



## Short Communication

# *Sphaerocarpos muccilloi* (Sphaerocarpaceae, Marchantiophyta), a critically endangered species recollected in Rio Grande do Sul, Brazil, and *Sphaerocarpos texanus*, a new record to Brazil

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### Abstract

*Sphaerocarpos muccilloi* (Sphaerocarpaceae, Marchantiophyta) was described in 1981, being an endemic species and the only species of the family to Brazil. This species is considered as Critically Endangered (CR) according to “Red List of threatened species of the Rio Grande do Sul state”. *Sphaerocarpos muccilloi* was recorded in three places only in Rio Grande do Sul: Porto Alegre, São Leopoldo and Ivoti (collected from 1963 to 1977). These sites are highly anthropized and the last records being from more than 40 years. After a revision of herbarium specimens and several field trips we recollected *S. muccilloi* in the Pampa Biome, in Santana do Livramento municipality, at the Ibirapuitã Environmental Protection Area (APA do Ibaratuitã), Mata and Santa Vitória do Palmar municipalities. Another species (*S. texanus*), not reported to Brazil, was reported now to Paraná state. These new records provide important information about occurrence and distribution of the family to Brazil. Regarding to *S. muccilloi*, these new records show that the range of occurrence is wider than previous reported. This new data will help the next revision of the Red List of Threatened Species of Rio Grande do Sul and Brazil and will subsidize conservation strategies.

**Key words:** conservation, liverwort, Marchantiophyta, red list.

### Resumo

*Sphaerocarpos muccilloi* (Sphaerocarpaceae, Marchantiophyta) foi descrito em 1981 como uma espécie endêmica e única da família no Brasil. É considerada Criticamente Ameaçada (CR) no estado do Rio Grande do Sul, Brasil, de acordo com a “Lista Vermelha das espécies da flora ameaçadas do estado do Rio Grande do Sul”. *S. muccilloi* é citado apenas para 3 localidades: Porto Alegre, São Leopoldo e Ivoti (coletado entre 1963 e 1977), todas áreas hoje altamente antropizadas, sendo a última coleta ocorrida há mais de 40 anos. Após uma revisão em herbários e coletas em campo *S. muccilloi* foi recoletado no ano de 2017 no Bioma Pampa (municípios de Santana do Livramento - Área de Proteção Ambiental do Ibirapuitã; Mata e Santa Vitória do Palmar). Outra espécie, *Sphaerocarpos texanus*, não registrada para o Brasil, foi reportada para o estado do Paraná. Estes novos registros fornecem importantes informações sobre a ocorrência e distribuição da família no Brasil. Para *S. muccilloi*, estes novos registros indicam que a distribuição desta espécie ameaçada é mais ampla. Estes dados subsidiarão a revisão da lista de espécies ameaçadas do Rio Grande do Sul e Brasil, além de subsidiar estratégias de conservação.

**Palavras-chave:** conservação, hepáticas, Marchantiophyta, listas vermelhas.

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*Sphaerocarpos mucilloi* E. Vianna (Sphaerocarpaceae, Marchantiophyta) is a Brazilian endemic species that was described in 1981 as a thallose, dioecious species, with female gametophytes with suborbicular thallus with large balloon-like involucre structures around the oosphere, 5–8 mm in length and the male gametophyte is oval, lobed thallus, often colored of purple, with smaller pear-shaped structures around the antheridia, 1–3 mm long gametophytes. The sporophyte develops inside the balloon-like structures on the thallus, the seta is short and the foot is bulbous and embedded in the thallus. It grows in moist and compacted soils, in open and illuminated areas (Vianna 1981).

The official List of Threatened Endangered Flora Species in Rio Grande do Sul state (available at <<https://secweb.procergs.com.br/livlof/>>) was established in December 2014 by decree 52.109. Currently it comprises 1294 taxa, being 1137 Angiosperms, 3 Gymnosperms, 90 Pteridophytes and 64 Bryophytes.

The bryophytes list (Antocerotophyta, Marchantiophyta and Bryophyta) presents 35 taxa classified as Deficient Data (DD), 11 taxa considered of Least Concern (LC), four taxa as Near Threatened (NT), 12 as Vulnerable (VU), and among the most threatened species we have *Archidium tenerrimum* Mitt. and *Sclerodontium clavinerve* (Müll. Hal.) H.A. Crum and *Sphaerocarpos mucilloi* E. Vianna as Critically Endangered (CR).

*Sphaerocarpos mucilloi* is endemic to Rio Grande do Sul state and it was only known from the type locality: Porto Alegre, and from two other municipalities near the type locality: São Leopoldo and Ivoti (all collections are from 1963 to 1977). These localities correspond today to areas with great human impact, so, it is possible that the species no longer occurs there.

So far, no other collections of this species is known and all literature only refers to the original description (e.g., Gradstein & Costa 2003; Bordin & Yano 2010; BFG 2018; Costa & Peralta 2015).

Having in mind the necessity to know the real threatened status of this species and to provide new data for the next evaluation, we are doing several field trips in Rio Grande do Sul. From August 27 to September 3, 2017 we visited areas of Atlantic Forest and Pampa in Santana do Livramento (Ibirapuitã Environmental Protection Area - APA do Ibaratuitã) and Mata municipalities.

The APA do Ibirapuitã was created in 1992 (Decree N°. 529 of May 20, 1992), with an area of 316,790.42 hectares. It is located in the southwest region of the State of Rio Grande do Sul (55°29'W to 55°53'W and 29°05'S to 30°51'S) covering part of the municipalities of Alegrete, Quaraí, Rosário do Sul and Santana do Livramento, about 600 km from Porto Alegre. It includes areas of forest formations with well-preserved alluvial and gallery forests, and rural formations largely affected by the presence of cattle and fire (Management Plan 1999). According to Teixeira *et al.* (1986), the vegetation in this area is typical of the Savanna, Steppe and Deciduous Seasonal Forest formations.

The municipality of Mata is also located in the Pampa Biome and has an area of 311.90 km<sup>2</sup>, most of which is occupied by crops (corn, soybeans and rice) and together with the municipality of São Pedro do Sul, it is part of the Paleobotanical Sites of Arenito Mata, created by the Brazilian Commission of Geological and Paleontological Sites in 1978 (Sommer & Sherer 2002). From Triassic age, these “petrified forest” exhibitions attract tourists to the city because they are among the most important records of its kind on the planet, having formed more than 200 million years ago (Sommer & Sherer 2002).

*Sphaerocarpos mucilloi* was collected in Santana do Livramento municipality, at APA do Ibirapuitã, in Estância da Glória (30°44'59.9"S, 55°34'07.1"W), 227 m altitude, on compacted soil and ravine (Fig. 1). It was collected in the center of the municipality of Mata, in compacted soil of the stairs formed by fossilized wood, associated to *Phaeoceros* sp. The samples are deposited at three different Herbaria: Herbário Dr. Ronaldo Wasum da Universidade Estadual do Rio Grande do Sul - Litoral Norte (HERW), Herbário do estado “Maria Eneyda P. Kauffman Fidalgo” (SP) e no Herbário da Universidade de Brasília (UB).

The recollection of *S. mucilloi* after 40 years increased the knowledge about this species and brought a new perspective to its conservation, since there were doubts if the species populations still exist.

We examine herbarium specimens and found another site to *S. mucilloi*, in Santa Vitória do Palmar, and the occurrence of *S. texanus* (Fig. 2), not previously reported to Brazil. *Sphaerocarpos texanus* is widely distributed in Americas and is differentiated by its regular and high partition walls of the spore, in contrast with *S. mucilloi* that

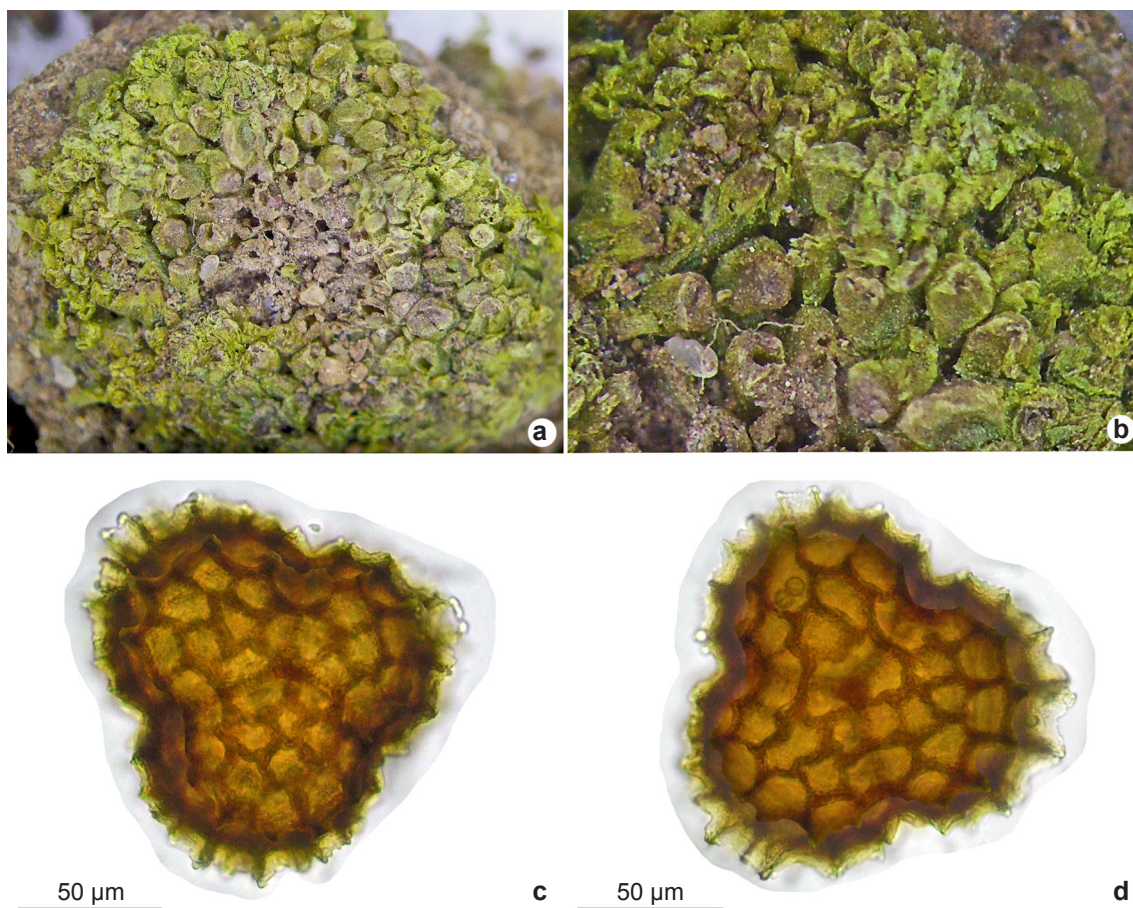
show a small portion of the outer surface of the spore with high partitions. For further details of the characterization of *S. texanus* see Haynes (1910).

These new data will help in the next revision of the Bryophytes Species List in Rio Grande

do Sul and in Brazil as goals of Brazil in the Convention on Biological Diversity (Brasil 2002). Probably these new data will change the status of the *S. mucilloi* low risk because the range of occurrence was largely increased.



**Figure 1** – a-f. *Sphaerocarpos mucilloi* – a-b. pictures at field in Santana do Livramento municipality, at APA do Ibirapuitã; c-d. rehydrated plants; e-f. spores in tetrad.



**Figure 2** – a-d. *Sphaerocarpos texanus* – a-b. pictures at field; c-d. spores in tetrad.

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**Specimens examined** of *Sphaerocarpos mucilloi* Vianna: Bagé, nos bordos de um canal de drenagem, 16.VII.1980, *D.M. Vital 9164* (SP); mata, fragmento de mata na área urbana, próximo à gruta de Lourdes, em barranco associado com *Phaeoceros*, 29°33'44"S, 54°27'10"W, 131 m, 1.IX.2017, *D.F. Peralta et al. 21204* (SP); Santa Vitória do Palmar, 13.VII.1980, *D.M. Vital 9043* (SP); Santana do Livramento, Área de Proteção Ambiental do Ipirapuitanga, mata próximo a banhado e mata paludosa, em solo, 30°46'04"S, 55°34'47"W, 293 m, 2.IX.2017, *D.F. Peralta et al. 21260, 21287* (SP).

**Specimens examined** of *Sphaerocarpos texanus* Austin: BRAZIL. PARANÁ: Foz do Iguaçu, in forest along Rio Iguaçu, mesic forest, 22-23.IX.1984, *D.M. Vital & W.R. Buck 12027* (NY, SP).

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