4.3), 844 (4.13), 846 (4.17), 848 (7.4), 852 (4.16), 856 (4.16), 857 (7.4), 858 (4.5), 860 (4.7), 861 (4.15), 862 (4.10), 863 (4.7), 864 (7.2), 865 (4.6), 866A (5.2), 866B (5.6), 867A (5.5), 867B (5.6), 868 (5.4), 875 (4.6), 876A (5.2), 876B(5.6), 878 (4.7), 891 (1.2), 892 (11.6), 897 (12.8), 902 (11.9), 903 (1.1), 904 (1.5), 909 (12.8), 914 (11.3), 926 (12.8), 928 (5.6), 929 (4.18), 930 (11.17), 931 (11.14), 932 (9.1), 934 (2.1), 935 (2.2), 936 (12.5), 968 (11.7), 969 (11.17), 971 (1.4), 972 (12.8), 975 (11.11), 976 (11.6), 989 (11.8). **Maciel-Silva J** 264 (11.4), 265 (2.1), 266 (11.4), 305 (12.7). **Nunes CS** 377 (10.2), 378 (12.5), 379 (11.8), 380 (11.10), 381 (11.15), 382 (10.1), 383 (11.18), 384 (1.4), 385 (11.9), 386 (4.17), 388 (5.5), 389 (4.13), 390 (7.4), 391 (7.1), 395 (5.1), 397 (11.11), 399 (11.2), 401 (12.9), 403 (11.15), 404 (4.1), 406 (11.9), 407 (6.1), 411 (11.12), 412 (4.14), 413 (12.7), 416 (2.1), 417 (12.4), 418 (12.9), 425 (1.6), 430 (12.8), 435 (11.15), 437 (11.15), 439 (11.18), 442 (12.5), 443 (12.3), 445 (11.4). **Oliveira AA** 4593 (1.9). **Pereira-Silva G** 9042 (4.2). **Pinto NP** 19 (12.6), 45 (12.2). **Rocha AES** 770 (4.8), 782 (4.12), 783 (4.4), 1731 (1.1), 1732 (11.2), 1733 (4.1), 1734 (4.6), 1756 (11.16), 1757 (1.3), 1758 (11.1). **Schneider L** 238 (12.8), 258 (1.5), 259 (1.3), 260 (4.1), 261 (12.5), 264 (12.3), 265 (4.15), 226 (12.4), 267 (12.3), 268 (7.2), 269 (4.15), 270 (1.3), 277 (11.14), 271A (4.14), 271B(4.18), 278 (1.4), 263 (11.7). **Silva FA** 543 (1.3), 551 (1.3), 552 (1.1), 564 (1.1), 565 (11.2), 569 (12.5), 570 (11.4). **Souza MGC** 56 (5.4), 677 (11.4), 689 (7.2).

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