

Orobanche laxissima Uhlich & Rätzel (Orobanchaceae) – a new species for Dagestan (Russia) and Azerbaijan

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Abstract: *Orobanche laxissima* Uhlich & Rätzel (Orobanchaceae) is a probably endemic Caucasian parasite of trees. New localities of this species are reported from the Greater Caucasus: Russia (Dagestan) and Azerbaijan. These are the easternmost sites known for the species, so they extend its distribution range. Its hosts, abundance, and habitat preferences at the new localities are described, and a supplemented map of distribution of this species in Caucasus Mts. is provided.

Key words: *Orobanche laxissima*, distribution, habitat, host, Caucasus, Russia, Dagestan, Azerbaijan

1. Introduction

The Caucasus is located at the border of Europe and Asia, between the Caspian and Black Seas. Politically it is divided between Georgia, Armenia, Azerbaijan, and the North Caucasian portion of the Russian Federation (including the Dagestan, Chechnya, Ingushetia, northern Ossetia, Kabardino-Balkaria, Karachay-Cherkessia, and Adygea Autonomous Republics), the north-eastern part of Turkey, and a part of north-western Iran. Topographically the Caucasus comprises the Greater Caucasus (with the highest peak Mt. Elbrus, 5642 m a.s.l.), the Lesser Caucasus (up to 4000 m), the South Caucasian Uplands (covering parts of Asia Minor, Armenian and Iranian uplands), and the Transcaucasian Depression, between the Greater and Lesser Caucasus. Caucasian flora comprises 6350 native species of vascular plants, 1600 of which are endemic. There are 17 endemic genera of plants in this region, 9 of which are associated with high mountain ecosystems (Holubec & Křivka 2006).

The Caucasus and mountains of Central Asia are centres of origin of the genus *Orobanche* L. In this area, 70-85 species of this genus are known, and many of them are endemic. Distribution of the genus *Orobanche* and related genera and their hosts is still not sufficiently known (Rätzel & Uhlich 2004).

Orobanche laxissima Uhlich & Rätzel was first described from the Republic of Adygea (NW Caucasus, Russia), near the village of Novoprokhladnoye. It was considered to be probably endemic to the Caucasus Mts. Its distribution apparently is restricted to the foothills of the Caucasus Mts., especially Adygea (Maykopsky District), Krasnodar Krai, Stavropol Krai, to the Turkish coast of the Black Sea and Georgia (Kakheti region). Previously, it was known from about 20 localities (Rätzel & Uhlich 2004; www.owiki.org), but probably the species is most common within the Caucasus.

The aim of this paper is to describe new localities of *Orobanche laxissima* in the Caucasus Mts. Its taxonomy, biology, ecology, and distribution are also briefly discussed below.

Herbarium acronyms are given after Holmgren & Holmgren (1998). Authors abbreviations of taxa are taken from Brummitt & Powell (1992).

2. Taxonomic problems, biology, and ecology

Taxonomic notes

Orobanche laxissima Uhlich & Rätzel, Feddes Repert. 115 (1-2): 194, 2004.

Syn. *Orobanche fraxinii* Uhlich in sched.

Type: Russia, in Caucaso boreo-occidentali (Adygea) prope pagum Novoprokhladnoye, ca. 700 m

a. s. l., in fruticetis, leg. S. Rätzel, 30.06.2002 n. 2334 (B; Isotypi 2333, 2335, Herbarium Rätzel).

Orobanche laxissima belongs to the grex *Minores* Beck, characterized by calyx teeth filiform, narrow and long (cf. description of calyx Rätzel & Uhlich 2004). *O. laxissima* resembles *O. crenata* Forsk. or *O. owerinii* (Beck) Beck (parasitizing Fabaceae), mainly in stigma colour, lips and venation of the corolla. Unfortunately, in the original description of *O. laxissima* the colour of glandular hairs on the corolla is not mentioned. The photographs in www.orowiki.org, as well as authors' photographs and herbal material clearly show that hair colour is pale, white or bright yellow. This excludes *O. laxissima* from the grex *Glandulosae* Beck, containing e.g. *O. reticulata* Wallr. and *O. alba* Stephan ex Willd.

In spite of its distinctive habit, it has been confused in the literature with another species occurring in similar habitats, namely, *O. hederæ* Duby (parasite of *Hedera helix* L. and *H. colchica* (K. Koch) K. Koch). *O. laxissima* has quite a distinctive habit, pink or deep purple flowers (20–24 mm long) with yellow colouring inside the corolla. Shoots deep pink, violet or purple, often yellow or light yellow (Fig. 1). Many species of the genus *Orobanche*, e.g. *O. alba*, *O. alsatica* Kirschl., *O. bartlingii* Griseb., *O. caryophyllacea* Sm., *O. hederæ*

group, are often yellow, but the yellow forms almost never constitute the majority of a population. Such coloration is not typical and is a result of low insolation, soil pH, or incomplete plant pigmentation. Yellow and albinotic forms usually occur in shaded sites (Halamski 2011; Halamski & Piwowarczyk 2008; Piwowarczyk 2011, 2012), perhaps also when the parasite grows on untypical or weakened hosts. A detailed description of the species with photos has been provided by Rätzel & Uhlich (2004).

Host plants: mostly *Fraxinus excelsior* L., *F. pennsylvanica* Marshall, *Carpinus orientalis* Mill., *Cornus mas* L., *Ligustrum vulgare* L. (Rätzel & Uhlich 2004).

Habitat, plant communities, and abundance: moist, shady or semishady places in deciduous forests, parasitic on roots of woody plants in the submontane zone (ca. 250–950 m a. s. l.), usually in communities of the alliance *Carpinion orientalis*, the *Quercus pubescenti-Carpinetum orientalis*, with some species from the association *Pistacio muticae-Juniperetum excelsae*. *Orobanche laxissima* occurs most often in large groups of about 100 up to 2000 shoots (Rätzel & Uhlich 2004; www.orowiki.org).

Flowering period: (May) June to July.



Fig. 1. Plant habit of *Orobanche laxissima* in Gabala (Azerbaijan) (photograph by I. Tatanov, 9 June 2012)

3. Results

During a revision of the genus *Orobanche* in the herbarium LE in Saint Petersburg in 2013, the first author (RP) found *O. laxissima* (labelled as *Orobanche* sp.) collected together with the hosts *Carpinus* L. and *Ligustrum* L. from Russia (Dagestan) and Azerbaijan (Fig. 2).

New localities. Russia: Dagestan, Tabasaran District, left bank of the river Rubas-chai above the village of Huchni, in bushes on a slope. Corolla dirty-pink, yellowish inside (with a host: *Ligustrum*), 23 June 1961, leg. N. N. Tzvelev, S. K. Cherepanov, G. N. Nepli, A. E. Bobrov (LE, 1681); Azerbaijan: Gabala Hanlar ("Russian forest"), 1400-1500 m, near a stream (with hosts: *Carpinus* and *Ligustrum*), 9 June 2012, leg. L. I. Krupkina, B. I. Tatanov, B. B. Svanova (LE).

4. Conclusions

Orobanche species parasitic on roots of trees, characterized by generally narrow distribution ranges, are most often endemic. For example, *O. lucorum* A. Braun ex Koch is a parasite of *Berberis* L., rarely *Crataegus* or *Rubus* L., and occurs only in alpine sites of the Central Alps [the species is occasionally cultivated

in botanical gardens (Halamski 2005; Piwowarczyk & Kirpluk 2011)]; *O. sogdiana* Novopokrovskij, parasitic on *Amygdalus* L., is endemic to Pamir-Alay (Novopokrovskij & Tzvelev 1958; Kabulov 1978); *O. transcaucasica* Tzvelev, parasitic on *Rhus coriaria* L., is endemic to the Caucasus (Novopokrovskij & Tzvelev 1958; Carlón *et al.* 2005); while *O. ebuli* Huter & Rigo, on *Sambucus ebulus* L., is endemic to Italy, restricted to the districts of Abruzzi and Lazio (Lattanzi *et al.* 1999).

New localities of *Orobanche laxissima* reported from the Greater Caucasus in Russia (Dagestan) and Azerbaijan are the easternmost sites known for this species, so they extend its distribution range. The discovered localities are situated in the highest altitudes of the occurrence *O. laxissima* in the Caucasus. Parasiting on shrubs and trees as a phenomenon is rare among the *Orobanche*, so another example of *O. laxissima* is very interesting and valuable. Probably, more populations of this species can be found in the Caucasus Mts.

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Fig. 2. Distribution of *Orobanche laxissima* in the Caucasus Mts. (after Rätzel & Uhlich 2004; www.owiki.org; modified and supplemented)
 Explanations: ▲ – new locality, ● – earlier locality

References

- BRUMMITT R. K. & POWELL C. E. (eds.). 1992. Authors of Plant Names. 732 pp. Royal Botanic Gardens, Kew.
- CARLÓN L., GÓMEZ C., LAÍNZ M., MORENO MORAL G. M., SÁNCHEZ PEDRAJA Ó. & SCHNEEWEISS G. M. 2005. Más, a propósito de algunas *Orobanche* L. y *Phelipanche* Pomel del oeste del Paleártico. Documentos Jardín Botánico Atlántico Gijón 3: 1-71.
- HALAMSKI A. T. 2005. *Orobanche lucorum* introduced in the Botanical Garden of Warsaw University. Biuletyn Ogródów Botanicznych 14: 115-117.
- HALAMSKI A. T. 2011. *Orobanche hederæ* Vaucher ex Duby (Orobanchaceae) – plasticité phénotypique et micromorphologie des graines. Bull. mens. Soc. linn. Lyon 80(7-8): 170-178.
- HALAMSKI A. T. & PIWOWARCZYK R. 2008. Graines d'Orobanches comme critère taxonomique-information sur les travaux en cours. Bull. mens. Soc. linn. Lyon 77(3-4): 37-40.
- HOLMGREN P. K. & HOLMGREN N. H. 1998. Index Herbariorum. New York Botanical Garden; <http://sciweb.nybg.org/science2/IndexHerbariorum.asp>.
- HOLUBEC V. & KŘIVKA P. 2006. The Caucasus and its flowers. 390 pp. Loxia, Pardubice.
- KABULOV D. T. 1978. Zarazichovye Srednej Azii. 66 pp. Tashkent.
- LATTANZI E., MINUTILLO F. & TILIA A. 1999. Segnalazioni floristiche italiane: 932. *Orobanche ebuli* Huter et Rigo. Informatore Botanico Italiano 31(1-3): 81.
- NOVOPOKROVSKIJ I. V. & TZVELEV N. N. 1958. Orobanchaceae. In: Flora SSSR, vol. 23, pp. 19-117, 685-687. Moscow-Leningrad.
- PIWOWARCZYK R. 2011. *Orobanche mayeri* (Suess. & Ronniger) Bertsch & F. Bertsch – a species new to Poland. Acta Soc. Bot. Pol. 80(3): 179-183.
- PIWOWARCZYK R. 2012. *Orobanche alba* subsp. *alba* and subsp. *major* (Orobanchaceae) in Poland: current distribution, taxonomy, plant communities, hosts, and seed micromorphology. Biodiv. Res. Conserv. 26: 23-38.
- PIWOWARCZYK R. & KIRPLUK I. 2011. *Orobanche flava* (Orobanchaceae) w Ogrodzie Botanicznym Uniwersytetu Warszawskiego. Fragm. Flor. Geobot. Polonica 18(1): 163-165.
- RÄTZEL S. & UHLICH H. 2004. *Orobanche benkertii* sp. nov. (Orobanchaceae Vent.) und weitere *Orobanche*-Sippen aus dem Nordwest-Kaukasus. Feddes Repertorium 115(1-2): 189-211.
- www.orowiki.org