

# On the identity and distribution of some elusive bryophyte species in the Bulgarian flora

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**Abstract.** The article presents the results of a revision of the herbarium specimens reported by J. Velenovsky and J. Podpéra of four moss species of uncertain occurrence in Bulgaria (*Brachythecium geheebii*, *Cheilothela chloropus*, *Meesia triquetra*, and *Sphagnum riparium*). The authors conclude that *Cheilothela chloropus* and *Sphagnum riparium* do not occur in Bulgaria, because the specimens of these species were misidentified. Distribution of *Brachythecium geheebii* and *Meesia triquetra* in Bulgaria is amended on the basis of the present revision.

**Key words:** *Brachythecium geheebii*, bryophytes, Bulgaria, *Cheilothela chloropus*, distribution, *Meesia triquetra*, *Sphagnum riparium*

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## Introduction

The works of Jozef Velenovsky (1902) and Jozef Podpéra (1911) were the first comprehensive studies on the bryophyte flora of Bulgaria. Of the many reported species, few have been never reported afterwards in Bulgaria and their occurrence remains uncertain. Some specimens from Podpéra's and Velenovsky's collections are kept in the Herbarium of the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences (SOM), but others are unavailable, thus making impossible any further revisions and conclusions regarding the species distribution. Updating of the checklists and assessment of the status of conservation-important species require clarification of the uncertainties concerning some taxa and their localities. Revision of the herbarium specimens helps clarify these issues.

This paper presents the results of revision of some herbarium specimens published by Podpéra (1911) and Velenovsky (1902) stored in the herbarium col-

lections at the Charles University (PRC) and the National Museum (PR) in Prague.

## Material and methods

The authors have studied the bryophyte herbarium collections of J. Velenovsky and J. Podpéra stored at PRC and PR. Since the specimens had no numbers, we have enclosed the original label details for further reference. The obtained data was complemented by the revisions of specimens in the Herbarium of the University of Warsaw, Poland (WA) and SOM.

## Results and discussion

***Brachythecium geheebii* (Bruch ex Spruce) Schimp.** This species was reported for the first time for Bulgaria by J. Podpéra (1911) from three sites on Mt Vitosha: Dragalevsko Blato locality, valley of river Stara

Reka and peak Reznyovete. Subsequently, it was reported again by Mickiewicz & al. (1966) from Mt Vitosha and the Western Balkan Range (loc. Vitinya), without more precise locations. The species has never been found again at these sites, despite several purposeful searches. Until recently, no specimens from these collections have been available to the authors, in order to confirm the identity of the reports. Recently, *Brachythecium geheebii* has been collected in 2006 in the Western Balkan Range (the region of Varshets town), in an old-growth beech forest, and thus its occurrence in Bulgaria was confirmed (Ganeva & al. 2008, SOM 9830-B, duplicates in the Herbarium of the Hungarian Natural History Museum, Budapest). However, distribution of this extremely rare species still remains unclear. A revision of the herbarium specimens labelled *B. geheebii* by J. Podpéra at PRC revealed the following:

1) A specimen labelled “Vitosha planina: Dragalevsko Blato”, collected on 17.07.1908 at 1800 m a.s.l. was confirmed to be *Brachythecium geheebii*.

2) Two specimens collected in the vicinity of Bistritsa village belong to *Homalothecium sericeum* (Hedw.) Schimp.: a) collected at 1000 m a.s.l. on 25.07.1908, “ad pedem m. (Vitosha Mt., our comment) supra vic. Bystrica”, labelled *B. geheebii*, and b) collected at the same elevation on 17.07.1908 “ad pedem m. (Mt Vitosha, our comment) supra vic. Bistrica, Stara Reka”, labelled *B. geheebii* var. *angustioribus*. Since river Stara Reka flows down Mt Vitosha across Bistritsa village and both collections were made at similar altitude, apparently they were made close to each other.

3) A specimen collected at loc. Reznyovete at 1800 m a.s.l. on 17.07.1907, labelled “*Brachythecium* aff. *geheebii* sp. n. ?” proved to belong to *Brachythecium salebrosum* (Hoffm. ex F. Weber et D. Mohr) Schimp.

The herbarium specimen collected and determined by I. Grochowska from Mt Vitosha – “on beech with *Radula complanata*” (WA 0000044505, Mickiewicz & al. 1966) belongs to *Homalothecium sericeum*.

Thus, of the four reported localities on Mt Vitosha, only one proved to be *B. geheebii*.

The report of Mickiewicz & al. (1966) from loc. Vitinya (Western Stara Planina) could not be verified in the field and the authors were unable to locate the herbarium specimen. Beach forests at Vitinya are strongly affected by windfalls, intensive forestry and highway construction which puts under ques-

tion the present occurrence of the species there, if indeed the report was correct. Therefore, there are only two confirmed localities of *B. geheebii* in Bulgaria, of which only one is recent (Ganeva & al. 2008, Fig. 1).

*Brachythecium geheebii* is red-listed both at national (CR, Natcheva & al. 2006) and at European (R, ECCB 1995) level. It is subject to monitoring by the Bulgarian National System for Environmental Monitoring.

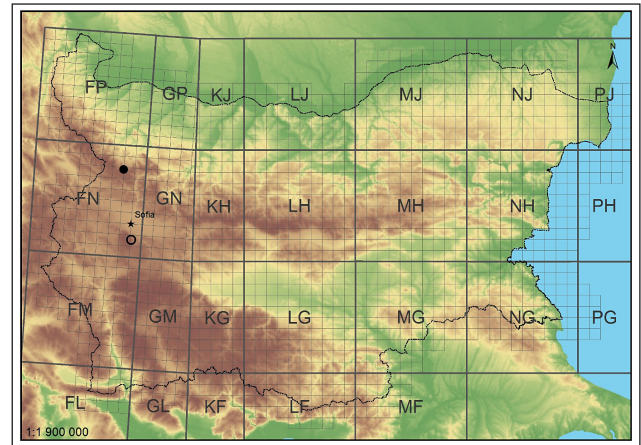


Fig. 1. Distribution of *Brachythecium geheebii* in Bulgaria. ● – recent reports, ○ – old reports.

***Cheilothela chloropus* (Brid.) Broth.** The species was reported for the first time in Bulgaria by Velenovsky (1902), at the foothills of the Rodopi Mts, near Parvenets village (former Dermendere). The material in Velenovsky’s collection at PR labelled “*Cheilotella chloropus*” collected from the same locality by V. Stribrny in 1900 visibly deviates from the description of this species, i.e. leaf cells completely lack mamillae but have thick walls, leaves are with ovate-lanceolate base, relatively abruptly tapering into channelled acumen, costa occupying 1/3 to 1/2 of leaf base, lamina unistratose, with auricles at base. These characters refer to *Ditrichum flexicaule* Brid. The second report of *C. chloropus* from Bulgaria was made by Mickiewicz & al. (1966), from Mt Vitosha on humus soil in a forest. The authors were unable to find the herbarium voucher from this report. The fact that *C. chloropus* is a lowland Mediterranean-Atlantic calcicolous species of open ground (Pedrotti 2001, Smith 2004) makes the latter report highly doubtful, since the collecting area lays on acidic bedrock with prevalence of the boreo-nemoral flora of broadleaf forests. Our study indicates that *C. chloropus* does not occur in Bulgaria.

*Meesia triquetra* (L. ex Jolycl.) Ångstr. Revision of the herbarium specimens of J. Podpéra at PR: 1) from Rila Mts “in silvicis (*Picea excelsa*) circa Cam Koryje” collected at 1300 m a.s.l. on 29.07.1908, and 2) from Mt Vitoshka, Dragalvsko Blato collected at 1800 m a.s.l. on 19.07.1908. The specimens clearly belong to *M. triquetra*. Presently, the fate of the former locality is highly uncertain, since it most likely falls within the area of the strongly expanded Borovets Ski Resort. The resort was founded in 1896 (under the name Čam Koryje, only 12 years before the visit of Podpéra) and covered less than 12 ha of scattered low buildings. Today it occupies more than 170 ha of much denser-built urban area. We have visited the locality at Mt Vitoshka many times in different years in search of *M. triquetra* but we have never succeeded in finding it. On the other hand, the latter habitat shows clear signs of desiccation and a tendency for overgrowing by strong competitors, such as various grasses and sedges (Dimitrov & al. 2015)

The collection revised by Hájková and Hájek (Hájková & al. 2007) from peak Bolvan in the Central Stara Planina Mts (SOM 4352-4365-B) was originally determined by S. Petrov as *M. uliginosa* Hedw and published under the same name (Petrov 1966). Subsequently, it was revised as *M. triquetra* but with a question mark. Hájková & al. (2007) did not mention the revision history of the specimens and concluded that the occurrence of *Meesia triquetra* in Bulgaria was uncertain and of low probability (Hájková & al. 2007). Our study showed that there are two confirmed reports of *M. triquetra* in Bulgaria (Fig. 2), none of which is recent.

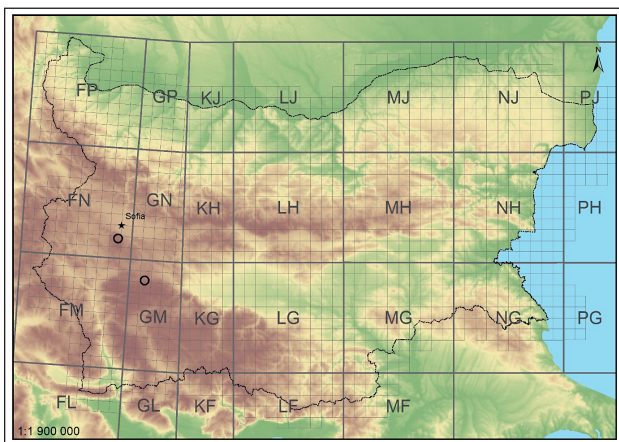


Fig. 2. Distribution of *Meesia triquetra* in Bulgaria. ○ – old reports.

*Meesia triquetra* was not included in the national bryophyte Red List (Natcheva & al. 2006) and is a red-list candidate at European (Hodgetts 2015) level. The present distribution of the species in Bulgaria remains unclear and there is a probability that it is extinct from the Bulgarian flora. Further thorough searches are needed.

*Sphagnum riparium* Ångstr. The herbarium specimen in PRC labelled *Sphagnum riparium* was collected by Podpéra in Rila Mts “in sylvaticis (*Picea excelsa*) circa Čam Kuryje” on 29.07.1908 at 1300 m a.s.l. near the Borovets Resort (probably the same locality as *Meesia triquetra*, see above). The envelope contained only shoots of *S. teres* (Schimp.) Ångstr. There is one more report of the species by Ganeva & Düll (1999) from Rila Mts. Our attempts to locate the voucher specimens of *S. riparium* collected by R. Düll have so far proved unsuccessful, as were all attempts to find the species at the cited location. Therefore, its occurrence in Bulgaria has to be treated as doubtful until more information is available.

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