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## ***SPHAEROCARPOS* BOEHM. (MARCHANTIOPHYTA), NEW GENUS IN BRYOPHYTE FLORA OF MONTENEGRO**

### *Abstract*

In this paper the genus *Sphaerocarpos* Boehm (Marchantiophyta) is reported as a new for bryophyte flora of Montenegro. Material was collected in the Capital city Podgorica (Stara Varoš), on a very small grassy surface. The species isn't identified based on certain morphological characteristics, since a main determination character — spores, was not found in the thalli. Certainly, this record is significant having in mind the fact that genus *Sphaerocarpos* is rare in SE Europe.

*Keywords:* *Sphaerocarpos*, Marchantiophyta, new record, Montenegro, rare liverwort, SE Europe

### **INTRODUCTION**

Until a decade ago, bryophyta has been a neglected research field in Montenegro. A large part of the results were very old and referred to the most part to the coastal area. So, the largest part of Montenegro has remained almost completely uninvestigated [4]. Last ten years, several bryological field trips were organised in the country, mainly in national parks, protected areas were investigated from the sea shore to the highest mountains, e. g. Kotor bay, Skadar Lake, Lovćen Mts, Durmitor Mts, Prokletije Mts, Bjelasica Mts, Komovi Mts, Orjen Mts and Rumija Mts [7]. According to recent data bryophyte flora of Montenegro

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comprises 704 taxa (555 mosses and 149 liverworts) [2], while the latest data from Prokletije Mts presented a new 12 species (2 liverworts and 10 mosses) [3] (bryological research in several unexplored areas in Montenegro was conducted during 2017/18, funded by Montenegrin Academy of Sciences and Arts, but results are still unpublished).

The genus *Sphaerocarpos* Boehm. (Sphaerocarpaceae, Marchantiopsida) is represented by nine species in the World [12]. Plants are small and delicate; species form a tiny, disc-like thallus which bears densely packed, balloon-like structures that surround the sex organs and spore bodies while are not likely to be confused with other liverworts [1; 8]. Tree species — *Sphaerocarpos michelii* Bellardi, *S. stipitatus* Bisch. ex Lindenb. and *S. texanus* Austin are present in Europe and Macaronesia [11] in order that *S. stipitatus* was accidentally introduced in Portugal [8]. In the SE Europe, *S. texanus* and *S. michelii* were registered in Croatia, Greece [9, 10] and Crete [5]. Also, recently *S. michelii* was found in Bulgaria [5].

## MATERIALS AND METHODS

Bryological material was collected in the city Podgorica, in the vicinity of the city center, more precisely in front of the building of the Natural History Museum of Montenegro (very small grassy surface, on the area less than 10 m<sup>2</sup>). Materials were studied using a binocular and a stereo-microscope (Olympus CX 41 and Olympus CZX 12) and Scanning Electron Microscopy (SEM) and identified using relevant bryological literature: [6], [8], [13]. Nomenclature follows [12]. The samples are deposited in the Natural History Museum of Montenegro in Podgorica (NHM 1522/6966).

## RESULTS AND DISCUSSION

*Sphaerocarpos* Boehm., Def. gen. pl., ed. 3: 501, 1760 (Ludwig 1760).

Material examined:

Montenegro: Capital city Podgorica, Stara Varoš, Sahat kula square (in front of the Natural History Museum of Montenegro building), 42°26'8.91" N, 19°15'35.99" E, 41 m a. s. l., 24 February 2014, leg./det.: *S. Dragičević*, conf.: M. Veljić.

Two very similar species, *S. michelii* and *S. texanus* form a tiny rosettes, disc-like thallus which bears densely packed, balloon-like structures that surround the sex organs and spore bodies. Both species are growing in substrates which are usually non-calcareous or neutral: in neglected corners of gardens, plant nurseries and in arable fields, especially fields of bulbs, flowers and vegetables, cereal stubble, and more rarely on roadsides and waste ground [1] (we collected material from very small grassy surface, on the area less than 10 m<sup>2</sup>, surrounded by



Figure 1. Thalli of *Sphaerocarpos* sp.

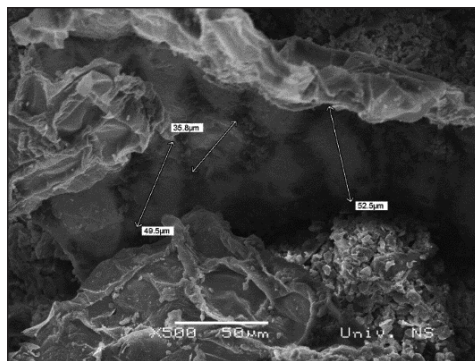


Figure 2. SEM photo of cells of thalli.

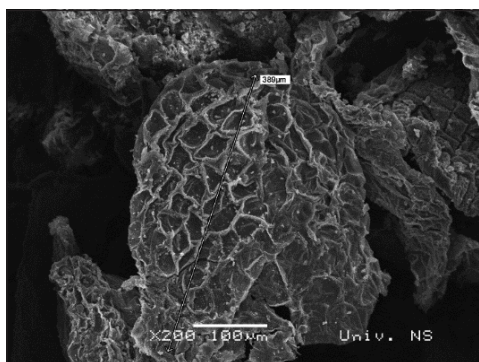


Figure 3. SEM photo of length of perigynium

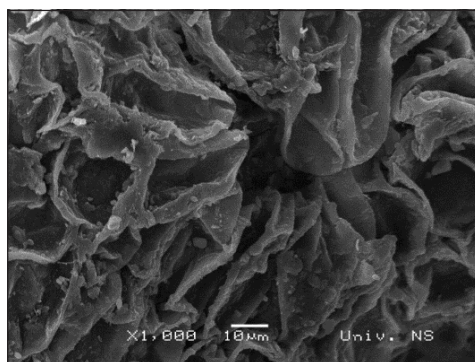


Figure 4. SEM photo of dentate mouth of female involucre

concrete paths and several trees of *Cupressus sempervirens* L.; no other bryophyte species were found growing with mentioned liverwort). Most reliable, *S. michelii* and *S. texanus* can be distinguished from each other by microscopical examination of the spore tetrads: *S. texanus* has papillose lamellae without spines while *S. michelii* has smooth lamellae with spines at the angles [8].

During the determination of the collected material (used SEM) certain morphological characteristics showed: cells of thalli, 35–52.5 µm, length of perigynium to 389 µm and toothed mouth of female involucre (Figure 1–4). Liverwort species is not identified based on certain morphological characteristics (there are expectations about *S. texanus*), since spores were not found in the thalli.

## CONCLUSION

Genus *Sphaerocarpos* Boehm (Marchantiophyta) is registered for the first time for bryophyte flora of Montenegro. Material was collected on a small grassy surface in Stara Varoš, near the center of the Capital city Podgorica. We did not identify a species based on certain morphological characteristics of the thalli and

sex organ because the main difference from *S. texanus* and *S. michelii* is structure of spore tetrads: *S. texanus* has papillose lamellae without spines while *S. michelii* has smooth lamellae with spines at the angles. This record is significant having in mind the fact that *Sphaerocarpos* is rare in SE Europe.

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***Sphaerocarpos* Boehm. (Marchantiophyta), novi rod  
u flori mahovina Crne Gore**

*Sažetak*

U ovom radu prikazan je rod *Sphaerocarpos* Boehm (Marchantiophyta) koji je po prvi put registrovan za floru mahovina Crne Gore. Materijal je sakupljen u Glavnom gradu Podgorica (Stara Varoš), na veoma maloj travnatoj površini. Kako spore koje su važan determinacioni karakter nisu nađene, vrsta nije identifikovana na osnovu morfoloških karakteristika talusa. Svakako, ovaj nalaz je važan jer je rod *Sphaerocarpos* rijedak u jugoistočnoj Evropi.

*Ključne riječi:* *Sphaerocarpos*, Marchantiophyta, novi nalaz, Crna Gora, rijetka jetrenjača, jugoistočna Evropa

