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Discovery of *Poa remota* in the Bakony Mts – A new occurrence on the southern margin of the species' area

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A *Poa remota* felfedezése a Bakonyban, a faj déli areaperemén

Összefoglalás – A Magyarországon eddig csak az Északi-középhegységből ismert *Poa remota* előkerült a Bakonyban. A fajt az Öreg-Bakony központi részén a Fekete-séd völgyrendszerében három különálló lelőhelyen sikerült feltérképezni. A közép-európai tapasztalatokhoz hasonlóan a faj forrásfeltörések körül kialakult forrásláp élőhelyen és égeres láperdőben él. A *Poa remota* a Bakonyban egy hidegebb klímaperiódus maradványfaja lehet, új előfordulása növényföldrajzi szempontból azért is jelentős, mert bakonyi előfordulásával regionális áreapereme a Kárpát-medencében kissé délebbre tolódott.

Kulcsszavak: Dunántúli-középhegység, forrásláp növényzet, növényföldrajz, reliktum, természetvédelem

Summary – *Poa remota*, previously known in Hungary only from the northern part of the Hungarian Middle Range, was found in the Bakony Mountains, the southern part of the mountain range. The species was recorded at three localities in the central part of the „Öreg-Bakony" geographic unit, in the valley system of the „Fekete-séd" stream. Similar to other Central European observations, the species thrives in spring marsh habitats and alder swamp forests around the springs. *Poa remota* may be a relict species of a colder climate period in the Bakony Mts. Its occurrence is also important from a phytogeographical point of view, as this record slightly expands the local distribution limit southwards.

Keywords: karstic spring marsh, nature conservation, plant geography, relict species, Transdanubian Mts

Introduction

Poa remota Forselles is a boreal flora element of Eurasia with an occurrence centre in the coniferous forest belt of Northern Europe and Western Siberia (REGEL 1958, MEUSEL *et al.* 1965, HULTÉN & FRIES 1986). In Central Europe, it is frequent only at some parts of the Alps (AESCHIMANN *et al.* 2004, GBIF); in the Czech Republic and in Slovakia, it occurs sporadically, although with few confirmed records (Pladias1, 2). The species is legally protected in Hungary, it has only been recorded from two areas of the North Hungarian Mountains, from the Mátra Mts (JÁVORKA 1954, BÁNKUTI 1984, HARMOS & SRAMKÓ 2000, MOLNÁR 2002, SRAMKÓ *et al.* 2008) and from the Gömör-Torna Karst region (VIRÓK *et al.* 2010), where the mountainous character of the landscape and Carpathian phytogeographical relationships were clearly emphasised before (PÓCS 1981, VOJTKÓ 2001, 2004, 2006, 2021). In light of the regional distribution known so far, it is particularly surprising that *Poa remota* was found in 2020 in the western part of the Transdanubian Mountains within Hungary, in the Bakony Mountains. In

the present paper, I discuss the regional occurrences in the mountains and the phytogeographical significance of the population outside the formerly known local range of the species.

Material and methods

The first occurrence of the species in the Bakony Mts was recorded on 7 June 2020, during a field survey of a Natura 2000 habitat, namely hydrophilous tall herb fringe communities (Fig. e1). After the discovery, the question was raised whether it was a single occurrence or more localities can be traced. Systematic fieldwork to map the occurrences in the Bakony Mts was carried out in the summer of 2024. After the survey of the entire region of the "Fekete-séd" stream valley and its tributaries (i.e., the entire valley system), the similarly situated "Vörös János-séd", "Som-berek-séd", and "Gella-patak" valleys of the "Öreg-Bakony" Mts [~Northern-Bakony Mts] microregion (DÖVÉNYI 2010) were also investigated. Further, karst-spring stream valleys with similar vegetation in the Southern Bakony (Kab-hegy: Ajka: Köves-árok; Agár-tető: Monostorapáti: Ráskói-patak valley) were also visited.

The occurrences were documented by recording data with a handheld GPS device (Mobile Mapper 60) and collecting herbarium specimens for the BP collection. The mapped localities were mentioned by giving the name of the locality and topographical names, following the nomenclature of the tourist maps and the M 1:10.000 topographic maps. For the nomenclature of the taxa, I followed the Euro+Med Plantbase (Euro+Med 2006–). The species recorded in the herbaceous layer of the detected habitats of *Poa remota* are summarized in Table 1 (Table e1.). These lists are not phytosociological relevés, the sole aim was to document the species co-occurring with *Poa remota* (in the summer aspect, excluding early spring geophytes). In addition to published data, specimens from BP and DE herbaria were used to compile the distribution map of the species in Hungary (Table e2.).

QGIS 2.18 (QGIS Development Team 2018) software was used to create the regional (Fig. 1) and Hungarian (Fig. 2) distribution maps, where grid cells of 5 km × 6 km follow the Central European flora mapping system (NIKLFELD 1971).

Results

I found the first occurrence of *Poa remota* in the Bakony Mts in the alder swamp habitat of the upper part of the valley "Fekete-séd" (Szentgál: „Szénégető-völgyi égerláp"). In the dry and extremely hot summer of 2024, two more occurrences were found by systematic search (Bakonyjákó: "Maci-árok"; Szentgál: "Pap-kúti-völgy", a tributary of "Fekete-séd"). The population size is difficult to estimate due to the clonal habit of the plant, but perhaps not overestimated if set at a few hundred individuals. All three occurrences are in the valley system of "Fekete-séd" (Fig. 1) and the species was not found in other valleys with similar conditions and karstic spring marshes of the Bakony Mts.

Poa remota occurrences in the Bakony Mts can be found near karst springs, in alder swamps and at their light-rich margins, mostly in very narrow bands around the spring and on the immediate banks of the stream, on permanently moist, peaty soils. In addition to peat formation, the karst spring habitats are also characterised by calcareous tufa formation, which can be seen in the formation of white calcareous tufa grains (ranging from one to several centimeters thick) in the black peaty soil. The occurrences of the species are restricted to the narrow environment of marshy springs; its most extensive population, the one in „Maci-árok" valley, can be detected along four hundred metres.

Of the accompanying species recorded at the three sites (Table e1.), thirty-nine species were found to be constant, including many typical calcareous marshy (*Cardamine amara* L., *Cirsium oleraceum* (L.) Scop., *Crepis paludosa* (L.) Moench) and mesic forest elements (*Carex pendula* Huds., *Cerastium sylvaticum* Waldst. & Kit., *Chrysosplenium alternifolium* L., *Dryopteris carthusiana* (Vill.) H.P. Fuchs, *Equisetum telmateia* Ehrh., *Ranunculus lanuginosus* L., etc.). These species also confirm that habitats of *Poa remota* in the Bakony Mts are marshy spring vegetation (habitat classification according to Á-NÉR system: C1 Springs with *Cardaminetum amarae* Br.-Bl. 1925; Natura 2000: 7220 Petrifying springs with tufa formation), tussock sedge communities (*Caricetum paniculatae* Vangerin ex von Rochov 1951; Á-NÉR: B4; Natura 2000: 7230 Alkaline fens) and alder swamps (ÁNÉR: J2 Swamp forests, Natura 2000: Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* /Alno-Padion, Alnion incanae/), but a semi-shaded transition zone between alder swamp and herbaceous vegetation.

Discussion

Phytogeographical importance

The area of Öreg-Bakony between Bakonybél and Szentgál, dissected by deep tectonic valleys and stream gorges, is one of the landscapes with the strongest mountainous character in the Transdanubian Middle-Range, where, besides the frequent mountain species of the region (*Anthriscus nitidus* (Wahlenb.) Hazsl.*, Cerastium sylvaticum* Waldst. & Kit., *Dryopteris dilatata* (Hoffm.) A. Gray, *Lunaria rediviva* L., *Veronica montana* L. etc.), relict occurrences of many rare species are also known. Despite its low altitude, the "Fekete-séd" valley and its surrounding area spanning a few kilometres are a refuge for many boreal and mountain species. In the Transdanubian Middle-Range, *Orobanche flava* F. W. Schultz (TALLÓS 1956) is found only here, but *Asplenium viride* Huds. (BOROS 1954, BÖLÖNI *et al.* 1997)*, Epipogium aphyllum* (F. W. Schmidt) Sw. (FEKETE *et al.* 1961, BÖLÖNI & KIRÁLY 1997), *Equisetum sylvaticum* L. (RÉDL 1942), *Ribes alpinum* L. (ZSÁK 1941, BÖLÖNI *et al.* 1997) have also been reported from these valleys. Given the presence of the above species, the finding of *Poa remota* is not so surprising; its occurrence confirmed the mountainous character and special mesoclimatic conditions of the region. The occurrence of the species is also a good contribution to a more accurate reconstruction of the vegetation history of the Bakony Mts. MAGOS (2006) considers the species a relict based on his experiences in the Mátra Mts (Northern Hungarian Middle-Range), and explains its remaining populations by the richness of spring marshes, where *Poa remota* may have survived the drier periods of vegetation history. The occurrences in the Bakony Mts presented in the present paper confirm the relict status of the species, as that population is an isolated occurrence far from the high mountains of Central-Eastern Europe. With these published data, the distribution margin of the known regional area in Hungary and thus in the Carpathian Basin has shifted southwards (Fig. 2).

The detailed distribution pattern of the species in and around the Carpathian Basin is still surrounded by many uncertainties. In Romania and Slovakia, it is mentioned from several mountain ranges of the Carpathians (SĂVULESCU 1972, CIOCÂRLAN 2009, Pladias2), but its distribution in these ranges requires precise revision, because the distribution area of *P. remota* and the more common, maybe closely related *Poa chaixii* Vill. are overlapping in this region. It should be investigated whether they differ ecologically and in habitat selection as is suggested. The species is also data deficient in Croatia. According to NIKOLIĆ (2020), it occurs in Istria and in lowland areas of northern Croatia ("Nizinska područja sjeverne Hrvatske") regions. The latter is rather doubtful based on Hungarian experience, but systematic research in the karst mountain regions of Croatia would be promising, especially in calcareous marshy spring habitats.

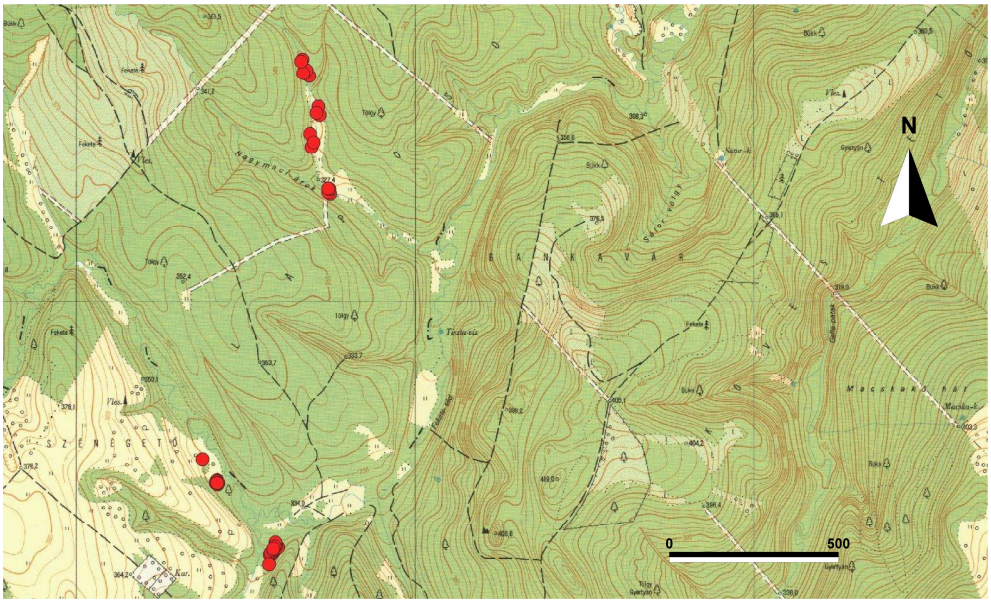

Fig. 1 Records of *Poa remota* in the stream valley network of the "Fekete-séd" (Bakony Mts) mapped onto the 1:10,000 topographic base map of Hungary
1. ábra A *Poa remota* feltérképezett előfordulásai a Fekete-séd völgyrendszerében (Bakony hegység)

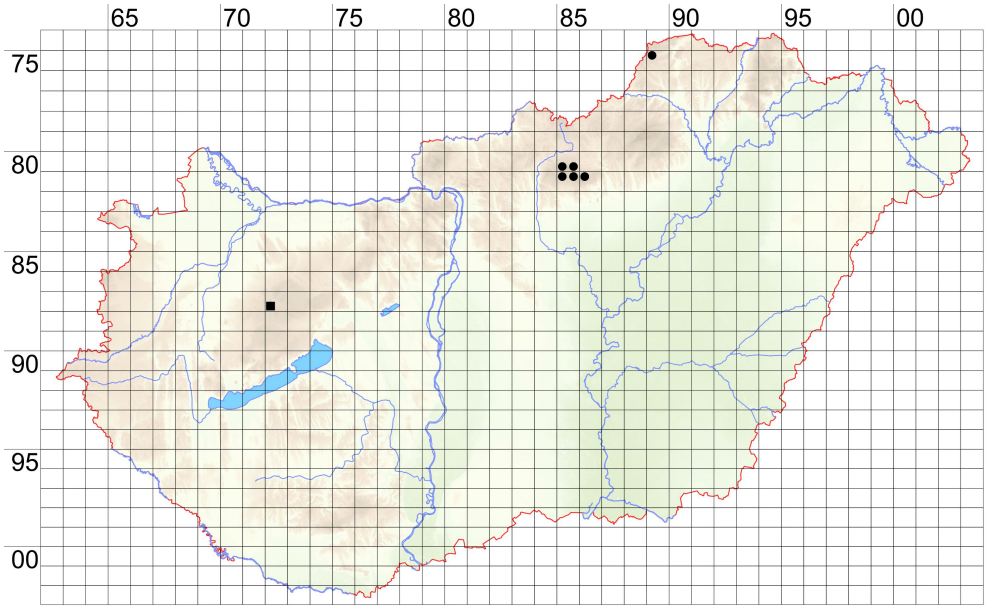

Fig. 2 Distribution of *Poa remota* in Hungary (dots) with the new occurrence (square) from the Bakony Mts (the underlying map uses the Central European Flora mapping grid projected onto the physical map of Hungary)
2. ábra A *Poa remota* elterjedése Magyarországon (az új bakonyi előfordulást négyzet jelöli)

Conservation implications for the occurrences in Bakony Mts

The habitat requirements of *Poa remota* in the Bakony Mts confirm the Central European observations. ELLENBERG (1996) described it as an Alno-Ulmion element with high soil moisture and a calcareous character (ELLENBERG 1996, p. 138.). SOÓ (1973) considered it an Alno-Padion species in Central Europe and, based on the only known occurrence in the Mátra Mts at that time, he identified the Hungarian habitat as the ash swamp forest and peaty meadows. Current floristic surveys of the North Hungarian Middle-Range also indicate these habitats ("association fragments of *Carici remotae-Fraxinetum* in the Mátra Mts") along with spring marshes, water-filled depressions (SRAMKÓ *et al.* 2003, 2008, VIRÓK *et al.* 2010) in several cases also noting the transitional nature of the stands between these habitats. In the Mátra Mts, the species grows in very narrow, linear habitats; MAGOS (2006) mentioned it from spring marshes and the small brooks and streams originating from them, similar to the case of the newly discovered sites in the Bakony Mts.

After the discovery of the species in the Bakony Mts, and mapping it I started to wonder how could this tall, characteristic grass species have been just discovered in the otherwise botanically well-explored mountains? The reason might be the accessibility of its habitats; these have never been so easily accessible. The central part of the deeply depressed, peaty spring marsh habitats were nearly inaccessible even during the dry summers of the last decade. Even in the extremely hot and dry summers of recent years (e.g., 2022 and 2024), these interior wetland patches have remained wet in small patches, however, dry summers made them accessible and explorable from the sides. The discovery of the species is a positive result, but the increasingly dry and hot summers also highlight the decline in spring water yields and the shrinking of the spring marsh habitat as a whole.

Just like in the Mátra Mts (MAGOS 2006), the damage and organic fertilization caused by oversized game populations, and the trampling of wild boars and red deer around the springs while they seek water, are significant conservation issues in the Bakony Mts as well. The problem is indicated by the presence of uprooted *Poa remota* shoots in the drying spring marshes. The cutting/logging/disturbance of the surrounding forests (typically beech forests) has a negative impact on the specific microclimatic conditions of the habitat due to the drier and hotter microclimatic conditions. As a combined consequence of the effects mentioned above, invasive species of the surrounding forest areas (i.e., *Erigeron annuus* (L.) Desf., *Galinsoga quadriradiata* Ruiz & Pav., *Impatiens glandulifera* Royle, *Impatiens parviflora* DC., *Solidago gigantea* Aiton, etc.) also pose a direct threat to the populations and habitat of *Poa remota* in the Bakony Mts. Responsible forest management is paramount for the conservation of the studied relict species, which, in addition to protecting biodiversity and other conservation aspects, also has a public well-being aspect (BARTHA & PUSKÁS 2014). The effective conservation of *Poa remota* in the Bakony Mts and other Hungarian habitats must also consider the maintenance of forest microclimatic conditions. To this aim, not only the forest patches of the narrow stripes of spring marshes and its drainages but also the mesophilic woods of the surrounding valley sides should be protected, as closed forests are more resistant to drought and extreme heat waves (ZELLWEGER *et al.* 2020).

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Electronic appendix / Elektronikus melléklet

Fig. e1 Voucher specimen of *Poa remota* from the Bakony Mts (BP, HNHM-TRA 00703806, HNHM-TRA 00703807, Szentgál: Szénégető-völgy, N 47.324664° E 18.315074°, 07. 06. 2020., leg. et det. N. Bauer)
e1. ábra A *Poa remota* első gyűjtésének példányai (BP, HNHM-TRA 00703806, HNHM-TRA 00703807) a Bakonyból (Szentgál: Szénégető-völgy, N 47.324664° E 18.315074°, 2020.06.07., leg. et det. Bauer N.)
Table e1. Herbaceous vascular plant species recorded in the habitats of *Poa remota* (Locations: 1. Szentgál: Szénégető-völgy égerlápja; Dates: 07.06.2020., 27.07.2024.; Alt.: 338–340 m; 2. Szentgál: Szentgál: Pap-kúti-völgy /Fekete-séd oldalvölgye/; Dates: 27.07.2024., 03.08.2024.; Alt.: 338–342 m; 3. Bakonyjákó: Maci-árok; Dates: 09.08.2024., 10.08.2024.; Alt.: 325–335 m)
e1. táblázat A *Poa remota* élőhelyein, a gyepszintben feljegyzett edényes növényfajok (Lelőhelyek: 1. Szentgál: Szénégető-völgy égerlápja; 2020.06.07., 2024.07.27.; Tszf.m.: 338–340 m; 2. Szentgál: Szentgál: Pap-kúti-völgy /Fekete-séd oldalvölgye/; Date: 2024.07.27., 2024.08.03.; Tszf.m.: 338–342 m; 3. Bakonyjákó: Maci-árok; 2024.08.09., 2024.08.10.; Tszf.m.: 325–335 m)
Table e2. Voucher specimens of *Poa remota* collected in Hungary (BP: Herbarium of Hungarian Natural History Museum; DE: Herbarium of Debrecen University). 1: collector; 2: date; 3: text; 4: collection ID
e2. táblázat A *Poa remota* magyarországi herbáriumi gyűjtései (BP, DE gyűjteményekben őrzött példányok)

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e1. ábra A *Poa remota* első gyűjtésének példányai (BP, HNHM-TRA 00703806, HNHM-TRA 00703807) a Bakonyból (Szentgál: Szénégető-völgy, N 47.324664° E 18.315074°, 2020.06.07., leg. et det. Bauer N.)

Table e1 Herbaceous vascular plant species recorded in the habitats of *Poa remota* (Locations: 1. Szentgál: Szénégető-völgy égerlápja; Dates: 07.06.2020., 27.07.2024.; Alt.: 338–340 m; 2. Szentgál: Szentgál: Pap-kúti-völgy /Fekete-séd oldalvölgye/; Dates: 27.07.2024., 03.08.2024.; Alt.: 338–342 m; 3. Bakonyjákó: Maci-árok; Dates: 09.08.2024., 10.08.2024.; Alt.: 325–335 m)

e1. táblázat A *Poa remota* élőhelyein, a gyepszintben feljegyzett edényes növényfajok (Lelőhelyek: 1. Szentgál: Szénégető-völgy égerlápja; 2020.06.07., 2024.07.27.; Tszf.m.: 338–340 m; 2. Szentgál: Szentgál: Pap-kúti-völgy /Fekete-séd oldalvölgye/; Date: 2024.07.27., 2024.08.03.; Tszf.m.: 338–342 m; 3. Bakonyjákó: Maci-árok; 2024.08.09., 2024.08.10.; Tszf.m.: 325–335 m)

Taxon	**1**	**2**	**3**
Aegopodium podagraria L.	+	+	+
Aconitum lycoctonum subsp. *vulparia* (Spreng.) Ces.	+	+	
Actaea spicata L.		+	
Aethusa cynapium L.	+		
Agrimonia procera Wallr.		+	+
Ajuga reptans L.	+		+
Alisma plantago-aquatica L.			+
Alnus glutinosa (L.) Gaertn.		+	+
Angelica sylvestris L.	+	+	+
Anthriscus nitidus (Wahlenb.) Hazsl.	+	+	
Athyrium filix-femina (L.) Roth.	+	+	+
Berula erecta (Huds.) Coville	+	+	+
Betula pendula Roth	+	+	+
Bidens tripartitus L.		+	
Brachypodium sylvaticum (Huds.) P. Beauv.	+		+
Bromus benekeni (Lange) Trimen	+	+	
Bromus ramosus Huds.			+
Calamagrostis canescens (Web.) Roth. em Druce			+
Caltha palustris L.	+	+	+
Cardamine amara L.	+	+	+
Carex pallescens L.			+
Carex paniculata Juslen		+	+
Carex pendula Huds.	+	+	+
Carex remota Grufbg.	+	+	+
Carex sylvatica Huds.	+	+	+
Cerastium fontanum subsp. *lucorum* (Schur) Soó			+
Cerastium sylvaticum Waldst. & Kit.	+	+	+
Chrysosplenium alternifolium L.	+	+	+
Circaea lutetiana L.	+	+	+
Cirsium oleraceum (L.) Scop.	+	+	+
Cirsium rivulare (Jacq.) All.			+
Cornus sanguinea L.	+		
Corylus avellana L.	+		+
Crataegus laevigata (Poir.) DC.		+	+
Crepis paludosa (L.) Moench	+	+	+
Daphne mezereum L.	+	+	+
Deschampsia cespitosa (L.) P. Beauv.	+	+	+
Dipsacus pilosus L.	+	+	+
Dryopteris carthusiana (Vill.) H.P. Fuchs	+	+	+
Dryopteris dilatata (Hoffm.) A. Gray.	+	+	
Dryopteris filix-mas (L.) Schott.	+	+	+
Epilobium hirsutum L.			+
Epilobium parviflorum Schreb.	+		+
Epipactis helleborine (L.) Crantz		+	+
Epipactis moravica Batoušek			+
Epipactis nordeniorum Robatsch		+	+
Epipactis tallosii A. Molnár & Robatsch			+
Equisetum arvense L.	+	+	+
Equisetum fluviatile L.			+
Equisetum hyemale L.			+
Equisetum palustre L.			+
Equisetum telmateia Ehrh.	+	+	+
Eupatorium cannabinum L.	+	+	
Fragaria vesca L.			+

Frangula alnus (L.) Mill.	+	+	
Galeopsis pubescens Bess.	+	+	+
Galeopsis speciosa Mill.	+		+
Geranium phaeum L.	+		
Heracleum sphondylium subsp. *sibiricum* (L.) Simonk.	+		
Hypericum tetrapterum Fr.			+
Impatiens parviflora DC.	+	+	+
Iris pseudacorus L.			+
Juncus effusus L.		+	+
Juncus tenuis Willd.		+	
Knautia drymeia Heuff.	+	+	+
Lamium galeobdolon subsp. *montanum* (Pers.) Hayek	+		
Lathyrus pratensis L.			+
Lycopus europaeus L.			+
Lysimachia nummularia L.	+	+	+
Lysimachia vulgaris L.			+
Maianthemum bifolium (L.) F. W. Schmidt	+		+
Mentha longifolia (L.) L.		+	+
Milium effusum L.	+		
Moehringia trinervia (L.) Clairv.		+	+
Molinia arundinacea Schrank			+
Myosotis scorpioides L.	+	+	+
Neottia nidus-avis (L.) Rich.		+	
Neottia ovata (L.) Bluff & Fingerh.	+	+	+
Oxalis acetosella L.	+	+	+
Paris quadrifolia L.		+	+
Persicaria minor (Huds.) Opiz	+		
Petasites hybridus (L.) G. Gaertn. & al.	+	+	+
Phragmites australis (Cav.) Steud.			+
Platanthera bifolia (L.) Rich.	+		+
Platanthera chlorantha (Custer) Rchb.			+
Poa remota Forselles	+	+	+
Poa trivialis L.	+	+	+
Pulmonaria officinalis L.	+	+	+
Quercus robur L.		+	+
Ranunculus lanuginosus L.	+	+	+
Ranunculus repens L.	+	+	+
Rubus caesius L.	+		+
Rumex conglomeratus Murr.			+
Salix cinerea L.		+	+
Salvia glutinosa L.		+	
Schedonorus giganteus (L.) Holub	+	+	+
Scirpus sylvaticus L.	+	+	+
Scrophularia umbrosa Dumort.	+	+	+
Scutellaria galericulata L.			+
Selinum carvifolia (L.) L.		+	+
Silene dioica (L.) Clairv.	+		
Solanum dulcamara L.	+	+	+
Stachys sylvatica L.	+		+
Thelypteris palustris Schott			+
Tilia cordata Mill.			+
Tussilago farfara L.	+		+
Urtica dioica L.	+	+	+
Valeriana officinalis L.	+		+
Veratrum album L.	+		
Veronica beccabunga L.	+		+
Veronica montana L.			+
Viburnum opulus L.	+		+

Table e2 Voucher specimens of *Poa remota* collected in Hungary (BP: Herbarium of Hungarian Natural History Museum; DE: Herbarium of Debrecen University). 1: collector; 2: date; 3: text; 4: collection ID
e2. táblázat A *Poa remota* magyarországi herbáriumi gyűjtései (BP, DE gyűjteményekben őrzött példányok)

1.	2.	3.	4.	5.
Mátra Mts				
Jávorka S.	1952.06.19.	Mátra, Mátraháza felett, a Kékes északi lejtőjén, a Somhegy felé lápréten	BP 200053	8186.1
Jávorka S.	1953.06.19.	Mátra, Mátraháza felett, a Kékes északi lejtőjén, a Somhegy felé lápréten	BP 200054	8186.1
Jávorka S. & Csapody V.	1953.06.24.	Kékes mögött Sombokor fele Kőrises-tó nyugati partján	BP 200376	8186.1
Csapody V.	1953.06.25.	Kőrismocsár sub monte Sombokor prope Parád	BP 406966	8186.1
Jávorka S.	1954.06.24.	Mátraháza mögött, a Kékes északi lejtőjén, a somhegyi erdészház felé, Kőrismocsár	BP 200982	8186.1
Jávorka S. & Csapody V.	1958.05.13.	Mátra, a Kékes alatt, Kőrises mocsár	BP 207576	8186.1
Somlyay L.	2000.07.10.	Gyöngyössolymos: a Nagy-Lipót forrásánál	BP 657585	8085.4
Sramkó G.	2000.07.22.	Mátra: Kőris-mocsár	DE-Soo-03856	8186.1
Sramkó G. & Lukács B. A.	2000.07.27.	Mátra: Somor-patak völgye	DE-Soo-36967	8185.2
Magos G., Löki V. & Süveges K.	2016.05.13.	Galya-tető, Mátra erdei forráslápban	DE-Soo-43692	8085.3 / 8085.4
Nagy T. & Molnár Cs.	2017.10.12.	Mátra, Parád, Kőris-mocsár	DE-Soo-43691	8186.1
Gömör–Torna Karst				
Farkas R.	2007.05.17.	Jósvafő: Fenyves alja	DE-Soo-39250	7589.1
Virók V. & Sramkó G.	2008.06.12.	Gömör-Tornai-karszt: Jósvafő: a falutól K-re lévő égeres	DE-Soo-03859	7589.1
Bakony Mts				
Bauer N.	2020.06.07.	Szentgál: Szénégető-völgyi égerláp, (Fekete-séd völgye) in alnetis paludosis; Öreg-Bakony, Veszprém megye	BP HNHM-TRA 00703806, BP HNHM-TRA 00703807	8772.3
Bauer N.	2024.07.27.	Szentgál: Pap-kúti-völgy /Fekete-séd oldalvölgye/, in alnetis paludosis; Öreg-Bakony, Veszprém megye	BP HNHM-TRA 00704884, BP HNHM-TRA 00704885, BP HNHM-TRA 00704886	8772.3
Bauer N.	2024.08.09.	Bakonyjákó: Maci-árok; in locis paludosis, ad marg. sylv., Öreg-Bakony, Veszprém megye	BP HNHM-TRA 00704882, BP HNHM-TRA 00704883	8772.3