ACTA
AMAZONICA

http://dx.doi.org/10.1590/1809-4392202301040

ORIGINAL ARTICLE

A new species of *Rhynchospora* section *Pluriflorae* (Cyperaceae) from the southwestern edge of the Brazilian Amazon

Karina de Nazaré Lima ALVES[1]*, William Wayt THOMAS[2], Mathias Erich ENGELS[3], André dos Santos Bragança GIL[4]

[1] Universidade Federal Rural da Amazônia/Museu Paraense Emílio Goeldi. Programa de Pós-Graduação em Ciências Biológicas – Botânica Tropical, Av. Perimetral 1901, Terra Firme, 66077-830, Belém, Pará, Brazil

[2] The New York Botanical Garden, Bronx, NY 10458-5126, New York, USA

[3] Universidade Federal do Paraná, Departamento de Botânica, Programa de Pós-graduação em Botânica, Jardim das Américas, 81530-900, Curitiba, Paraná, Brazil

[4] Museu Paraense Emílio Goeldi – MPEG, Campus de Pesquisa, Coordenação de Botânica, Av. Perimetral, Terra Firme, Belém, Pará, Brazil

* Corresponding author: karinalvesnl@gmail.com; https://orcid.org/0000-0002-1360-735X

ABSTRACT

A new species of *Rhynchospora* (Cyperaceae) only known from the Parecis plateau, on the southwestern edge of the Brazilian Amazon, is described here. *Rhynchospora parecisensis* was found growing only in open environments of deciduous seasonal forest and savanna enclaves in the midst of seasonal evergreen forest, in the state of Mato Grosso, western Brazil. *Rhynchospora parecisensis* differs from the other species of *Rhynchospora* sect. *Pluriflorae* subsect. *Subebracteatae* by the distally puberulent to pubescent glumes. The new species resembles *Rhynchospora acanthoma*, but differs from it by the subtriangular to quadrangular scapes in cross-section and the distally puberulent to pubescent glumes, with ciliate to ciliolate margins. Taxonomic comments, illustrations and a distribution map are also provided.

KEYWORDS: Brazilian flora, *Cerrado*, Cyperoideae, Parecis plateau, taxonomy

Uma nova espécie de *Rhynchospora* seção *Pluriflorae* (Cyperaceae) do sudoeste da Amazônia brasileira

RESUMO

Uma nova espécie de *Rhynchospora* (Cyperaceae), conhecida apenas para o Planalto dos Parecis, no sudoeste da Amazônia brasileira é descrita. *Rhynchospora parecisensis* foi encontrada apenas em ambientes abertos de floresta sazonal decídua e enclaves de savana, em meio a áreas de floresta estacional sempre verde, estado do Mato Grosso, centro-oeste do Brasil. *Rhynchospora parecisensis* difere das outras espécies de *Rhynchospora* sect. *Pluriflorae* subsect. *Subebracteatae* pelas suas glumas puberulentas a pubescentes distalmente. A nova espécie é semelhante a *Rhynchospora acanthoma*, porém difere pelos escapos subtriangulares a quadrangulares em secção transversal, e pelas glumas puberulentas a pubescentes distalmente, com margens ciliadas a cilioladas. Comentários taxonômicos, ilustrações e mapa de distribuição são apresentados.

PALAVRAS-CHAVE: flora brasileira, *Cerrado*, Cyperoideae, Planalto dos Parecis, taxonomia

INTRODUCTION

Rhynchospora Vahl comprises about 400 species worldwide (Buddenhagen *et al*. 2017; Larridon *et al*. 2021; Silva Filho *et al*. 2021) and is most diverse in the Americas and especially in the Neotropics (Strong 2006). It is the most species-rich genus of Cyperaceae in Brazil, with 168 species distributed across all states and habitats (Schneider *et al*. 2020). Kükenthal (1949) revised *Rhynchospora* and described the sections *Pauciflorae* Kük., with 1-3 (rarely 4) flowers per spikelet (currently comprising 24 species), and *Pluriflorae* Kük., with 4-9 flowers per spikelet (22 species), both characterized by capituliform inflorescences. During a taxonomic revision involving these two sections (Alves *et al*., unpublished data), a new species of *Rhynchospora sect. Pluriflorae* was found and is described here. The new species is morphologically circumscribed in *Rhynchospora sect. Pluriflorae subsect. Subebracteatae* Kük. for presenting scale-like bracts, five plumose perianth bristles, and biconvex nutlets (Kükenthal 1949).

CITE AS: Alves, K.N.L.; Thomas, W.W.; Engels, M.E.; Gil, A.S.B. 2023. A new species of *Rhynchospora* section *Pluriflorae* (Cyperaceae) from the southwestern edge of the Brazilian Amazon. *Acta Amazonica* 53: 208-214.

MATERIAL AND METHODS

Rhynchospora specimens available in the herbaria BHCB, IAN, INPA, IPA, JPB, MBM, MFS, MG, PEUFR, R, RB, SP, SPF, and UFP were analyzed (acronyms according to Thiers 2020 - continuously updated). Morphological descriptions were based on dried materials, using a stereomicroscope. Morphological terminology of the specific features of Cyperaceae are based on terms used by Strong (2006), and Simpson (2006), the inflorescence morphology followed Reutemann *et al*. (2012), and the trichome descriptions followed Harris and Harris (2001). A taxonomic identification key for *Rhynchospora* sect. *Pluriflorae* subsect. *Subebracteatae* is provided and was based on published descriptions (i.e., Humboldt and Bonpland 1816; Boeckeler 1880; Araújo *et al*. 2003, 2008), and on the unpublished revision by Araújo (2001). Digital images were taken using a stereomicroscope equipped with a digital camera, and the LAS package. The plates were composed using the software Gimp 2.10 (GNU Image Manipulation Program).

Images of the nutlets were taken in a scanning electron microscopy (SEM) with a FEG-type electron gun (field emission weapon). The samples were coated with Au for 2 minutes and 30 seconds, with a thickness of 10 to 15 nm. The images were generated by secondary electron detection, using a voltage acceleration of 5 kV and a working distance between 15 and 25 mm.

Geographic distribution and habitat data were obtained from the labels of the herbarium specimens examined, and field observations by the authors. Conservation status assessment was performed following IUCN Red List Categories and Criteria v.14 (IUCN 2022). The area of occupancy (AOO) of the species (grids of 10 km) was estimated using the GeoCAT - Geospatial Conservation Assessment Tool (Bachman *et al*. 2011).

RESULTS

***Rhynchospora parecisensis* K. Alves, W.W. Thomas & A. Gil, sp. nov.** (Figures 1–4)

Type material: Brazil. Mato Grosso, Itaúba, resgate de Flora da UHE Colíder, 11°06'31.2"S, 55°25'14.1"W, 268 m, 27.iv.2017 (fl. and fr.), *M.E. Engels, R.S. Thomé & L.S. Silva 5367* (Holotype: MBM 412644!; isotypes: HERBAM 1740!, RB 01378012!, TANG 5845).

Similar to *Rhynchospora acanthoma* A.C. Araújo & Longhi-Wagner, but differs by the subtriangular to quadrangular scapes in cross-section, and the distally puberulent to pubescent glumes, with ciliate to ciliolate margins.

Annual herb, cespitose, 17–54 cm tall, base rigid, blackened to vinaceous, lacking rhizome or a bulb-like base (Figures 1, 5d). Roots fasciculate, 0.4–1 mm wide. Stems erect, 0.3–0.9 mm wide, subtriangular to quadrangular in cross section, glabrous, angles unarmed, light green to ochraceous. Leaves rosette-like, 1–4 basal and 1–2 cauline per scape, ascendent, erect to curved, 6–32 × 0.05–0.14 cm; sheaths 1.6–5 cm long, eligulate, papery to membranous distally, glabrous, greenish to vinaceous, not becoming fibrous when old, apex truncate; blades linear, 1⁄4 to 1⁄2 the height of the stems at maturity, flattened, papery to chartaceous, green to ochraceous, margins scabrous toward the apex, adaxial side cellular-reticulate, midvein unarmed, abaxially scabrous toward the apex; apex acute, triangular to subtriangular in cross section; involucral bracts 4–5, 4–6 × 3.5–5.5 mm (not including the apiculus or arista), ovate to suborbiculate, yellowish brown, glumaceous, subcoriaceous, sometimes exceeding the inflorescence, margins ciliate, trichomes 0.2–0.5 mm long, apex apiculate to long aristate, the arista of the lowest involucral bract up to 7.5 mm long in immature inflorescences, antrorsely scabrous (Figure 2b). Inflorescences terminal, capituliform, turbinate to hemispherical, 5–9 × 3.5–10 mm, with 6–15 spikelets (Figure 3b, 5c); spikelets hermaphrodite, ellipsoid, 3.8–6 × 0.6–1.4 mm, inconspicuously stalked (Figures 2c, 3c), the glumes 7–8(–9) per spikelet, cymbiform, base cuneate, apex acute, midvein inconspicuous, thin, yellowish brown, keel glabrous and ending at the glume apex; proximal sterile glumes 3–4, narrowly ovate to ovate, 2.4–3.2 × 0.9–2.2 mm, membranous, yellowish brown, basally glabrous, apically puberulent to pubescent, margins distally ciliate, trichomes 0.2–0.4 mm long, hyaline; distal fertile glumes 4–5, 3.1–5 × 1.4–2.8 mm, ovate to lanceolate, the first and second membranous proximally, leathery distally, yellowish brown to vinaceous distally, proximally glabrous, distally puberulent to pubescent, base truncate, apex rounded to acute, margins hyaline, ciliate to ciliolate, trichomes 0.1–0.2 mm long, the remaining fertile glumes 2–3, inside the second glume, membranous, yellowish brown. Female flower 1, subtended by the first distal fertile glume, style undivided or shortly bifid or trifid at apex. Male flowers (2–)3, each subtended by the second or more distal fertile glumes, stamens 3, the filaments connate at base, free at apex, flattened, the anthers 1.5–2.3 mm long, mucronate, yellowish with a vinaceous to greenish line along the theca, base attenuate, apex acute. Perianth bristles (4–)5, 1.8–2.2 mm long, beige, plumose up to 1.2–1.8 mm of the bristles, with hyaline to yellowish trichomes, distally antrorsely scabridulous, exceeding the nutlet and the style-base (Figures 2d, 3d, 4a). Nutlets lenticular, obovoid, 1.3–1.7 × 0.9–1.3 mm (without the style-base), base cuneate, apex rounded, margins not involute, surface proximally slightly cellular-reticulate (sometimes appearing smooth), distally densely pilose, the trichomes ca. 0.24–0.28 mm long, yellowish brown (Figures 2e-f, 3e, 4b-c,e). Style-base trapezoidal, 0.3–0.4 × 0.3–0.5 mm, not confluent with the fruit body, yellowish to brown, lateral margins antrorsely scabridulous, apex sometimes slightly biacuminate (Figure 2e, 4d).

Figure 1. Holotype of *Rhynchospora parecisensis* [*M. E. Engels et al.* 5367 (MBM)]. Courtesy of the Herbarium MBM curators. This figure is in color in the electronic version.

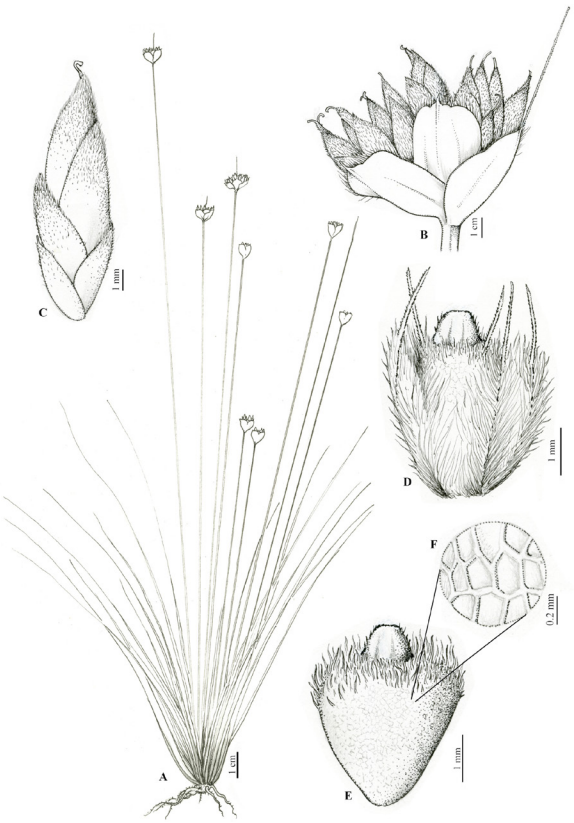

Figure 2. *Rhynchospora parecisensis*. A – Habit; B – Inflorescence with spikelets apices and three involucral bracts; C – Spikelet; D – Side view of nutlet, with five surrounding bristles. E – Side view of nutlet, without bristles; F – Detail of nutlet surface. Line drawing by Elielson Rocha, from the isotype [*M.E. Engels et al.* 5367 (RB)]. This figure is in color in the electronic version.

Figure 3. *Rhynchospora parecisensis* digital images in stereomicroscope. A – Inflorescence with spikelets apices and involucral bracts; B – Immature inflorescence showing aristate apex of involucral bract; C – Spikelet; D – Side view of nutlet, with bristles; E – Side view of nutlet, without bristles [Illustrations from *M.E. Engels et al*,.5367 (MBM)]. This figure is in color in the electronic version.

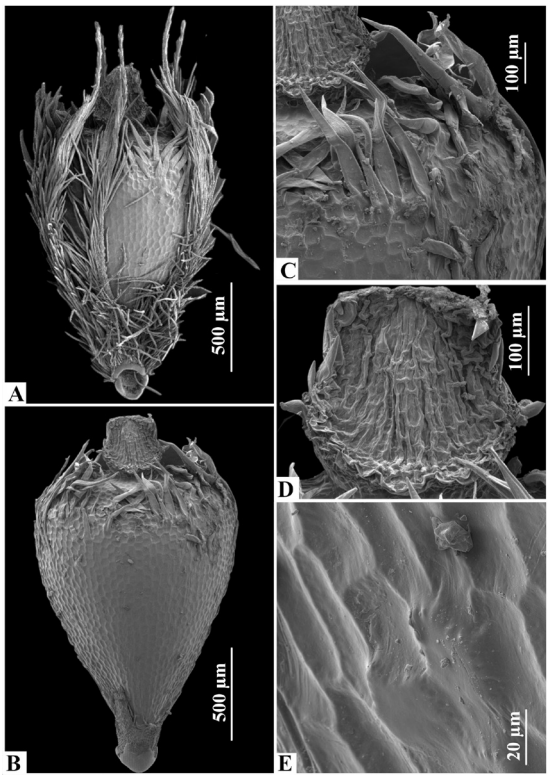

Figure 4. *Rhynchospora parecisensis.* SEM Images. A – Side view of nutlet, with bristles; B – Side view of nutlet, without bristles; C – Apical surface of nutlet; D – Side view of style-base; E – Detail of nutlet surface. [Illustrations from *M.E. Engels et al.* 5367 (RB)].

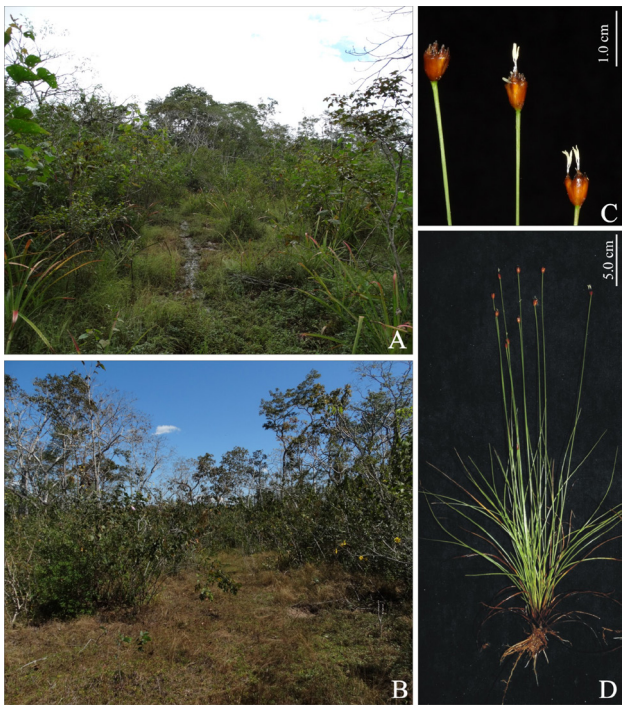

Figure 5. A-B – Habitat of *Rhynchospora parecisensis* in the rainy season and in the dry season, respectively; C – Detail of inflorescences; D – Plant habit. Photos by M.E. Engels. This figure is in color in the electronic version.

Additional specimens examined: Brazil. Mato Grosso, Itaúba, resgate de Flora da UHE Colíder, encrave de cerrado nas proximidades do Lote E de supressão, 10°58'20.0"S, 55°35'42.0"W, 281 m, 20 February 2015, *M.E. Engels 2784* (CNMT 6680, HERBAM barcode 001741!, MBM barcode 398391!, RB barcode 01077944!, TANG 2308).

Distribution and habitat

Rhynchospora parecisensis occurs in open environment areas of deciduous seasonal forest (*mata seca*) and open savanna (*Cerrado*) within seasonal evergreen forest (*floresta estacional sempre verde* or *floresta do Planalto do Parecís*; IBGE 2012), along the banks of the Teles Pires River on the southwestern edge of the Brazilian Amazon (Figure 6). This region is covered by a mosaic of forests and savannas due to its proximity to the *Cerrado* domain. The specific habitats where the new species occurs are open environments with shallow soils and rocky outcrops. Because of poor drainage during the rainy season, the soils are wet, while in the dry season, the soils dry out completely, resulting in an herbaceous-shrubby vegetation (Figure 5a,b). Some newly described species, *Anemia paripinnata* Labiak & J.T. Mickel (Anemiaceae) and *Zamia brasiliensis* Segalla and Calonje (Zamiaceae) occur in sympatry with *R. parecisensis* (Labiak *et al.* 2018; Segalla and Calonje 2019), showing the high diversity of dry forests in the Amazon domain.

Etymology

The epithet of this species refers to the Parecis plateau, the only known location for this species at this time.

Key to the species of *Rhynchospora* sect. *Pluriflorae* subsect. *Subebracteatae* (adapted from Araújo *et al*. 2003, 2012)

1. Culms villous, involucral bracts margins lanuginose, keel of glumes villous to sparsely villous ....*Rhynchospora bracteovillosa*

1'. Culms glabrous, involucral bract margins ciliate or glabrous, keel of glumes glabrous or pubescent, never villous 2

2. Bases bulbiform, glumes yellowish…..... 3

2'. Bases not bulbiform, glumes castaneous to blackish……. 4

3. Leaf blades filiform, inflorescences turbinate to hemispheric, spikelets 8-50 ….....…. *Rhynchospora globosa*

3'. Leaf blades flat, inflorescences globose, spikelets 80-100 ..... *Rhynchospora loefgrenii*

4. Involucral bract margins glabrous, keels of glumes scabrous....5

4'. Involucral bract margins ciliate to distally ciliate, keels of glumes unarmed …..... 6

5. Inflorescences globose, involucral bracts 0-1, margins ciliate, sterile glumes with scabrous keels, style base ca. 0.2 mm long..…..... *Rhynchospora melanocarpa*

5'. Inflorescences turbinate to hemisferic, involucral bracts 3-5, margins glabrous, sterile glumes with unarmed keels, style base 0.4-0.8 mm long .....…*Rhynchospora capitata*

6. Involucral bracts 2, linear, 2.1 mm long…..... .....*Rhynchospora leucoloma*

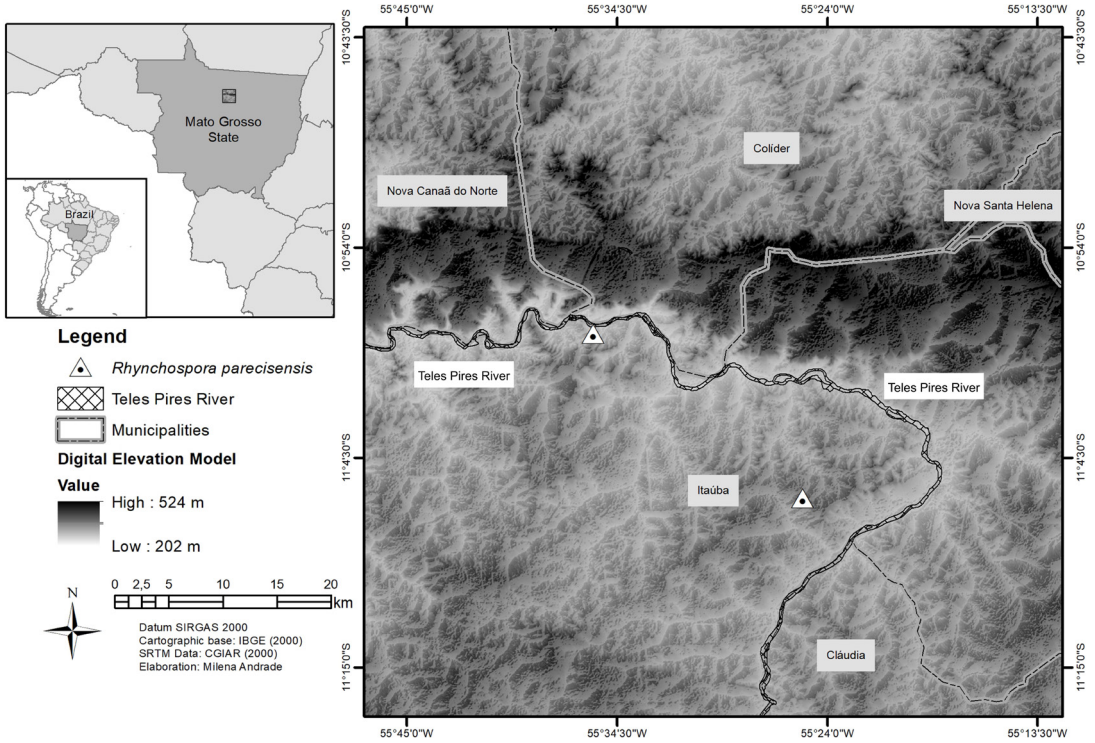

Figure 6. Distribution map of *Rhynchospora parecisensis.*

6'. Involucral bracts 4-6, ovate, lanceolate or suborbiculate, 4-12 mm long …..... 7

7. Scapes cylindric to subcylindric in cross section, style base 0.6 mm long .....….. *Rhynchospora acanthoma*

7'. Scapes subtriangular to quadrangular in cross section, style base 0.2-0.4 mm long …..... 8

8. Involucral bracts with obtuse apex, glumes glabrous distally, nutlet surface distally sparsely pubescent …..... ..... *Rhynchospora exilis*

8'. Involucral bracts with apiculate to long aristate apex, glumes pubescent distally, nutlet surface distally densely pilose …..... *Rhynchospora parecisensis*

DISCUSSION

Taxonomic relationships

Rhynchospora parecisensis is characterized by a blackened to vinaceous rigid base, the (4–) 5 perianth bristles which are proximally plumose and scabridulous distally, and nutlets with a slightly reticulate surface basally. It is closer morphologically to the species in section *Pluriflorae* (*sensu* Kükenthal 1949) due to the solitary and rigid stems, and the spikelets with 4-9 flowers. It is also similar to species in subsection *Subebracteatae* Kük., which is characterized by stramineous to brown scale-like bracts, hemispheric, turbinate, oblong or digitate capituliform inflorescences, five plumose perianth bristles, and biconvex nutlets (Kükenthal 1949; Araújo *et al*. 2003). It is morphologically similar to *Rhynchospora acanthoma* A.C. Araújo & Longhi-Wagner, *R. bracteovillosa* A.C. Araújo & Longhi-Wagner, *R. capitata* Roem. & Schult., *R. exilis* Boeckeler, *R. globosa* Roem. & Schult., and *R. leucoloma* A.C. Araújo & Longhi-Wagner, which are similar and probably closely related (Araújo *et al*. 2008), and which were placed in *Rhynchospora* sect. *Pluriflorae* subsect. *Subebracteatae* by both Kükenthal (1949) and Araújo (2001). These species are similar in having turbinate to hemispherical inflorescences with scale-like involucral bracts, spikelets with only one bisexual flower, 4-5 perianth bristles which are plumose and scabridulous distally, and biconvex nutlets. *Rhynchospora parecisensis* differs from all these species by having involucral bracts with an apex that is apiculate to long aristate (in immature inflorescences, glumes which are pubescent distally to pubescent, and nutlets with a distally papillose surface). It differs from *R. acanthoma* due to the triangular to quadrangular stems in cross section (*vs*. cylindrical to subcylindrical in *R. acanthoma*), and its distally puberulent to pubescent glumes (*vs*. glumes glabrous in *R. acanthoma*) with ciliate to ciliolate margins (*vs*. margins glabrous in *R. acanthoma*). It differs from *R. bracteovillosa* by glabrous scapes, involucral bracts with margins ciliate, never lanuginose, and glumes with non-glabrous to pubescent keels (*vs*. villous culms, involucral bracts with lanuginose margins, and glumes with villous keels in *R. bracteovillosa*); differs from *R. capitata* by the involucral ciliated to ciliolated-margin bracts (*vs*. glabrous margins in *R. capitata*); differs from *R. exilis* by the 1.8-2.2 mm long perigonial bristles, exceeding the fruit body (*vs*. 1.7 mm long perigonial bristles, smaller than the fruit body in *R. exilis*); differs from *R. globosa* in the absence of bulbiform structures at the base of the scape (*vs*. 8-17 mm wide bulbiform structures at the base of the scapes in *R. globosa*); and finally differs from *R. leucoloma* by the involucral bracts 4-5 (*vs*. involucral bracts 2 in *R. leucoloma*).

Conservation status

According to the IUCN (2022) criteria, *Rhynchospora parecisensis* can be categorized as Data Deficient (DD) because only two specimens are known and appropriate data to better evaluate its abundance and/or distribution are presently unknown. Nevertheless, it is possible that, after a more thorough survey, *R. parecisensis* may be considered Critically Endangered (CR), due to restricted distribution, fragmentation, degradation and decrease of the natural habitat in the region where the new species occurs. The species is known from only two populations in the municipality of Itaúba, in an ecotone between Amazon Forest and *Cerrado* biomes. As known today, the species has an Area of Occupancy (AOO) of 8000 km^2, and the Extent of Occurrence (EOO) cannot be calculated from only two points. Specimens of the new species were collected during the plant rescue because of the installation of the Colíder hydroelectric dam power plant. After the creation of the reservoir, a residential condominium was built at the edge of the reservoir, adversely affecting one of the two known populations. Additionally, after an extensive review of herbaria and literature, no other records of *R. parecisensis* were found.

CONCLUSIONS

We describe a new species of *Rhynchospora* (Cyperaceae), sect. *Pluriflorae*, subsect. *Subebracteatae* Kük., from the Parecis Plateau, on the southwestern edge of the Brazilian Amazon. The species is positioned in *subsect. Subebracteatae* Kük. due to the scale-like bracts, five plumose perianth bristles, and biconvex nutlets. It can be recognized by the subtriangular to quadrangular scapes in cross-section, and the distally puberulent to pubescent glumes, with ciliate to ciliolate margins.

ACKNOWLEDGMENTS

We thank Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for KNLA's scholarship (process # 140314/2021-0 - PROTAX/CNPq), and for ASBG's productivity grant (process # 314271/2020-1 – PQ/CNPq), for funding project PROTAX/CNPq (process # 441488/2020-0) and project PRONEM/FAPESPA/CNPq (process # 052/2021); Fundação Amazônia de Amparo a Estudos e Pesquisas (FAPESPA) for co-funding project PRONEM/FAPESPA/CNPq;

Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for MEE's doctoral scholarship (process # 88887.617522/2021-00); Museu Paraense Emílio Goeldi (MPEG), and Universidade Federal Rural da Amazônia (UFRA) for logistic support. We would also like to thank the curators and staff of the HERBAM, MBM, and RB herbaria for facilitating our access to their collections or information; Milena Andrade for providing the map of the study area; Elielson Rocha for the line-draw illustrations; Alexandre Bonaldo, coordinator of the Arachnology Lab of MPEG for allowing the use of the stereomicroscope with digital camera; and Hilton Costi, Scanning Electron Microscopy Lab Manager, for the images. This study was partially funded by CAPES– (Financial Code 001).

REFERENCES

Araújo, A.C. 2001. *Revisão de Rhynchospora Vahl sect. Pluriflorae Kük. (Cyperaceae)*. Doctoral thesis, University of São Paulo, Brazil, 369p. (https://repositorio.usp.br/item/001205428).

Araújo, A.C.; Longhi-Wagner, H.M.; and Thomas, W. 2003. New unicapitate species of *Rhynchospora* (Cyperaceae) from South America. *Brittonia* 55: 30-36.

Araújo, A.C.; Longhi-Wagner, H.M.; Thomas, W.W. and Simpson, D.A. 2008. Taxonomic novelties in *Rhynchospora* (Cyperaceae) from South America. *Kew Bulletin* 63: 301-307.

Araújo, A.C.; Longhi-Wagner, H.M.; and Thomas, W.W. 2012. A synopsis of *Rhynchospora* sect. *Pluriflorae* (Cyperaceae). *Brittonia* 64: 381-393.

Bachman, S.; Moat, J.; Hill, A.W.; Torre, J. and Scott, B. 2011. Supporting Red List threat assessments with GeoCAT: geospatial conservation assessment tool. *ZooKeys* 150: 117–126.

Boeckeler, J.O. 1880. Diagnosen neuer Cyperaceen. Flora 63: 440.

Buddenhagen, C.E.; Thomas, W.W.; Mast, A.R. 2017. A first look at diversification of beaksedges (Tribe Rhynchosporeae; Cyperaceae) in habitat, pollination, and photosynthetic features. *Memoirs of the New York Botanical Garden* 118: 113-126.

Harris, J.G. and Harris, M.W. 2001. *Plant Identification Terminology and Illustrated Glossary*. Spring Lake Publishing, Utah, 216p.

Humboldt, F.W.H.A.; Humboldt, F.W.H.A. and Bonpland A.J.A.. 1816. *Nova Genera et Species Plantarum*. Librairie Grecque-Latine-Allemande, Paris, 377p.

IUCN. 2022. IUCN Red List Categories and Criteria, version 14. International Union for Conservation of Nature, Gland, 114p.

IBGE. 2012. Instituto Brasileiro de Geografia e Estatística. Indicadores agropecuários. (http://www.ibge.gov.br/home/estatistica/indicadores/agropecuaria/lspa/default.shtm). Accessed on 11 Jul 2023.

Kükenthal, G. 1949. Vorarbeiten zu einer Monographie der Rhynchosporoideae - *Rhynchospora* – XVII. *Botanisches Jahrbuch der Systematik* 74: 375-509.

Labiak, P.H.; Mickel, J.T.; Matos, F.B. 2018. *Anemia paripinnata* (Anemiaceae), a new species from Central Brazil. *American Fern Journal* 108: 1–6.

Larridon, I.; Zuntini, A.R., Léveillé-Bourret; É., Barrett, R.L.; Starr, J.R.; Muasya, A.M.; *et al.* 2021. A new classification of Cyperaceae (Poales) supported by phylogenomic data. *Journal of Systematics and Evolution* 59: 852-895.

Reutemann, A.; Lucero, L.; Guarise, N.; and Vegetti, A.C. 2012. Structure of the Cyperaceae inflorescence. *The Botanical Review* 78: 184-204.

Segalla, R.; Calonje, M. 2019. *Zamia brasiliensis*, a new species of Zamia (Zamiaceae, Cycadales) from Mato Grosso and Rondônia, Brazil. *Phytotaxa* 404: 1-11.

Schneider, L.J.C.; Pereira-Silva, L.; Thomas, W.W.; Matzenauer, W.; Hefler, S.M.; Nunes, C.S.; *et al.* 2020. Cyperaceae. *Flora e Funga do Brasil* (https://floradobrasil.jbrj.gov.br/FB100). Accessed on 11 Jul 2023.

Silva Filho, P.J.S.; Thomas, W.W.; Boldrini, I.I. 2021. Redefining *Rhynchospora* section *Tenues* (Cyperaceae), a phylogenetic approach. *Botanical Journal of the Linnean Society* 196: 313–328.

Simpson, D.A. 2006. A flora da Reserva Ducke, Amazonas, Brasil: Cyperaceae. *Rodriguésia* 57: 171–188.

Strong, M.T. 2006. Taxonomy and distribution of Rhynchospora (Cyperaceae) in the Guianas, South America. *Contributions from the United States National Herbarium* 53: 1-225.

Thiers, B. 2020. [continuously updated]. Index Herbariorum: A global directory of public herbaria and associated staff. (http://sweetgum.nybg.org/science/ih/). Accessed on 11 Jul 2023.

RECEIVED: 06/04/2023
ACCEPTED: 08/07/2023
ASSOCIATE EDITOR: Ricarda Riina

DATA AVAILABILITY

The data that support the findings of this study were published in this article.