

A new monocotyledonous weed species has been detected in Hungary (*Tragus berteronianus* Schult.)

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Tragus genus is a small genus belonging to the *Poaceae* family. The spine-like projections on the upper glumes make the genus easily distinguishable. *Tragus* species spreads widely across subtropical and tropical climates in the world among *Tragus berteronianus* Schult. Carlo Giuseppe Bertero (1789-1831) an Italian physician described it for the first time in the world in 1824. (Linné, Carl von. et al. 1824). The meaning of *Tragus* is 'goat' from the Greek *tragos* (Hyde, M.A., Wursten, B.T. and Ballings, P. 2014).

Key words: *Tragus*, *berteronianus*, *Poacea*, Carrot seed grass, weed.

Taxonomy

Kingdom Plantae

Phylum Tracheophytes

Class Magnoliopsida

Superorder Lillanae

Order Poales

Family Poaceae

Genus *Tragus* Haller

Species *Tragus berteronianus* Schult.



Figure 1: *Tragus berteronianus* Schult. Caption: Roland Szabó

Synonyms: *Lappago berteroniana* subsp. syn; *Lappago occidentalis* (Nees) Hook.f.; *Lappago phleoides* Fig. & De Not.; *Lappago racemosa* var. *erecta* Kunth; *Nazia occidentalis* (Nees) Scribn.; *Tragus alienus* var. *brevispinus* Henrard; *Tragus ciliatus* subsp. syn; *Tragus occidentalis* Nees; *Tragus racemosus* var. *berteronianus* (Schult.) Hack.; *Tragus racemosus* var. *brevispiculus* Döll; *Tragus tcheliensis* Debeaux

Tragus berteronianus Schult. is distinguished from *T. racemosus* on the basis of quantitative characters. Comparing the size of the spikelet of the cluster, we could have enough evident characters for the accurate identification (Antón 1981).

Description of *Tragus berteronianus* Schult.

Scape: Introduced annual grass, caespitose, geniculate with thick, broad sheaths, uppermost strongly inflated with reduced blades. Culms erect or ascend decumbent at base, up to 60 cm tall. The average high was from 30 to 40 cm in full maturity in Hungary. Lower internodes are enclosed by leaf sheaths.

Leaves: Leaf sheath - which is glabrous - is shorter than or subequal to internodes. Leaf blades are broadly flat with sinuate, up to 9 cm long and 1-10 mm wide, thick margins with a pectinate spine from middle to base, apex acute to acuminate. Ligule is 0.5-1 mm, a ring of short woolly hairs. Flowering culm is with 1 or 2 exposed nodes.



Figure 2: *Tragus racemosus* vs. *Tragus berteronianus* Schult. Caption: Roland Szabó

Inflorescence: Panicle is 4-11 cm long and 0.4-1 cm wide. There are two spikelets on peduncle. Peduncle is covered with 0.1 mm long ciliate which easily sticks to clothing and fur. The two spikelets are separated by a short but distinct internode, the upper being shorter than the lower. The fertile lower spikelet is 2-3 mm long, ovate shape and sessile or nearly so. The upper spikelet is 0.3 - 0.7 mm long. Rachis is 0.2-0.4 mm long, coated with cilia and with hooked spines, 0.1-0.2 mm long spines on dorsal side. Lower glumes are absent or obscure. The lower glume is less than 0.5 mm, ovate, membranous and minutely pubescent. The boat shaped upper glume is ovate, apex acute, 5-veined and ribbed, with hooked, swollen-based 0.2-0.5 mm long spines. Fertile lemma is ovate and dorsally compressed, approximately 2 mm long shorter than the upper glume, membranous and 1-3 (5) veined, but never more than 5. Lemma surface puberulous and apex acuminate. The ovate palea is up to 1.8 mm long, apex acute, 2-veined and membranous (Ming-Jer Jung and Chien-Hsun Cheng 2016).



Figure 3: The inflorescences comparing *T. berteronianus* (the axis is green, left side) with *T. racemosus* (the colour of the inflorescence axis is not green at ripening, right side). Caption: Roland Szabó

Anthers are 0.4-0.6 mm long, yellow, occasionally purple- or green-tinged.

Caryopses with adherent pericarp are 1.2-2 mm long and 0.4-0.8 mm wide, dorsally compressed and biconvex. The size of the embryo is half of the length of the caryopsis.

Detection and spread in the World

Tragus berteronianus Schult. was detected in several places in the world. It is native to Africa and South Asia. It was introduced to North and South America and much of the northeast coast (<http://herbanwmex.net/portal/taxa/index.php?taxon=3247>). In Europe, *Tragus berteronianus* Schult. was found in Belgium and in the United Kingdom (CABI Data Mining, 2011. Invasive Species Databases). There is no information about their colonization rate and extent. So far, no-one has reported any damage caused by this species and we therefore do not expect it to become a problem weed.

Characteristic of the detection place in Hungary

Tragus berteronianus Schult. is a monocotyledonous plant. It grows in areas with trampled or overgrazed places, often on poor sandy or rocky soils. The place where we found the plant is in the gaps between the stones of the platforms of the railway stations (Figure 1) in Budapest.

Detection and Spread in Hungary

Tragus berteronianus Schult. was discovered first in Hungary's capital city in 2018. After this year we have detected this weed in the town of Mezotúr (Jász-Nagykun County) on the Hungarian Great Plain in a similar venue (railway station). We believe that this weed is more frequently along railways than we think because it is not a preferred researching venue. There is no data available on the presence of this plant in other parts of Hungary. This plant has already been found in Asia, Europe and North America. It is an animal-dispersed, C4, bunch grass native to arid regions. Therefore, it was expected to appear in Hungary as well.

Materials and methods (Problem description mainly in terms of Nature and Plant Protection)

Tragus berteronianus Schult. is a new species in Hungary's flora. This is a little problem regarding the isolated venue and the big distance from cultivated lands at the moment. We think that it could spread in Hungary not only in suburban areas where mechanical and chemical weed control is conducted, but also in meadows due to the wide ecological tolerance of the species. Unfortunately, we do not have any information about herbicide tolerance and the speed of spread. A closely related species - *Tragus racemosus* - that is not a native species of Hungary either can cause some problems in the sandy arable lands in the middle of the country.

Conclusion

As far as we are concerned, *Tragus berteronianus* Schult is not as wildly spread as *Tragus racemosus* (L.) All. However, due to the similarity between *Tragus berteronianus* Schult and *Tragus racemosus* (L.) All. we can be sure it will appear in more places in Hungary soon. According to R. Szabó examination we want to share some new practical observations between the mentioned two species. The indicated differences are clearly visible to the naked eye.

<i>Tragus berteronianus</i>	<i>Tragus racemosus</i>
bushes in space	kneels in plane (Figure 2)
most of the leaves are green at ripening	a lot of leaves already dry at ripening
the base of the leaves is not / barely inflated	the base of the leaves is inflated
leaf blades approx. 25-33% longer the sheath	leaf blades are approx. as long as the sheath
leaves form is strip and decumbent	leaves form is triangular and stiff
visually Digitaria form	visually Cynodon form
there is no rupture in the axis at the base regarding the inflorescence	often there is a rupture in the inflorescence
the axis is all green	the colour of the inflorescence axis is not green at ripening (Figure 3)
the uncovered stem is maximum pink	the uncovered stem is typically burgundy

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