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Abstract: The present part of the series of miscellaneous new records provides the second record of a bryophyte (*Sematophyllum adnatum*) and the second confirmation of a fungus (*Serpula himantoides*) in natural habitats in Hungary. New regional records of two ferns are also reported here, the first occurrence of *Dryopteris affinis* in the Aggtelek Karst region and a new occurrence of *Polystichum aculeatum* in the middle of the Great Hungarian Plain in an artificial habitat. New records of recent escapes and naturalisation of *Pennisetum alopecuroides* are listed here from various parts of Hungary.

Key words: Dryopteridaceae, Hungary, Poaceae, Sematophyllaceae

INTRODUCTION

This paper is the ninth part of the series launched in *Studia botanica hungarica* focusing on the new chorological records, nomenclature, and taxonomy of plant species from algae to vascular plants and fungi (BARINA *et al.* 2015, PAPP *et al.* 2016, TAKÁCS *et al.* 2016, CSIKY *et al.* 2017, MESTERHÁZY *et al.* 2017, SCHMIDT *et al.* 2018, MATUS *et al.* 2018, KIRÁLY *et al.* 2019).

MATERIAL AND METHODS

Nomenclature of fungi follows Index Fungorum (2019). Micromorphological examinations of fungal specimens were obtained from dried basidiocarps, and following the method described in PAPP & DIMA (2017).

Nomenclature of vascular plants follows KIRÁLY (2009) and The Plant List (2013). Nomenclature of bryophytes follows PAPP *et al.* (2010). Codes of the Central European Flora Mapping grid are in square brackets. Abbreviations of herbaria follow THIERS (2017).

NEW RECORDS WITH ANNOTATIONS

Fungi

(94) *Serpula himantioides* (Fr.) P. Karst. (Serpulaceae)

Hungary, Vértes Mts: near Csákberény, Juhdöglő-völgy Forest Reserve, on *Fagus sylvatica* log, 47.37745° N, 18.32497° E; leg. & det.: V. Papp, 15.10.2010 (PV269); on *Quercus petraea* log, 47.37745° N, 18.32497° E; leg. & det.: V. Papp, 08.10.2012 (PV1034); on *Quercus petraea* log, 47.37745° N, 18.32497° E; leg. & det.: V. Papp, 19.10.2019 (VPapp 81020121).

Hungary, Bakony Mts: near Fenyőfő, on *Pinus sylvestris* log, 47.35588° N, 17.76517° E; leg. & det.: V. Papp, 04.10.2018 (V. Papp 1810141); on *Pinus sylvestris* log, 47.35558° N, 17.77590° E; leg.: V. Papp & B. Palla, det.: V. Papp, 03.11.2018 (VPapp 18110311).

The merulioid fungal genus *Serpula* (Pers.) Gray contains mainly conifer-dwelling saprotrophic taxa, producing brown heartrot in the substrate (SKREDE *et al.* 2011). The generic type, *S. lacrymans* (Wulfen) J. Schröt. almost restrictively degrades structural wood in buildings, while the morphologically similar *S. himantioides* occurs in natural habitats (SEEHANN 1986, CARLSEN *et al.* 2011).

The occurrence of *S. himantioides* in Hungary was mentioned by earlier literatures (MOESZ 1934, BÁNHEGYI *et al.* 1953, COOKE 1957), but without any information of the collection sites or specimens. SZEMERE (1965) referred to *S. lacrymans* as a common fungus in the Bakony Mts; however, according to the habitat preference of this species, there is a slight chance, that *S. himantioides* was present instead of *S. lacrymans* in the studied sites. The first well-documented occurrence of *S. himantioides* in Hungary was published by NAGY & GORLICZAI (2007) from Töserdő (Bács-Kiskun County). The specimens found in the Juhdöglő-völgy Forest Reserve (Vértes Mts) and in the Fenyőfő Nature Reserve (Bakony Mts) were identified based on macro- and micromorphological examinations (Fig. 1), thus being new reports on the occurrence of this fungus in Hungary.

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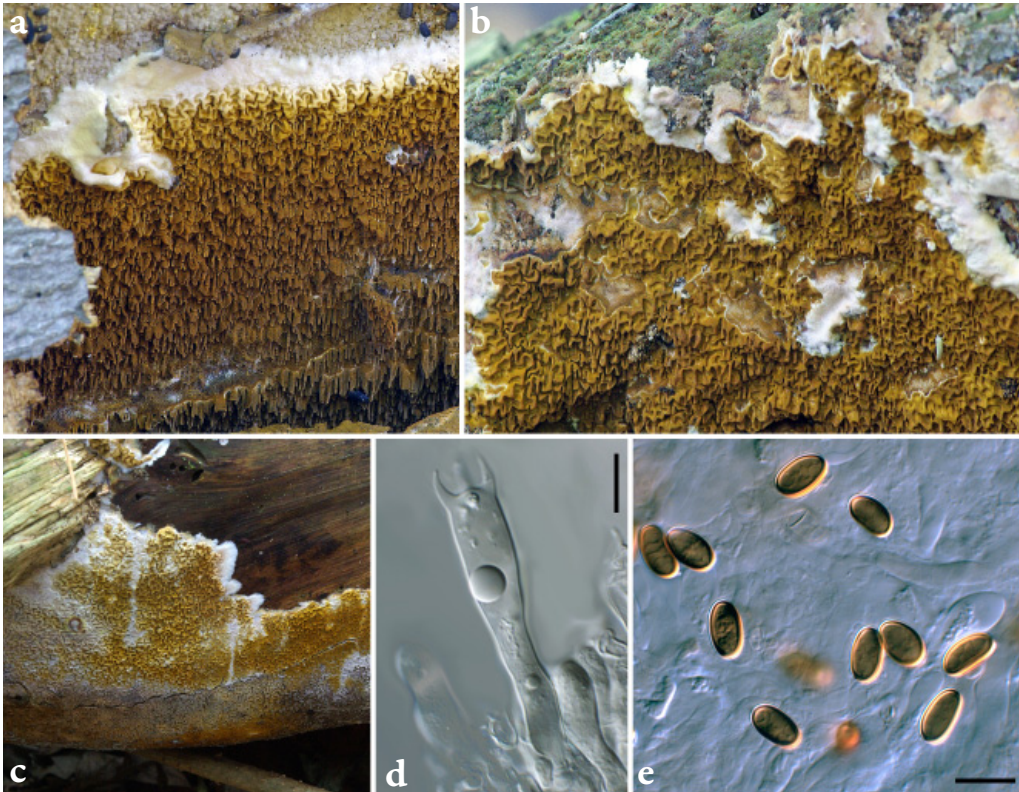


Fig. 1. Macromorphology and microscopic structure of *Serpula himantioides*. a = basidiomata on *Fagus sylvatica* log (PV269). b = basidiomata on *Quercus petraea* log (PV1034). c = basidiomata on *Pinus sylvestris* log (VPapp 18110311). d = basidium (VPapp 18110311). e = basidiospores (V. Papp 18110311). Scale bars: d, e = 10 μ m. Photos (a, b, c: V. Papp, d, e: B. Palla).

Bryophytes

(95) *Sematophyllum adnatum* (Michx.) E. Britton (Sematophyllaceae)

Hungary, Zala County, Zala Hills: Zalalövő, northwest from Irsapuszta, in a small branch-ravine (at present dry) of Palotai stream, on decayed *Carpinus betulus* wood, 46.81762° N, 16.56848° E, 255 m [9165.3]; leg.: J. Deme, K. Baráth, J. Csiky, P. Erzberger, D. Kovács, A. Zurdo Jorda, det.: P. Erzberger, conf.: K. Baráth, 24.03.2019 (B-Erzberger 25843 and JPU).

This bryophyte widespread in North, Central and South America and tropical Africa is listed among the non-native mosses in Europe (HILL *et al.* 2006). The first European data is from Italy (BLOCCKEEL *et al.* 2000) but later was found in Switzerland (SCHNYDER 2015) and Hungary (ELLIS *et al.* 2018) as well. We report here its second Hungarian occurrence.

Both of the first Italian and Hungarian stands were found in former nursery or botanical gardens among exotic trees, so the introduction to Europe occurred

presumably accidentally, with ornamental plants. On the other hand, the new Hungarian stand was most likely established by spores, since it was found in a semi-natural beech forest, moreover the closest known stand with sporophytes is less than 40 km away (Kám, Jeli-Arborétum Botanical Garden) (ELLIS *et al.* 2018).

The species was noticed in the field by means of the typical, numerous sporophytes and the small, erect capsule born on a seta less than 10 mm long. The extension of the stand is about 4 cm², growing on a well-decayed, lying *Carpinus betulus* log about 20 cm in diameter. Associated species were *Hypnum cupressiforme* and *Lophocolea heterophylla*.

Due to the abundant production of sporophytes and spores, this moss is able to colonise effectively the suitable habitats (bark – mainly trunk base of *Quercus* spp., decaying wood and rarely siliceous rock in meso-acidophilous forests (BRUSA 2001)), thus it appears to have the potential to spread further into adjacent regions and possibly become an invasive alien (ELLIS *et al.* 2018).

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Pteridophyta

(96) *Dryopteris affinis* (Lowe) Fraser-Jenk. (Dryopteridaceae)

Hungary, Borsod-Abaúj-Zemplén County, Gömör–Torna Karst: Szögliget, NW of the village, in a gap of an old spruce plantation recovering as a mountain beech forest, close to the blue-red tourist pathway at the junction of the watercourses Puska Pál-forrás and Ménes-patak, 48.52837° N, 20.61694° E, 300 m [8672.2]; leg./det. Csiky J., 12.07.2019 (photodocumented).

This single, but strong individual (with 8 leaves) is the first finding of *D. affinis* in a limestone mountain within the North Hungarian Mts. Although this fern has a sub-Mediterranean and sub-Atlantic preference, it usually occurs in conifer plantations out of the aforesaid climatic influence in the Pannonian Basin (CSIKY *et al.* 2018, KIRÁLY & KIRÁLY 2018).

D. affinis is new for the Gömör–Torna Karst (BARTHA *et al.* 2015, VIRÓK *et al.* 2016). This taxon prefers acidic habitats in Hungary (FARKAS 1999), but also occurs in forests of deep valleys, limestone gorges, and sink-holes with Tilio-Acerion character in karst landscapes (CSIKY & SOMLYAY 2005, BÁTORI *et al.* 2006). Since spruce plantations are rather frequent in this area, further populations of *D. affinis* are likely to be found in humid valleys of the karst.

The following phytosociological relevé represents its habitat in the Gömör–Torna Karst (10 × 10 m; Exposition: 325°; Inclination: 33°; Sum E: 90%; Sum E3: 45%; Height E3: 15 m; Sum E2: 25%; Height E2: 5 m; Sum E1: 90%; Height E1: 120 cm; Sum E0: 1%; Height E0: 5 cm; Sum Litter: 10%): E3: *Fagus sylvatica* 45%; E2: *Acer campestre* 0.1%, *Acer pseudoplatanus* 0.5%, *Carpinus betulus* 0.5%, *Cornus sanguinea* 0.5%, *Corylus avellana* 2%, *Euonymus verrucosus* 0.5%, *Fagus*

sylvatica 20%, *Fraxinus excelsior* 2%, *Lonicera xylosteum* 0.1%, *Rosa corymbifera* 0.5%, *Sambucus nigra* 1%, *Staphylea pinnata* 0.1%; E1: *Acer campestre* 0.1%, *A. platanoides* 0.5%, *Actaea spicata* 0.1%, *Aegopodium podagraria* 5%, *Aethusa cynapium* 0.1%, *Ajuga reptans* 0.5%, *Asarum europaeum* 1%, *Athyrium filix-femina* 0.5%, *Brachypodium sylvaticum* 5%, *Campanula rapunculoides* 0.5%, *C. trachelium* 0.1%, *Carex digitata* 0.5%, *Circaea lutetiana* 0.5%, *Cirsium vulgare* 0.1%, *Clematis vitalba* 1%, *Dactylis glomerata* 0.1%, *Dryopteris affinis* 0.5%, *D. carthusiana* 0.5%, *D. dilatata* 0.1%, *D. filix-mas* 6%, *Eupatorium cannabinum* 0.5%, *Fragaria vesca* 0.5%, *Fraxinus excelsior* 3%, *Galeobdolon luteum* 5%, *Galium schultesii* 1%, *Geranium robertianum* 0.5%, *Gymnocarpium robertianum* 0.5%, *Hypericum hirsutum* 0.1%, *Impatiens noli-tangere* 0.1%, *Lathyrus vernus* 0.5%, *Lonicera xylosteum* 0.1%, *Mercurialis perennis* 1%, *Mycelis muralis* 0.5%, *Oxalis acetosella* 1%, *Physalis alkekengi* 0.1%, *Pulmonaria obscura* 0.1%, *Rosa corymbifera* 0.1%, *Rubus idaeus* 1%, *Rubus* sp. 0.1%, *Salvia glutinosa* 1%, *Scrophularia nodosa* 0.1%, *Senecio hercynicus* 0.5%, *Symphytum tuberosum* 0.1%, *Viola reichenbachiana* 0.5%, E0: *Cephalozia bicuspidata* 0.5%, *Cladonia* sp. 0.5%, *Brachythecium salebrosum* 0.5%, *Dicranum scoparium* 0.5%, *Eurhynchium angustirete* 0.1%, *Herzogiella seligeri* 0.5%, *Hypnum cupressiforme* 0.5%, *Lophocolea heterophylla* 0.5%, *Plagiomnium undulatum* 0.5%, *Rhizomnium punctatum* 0.1%.

J. Csiky

(97) *Polystichum aculeatum* (L.) Roth (Dryopteridaceae)

Hungary, Kiskunfélegyháza, on the brick wall of the ramp, 46.70595° N, 19.83556° E, alt. 99 m [9285.3]; leg.: Gy. Haszonits, 03.04.2019 (photodocumented).

The species was discovered on a brick wall of the railway loading docks in Kiskunfélegyháza railway station in the spring of 2019. The loading dock's neglected condition played a significant role in the species' appearance (Fig. 2). A part of the structure between the dock edges has deteriorated. As a result, water and various organic matter seeps through the crevice to the base where the plant is located. This area is under permanent shade, as the ledge of the dock remains undamaged. Only one strain of the species was found, and this one strain colonised the humus-pioneer surface with *Asplenium trichomanes* and *Dryopteris filix-mas*. In August 2019, I visited the plant again; it had lost its wintering leaves in the spring, but some vital leaves remained intact.

The species is not rare in Hungary's mountainous regions, but in the arid/semi-arid region between the Danube and Tisza rivers, it can only establish itself in artificial conditions. Its closest known occurrences are near Kunfehértó, and in the Mezőföld and Ormánság regions (CSIKY 2005, BARTHA *et al.* 2015). Herbarium specimens from the Great Hungarian Plain have only been found in



Fig. 2. Habitat (above) and the plant (below) of *Polystichum aculeatum* in Kiskunfélegyháza.

the region east of the Tisza River, Makó: (Győrffy I. 1908); Mindszent: (Olasz I. 1938). It is worth noting that the species was discovered on several old walls in the capital city, Budapest, occurrences detailed in the following article (TAMÁS *et al.* 2017). Since the species usually occurs in mountainous and sub-mountainous regions, the long-term survival of the specimen at the Kiskunfélegyháza site is uncertain and is likely only a temporary ecesis.

Gy. Haszonits

FLOWERING PLANTS

(98) *Pennisetum alopecuroides* (L.) Spreng (Poaceae)

Hungary, Somogy County, Dunántúli-dombság: Fonyód, Fonyódliget, Árpád street, in mowed lawn in front of a summer house, 46.75777° N, 17.58508° E, alt. 104 m [9271.2]; leg. & det.: M. Wolf, 25.08.2016.

Hungary, Somogy County, Dunántúli-dombság: Balatonfenyves, Kaposvári street 3, in mowed lawn in front of a summer house, 46.70874° N, 17.45322° E, alt. 107 m [9270.4]; leg. & det.: D. Schmidt, 22.08.2019.

Hungary, Somogy County, Dunántúli-dombság: Balatonfenyves, Kaposvári street 17 and 19, in a ditch in front of a summer house, 46.70853° N, 17.45137° E, alt. 106 m [9270.4]; leg. & det.: D. Schmidt, 23.08.2019.

Hungary, Somogy County, Dunántúli-dombság: Balatonmárfürdő, Mária street 44, in a ditch in front of a summer house, 46.70373° N, 17.42135° E, alt. 105 m [9270.4]; leg. & det.: D. Schmidt, 23.08.2019.

Hungary, Somogy County, Dunántúli-dombság: Balatonmárfürdő, Mária street 10, in a ditch in front of a summer house, 46.70314° N, 17.41441° E, alt. 106 m [9270.3]; leg. & det.: D. Schmidt, 23.08.2019.

Hungary, Somogy County, Dunántúli-dombság: Balatonmárfürdő, Dózsa Gy. street 76, in mowed lawn in front of a summer house, 46.70451° N, 17.39122° E, alt. 105 m [9270.3]; leg. & det.: D. Schmidt, 23.08.2019.

Hungary, Bács-Kiskun County, Alföld: Kecel, Szabadság tér, in mowed lawn in a park, 46.523895° N, 19.253663° E, alt. 102 m, [9481.4]; leg. & det. D. Schmidt, 30.08.2019.

Hungary, Győr-Moson-Sopron County, Nyugat-Dunántúl: Sopronkövesd, Kossuth L. street, in mowed lawn in a park, 47.54494° N, 16.74569° E, alt. 192 m [8466.3]; leg. & det.: D. Schmidt, 31.08.2019.

Hungary, Győr-Moson-Sopron County, Kisalföld: Mosonmagyaróvár, between Kórház street and Fő street, in mowed lawn in a park, 47.87423° N, 17.26950° E, alt. 121 m [8169.2]; leg. & det.: D. Schmidt, 22.09.2019.

Hungary, Veszprém County, Dunántúli-középhegység: Tihany, along a gravel pathway near the ferry terminal, 46.88870° N 17.89205° E, alt. 104 m, [9173.1]; leg. & det.: M. Wolf, 27.09.2019.

Pennisetum alopecuroides is a warm season perennial ornamental grass in Europe. Its natural distribution extends from East and Southeast Asia (South China, Japan, and the Philippines) to Western Australia (VELDKAMP 2014), where it grows in grasslands, open woods, wastelands, and wetlands. It was introduced into the USA and became naturalised in a few eastern states (USDA,

NRCS 2019). Because of its decorative value it is one of the most commonly planted ornamental grasses in Europe nowadays, especially in private gardens and public greenery. In Europe only a few observations of escaped populations have been published hitherto. According to VERLOOVE (2011) escape of *Pennisetum alopecuroides* was first reliably recorded in Belgium in 2010. Other escapes are known from Austria (GILLI 2016, HOHLA *et al.* 2015).

In the species list of neophytes in Hungary (BALOGH *et al.* 2004) no member of the genus *Pennisetum* can be found. In 2017 the closely related *Pennisetum setaceum*, a dangerous invader, appeared on the List of invasive alien species of Union concern, which forms the core of Regulation (EU) 1143/2014, imposing restrictions to importing, selling, and growing the listed species.

Pennisetum alopecuroides is a caespitose perennial with erect to geniculate culms not rooting at the nodes, involute blades, and a dense, narrow, terminal panicle containing fascicles of a solitary spikelet with several 8–30 mm long involucral bristles. It flowers in late summer and early autumn. It can be distinguished from closely related species by the pilose rachis, the solitary, stipitate spikelets, and the scaberulous but not pilose involucral bristles (COSTERUS 2018). Many cultivars are available in commerce in Hungary.

The first escaped population was observed in 2016, in the summer house area of Fonyódliget near Lake Balaton, in front of a holiday house in intensively mowed lawn. It has been followed since then, and proved to be viable with abundant flowering in September, when the mowing activity has decreased. In 2019 further escaped populations were found, mostly in the summer house area along the coast of Lake Balaton, but also in other parts of Hungary (Kecel, Mosonmagyaróvár, Sopronkövesd). The plants grow in regularly mowed lawn in every location, except the one on the Tihany Peninsula, where it grows in ruderal habitat along a gravel pathway. Among these occurrences there are huge populations with almost monodominant stands (like in Dózsa Gy. street and in Kaposvári street in Balatonmárfürdő), as well as small populations with only a few specimens. According to our observations, *Pennisetum alopecuroides* tolerates intensive mowing extremely well, and can persist and spread. Because of the disadvantageous circumstances, the rachis reaches only 5–15 cm (planted and well-kept individuals usually reach 80–120 cm), but the plants can bloom and produce seeds. Associated species in *Pennisetum alopecuroides* dominated lawn were *Bellis perennis*, *Cynodon dactylon*, *Festuca pratensis*, *Glechoma hederacea*, *Lolium perenne*, *Lysimachia nummularia*, *Plantago major*, *Potentilla reptans*, *Prunella vulgaris*, *Ranunculus acris*, *Setaria pumila*, *Taraxacum sect. Ruderale*, *Trifolium fragiferum*, and *Trifolium pratense*. This ornamental plant presumably escapes from cultivation by seed scattering from nearby planted stands in most cases. The dispersal of seeds may be facilitated by mowing and throwing out the

garden waste (like grass clippings or withered inflorescences). Consequently, *Pennisetum alopecuroides* might become an unpleasant weed in the close future, mainly in resort areas, parks, and private gardens. This species does not seem to represent a threat to natural habitats at present, but attention should be paid to it, as well as to other potentially invasive ornamental grasses.

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Összefoglaló: Regionális adatokat közlő rovatunk jelen részében beszámolunk egy mohafaj (*Sematophyllum adnatum*) és egy gomba (*Serpula himantioides*) második, természetes hazai élőhelyről származó adatairól. Két páfrányfaj regionálisan új adatait közöljük: a pelyvás pajzsika (*Dryopteris affinis*) előfordulását a Gömör–Tornai-karszt területéről és a karéjos vesepáfrány (*Polystichum aculeatum*) újabb megjelenését mesterséges alföldi élőhelyen. A dísznövényként előszerezettel ültetett évelő tollborzfü (*Pennisetum alopecuroides*) számos kivadulását jelezzük a Balaton mellékéről és az ország más területeiről.

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