

HETEROCLADIUM HETEROPTERUM, A NEW MEMBER OF THE HUNGARIAN BRYOPHYTE FLORA

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Abstract: During the systematic field studies aimed at exploring the recent bryophyte flora of the Kőszeg Mts and in the framework of grid-cell based bryophyte recording, *Heterocladium heteropterum* was discovered in the valley of the stream Hármas-patak, as a new moss species for Hungary. The size of the population is estimated and the habitats are characterised. Taxonomic characterisation and illustrations are provided to distinguish it from *H. dimorphum*, which is the only related species growing in Hungary. Since *H. heteropterum* is known only in one location in the country so far, we suggest considering it as a critically endangered (CR) species.

Key words: bryophyte diversity, Hungary, Kőszeg Mts, moss species

INTRODUCTION

Heterocladium heteropterum (Brid.) Schimp. (Heterocladiaceae) is one of the first described species of the genus, published together with the descriptions of *H. dimorphum* and *H. kurzii* (SCHIMPER 1852). It is widespread in northern and western Europe, in the mountains of Central and southern Europe up to the alpine region, and with isolated occurrences in Turkey, Lebanon, Georgia, the Caucasus, and Azerbaijan (WIGGINGTON & BLOCKEEL 2014). *H. heteropterum* occurs in all countries surrounding Hungary (HODGETTS 2015). Since there is an old report of this species from the Austrian part of the Kőszeg Mts (LATZEL 1930, PURGER *et al.* 1997) it was perhaps to be expected that *H. heteropterum* might occur in the Hungarian part of this mountain range as well. Although the species was already mentioned from Hungary, from the Pilis Mts by SZEPESFALVY (1940, 1941, 1942), and this report was accepted by BOROS (1953), it is clear now that only a collected specimen of *Pterigynandrum filiforme* was misidentified as *H. heteropterum* (BOROS 1968). Consequently *H. heteropterum* is missing in the latest Hungarian checklist (PAPP *et al.* 2010).

MATERIAL AND METHODS

Extensive field studies have been conducted since 2015 to investigate the bryophyte diversity and distribution patterns in the Kőszeg Mts. Geographical coordinates of the *H. heteropterum* populations were determined using a Garmin eTrex-30 GPS. The photos were made with Canon SX50 camera and with stereomicroscope Olympus SZ51. The drawings of the details of *H. heteropterum* were made by the first author. The nomenclature of the bryophyte taxa follows PAPP *et al.* (2010) and HODGETTS (2015). In the case of the vascular plants the nomenclature follows KIRÁLY (2009).

RESULTS AND DISCUSSION

During the exploration of the bryophyte flora of the Kőszeg Mts and in the framework of grid-cell based bryophyte recording (ERZBERGER 2012, ERZBERGER & NÉMETH 2013), *Heterocladium heteropterum* was discovered on a steep slope of the valley of the stream Hármás-patak below Stájer-házak, ca 100 m from the border to Austria. Altogether seven colonies of *H. heteropterum* covering an overall area of ca 1400 cm² were found in earth-filled crevices of siliceous rock in mixed forest on 24 July, 2016 (B-Erzberger s. n., herbarium K. Baráth).

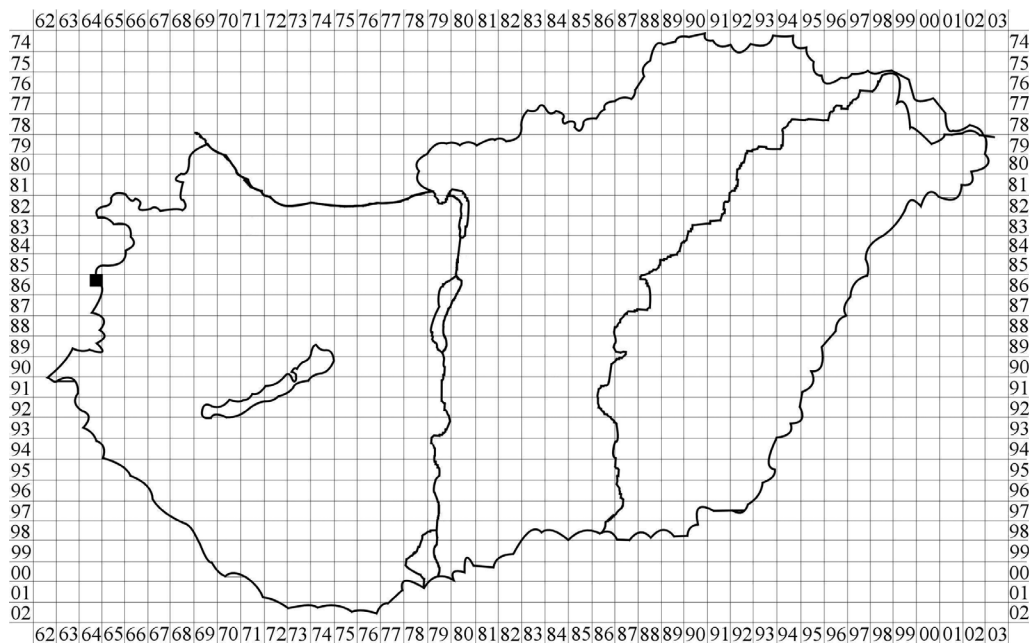


Fig. 1. Geographical locations of *Heterocladium heteropterum* in Hungary according to the grid of the Central European Mapping System.

The centre of population was at *ca* 400 m, 47.38703° N, 16.45706° E, [8664.2] (Central European Mapping System; NIKLFELD 1971) (Figs 1–2). The associated bryophytes were the following: *Cynodontium polycarpon*, *Dicranella heteromalla*, *Dicranum scoparium*, *Hypnum cupressiforme*, *Isothecium myosuroides*, *Leucobryum juniperoideum*, *Pohlia melanodon*, *Pseudotaxiphyllum elegans*, *Rhabdoweisia crispata* and *R. fugax*. Vascular plants in the habitat include *Asplenium ruta-muraria*, *A. trichomanes*, *Campanula rotundifolia*, *Corylus avellana*, *Cystopteris fragilis*, *Dryopteris carthusiana*, *Fagus sylvatica*, *Oxalis acetosella*, *Picea abies*, *Pinus sylvestris*, *Polypodium vulgare* and *Vaccinium myrtillus*.

An additional population was found nearby: *ca* 515 m to the SE of the first site, at 405 m, 47.38417° N, 16.46236° E, 14 August 2016 (B-Erzberger 22286, herbarium K. Baráth). In this site the associated bryophytes were found to be *Atrichum undulatum*, *Bartramia pomiformis*, *Hypnum cupressiforme*, *Lejeunea*

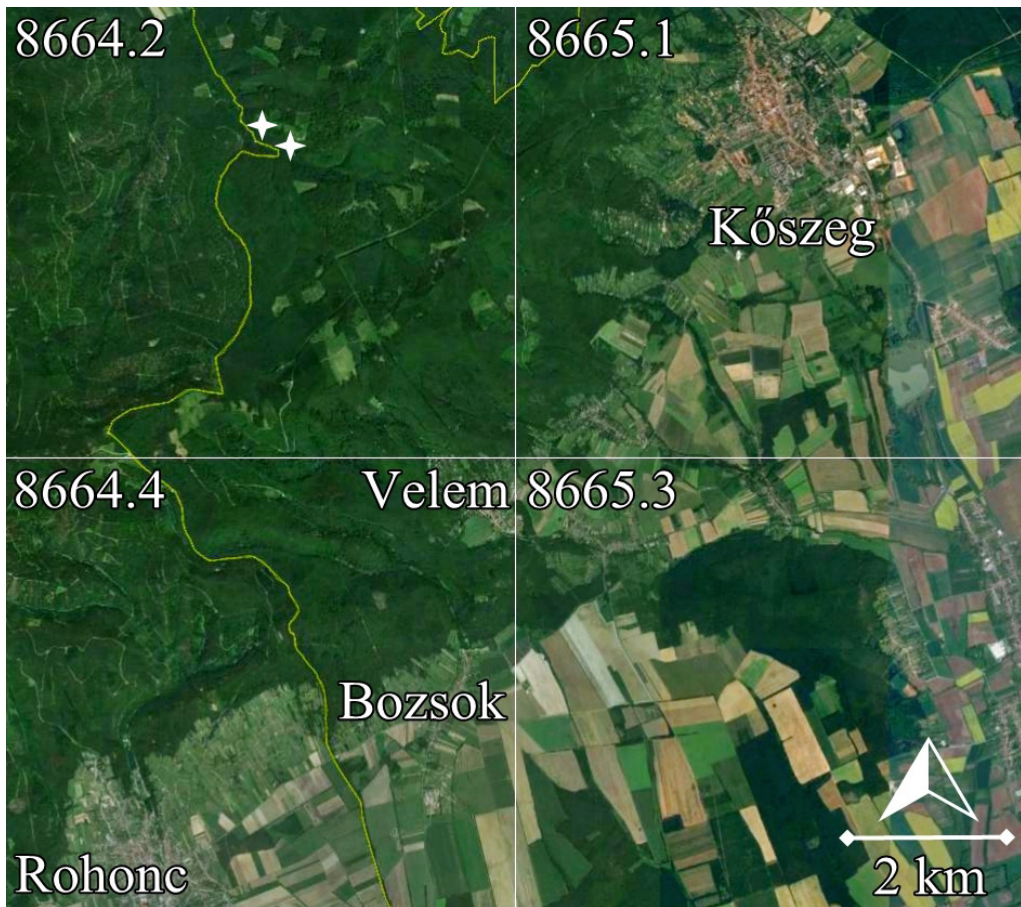


Fig. 2. Geographical location of the two new populations of *Heterocladium heteropterum* in the Kőszeg Mts.

cavifolia, *Leucobryum juniperoideum*, *Polytrichum formosum*, *Pseudotaxiphyllum elegans*, *Rhabdoweisia crispata*, *R. fugax*, *Rhizomnium punctatum* and *Scapania nemorea*. In the second site only two colonies of *H. heteropterum* covering an overall area of ca 2700 cm² were present.

Short characterisation of *Heterocladium heteropterum*

syn.: *Hypnum heteropterum* (Brid.) Hampe, *Pterigynandrum heteropterum* Brid., *Pterigynandrum filiforme* var. *heteropterum* (Brid.) Schimp., *Thuidium heteropterum* (Brid.) Kindb., *Leptohymenium heteropterum* (Brid.) Huebener, *Pterogonium heteropterum* (Brid.) Bruch, *Pseudoleskea heteroptera* (Brid.) Schimp., *Pseudoleskeella heteroptera* (Brid.) Kindb.

Plants slender, forming shoots up to about 3 cm long, dull green, rarely yellowish green, with roughly pinnate branching and down-curved stem leaves. Stem and branch leaves similar in shape but stem leaves about twice the size of the branch leaves. Stem leaves about 500–600 µm long, from an ovate base gradually narrowed to a short point, and erect spreading, apex acute to acuminate not reflexed. Costa double, less than halfway up the leaf. Capsules rare.

Heterocladium heteropterum usually grows on lime-free siliceous, moist, shaded rocks, often on vertical faces and near streams (Figs 3–6).



Fig. 3. Habitat of *Heterocladium heteropterum* in the Kőszeg Mts.



Fig. 4. Habit of *Heterocladium heteropterum*.



Fig. 5. Leafy shoots of *Heterocladium heteropterum*.

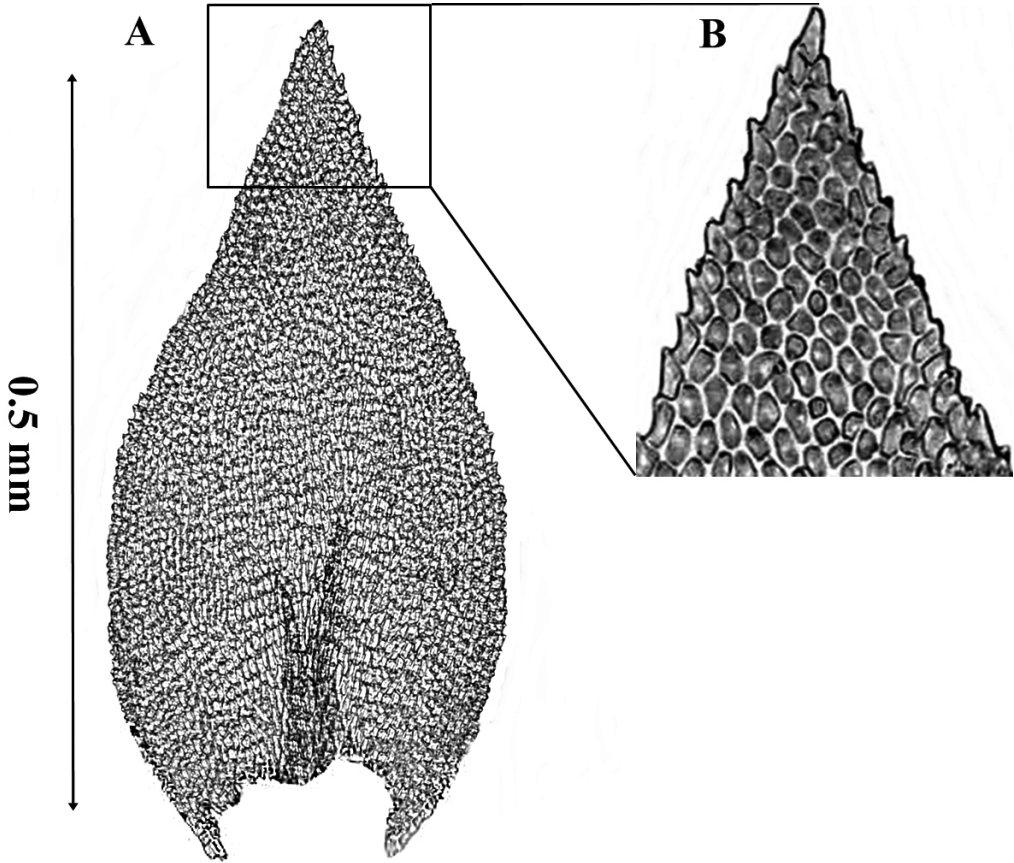


Fig. 6. Stem leaf (A) and apical cells (B) of *Heterocladium heteropterum*.

Heterocladium dimorphum the only related species growing in Hungary (PAPP *et al.* 2010) differs from *H. heteropterum* by strongly dimorphic leaves. Stem leaves reflexed, from a broad base abruptly narrowed to an acuminate point, branch leaves erecto-patent, shortly pointed. *H. dimorphum* usually grows in shady, woody habitats on loamy or gritty soil and at tree bases.

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Összefoglaló: A Kőszegi-hegység mohafőráját feltáró terepmunkák során 2016-ban egy újabb, Magyarországra nézve új mohafaj került elő. A *Heterocladium heteropterum* a Kőszegi-hegység osztrák oldaláról már ismert volt, előfordulására Magyarországon is számítani lehetett. A faj Közép- és Dél-Európában elsősorban hegyvidéken, árnyékos szilikátos sziklákon, gyakran patakok

közeliében fordul elő. A Kőszegi-hegységben a Hármaspatak völgyéből 2 populáció összesen 9 telepe került elő, amelyek együttes kiterjedése kb. 4100 cm² volt. A *Heterocladium* nemzetségből a *H. dimorphum* fordul még elő Magyarországon, azonban az utóbbinak nemcsak méretükben, hanem alakjukban is eltérnek szár- és áglevellei. A két rokon faj elkülönítését az élőhelyi különbözőségek is elősegítik, ugyanis a *H. dimorphum* agyagos, vagy kavicsos talajon, útrézsűkben, fák tövében fordul elő. Mivel a *H. heteropterum* ez idáig csak a Kőszegi-hegységből került elő Magyarországon, ezért javasoljuk a vörös listán a súlyosan veszélyeztetett kategóriába (CR) való besorolását.

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