Contribution to the flora of Asian and European countries: new national and regional vascular plant records

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Abstract: The paper presents new records for 10 vascular plant species from three Asian and four European countries. Of this number, three species (\textit{Panicum capillare}, \textit{Stipa macroglossa}, \textit{Tribulus longipetalus}) are reported from Tajikistan, two (\textit{Calamagrostis emodensis}, \textit{Calamagrostis lahalensis}) from Myanmar, two (\textit{Euphorbia taurinensis}, \textit{Origanum vulgare} var. \textit{megastachyum}) from Poland, one (\textit{Sagina apetala}) from Uzbekistan, one (\textit{Orobanche ritro}) from Ukraine and Russia, and one (\textit{Leontodon saxatilis}) from the Czech Republic. Eight of these taxa are new to the flora of different Asian and European countries; and two, very rare but recently spreading species, namely \textit{Leontodon saxatilis} and \textit{Euphorbia taurinensis}, were reported from the Czech Republic and Poland, respectively. Four of the taxa presented (\textit{Euphorbia taurinensis}, \textit{Panicum capillare}, \textit{Sagina apetala} and \textit{Tribulus longipetalus}) should be regarded as alien to the studied areas, intensively spreading or even invasive, whereas the other six are native elements given for the first time from the countries. In each of the species, synonyms, the general distribution, habitat preferences and habitats occupied in the particular country, taxonomy with remarks on recognition and differentiating the species from the most similar occurring in particular country as well as a list of localities of examined species occurring in a given country, often far from the previously known areas, were presented. In the case of \textit{Stipa macroglossa} a lectotype for the species was designated in the present paper. Illustrations for \textit{Stipa macroglossa} and \textit{Orobanche ritro} were also provided.

Keywords: alien species; Asia; chorology; Europe; native species; range; taxonomy

Introduction

During field exploration in different Central European and Central Asian countries, as well as during taxonomical revisions of herbarium material of different groups of vascular plants housed in A, BM, CAL, E, FRU, K, KRA, KTC, L, LE, OPUN, P, TAD, TASH and US herbaria (acronyms follow Thiers 2011), the authors found some species that are new or rare to the flora of particular countries. The purpose of this paper is to report new records of 10 vascular plant taxa from seven Asian and European countries, namely the Czech Republic, Myanmar, Poland, Russia, Tajikistan, Uzbekistan and Ukraine. Four of the taxa presented should be regarded as alien to the studied areas, intensively spreading or even invasive, whereas the other three are native elements given for the first time from the Asian and European countries. The taxa are presented alphabetically in two groups, Asian and European countries.

New records for Asian countries

\textit{Calamagrostis emodensis} Griseb. (Poaceae)

Distribution and habitat

To date, \textit{Calamagrostis emodensis} has only been recorded from Bhutan, China (Yunnan, Shaanxi, Sichuan, Xizang), North India, Nepal and North Pakistan (Bor 1960; Cope 1982; Noltie 2000; Press, Shrestha and Sutton 2000; Lu and Phillips 2006). No species of \textit{Calamagrostis} or \textit{Deyeuxia} are listed by Kress et al. (2003) in a checklist of Myanmar’s seed plants. In the present work, the first record of \textit{C. emodensis} is reported from northeastern Myanmar. It was collected there in 1924 by a Scottish botanist George Forrest (1873–1932) on hills around Atawgaw in Myanmar’s northern Kachin State. In Himalayas \textit{C. emodensis} grows at an elevation between 1900 and 4100 m, in old clearings and edges of thickets and roadsides, steep mountain slopes with thickets, grassy slopes along streams and in the fir forest.

Taxonomic notes

\textit{Calamagrostis emodensis} is a member of the genus \textit{Calamagrostis}, which comprises a few closely related groups of taxonomically difficult species (Paszko and Nobis 2010; Paszko 2013; Paszko and Chen 2013;
Paszk and Pendry 2013). The examined species is usually characterized by having relatively broad leaf blades, a nodding panicle, five-veined lemma with a deeply two-toothed apex, awn 5–9 mm arising between teeth, and its florets containing one stamen with a single plump anther (Bor 1960; Lu and Phillips 2006). *Calamagrostis emodensis* is similar to some members of *Calamagrostis pseudophragmites* complex in its appearance. However, it is regarded as a very distinctive species, which is quite easy to distinguish from the members of the *C. pseudophragmites* complex. Morphological analysis revealed that *C. emodensis* differ from *C. pseudophragmites* complex by longer awns (5.0–8.5 mm versus 1–4 mm), shorter anthers (0.6–1.1 mm versus 1.0–2.3 mm), relative awn insertion on the lemma (exerted between deep teeth above the midpoint versus apical or subapical), shorter leaf ligules (0.5–4.0 mm versus 2–26 mm) (Paszk 2012).

**Examined specimens (new records)**

MYANMAR (BURMA). Northeast Upper Burma, hills around Atawgaw, 26°10′ N, 98°25′ E, 1829–2134 m, September 1924, G. Forrest 24995 (E!); northeast Upper Burma, 1829–2134 m, September 1924, G. Forrest 24995 (K!).

*Calamagrostis lahulensis* Singh (Poaceae)

*Calamagrostis pulchella* Griseb., not Reichenbach; *Deyeuxia pulchella* Hook. f.

**Contributor**

Beata Paszk

**Distribution and habitat**

Until now, *Calamagrostis lahulensis* (some authors recognizing it under *Deyeuxia*, as *D. pulchella*) has only been recorded from Bhutan, China (Yunnan, Sichuan, Xizang), North India and Nepal (Bor 1960; Noltie 2000; Press et al. 2000; Lu, Chen and Phillips 2006). In the present work, the first records of *C. lahulensis* are reported from northeastern Myanmar. Specimens of *C. lahulensis* were collected in 1931 by the famous plant collector, explorer and ecologist Frank Kingdon-Ward in the Adung Valley, which is almost on the border with Xizang (China) in Myanmar’s northern Kachin State. In Himalayas, *C. lahulensis* grows at elevations between 2700 and 5200 m, in alpine meadows, woodlands and among bushes. In northeast Myanmar it is also a common grass of the alpine meadows, but not in marshy or boggy ground.

**Taxonomic notes**

*Calamagrostis lahulensis* and *Calamagrostis scabrescens* Griseb. are two closely related polymorphic species, varying especially in the compactness of the panicle, and in length, shape (straight or geniculate and slightly twisted at the base) and place of attachment of awn on the lemma back (Lu et al. 2006; Paszk unpublished results). With respect to the great variation in spikelet morphology both of them are similar to *Calamagrostis villosa* (Chaix ex Vill.) Gmel., which occurs in Central Europe (Paszk 2011). *Calamagrostis lahulensis* can be distinguished from *C. scabrescens* by shorter awn on the lemma back (1–5 mm versus 5–9 mm) and grass habit (stout low grasses decumbent at the base to a woody rootstock versus robust grass, tufted, erect from the base, tall) (Bor 1960; Paszk unpublished results).

**Examined specimens (new records)**

MYANMAR (BURMA). [Kachin State], Adung Valley (sources of the Irrawaddy), 28°20′ N, 97°40′ E, a tufted grass, common in meadows, 3353–3658 m, 11 July 1931, F. Kingdon-Ward 9786 (BM001050211!); [Kachin State], Adung Valley (sources of the Irrawaddy), 28°20′ N, 97°40′ E, 3658 m, 29 July 1931, F. Kingdon-Ward 9879 (BM!); [Kachin State], Adung Valley, 3658 m, July 1931, F. Kingdon-Ward 9879 (US1598450!).

*Panicum capillare* L. (Poaceae)

**Contributors**

Marcin Nobis, Arkadiusz Nowak

**Distribution and habitat**

*Panicum capillare* is a broadly distributed taxon, originating from North America and occurring worldwide (Tzvelev 1976; Clayton 1980; Clements et al. 2004). It is a new, alien species to the flora of Tajikistan. Probably, it has been transiently introduced and temporarily occurring in anthropogenic habitats. However, in some neighbouring countries, e.g. in Pakistan, the species becomes fully established shortly after introduction as a weed of cultivated grounds (Cope 1982). That is why the species requires attention.

**Taxonomic notes**

To date, the genus *Panicum* has been represented in Tajikistan only by *Panicum miliaceum* L. commonly cultivated in arable fields of the country, and temporarily escaping from cultivation. *Panicum capillare* is the second species of the genus. *Panicum capillare* distinctly differs from *P. miliaceum* by shorter spikelets (1.8–3.3 versus 3.5–5.5 mm long), shorter anthers (0.6–1.2 versus 1.3–1.8 mm long) and in more general habit, which in *P. capillare* is more gentle.

**Examined specimens (new records)**

TAJKISTAN. roadside and lawn in National University campus, near Varzob channel in Dushanbe, 900 m, 8 September 2010, M. Nobis, A. Nowak (KRA!).
**Sagina apetala** Arduino (Caryophyllaceae)

Contributor
Arkadiusz Nowak

Distribution and habitat

*Sagina apetala* is a species native to Europe, known also from North and South America and southwest Asia (Friedrich 1979; Tutin et al. 2002). In Middle Asia, the species has been noted only in Tajikistan (Kamelin 1971). However, in the neighbouring countries it was also reported from Punjab and Hazara in central Pakistan (Ghazanfar and Nasir 1986) and from Afghanistan (Podlech 2012). It grows in different types of disturbed habitats. In Europe, the species was noted in field furrows, in stubble fields, in gaps between paving slabs, alongside road verges, on muddy bottoms of fish ponds and other relatively wet man-made habitats with sandy substrate. It is regarded as a plant typical for *Nanocyperion* and *Polygonion avicularis* communities.

*Sagina apetala* is a new species to the flora of Uzbekistan. The population found in Samarkand consists of several dozen individuals inhabiting exclusively anthropogenic habitats. The synanthropic status of the species is still questionable; however, the exclusive occurrence only in man-made habitats as well as no literature data about the species in other phytocoenoses, makes it necessary to classify *S. apetala* as an alien taxon in the flora of Uzbekistan. This is in line with the situation of the species in Tajikistan. In this country for the first time *S. apetala* was reported from the Varzob River valley (Odzhuk settlement by Gazhni village) by Kamelin (1971).

Taxonomic notes

To date, the genus *Sagina* has been represented in Uzbekistan only by *Sagina saginoides* (L.) Karst. (Vvedensky 1963). *Sagina apetala* is the second species of the genus recorded in Uzbekistan. It is an annual plant, up to 9 cm with very delicate, procumbent stems, glabrous or glandular above. In contrast to *S. procumbens* L., the species has no vegetative stems at the time of flowering. Additional distinctive characters are flowers, which are 4-merous, not 5-merous as in the case of *S. saginoides*.

Examined specimens (new records)

UZBEKISTAN. Between flagstones on pavement in Ulugh Bek Observatory, Samarkand, 39°40′30.9″ N, 67°00′17.2″ E, 771 m, April 2009, A. Nowak (OPUN!).

*Stipa macroglossa* P.A. Smirn. subsp. *macroglossa* (Poaceae)

Contributors
Marcin Nobis, Arkadiusz Nowak

Distribution and habitat

*Stipa macroglossa* subsp. *macroglossa* is an endemic taxon to Middle Asia. It is known from Kazakhstan, Kyrgyzstan and Uzbekistan (Lavrenenko and Nikolskaya 1965; Tzvelev 1976). It is another new, native species to the flora of Tajikistan, having recently been found in the country (Nobis and Nowak 2011; Nobis et al. 2010; Nowak et al. 2013). The species was found in the western Zeravshan Mountains, in high mountain feather grass steppes at elevations between 1700 and 2300 m. Populations of the species differ in size. From several to dozen tufts per locality were observed.

Taxonomic notes

The genus *Stipa* comprises c.30 species in Tajikistan (Ovczinnikov and Czukavina 1957; Tzvelev 1976; Nobis 2011a, b, 2013a, b; Nobis and Nowak 2011; Nobis, Nowak and Nobis 2013). *Stipa macroglossa* belongs to the section *Stipa*, which in the area of Tajikistan comprised three additional taxa: *Stipa kirghisorum* P.A. Smirn., *Stipa turkestanica* Hack. subsp. *turkestanica* and *Stipa turkestanica* subsp. *trichoides* (P.A. Smirn.) Tzel. All of these taxa have two geniculately bent awns, plumose in the upper part (on seta) and glabrous in the lower part (on column). It is most similar to *S. turkestanica* subsp. *trichoides*, but is easily distinguishable by longer setas (18–22 cm versus 10–14 cm long), which are at the same time 7–11 versus 3–4 times longer than the column (the lower part of the awn), and relatively longer ligules of the vegetative shoots (up to 10 mm versus up to 3.7 mm long). *Stipa macroglossa* is also somewhat similar to *S. kirghisorum*; however, in comparison to the latter species, it differs by having much longer ligules of the vegetative shoots (up to 10 mm versus up to 2.5 mm long) and much shorter column (the lower segment of the awn, 15–35 mm versus 40–70 mm long).

*Stipa macroglossa* subsp. *macroglossa* is also similar to *S. macroglossa* subsp. *kazachstanica* (Kotuch) M. Nobis occurring in western Kazakhstan, Mongolia and northwestern China (Nobis 2013a). However, *S. macroglossa* subsp. *macroglossa* differs from the latter taxon in having somewhat longer anthecium (11.9–13.0–14.4(–16.0) mm versus (11.3–)12.4–13.4–(13.9) mm long, dorsal line of hairs on anthecium which ends (4.1–)5.4–6.8(–8.0) mm versus (3.1–)3.7–4.5(–5.4) mm below the apex, slightly longer seta, and adaxial surface of blades of the vegetative shoots, which are covered by a mixture of short and long hairs 0.15–0.35 mm long versus covered by very short hairs up to 0.1 mm long only (Nobis 2013a).

The original description of *Stipa macroglossa* (Smirnov 1924) was prepared on the basis of nine collections, without designation of the type. One year later, Smirnov (1925), described the taxon once again, and designated the type of the taxon (type citation: Prov. Tur-gai. Mujun-kumy, ad fl. Ssary-ssu, H. Kraschennikow).
composed of four herbarium sheets and labelled by himself “Stipa macroglossa m., 1924. I., Det. P.A. Smirnow”. On each of these sheets, white labels with the inscription “Typus!” were attached by A. Ischschenko in 1958 (not by Smirnow). Tzvelev (1976) treated one of these sheets with specimens of *S. macroglossa* as type (= holotype) and the other three as isotypes; however, we do not know which one was treated as holotype. Because the holotype was not indicated by the author of the species description, according to the Melbourne code (McNeill et al. 2012), the lectotype should be designated. As a lectotype (designated here by M. Nobis) the specimen (Figure 1) from the original Krasheninnikov’s collection was chosen. Original label: “I.M. Krasheninnikov: Ekpeditiya v Turgaiskii yezd 1914 g., № 5203, Tyrgaiskaya obl. i y. Kizyl-dzhingiinskaya volost, R. Sary-su v svoikh nizovyakh, Okrestnosti Muyun-kumov, Obnazhenie tretichnykh peschanikov, 1914.VI.01, N. Krasheninnikov: Iter ad distr. Turgai. 1914” (LE!). Three remaining sheets with specimens of the species should be regarded as isolecotypes.

**Examined specimens (new records)**

TAJIKISTAN. Zeravshan Mountains, feather grass steppe, on the southeastern slope of the Nofin lake, Nofin settlement, 39°11'02" N, 67°50'09" E, 1800 m, incl. northwest, slope 35°, 13 June 2009, M. Nobis (KRA!); high mountain steppe, on the left slope of the Iskanderdarya river valley, c.0.5 km east of Serimadarun lake (near Iskanderkul Lake), 39°05' N, 68°23' E, 2340 m, incl. west; slope 5°, 15 June 2012, M. Nobis and A. Nowak (KRA!); steppe grassland on the eastern slope of mountains, Vashan river valley, near Vashan settlement, 39°24'49" N, 68°16'03" E, 1750 m, incl. east-northeast, slope 10°, 11 June 2012, M. Nobis and A. Nowak (KRA!).

*Tribulus longipetalus* Viv. (Zygophyllaceae)

**Contributors**

Arkadiusz Nowak, Marcin Nobis, Sylwia Nowak

**Distribution and habitat**

*Tribulus longipetalus* is a taxon distributed from North Africa to South and Middle Asia (Hadidi 1972). The species is surely an alien plant species in the flora of Tajikistan. It was recently found as a weed only in arable fields, in relatively dense and effectively weeded *Carthamus tinctorius* L. cultures in southwestern Tajikistan. It is probable, that seeds of *T. longipetalus* could be unintentionally introduced with seeds of cultivated plant obtained from southwestern Asia. Further localities for this species are likely to be found in Tajikistan.

**Taxonomic notes**

*Tribulus longipetalus* var. *macropterus* (Boiss.) Zohary was reported from Amu-Daria River valley in Turkmenistan (Kelif–Kerkichi and Kizyl-Ajak–Kerkki), approx. 400 km to southwest from the locality discovered in Tajikistan (Shishkin and Bobrov 1949). In Pakistan, all three subspecies of *T. longipetalus* have been noted: *T. longipetalus* var. *pterophorus* (C. Presl.) Hadidi, *T. longipetalus* var. *macropterus* and *T. longipetalus* var. *longipetalus*. It was reported also from Afghanistan by Podlech (2012) as *Tribulus macropterus* and *Tribulus petrophorus* from several locations in central parts of the country.

In Tajikistan two species of *Tribulus* L. occur: *T. longipetalus* and *Tribulus terrestris* L. The main difference between these species is the character of their fruits; *T. longipetalus* has winged mericarps whereas mericarps of *T. terrestris* have distinct spines. Taxonomic position of *T. longipetalus* and its distribution in Tajikistan (and middle Asia) require further studies.

**Examined specimens (new records)**

TAJIKISTAN. Foothills of Hissar Mountains, on the *Carthamus tinctorius* crop field, in segetal vegetation near...
New records for European countries

Euphorbia taurinensis All. (Euphorbiaceae)

Contributors
Agnieszka Nobis, Marcin Nobis

Distribution and habitat

Current range of Euphorbia taurinensis extends from Transcaucasus and Cyprus to Europe (WCSP 2013). In Europe, it is mostly recorded from disturbed ground (Smith and Tutin 1968). The species has been regarded in Poland as accidentally introduced, not established (Mirek et al. 2002). The new localities of the species were found in the border zone between the Western and Eastern Carpathians (southeastern Poland). Abundance of the populations in particular sites varies from a few (2–10 specimens, in Szczawne) to a dozen or so (20–60 specimens, in the remaining localities). On the listed localities, E. taurinensis was observed each year, since 2006, and in our opinion it should be regarded as a plant species established in anthropogenic habitats in the country (neophyte), similar to other species recently reported from Poland (e.g. Baryła et al. 2005; Nobis, Nobis and Nowak 2006; Tucharz, Nobis and Nobis 2011).

Taxonomic notes

Among almost 30 species of the genus Euphorbia L. recorded in Poland (Mirek et al. 2002), E. taurinensis is most similar to Euphorbia exigua L., but the species differ in seed sculpture. The seeds of E. taurinensis are deeply pitted, whereas those of E. exigua are vermiculate-rugose (Smith and Tutin 1968).

Examined specimens (new records)

POLAND. Radoszyce near Komańcz, on track-way, 49°18′21″ N, 22°04′18″ E, September 2006, A. Nobis and M. Nobis (KRA!); Rzepedź near Komańcz, along railway tracks and on track-way in the northern part of the railway station, 49°22′32″ N, 22°06′48″ E, 426 m, 15 September 2009, A. Nobis and M. Nobis (KRA!); between Rzepedź and Szczawne villages, on track-way, 49°23′14″ N, 22°07′43″ E, 407 m, 15 September 2009, A. Nobis and M. Nobis (KRA!); between Rzepedź and Szczawne villages, on track-ways, 49°24′28″ N, 22°08′32″ E and on track-way, approximately 500–600 m north-northwest of the railway station, 49°24′41″ N, 22°08′16″ E, 2006, 2009, A. Nobis and M. Nobis (KRA!).

Leontodon saxatilis Lam. (Asteraceae)

Contributors
Agnieszka Nobis, Marcin Nobis, Vítězslav Plášek

Distribution and habitat

The localities of Leontodon saxatilis are concentrated mostly in the western part of Europe (Hultén and Fies 1986), and it grows in different types of open habitats (Kaplan 2004; Nobis et al. 2011). In the Czech Republic, localities of the species were known from Southern Moravia and South Bohemia (Kaplan 2004). In that region, L. saxatilis was noted also from anthropogenic sites, e.g. from the lawn in city park in Přerov. Recently, the species has been classified as missing in the country (Daníhelka, Chátek and Kaplan 2012).

The newly recorded localities of the species in the Moravian–Silesian Region are very abundant. The species was noted on lawns and on a meadow in the vicinity of the town of Hlučín. It is worth noting that until the end of twentieth century in Poland as a neighbouring country it was reported from c.50 localities, mostly in its northwest part. Currently, over 150 new localities were found in central and southeast Poland (Nobis et al. 2011). Because our finding of L. saxatilis in the Czech Republic was accidental and not the result of a systematic search, further studies on the distribution and status of the species in Central Europe are required.

Taxonomic notes

Leontodon saxatilis differs from Leontodon hispidus L., which is most similar among the species of the genus Leontodon occurring in the Czech Republic, by having the outer achenes with a pappus of small scarious scales. The pappus of L. hispidus is of plumose hairs.

Examined specimens (new records)

CZECH REPUBLIC. Silesia, Hlučín town, lawns and road sides in the town centre, 8 September 2012, A. Nobis, M. Nobis (KRA!).

Locality of L. saxatilis recorded only in the field

CZECH REPUBLIC. c.1.2 km from Hlučín town, meadow near the Poštovní rybník pond, 230 m, 49°53′6.2″ N, 18°10′4.5″ E, 3 October 2012, V. Plášek.

Origanum vulgare L. var. megastachyum
W.D.J. Koch (Lamiaceae)

Origanum vulgare [ranglos] prismatcum Gaudin.

Contributors
Marcin Nobis, Agnieszka Nobis, Renata Piwowarczyk
Distribution and habitat

The taxon presents an Atlantic–sub-Mediterranean type of range; however, the precise distribution is still not fully known. The taxon was reported from several western and central European countries, e.g. England, France, Switzerland, South Germany, Hungary, Czech Republic, Slovakia and Hungary (Hrouda 2000). It is supposed that some of the northernmost locations could have anthropogenic origin. *Origanum vulgare* var. *megastachyum* is a new taxon to the flora of Poland. It was reported from xerothermic swards and grasslands, roadsides and also from anthropogenic habitats like railway stations. All new localities were recorded in the warmer, southeastern part of the country, in the area of uplands and foothills of mountains. Populations of the species differ in size. From several to a dozen specimens per locality were observed.

Taxonomic notes

*Origanum vulgare* var. *megastachyum* is a taxon most similar to *O. vulgare* var. *vulgare*, but differs in the length of spikelet-like inflorescences, which are clearly longer than in the nominal variety (10–25 mm versus up to 10 mm long) and in the number of flowers within individual spikelet (12–15–25 versus 5–8–12). Because the distributional ranges of these taxa in Europe overlap, the subspecies rank of these taxa is difficult to accept, as it was established in some countries (e.g. Hrouda 2000; Buttler and Hand 2007). Specimens with intermediate characters of spikelet length can also be observed, and for that reason both of these taxa were also treated as conspecific (Ferandes and Heywood 1972). We have also observed that in the second part of the vegetative season, in some specimens of *O. vulgare* subsp. *vulgare* spikelets increase, and then such specimens are reminiscent of *O. vulgare* var. *megastachyum*. However, in that case, spikelets rarely reach over 10 mm long, which is a characteristic feature for the latter taxon. Nomenclature (which was accepted following Buttler and Hand 2007) and taxonomic position of the taxon require further studies, similarly as its distribution in Poland.

Examined specimens (new records)

POLAND. Katy II near Zamość, xerothermic grassland and roadside, 10 July 2009, M. Nobis, A. Nobis (KRA!); railway tracks in Ustrzyki Dolne station, 22 August 2006, M. Nobis, A. Nobis (KRA!); xerothermic grassland and sub-ruderalized places near quarry, Dybkowa Mountain, Gnieździska village, 20 June 2007, R. Piwowarczyk, A. Adamiec (KTC!).

*Orobanche ritro* Gren. & Godr. (Orobanchaceae)

*Orobanche rhytrosepiphyta* St.-Lager, *Orobanche major* f. *ritro* (Gren. & Godr.) Beck, *O. major* var. *ritro* (Gren. & Godr.) Will., *O. major* subsp. *ritro* (Gren. & Godr.) Douin, O. *loscosii* Carlón, Laínz, Moreno Moral & Sánchez Pedraja.

Contributor

Renata Piwowarczyk

Distribution and habitat

*Orobanche ritro* is a taxon new to the flora of Ukraine and some regions of Russia, e.g. Saratov, Samara and Kursk. These are the easternmost sites known for the species, which extends its distribution range. To date, it has been known from areas of Central and Southern Europe from the northeast of the Iberian Peninsula (Spain) via France, Hungary, Serbia and Romania, to the southwestern part of European Russia, in the Volgograd Region (Pujadas-Salvá 2012).

Taxonomic notes

The taxon is poorly known, with rare and scattered localities and requires taxonomic clarification. It belongs to the section *Orobanche*, subsection *Orobanche* (Teryokhin et al. 1993). The taxon is known to parasitize roots of *Echinops ritro* L. (Asteraceae) (Pujadas-Salvá 2012). Parasitization of other species of the genus *Echinops* requires confirmation and further studies. *Orobanche ritro* grows in xerophytic bushes and grasslands, degraded scrubland, meadows, dry pasture, sub-ruderalized places, and in the steppe communities and in rocky places.

*Orobanche ritro* was described based on material collected by Grenier in Gap and by Boullu in Guilliztre (France), on *Echinops ritro*. Later it was treated at different taxonomic levels, and considered a form subordinate to *O. major* L. (e.g. Beck 1890; Douin 1926). Some botanists treated *O. ritro* as a synonym for *O. major* or *Orobanche elatior* Sutton (e.g. Chater and Webb 1972). Zázvorka (2010) includes it as a synonym of *Orobanche kochii* Schultz. Recently, Pujadas-Salvá (2012) reinstated *O. ritro* to the rank of a separate species.

*Orobanche ritro* can be easily distinguished from *O. elatior* and *O. icterica* Pau by its having sub-imbricate to sparse basal leaves; a usually longer calyx, shortly bipartite to bifi d calyx segments; tubular corolla with a straight to slightly curved dorsal line; densely pubescent staminal filaments. *Orobanche kochii* has a lax inflorescence and *O. ritro* a dense inflorescence and differences regarding calyx and corolla shape, colour and number of flowers (Pujadas-Salvá 2012) (Figure 2). There are also some differences between host plants: *O. ritro* parasitize *Echinops* species, while *O. kochii*, *O. elatior* and *O. icterica* parasitize various *Centaurea* and *Rhaponticoides* (Asteraceae) species (Piwowarczyk 2012; Pujadas-Salvá 2012).

Examined specimens (new records)

UKRAINE. Crimea, around Sevastopol, Mys Fiolent (with *E. ritro*), 29 June 1981, N.N. Tzelev (LE!).
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