

OROBANCHE CERNUA IN HUNGARY

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Discovery of a new member of the flora of Hungary, *Orobanche cernua*, is described with records of all occurrences that came to light to date. A brief overview of the distribution and taxonomic position of *O. cernua* deals with the species' relationship with *O. cumana*.

Key words: Hungary, *Orobanche cernua*, *O. cumana*

INTRODUCTION

The genus *Orobanche* L. is represented in Hungary with 20 species. Due to their holoparasitic life style and host specificity their identification is not easy. In the recent past the survival of some rare members of the genus in Hungary has been confirmed (DÉNES 1994, KALAPOSI and SZERÉNYI 1997), and new occurrences of other *Orobanche* species have become known (e.g. HOITSY and SZERÉNYI 1997, SCHMOTZER and VIDRA 1997, TÓTH 1999, BARINA 2001, 2003). *Orobanche cernua* Loefl. treated at species level is absent from the Hungarian botanical literature; only *O. cumana* Wallr. is recorded as an agricultural weed.

The discovery of *Orobanche cernua* in Hungary

On 15 June 2004 Krisztián Harmos found a specimen of *Orobanche* near Bátorjány (place Gyulakeszi, Nógrád county) in budding state. The broomrape sponged on an *Artemisia*, which seemed, at first sight, to be *A. santonicum* L., previously unknown in the region. On 30 June Krisztián Harmos and Zoltán Barina visited the place, collected some additional specimens of both the broomrape and its host and took photos of them.

It was a small broomrape with a glandular stem, violet corolla, bifid calyx segments and grew on *Artemisia santonicum* L. The broomrape was identified on the basis of KREUTZ (1995) and PUJADAS-SALVÀ and VELASCO (2000) and proved to be *Orobanche cernua* Loefl.: stout plant, dense inflorescence with numerous blue flowers; it grew on *Artemisia*. However, the related *O. cumana* is a slender plant with lax inflorescence, and grows on *Helianthus annuus*. Voucher specimens of *O.*

cernua have been deposited in the Herbarium of the Hungarian Natural History Museum (BP). *Orobanche cernua* as an independent species was not published from Hungary earlier, only *O. cumana* was reported from sunflower cultures.

In August 2004 at a distance of about 1 km from the place Gyulakeszi Krisztián Harmos and Balázs Pintér found a new occurrence (Bátonyterenye: Gyulatáró) of *Orobanche cernua* under similar circumstances: alkaline-like soil and halophyte plants. He later visited this site again together with Zoltán Barina.

These two habitats are very peculiar. They look like a mixture of a quarry and a white alkali: a steep slope with plants growing only sporadically. At the time of the visit the dominant species were *Artemisia santonicum* L. and *Bassia sedoides* (Pall.) Asch., and there were other halophytes such as *Ranunculus pedatus* W. et K., *Ceratocephalus orthoceras* DC., *Scorzonera laciniata* L., *Lepidium perfoliatum* L. and other locally rare species: *Lappula heteracantha* (Ledeb.) Borb., *Aster linosyris* (L.) Bernh., etc.

The places Gyulakeszi and Gyulatáró are tectonic elevations. Their rhyolite tuff bedrock ("Gyulakeszi Riolitufa Formáció"; HÁMOR 1985) has become exposed by natural erosion and later partly by illegal mining. The most typical mineral of this bedrock is Na-montmorillonite, which is very rare in Hungary. The special quality of rhyolite tuff with Na-montmorillonite allowed the establishment for alkaline plants on the bare surface. We plan to further investigate these places.

After identifying the specimens from Bátonyterenye the authors checked the herbarium of BP searching for *O. cernua*. Among the specimens designated as *Orobanche cumana* 4 sheets of *O. cernua* were found: two from Ferenc Németh (02.06.1977, Kiskunság National Park: Fülöpszállás; det. Ferenc Radics partly as *O. coerulescens* and as *O. cumana* and *O. cernua*; cit. in SZUJKÓ-LACZA and KOVÁTS 1993, p. 217; inventory numbers are 499914 and 499915), and two from Júlia Szujkó-Lacza (19.07.1978, Kiskunság National Park: between Jakabszállás and Kunszentmiklós; det. Ferenc Radics as *O. cumana* Wallr.; cit. in SZUJKÓ-LACZA and KOVÁTS 1993, p. 217; inventory numbers are 496030 and 496031).

Talking with botanists many other occurrences of *O. cernua* became known. Several colleagues have seen and/or collected specimens of *O. cernua*, but they considered them to be *O. cumana* or they could not identify them exactly. A. Schmotzer observed *O. cernua* near Heves (4 populations) and later in the Jászság region (1 locality). Gusztáv Jakab (*ex verb.*) reported it from Tótkomlós and LENDVAI (2005) from alkali soils of the Mezőföld region (Aba, Alap, Felsőszentiván, Felsőtöbörzsök, Sárszentágota).

The taxonomic status of *Orobanche cernua* and *Orobanche cumana*

The Hungarian flora works (SOÓ 1951, 1968, SOÓ and KÁRPÁTI 1968, SIMON 1992, 2000) uniformly treat *Orobanche cumana* Wallr. and *O. cernua* Loefl. conspecific (or in a combination as *O. cernua* Loefl. var. *cumana* Beck.). Most of the national flora works in Europe mention only *Orobanche cernua* (PIGNATTI 1982, HESS *et al.* 1980) or *O. cumana* (JOSIFOVIĆ 1974, SĂVULESCU 1961, TUTIN *et al.* 1972), treating them as synonyms; SHISHKIN (1958) however distinguished the two species. The use of names can be in correlation with the fact that there are different species in different countries, and only in a few of them do *O. cumana* and *O. cernua* occur together.

BECK (1890) has already distinguished five taxa within the *Orobanche cernua* Loefl. complex, one of them is "typica = *O. cernua* Loefling" and one "(*Orobanche*) *cumana* WALLROTH". Nevertheless, the distinction of these two *Orobanche* species has not become generally accepted until nowadays in Europe. Yet some recent publications treat *O. cernua* and *O. cumana* as closely related but separate species (KREUTZ 1995, PUJADAS-SALVÀ and VELASCO 2000, ROMÁN *et al.* 2004). As shown by several authors these taxa can be separated both morphologically (SHISHKIN 1958, PUJADAS-SALVÀ and VELASCO 2000) and genetically (KATZIR *et al.* 1996, PARAN *et al.* 1997, ROMÁN *et al.* 2004).

Distribution of *Orobanche cernua*

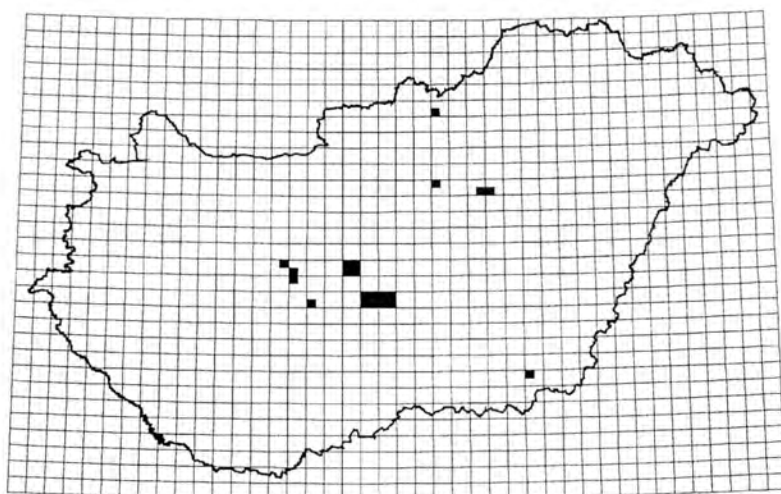
According to KREUTZ (1995) *Orobanche cernua* is distributed in the Western Mediterranean region of Europe and in the eastern part of the continent (Turkey, Bulgaria, East-Romania, Moldavia, East-Ukraine, etc.). *O. cumana* has a similar range, with more (adventive) populations in Central Europe and in the Balkan peninsula.

While *O. cumana* has been known as a weed of sunflower cultures in Hungary for more than 50 years (BOROS 1950), *O. cernua* has not been recognised until now. HORVÁTH (1996, 1999) had reported *Orobanche cernua*, *O. cumana* and their hybrid (!) from Hungary, all from sunflower cultures, but he may have misidentified the two species (mentioned dense inflorescence [!] and nearly uncurved corolla of *Orobanche cumana*, cf. KREUTZ 1995, PUJADAS-SALVÀ and VELASCO 2000).

Up to now 13 populations of *O. cernua* became known from the lowlands of Hungary (Table 1).

Table 1. Actual distribution data of *Orobanche cernua* in Hungary.

Locality	CEU	Date	Collector
Fülöpszállás (Bács-Kiskun county)	8980	02.06.1977	Németh, F. (BP)
Jakabszállás – Kunszentmiklós (Bács-Kiskun county)	9181 9182	19.07.1978	Szujkó-Lacza, J. (BP)
Heves, Bika-Nyilas (Heves county)	8487.4	22.07.1999, 01.07.2004	Schmotzer, A.
Heves, Bútelek (Heves county)	8487.4	04.08.1999	Schmotzer, A.
Bátonyterenye, Rákóczi-telep (Nógrád county)	7985.3	15.06.2004, 30.06.2004	Harmos, K.Harmos, K. and Barina, Z. (BP)
Bátonyterenye, Gyula-akna (Nógrád county)	7985.3	15.08.2004	Harmos, K.
Tarnaszentmiklós, Hanyi-ér (Heves county)	8488.3	03.07.2004	Schmotzer, A.
Jászágó, Rókalyuk-dűlő (Jász-Nagykun-Szolnok county)	8485.1	17.07.2004	Schmotzer, A.
Sárszentágota (Fejér county)	9077.1	2004	Lendvai, G.
Aba (Fejér county)	8977.3	2004	Lendvai, G.
Alap (Fejér county)	9178.3	2004	Lendvai, G.
Aba-Felsőszentiván (Fejér county)	8976.2	2004	Lendvai, G.
Tótkomlós, Kopáncspuszta (Békés county)	9690.1	17.07.2001	Jakab, G.

**Fig. 1.** Distribution map of *Orobanche cernua* in Hungary (grid system of the Central European flora).

To our present-day knowledge *Orobanche cernua* is a rare but characteristic plant of Hungarian salt communities (PUJADAS-SALVÀ and VELASCO (2000) published it from Spain from loamy gypsaceous soils).

Host plants of *Orobanche cernua*

By the authors experiences the host plants of *Orobanche cernua* are (mainly) *Artemisia* species. Reports on its presence on *Helianthus annuus* may have been based on confusion with *Orobanche cumana*. In Hungary its only host plant may be *Artemisia santonicum* L. GRULICH and FERÁKOVÁ (1999) mention *O. cernua* subsp. *cumana* as being parasitic on *Artemisia santonicum*. According to the authors' observation, *Orobanche cumana* grows exclusively in sunflower cultures in Hungary, as in Spain (PUJADAS-SALVÀ and VELASCO 2000), and in agreement with KREUTZ (1995) (but cf. SZATALA-né 1953). The separation of *O. cernua* and *O. cumana* became more difficult due to the fact that the host plants of *Orobanche cumana* originally were *Artemisia* species in Asia (VENKOV and BOZOUKOV 1994, PUJADAS-SALVÀ and VELASCO 2000). Moreover, according to LAZAROV and ANDREJEV (1968) and PETROV (1970) *Artemisia maritima* L. (= *A. santonicum* L.) could be the host plant which promoted the spreading of *O. cumana* to Central Europe.

Differences between *Orobanche cernua* and *O. cumana*

Orobanche cernua is a small plant with dense inflorescence, *Orobanche cumana* is taller with lax inflorescence. The flowers of *O. cernua* are dark blue to violet while those of *O. cumana* vary from whitish to pale blue. In Hungary *O. cernua* occurs in alkaline soils while *O. cumana* on cultivated lands. The latter one in Hungary grows on *Helianthus annuus* (KREUTZ 1995, but cf. LAZAROV and ANDREJEV 1968 and PETROV 1970) while *O. cernua* on *Artemisia santonicum*. PUJADAS-SALVÀ and VELASCO (2000) mention many further morphological differences between the two taxa.

CONCLUSIONS

Orobanche cumana Wallr. has been known in Hungary since about 1950 as an adventive species, but *Orobanche cernua* Loebl. was found only very recently and may be a native plant of the Hungarian flora. *Orobanche cernua* Loebl. as a morphologically separable taxon is a new member of the Hungarian flora, but the

definitive distinction of *O. cernua* and *O. cumana* requires further study. The effect of a possible host-change to the morphological features of the members of this complex is still unknown and the taxonomic status of these two taxa requires additional investigation.

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