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FESTUCA PSEUDOVAGINATA, A NEW SPECIES FROM SANDY AREAS OF THE CARPATHIAN BASIN

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A new species of *Festuca* (*F. pseudovaginata* Penksza) is described in the present study. It occurs on open sandy grasslands of the Carpathian Basin, in Hungary. The plant is 20–35 cm high, its inflorescence is short and lemmas carry long awn (1.2–1.8 mm). Matured basal leaves have continuous sclerenchyma. This taxon flowers as early as the end of April. The *locus classicus* of this species, where it was first found, is Kis-tece legelő (Kis-tece pasture) situated near Vácrátót, Hungary. Chromosome number of the specimens is 2n = 14. Specimens of taxa (altogether 6 specimens, 3 from the *locus classicus*, 1 of which is the holotype, and 3 from near Örkény) were placed in the Botanical Collection of the Hungarian Natural History Museum (BP).

Key words: *Festuca pseudovaginata*, Hungary, *Poaceae*, sandy vegetation

INTRODUCTION

Those taxa of *Festuca* species with linear leaves in sandy areas of the central part of the Carpathian Basin which have bowed basal and stem leaves are identified and mentioned by various authors of flora publications as belonging to the aggregation of *Festuca ovina* (Alexeev 1973, Beldie 1972, Dostal 1989, Englmaier 1994, Hackel 1882, Horánszky 1992, 2000, Horánszky *et al.* 1971, Májovský 1962, Nyárády and Nyárády 1964, Patzke 1961, 1968, Pils 1984, Schwarzová 1967, Soó 1955, 1973*a*, *b*, Stohr 1960, 2002, Tzvelev 1971). Generally two groups are divided in the Carpathian Basin within the *Festuca ovina* aggregation. These taxa can be identified easily on the basis of their characteristic tissue structure. The basal leaves have a continuous sclerenchyma ring or sclerenchyma strands. Based on the original descriptions and results, there is another, a third, transitional group. In case of taxa belonging to this group both segregated and continuous sclerenchyma occur. Those taxa were classified into this group, which are of a hybrid origin according to several authors (Horánszky 1992, 2000, Májovský 1962, Saint-Yves 1928, Soó 1955, Vetter 1915, 1916, 1917, 1922). In the case of the supposed hybrids a plant having a continuous sclerenchyma ring (*Festuca vaginata* on sandy areas) and another having sclerenchyma strands (*Festuca valesiaca*, *F. pseudovina*, *F. rupicola*) were consid-

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ered as parents. In the course of on-site identification, most problematic plants belong to the third group. This was one of the main factors that led to start the researches. Also various researches preceded the molecular examinations (Galli *et al.* 2001, 2003).

MATERIAL AND METHODS

Identification was made on the basis of *Festuca* specimens collected on the Kis-tece legelő (Kis-tece pasture) situated near Vácrátót on 6 May 2003 and near Örkény on 8 May 2003. Morphological data cited in the Description part of the current paper were recorded following the guidance of Auquier (1974) and Wilkinson and Stace (1991). Spikelet length was measured from the base of the lower glume to the tip of the fourth lemma (excluding awn) (Stohr 2002, Wilkinson and Stace 1991). Data of 10 specimens were measured, 5 of which were collected from Kis-tece legelő and 5 of which from between Örkény and Tatárszentgyörgy. The 4th spikelet from the top of the panicle and the 4th spikelet of the first pedicle of the panicle were measured (Csányi-Kovács and Horánszky 1973, Horánszky 1969, 1970). The leaf blade transverse section was made after Auquier (1970), from the lower one third of the developed (old) and young leaves (Penksza 2000). We also collected living material in the area, which was planted into the experimental garden of the Department of Genetics and Plant Breeding of Szent István University for further morphological and molecular examinations. Ploidy level was determined by a PARTEC 1 flow cytometer. Specimens (altogether 6 specimens, 3 from the *locus classicus*, 1 of which is the holotype, and 3 from near Örkény) were placed in the Botanical Collection of Hungarian Natural History Museum (BP). Furthermore, 15 specimens are found in my private collection, which are available for any request. Meanwhile description of the taxon, the International Code of Botanical Nomenclature (St Louis Code) (http://www.bgbm.fu-berlin.de/iapt/nomenclature/code) was taken into consideration.

RESULTS AND DISCUSSION

Based on the field researches so far, this taxon (*Festuca pseudovaginata*) can be found on the sandy areas between the Danube and Tisza rivers. It was registered so far on the following areas: Kis-tece legelő (this area was designated as *locus classicus* of this species, since it was first found there), Domony-völgy (open sandy area of Gödöllő Hills), between Örkény and Tatárszentgyörgy villages and near Imre-hegy (Fig. 1). The specimens occur in the association

considered as *Festucetum vaginatae danubiale* Soó 1929, they do not stand apart, but flower in the lawns together with spring species, particularly ephemers, as early as the end of April. Hybrid origin supposed can be also denied due to the fact that one of the supposed parents on sandy areas, *Festuca vaginata* having continuous sclerenchyma ring, and flowers 3–4 weeks later. Young leaves having ragged sclerenchyma occur in the case of other species having continuous sclerenchyma ring, too (Horánszky 1992, 2000, Wilkinson and Stace 1991). Besides morphological differences, this taxon can be clearly differentiated from the similar ones (*Festuca vaginata* W. et K., *Festuca dominii* Krajina *(Festuca vaginata* W. et K. subsp. *dominii* (Krajina) Soó, *Festuca vaginata* W. et K. var. *amethystina* Soó), *Festuca beckerii* (Hack.) Trautv.) based on its early flowering time (Domin 1930, Dostal 1989, Jávorka and Soó 1951, Markgraf-Dannenberg 1980, Tveretinova 1999). Author supposes that this taxon was overlooked so far due to its early flowering time, because field researches are particularly made during the flowering period of *Festuca vaginata*, when the observed taxon can already be found in desiccated state, therefore, without making leaf blade transverse sections, it can be seemed as a dried *Festuca pseudovina*.

DESCRIPTION

Festuca pseudovaginata Penksza, sp. nov.

Type: Kis-tece pasture, near Vácrátót, Hungary, GPS coordinates Unified Projection System: x = 262650, y = 663180, alt. *ca* 128 m, 06. 05. 2003. Penksza K., (BP 647351, holotype).

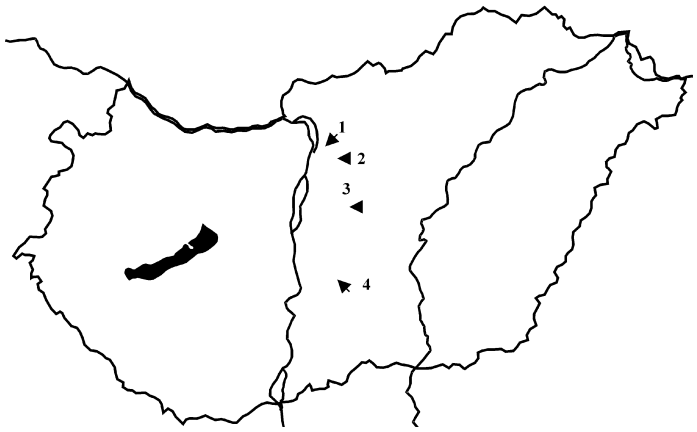

Fig. 1. Distribution map of *Festuca pseudovaginata*

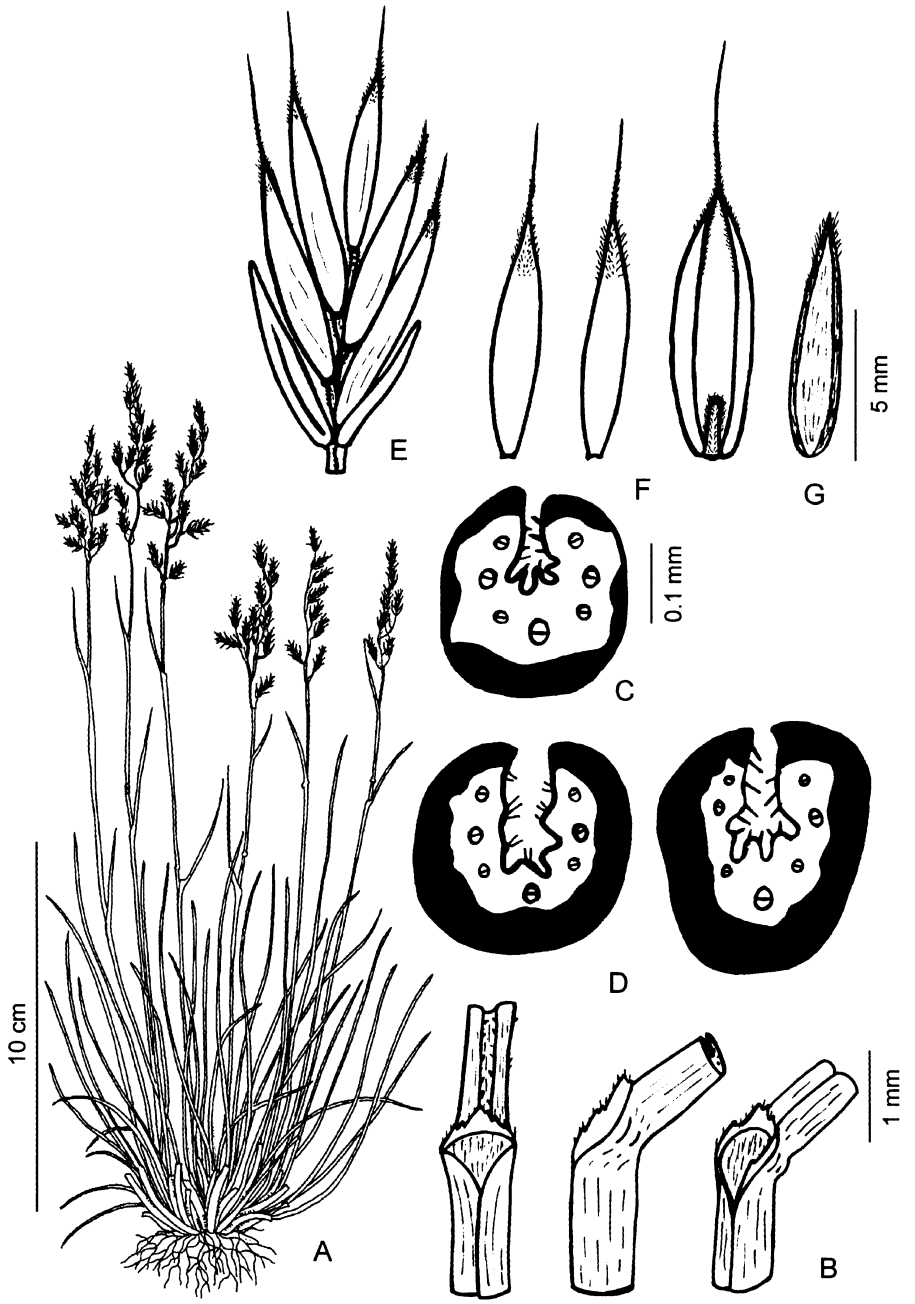

Fig. 2. Habitat of *Festuca pseudovaginata* (A). Spikelet and leaf parts and leaf-blade sections: ligula (B), leaf-blade section of young (C) and old (D) leaves, spicula (E), palea (F), lemma (G)

Planta (Fig. 2A) tumulosa, sine stolonibus. Culmus 20–35 cm altus, nudus. Vaginae foliorum apertae, nudae, costancae. Ligulae (0.1–0.2 mm alta) angustae, emarginatae, acie ciliatae (Fig. 2B). Folia radicalia nuda, 0.3–0.6 mm lata, pallide viridia, non pruinosa, longitudinaliter complicata, superficie aversa levi, venis 3 crassioribus, 4 infirmis, strato sclerenchymatico valde crasso ab uno margine usque ad adversum continuo, ad mesophyllum versus inaequali (Fig. 2C–D). Folia juvenilia radicalia forte strato sclerenchymatico discontinuo (Fig. 2D). Folia culmorum complicata, strato sclerenchymatico continunuo. Inflorescentia 5–8.5 cm alta. Ramuli paniculorum pilis parum asperi. Spiculae 5–7.1 mm longae, floribus 3–6 (Fig. 2E). Gluma inferior 2.9–3.2 mm longa (Fig. 2E), gluma superior 3.9–4.1 mm longa (Fig. 2E). Palea exterior in acie et parte apicali pilis aspera, 4–6.5 mm longa (Fig. 2F), palea inferior 4.1–5 mm longa (Fig. 2G). Arista 1.2–1.8 mm longa (Fig. 2E). Ovarium nudum. Caryopsis elongata depresse ellipsoidea, sulcata, 2.8–3 mm longa. Chromasomatum numero, 2n = 14.

The stem of *Festuca pseudovaginata* (Fig. 2A) is 20–35 cm high and hairless. Light green coloured basal leaves are hairless and are not glaucous. Surface of basal leaves is smooth. Leaf sheaths are hairless and ribbed. The ligule (0.1–0.2 mm long) is narrow, indented and the edges have hairs (Fig. 2B). Leaf sheath is open. Basal leaves are 0.3–0.6 mm wide. A basal leaf has 3 stronger and 4 lighter veins. Basal leaves have a continuous sclerenchyma ring. The sclerenchyma ring is extraordinarily thick, and not uniform in the side of the mesophyllum (Figs 2C–D). In young leaves ragged sclerenchyma rings can also be observed. Stem leaves are rolled. The inflorescence is 5–8.5 cm. On the branches of the panicle there are slightly rough hairs. Spikelets are 5–7.1 mm long, having 3–6 flowers (Fig. 2E). Lower glume is 2.9–3.2 mm (Fig. 2E), upper glume is 3.9–4.1 mm long (Fig. 2E). Surface of the edge of the outer lemma is slightly rough and the apical region has got slightly rough hairs. Lemma is 4.6–5 mm long (Fig. 2F), palea is of 4.1–5 mm (Fig. 2G). Awn on the lemma is 1.2–1.8 mm long (Fig. 2E). Ovary is hairless. Caryopsis is ribbed and 2.5–3 mm long. Chromosome number is 2n = 14.

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Appendix

Specimens examined: – *Festuca vaginata* W. et K.: Rákos, Boros Á. BP 614525, 18.06.1895; Soroksár, Degen Á. BP 614524, 08.06.1897; Soroksár, Degen Á. BP 654517, 04.06.1898; Csepel-sziget, Degen Á. BP 13362, 17.06.1899; Csepel-sziget, Degen Á. BP 13355, 17.06.1899; Szentirány, Degen Á. BP 614531, 21.06.1899; Szentirány, Degen Á. BP 209106, 17.06.1899; Piliscsaba, Simonkai L. BP 13366, 30.06.1902; Káposztásmegyer, Boros Á. BP 407434, 28.06.1949; Káposztásmegyer, Pénzes A. BP 402605, 24.06.1949; Káposztásmegyer, Kümmerle B. BP 13343, 16.06.1905; Rákos, Lyka K. BP 407436, 25.06.1906; Rákos, Thaisz L. BP 13397; Rákoskeresztúr, Kárpáti Z. BP 385019, 13.06.1943; Rákoskeresztúr (Akadémiai-erdő), Pénzes A. BP 368066, 13.07.1952; Rákoskeresztúr (Akadémiai-erdő), Felföldy L.

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