

***Orobanche pancicii* Beck (Orobanchaceae) in the flora of the Republic of North Macedonia**

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Abstract

The confirmation of the presence of *Orobanche pancicii* Beck, in the flora of North Macedonia, is presented in this paper. The only data for the occurrence of this species is from 1921 by Stojanov, for the mountain Belasica (southeastern part of North Macedonia). The new findings includes the mountains in the central (Karakjica, Kozjak) and western part of North Macedonia (Korab, Jablanica). In general, the distribution area of *O. pancici* includes Balkan Peninsula and countries from Central Europe (Austria, Hungary). In Euro+Med PlantBase, North Macedonia is not included in the distribution area of this species. *O. pancicii* belongs to the Subsect. Glandulosae that includes species in which corolla, especially the upper lip is covered with more or less dense dark-purple glandular hairs. *Knautia-* and *Scabiosa-* species appear to be the most frequent host plants for *O. pancicci*, but also some others are reported: *Valeriana montana*, *Ligustrum vulgare*, *Wulfenia carinthiaca*, *Centaurea scabiosa*, *Cephalaria sp.*, *Euonymus europaeus*, *Ailanthus altissima*. In our case, *Stachys tymphaea* and *Valeriana montana* are determined as certain host plants while the host plants for the population from the mountain Kozjak (Prilep) stay unknown. As it is mentioned above, *V. montana* is already known, but *S. tymphaea* is so far unknown host plant for *O. pancicci*. Species of the genus *Hieracium*, alleged for the mountain Belasica, are also unknown host plants, for this species.

Key words: rare species, host plants, North Macedonia.

Introduction

The work on the genus *Orobanche*, for more than a decade, revealed both new and rare species for the flora of North Macedonia (Nikolov, 2019, 2020, 2022). A total of 25 species for the territory of North Macedonia was reported, based on literature and new data (Nikolov, 2022). Meanwhile, another new species, *Orobanche laserpitii-sileris* Reut. ex Jord. for our flora, was recorded by Dimitrov (2022). Consequently, the number of species now reaches 26.

The presence of *Orobanche pancicii* Beck (Fig. 1) in the flora of North Macedonia, was based on only one and very old record by Stojanov (1921) for the mountain Belasica (southeastern part of North Macedonia). The new findings are the first confirmation after more than a century, for its occurrence in our flora and significantly extends the distribution area on the territory of North Macedonia.

General distribution

Up to now, the presence of *Orobanche pancicii* is reported from Austria, Hungary, Slovenia, Bosnia and Herzegovina, Serbia, Montenegro, Albania, Bulgaria and Greece (Rohlena, 1942; Parabućski, 1974; Hartvig, 1991; Pusch, 2000; Pusch & Günter 2009; Kiraly, Barina, Horvath & Mesterhazy, 2005; Dakskobler, Vreš & Pusch, 2010; Domina & von Raab-Straube (2010+); Stojanov, 2020).

Taxonomy position of *Orobanche pancicii*

Orobanche pancicii belongs to the subsect. Glandulosae (Beck) Teryokhin which comprises species with dark purple glandular hairs on the corolla. There are, in this subsection, 11 worldwide species, six of them in Europe (Pusch, 2000). Among the latter, *Orobanche alba* Stephan ex Willd., *Orobanche reticulata* Wallr. and *Orobanche serbica* Beck & Petrović are recorded for the territory of North Macedonia (Grecescu, 1899; Vandas, 1909; Stojanov, 1921; Jurišić, 1923; Urumov, 1923; Bornmüller, 1928; Grebenščikov, 1937(1938); Soška,



Fig. 1. *Orobanche pancicii* Beck
Kozjak (Prilep)

1937(1938), 1938-1939a, 1941; Petrovič, 1941; Černjavski, 1943; Rudski, 1943; Grupče, 1958; Drenkovski, 1969; Leute, 1978; Teofilovski, 2011; Nikolov, 2020).

Host plants

O. pancicii parasitizes mostly on *Dipsacaceae*-species: *Scabiosa leucophylla* Borbás, *Knautia fleischmanni* (Rchb.) Pacher, *K. magnifica* Boiss., *K. arvensis* (L.) Coul., *K. drymeia* Heuff., *K. dipsacifolia* Kreuzer, but also on *Valeriana montana* L., *Ligustrum vulgare* L., *Wulfenia carinthiaca* Jacq., *Centaurea scabiosa* L., *Hieracium* sp., *Cephalaria* sp., *Euonymus europaeus* L., *Aianthus altissima* (Mill.) Swingle, *Teucrium chamaedrys* L. (Hartvig, 1991; Uhlich, Pusch & Barthel, 1995; Pusch, 2000; Pusch & Barthel, 2009; Stojanov, 2020).

Materials and methods

An abundant material of this species was collected during the field research between 2010 and 2023, especially in the period 2011–2013 when the project "Taxonomy and chorology of the genus *Orobanche* in the Republic of Macedonia" was carried out. According to the standard procedures, the plants were herbarised, labelled and numbered. Different literature sources were used for the identification and distribution of *Orobanche* species: Beck (1890, 1930), Hayek (1929), Chater & Webb (1972), Delipavlov (1995), Hartvig (1991), Pusch (2000), Pusch & Günter (2009). Photos of the whole plants of *O. pancicii* as well as photos with the host plants are presented in the paper. A distribution map with literature records and new data is also presented. The voucher specimens are deposited in the herbarium of the Natural History Museum of the Republic of North Macedonia.

Results and discussion

Orobanche pancicii Beck in Ann. K. K. Naturhist. Hofmus. 2: 148. 1887.

Description of the collected plants from North Macedonia

Stem (11)15-40 (55) cm, erect, simple, yellowish to yellowish-purple, rarely dark purple, with glandular hairs. Scales up to 20 mm, at the base up to 8 mm, lanceolate, covered with dense glandular hairs. Inflorescence (3)4-17(22) cm, mostly dense, many-flowered, with dense glandular hairs. Calyx with two free, mostly unequally bidentate segments, rarely entire. Corolla (16)19-23(26) mm, yellowish, rarely yellow-whitish with less to intense purple to sometimes purple-brown nui-

sance, the veins often dark purple; the whole corolla especially the upper lip, even from the inner side, covered with more or less dense dark purple glandular hairs; the upper lip emarginated to 2-lobed, the lower 3-lobed. The filaments inserted at 2-2.5 (3) mm from the corolla base, ciliate in the lower part, near the anthers with few to many glandular hairs; the anthers with rare glandular hairs. The style in the lower part with rare, nearby the stigma with many glandular hairs. The stigma 2-lobed, intense-yellow, with red aureole.

Distribution in North Macedonia

In the following text, a detailed distribution of *O. pancicii* is presented based on the literature and new data for the area of North Macedonia, as well as a distribution map (Fig. 2).

Literature data: Belasica: maedows in beech forest above the villages Gabrovo and Kolešino, on *Hieracium* sp. (Stojanov, 1921).

New data:

Korab mountain

Korab (Štirovica): on the trail to "Golema Korabska Vrata", at the foothill of "Ziberova kula", 2028 m a.s.l., 31.07.2013, No. 9539, N: 41°49'00.1"; E: 020°34'22.3", Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata", locality "Pesok", 1850 m a.s.l., 31.07.2013, No. 9540, Leg./Det: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata", alongside the r. Štirovica", 1900 m a.s.l., 31.07.2013, No. 9541, Leg./Det: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata", 1900 m a.s.l., 31.07.2013, No. 9542, Leg./Det: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata", 1900 m a.s.l., 31.07.2013, No. 9543, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata", 1900 m a.s.l., 31.07.2013, No. 9544, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata", 1900 m a.s.l., 31.07.2013, No. 9545, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata", 1900 m a.s.l., 31.07.2013, No. 9546, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata", locality "Pesok", 1700-1800 m a.s.l., 31.07.2013, No. 9547, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata", locality "Pesok", 1700-1800 m a.s.l., 31.07.2013, No. 9548, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata" (Ziberova kula), locality "Pesok", 1860 m a.s.l., 31.07.2013, No. 9549, N: 41° 49' 27.4"; E: 020° 34' 44.3", Leg./Det.: Z. Nikolov; Korab (Štirovica): on

the trail to "Golema Korabska Vrata" (Ziberova kula), locality "Pesok", 1860 m a.s.l., 31.07.2013, No. 9550. N: 41° 49' 27.4"; E: 020° 34' 44.3", Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata" (Ziberova kula), locality "Pesok", 1900 m a.s.l., 31.07.2013, No. 9567. Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata" (Ziberova kula), locality "Pesok", 1860 m.n.v.; 31.07.2013; br. 9568. N: 41° 49' 27.4"; E: 020° 34' 44.3". Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata" (Ziberova kula), locality "Pesok", 1860 m a.s.l., 31.07.2013, No. 9569. N: 41° 49' 27.4"; E: 020° 34' 44.3", Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata" (Ziberova kula), locality "Pesok", 1900 m a.s.l., 31.07.2013, No. 9570, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata" (Ziberova kula), locality "Pesok", 1900 m a.s.l., 31.07.2013, No. 9571 Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata" (Ziberova kula), locality "Pesok", 1850 m a.s.l., 31.07.2013, No. 9572, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata" (Ziberova kula), locality "Pesok", 1700-1800 m a.s.l., 31.07.2013, No. 9573, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to "Golema Korabska Vrata" (Ziberova kula), locality "Pesok", 1700-1800 m a.s.l., 31.07.2013, No. 9574, Leg./Det.: Z. Nikolov; Korab (Štirovica): "Kobilino Pole", 2157 m a.s.l., 08.08.2014, No. 11359, N: 41°46'51.3"; E: 020°24'44.0", Leg./Det.: Z. Nikolov; Korab (Štirovica): "Kobilino Pole", 2157 m a.s.l., 08.08.2014, No. 11360, N: 41°46'51.3"; E: 020°24'44.0", Leg./Det.: Z. Nikolov; Korab (Štirovica): "Kobilino Pole", 2160 m a.s.l., 08.08.2014, No. 11423, N: 41°46'51.9"; E: 020°34'44.3", Leg./Det.: Z. Nikolov; Korab (Štirovica): "Kobilino Pole", 2160 m a.s.l., 08.08.2014, No. 11424, N: 41°46'51.9"; E: 020°34'44.3", Leg./Det.: Z. Nikolov; Korab (Štirovica): Kobilino Pole, 2160 m a.s.l., 08.08.2014, No. 11425, N: 41°46'51.9"; E: 020°34'44.3", Leg./Det.: Z. Nikolov; Korab (Štirovica): Kobilino Pole, 2160 m a.s.l., 08.08.2014, No. 11426; N: 41°46'51.9"; E: 020°34'44.3", Leg./Det.: Z. Nikolov; Korab (Štirovica): Kobilino Pole, 2170 m a.s.l., 08.08.2014, No. 11403, Leg./Det.: Z. Nikolov; Korab (Štirovica): Kobilino Pole, 2170 m a.s.l., 08.08.2014, No. 11404, Leg./Det.: Z. Nikolov; Korab (Štirovica): Kobilino Pole, 2170 m a.s.l., 08.08.2014, No. 11405, Leg./Det.: Z. Nikolov; Korab

(Štirovica): Kobilino Pole, 2170 m a.s.l., 08.08.2014, No. 11406, Leg./Det.: Z. Nikolov; Korab (Štirovica): Kobilino Pole, 2170 m a.s.l., 08.08.2014, No. 11407, Leg./Det.: Z. Nikolov; Korab (Strezimir): above the watchtower "Štirovica", 1700 m a.s.l., 23.07.2011, No. 8405, Leg./Det.: Z. Nikolov; Korab (Štirovica): Kobilino Pole, 2000-2100 m a.s.l., 04.08.2011, No. 8469, Leg./Det.: Z. Nikolov; Korab (Štirovica): Kobilino Pole, 2000-2100 m a.s.l., 04.08.2011, No. 8471, Leg./Det.: Z. Nikolov; Korab (Štirovica): Kobilino Pole, 2000-2100 m a.s.l., 04.08.2011, No. 8472, Leg./Det.: Z. Nikolov; Korab: in the vicinity of the sheep yard "Korab", 1700 m a.s.l., 22.07.2011, No. 8417, Leg./Det.: Z. Nikolov; Korab: in the vicinity of the sheep yard "Korab", 1750 m a.s.l., 22.07.2011, No. 8495, Leg./Det.: Z. Nikolov; Korab (Strezimir): on the trail to the peak „Golem Korab“, 2200 m a.s.l., No. 8496, 22.07.2011, Leg./Det.: Z. Nikolov; Korab: Kobilino Pole, 2000-2100 m.n.v., 04.08.2011; No. 8394, Leg./Det.: Z. Nikolov; Korab: Kobilino Pole, 2000-2100 m a.s.l., 04.08.2011, No. 8395; Leg./Det.: Z. Nikolov; Korab: Kobilino Pole, 2000-2100 m a.s.l., 04.08.2011, No. 8396, Leg./Det.: Z. Nikolov; Korab: Kobilino Pole, 2000-2100 m a.s.l., 04.08.2011, No. 8397; Leg./Det.: Z. Nikolov; Korab: Kobilino Pole, 2000-2100 m a.s.l., 04.08.2011, No. 8398, Leg./Det.: Z. Nikolov; Korab: Kobilino Pole, 2000-2100 m a.s.l., 04.08.2011; No. 8399, Leg./Det.: Z. Nikolov; Korab (Strezimir): on the trail to the peak "Golem Korab", 2200 m a.s.l., 22.07.2011, No. 8496, Leg./Det.: Z. Nikolov; Korab: Kobilino pole, 2000 m a.s.l., 04.08.2011, No. 8389, Leg./Det.: Z. Nikolov; Korab (Strezimir): Kobilino pole, 2000-2100 m a.s.l., 21.07.2012, No. 8873, Leg./Det.: Z. Nikolov; Korab (Strezimir): Kobilino pole, 2000-2100 m a.s.l., 21.07.2012, No. 8874, Leg./Det.: Z. Nikolov; Korab (Strezimir): Kobilino pole, 2000-2100 m a.s.l., 21.07.2012, No. 8875, Leg./Det.: Z. Nikolov; Korab (Strezimir): Kobilino pole, 2018 m a.s.l., 04.08.2011, No. 8468, Leg./Det.: Z. Nikolov; Korab (Strezimir): on the trail to the peak "Golem Korab", 1900-2750 m a.s.l., 22.07.2011, No 8351, Leg./Det.: Z. Nikolov; Korab: from „Kobilino pole“ to the waterfalls of „Dlaboka Reka“, maedows, 1800-2015 m a.s.l., No. 8567, Leg./Det.: Z. Nikolov; Korab: from „Kobilino pole“ to the waterfalls of „Dlaboka Reka“, maedows, 1800-2015 m a.s.l., No. 8566, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to the peak "Golem Korab", 1900-2200 m a.s.l., 22.07.2011, No. 8410, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to the peak "Golem Korab", 1900-2200 m a.s.l., 22.07.2011, No. 8411, Leg./Det.: Z.

Nikolov; Korab (Štirovica): on the trail to the peak "Golem Korab", 1900-2200 m a.s.l., 22.07.2011, No. 8412, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to the peak "Golem Korab", 1900-2200 m a.s.l., 22.07.2011, No. 8413, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to the peak "Golem Korab", 1900-2200 m a.s.l., 22.07.2011, br. 8414, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to the peak "Golem Korab", 1900-2200 m a.s.l., 22.07.2011, No. 8415, Leg./Det.: Z. Nikolov; Korab (Štirovica): on the trail to the peak "Golem Korab", 1900-2200 m a.s.l., 22.07.2011, No. 8416, Leg./Det.: Z. Nikolov; Korab: Kobilino Pole, 2300 m a.s.l., No. 8669, 19.07.2003, Leg./Det.: Z. Nikolov; Korab: Kobilino Pole, 2300 m a.s.l., No. 8670, 19.07.2003, Leg./Det.: Z. Nikolov; Korab: Kobilino Pole, 2300 m a.s.l., No. 8671, 19.07.2003, Leg./Det.: Z. Nikolov; Korab: above the v. Tanuše, 1616 m a.s.l., 05.08.2011, No. 8474, Leg./Det.: Z. Nikolov; Korab: above the v. Tanuše, 1616 m a.s.l., 05.08.2011, No. 8475, Leg./Det.: Z. Nikolov; Korab: above the v. Tanuše, 1616 m a.s.l., 05.08.2011, No. 8476, Leg./Det.: Z. Nikolov; Korab: above the v. Tanuše, 1616 m a.s.l., 05.08.2011, No. 8477, Leg./Det.: Z. Nikolov.

Jablanica mountain

Jablanica (v. Labunište): Upper (small) Labuniško lake, 1933 m a.s.l., 25.07.2013, No. 9698, Leg./Det.: Z. Nikolov; Jablanica (v. Labunište): Upper (small) Labuniško lake, 1933 m a.s.l., 25.07.2013, No. 9699; Leg./Det.: Z. Nikolov; Jablanica (v. Labunište): Upper (small) Labuniško lake, 1933 m a.s.l., 25.07.2013, No. 9700, Leg./Det.: Z. Nikolov; Jablanica (v. Labunište): Upper (small) Labuniško lake, 1933 m a.s.l., 25.07.2013, No. 9701, Leg./Det.: Z. Nikolov; Jablanica (v. Labunište): Upper (small) Labuniško lake, 1933 m a.s.l., 25.07.2013, No. 9702; Leg./Det.: Z. Nikolov; Jablanica (v. Labunište): Upper (small) Labuniško lake, 1933 m a.s.l., 25.07.2013, No. 9703; Leg./Det.: Z. Nikolov; Jablanica: Krstec, mountain pastures, 1800 m a.s.l., 18.07.2006, No. 8555, Leg./Det.: Z. Nikolov; Jablanica: Krstec, mountain pastures, 1800 m a.s.l., 18.07.2006, No. 8556, Leg./Det.: Z. Nikolov; Jablanica: Krstec, mountain pastures, 1800 m a.s.l., 18.07.2006, No. 8557; Leg./Det.: Z. Nikolov; Jablanica (v. G. Belica): "Krstec", mountain pastures, 1800 m a.s.l., 18.07.2006, br. 8560, Leg./Det.: Z. Nikolov; Jablanica (v. G. Belica): "Krstec", mountain pastures, 1800 m a.s.l., 18.07.2006, No. 8561; Leg./Det.: Z. Nikolov; Jablanica (v. G. Belica): "Krstec", mountain

pastures, 1800 m a.s.l., 18.07.2006, No. 8562, Leg./Det.: Z. Nikolov; Jablanica (v. G. Belica): "Krstec", mountain pastures, 1800 m a.s.l., 18.07.2006, No. 8563, Leg./Det.: Z. Nikolov; Jablanica (v. G. Belica): "Krstec", mountain pastures, 1800 m a.s.l., 18.07.2006, No. 8564, Leg./Det.: Z. Nikolov; Jablanica (v. Labuništa): Podgorečko lake, pastures, 1902 m a.s.l., 15.07.2012, No. 8866, Leg./Det.: Z. Nikolov; Jablanica (v. Labuništa): Podgorečko lake, 1900 m a.s.l., 26.07.2012, No. 8885, Leg./Det.: Z. Nikolov; Jablanica (v. Labuništa): Podgorečko ezero, pastures, 1902 m a.s.l., 15.07.2012, No. 8867, Leg./Det.: Z. Nikolov; Jablanica (v. Labuništa): Podgorečko lake, pastures, 1902 m a.s.l., 15.07.2012, No. 8868, Leg./Det.: Z. Nikolov; Jablanica (v. G. Belica): Čuma, 1669 m a.s.l., 11.07.2021, No. 14850, Leg./Det.: Z. Nikolov; Jablanica (v. Labunište): in the vicinity of the upper (small) Labuniško lake, 1900 m a.s.l., 16.07.2021, No. 14854, Leg./Det.: Z. Nikolov

Kozjak mountain (Prilep)

Prilep: Kozjak, 1200-1400 m a.s.l., 26.06.2010, No. 8685, Leg./Det.: Z. Nikolov; Prilep: Kozjak, 1300 m a.s.l., 26.06.2010, No. 8679, Leg./Det.: Z. Nikolov; Prilep: Kozjak, 1300 m a.s.l., 26.06.2010, No. 8680, Leg./Det.: Z. Nikolov; Prilep: Kozjak, 1300 m a.s.l., 26.06.2010, No. 8681; Leg./Det.: Z. Nikolov; Prilep: Kozjak, 1300 m a.s.l., 26.06.201, No. 8682, Leg./Det.: Z. Nikolov; Prilep: Kozjak, 1300 m a.s.l., 26.06.2010, No. 8683; Leg./Det.: Z. Nikolov; Prilep: Kozjak, 1300 m a.s.l., 26.06.2010, No. 8684, Leg./Det.: Z. Nikolov; Prilep (v. Pletvar): Kozjak, 1242 m a.s.l., 19.06.2012, No. 8833, Leg./Det.: Z. Nikolov

Karadjica mountain

Karadjica (v. Patiška Reka): in the forest belt, above the village, 1607 m a.s.l., 26.07.2022, No. 14828, N: 41°46.817'; E: 021°19.390', Leg./Det.: Z. Nikolov; Karadjica (v. Patiška Reka): in the forest belt, above the village, 1607 m a.s.l., 26.07.202, No. 14829, N: 41°46.817'; E: 021°19.390', Leg./Det.: Z. Nikolov; Karadjica (v. Patiška Reka): in the forest belt, above the village, 1607 m a.s.l., 26.07.2022, No. 14830, N: 41°46.817'; E: 021°19.390', Leg./Det.: Z. Nikolov; Karadjica (v. Patiška Reka): in the forest belt, above the village, 1607 m a.s.l., 26.07.2022, No. 14831, N: 41°46.817'; E: 021°19.390', Leg./Det.: Z. Nikolov; Karadjica (v. Patiška Reka): in the forest belt, above the village, 1607 m a.s.l., 26.07.2022, No. 14832, N: 41°46.817'; E: 021°19.390', Leg./Det.: Z. Nikolov; Karadjica (v. Patiška Reka): in the forest belt, above the village, 1607 m a.s.l., 26.07.2022, No. 14833, N: 41°46.817'; E: 021°19.390', Leg./Det.: Z. Nikolov; Karadjica (v. Patiška Reka): in the forest belt, above the village, 1607 m a.s.l., 26.07.2022, No. 14834, N:

41°46.817'; E: 021°19.390', Leg./Det.: Z. Nikolov; Karadjica (v. Patiška Reka): above the village, in the forest belt, 1512 m a.s.l., 15.07.2023, No. 15 158, N: 41°46.859'; E: 021°19.216', Leg./Det.: Z. Nikolov; Karadjica (v. Patiška Reka): above the village, in the forest belt, 1512 m a.s.l., 15.07.2023, No. 15 159, N: 41°46.859'; E: 021°19.216', Leg./Det.: Z. Nikolov; Karadjica (v. Patiška Reka): above the village, in the forest belt, 1512 m a.s.l., 15.07.2023, No. 15 160, N: 41°46.859'; E: 021°19.216', Leg./Det.: Z. Nikolov; Karadjica (v. Patiška Reka): above the village, In the forest belt, 1512 m a.s.l., 15.07.2023, No. 15 161, N: 41°46.859'; E: 021°19.216', Leg./Det.: Z. Nikolov; Karadjica (v. Patiška Reka): above the village, in the forest belt, 1512 m a.s.l., 15.07.2023, No. 15 162, N: 41°46.859'; E: 021°19.216', Leg./Det.: Z. Nikolov; Karadjica (v. Patiška Reka): above the village, in the forest belt, 1512 m a.s.l., 15.07.2023, No. 15 163, N: 41°46.859'; E: 021°19.216', Leg./Det.: Z. Nikolov;

Host plants for *O. pancicii* in North Macedonia

Two species are evident host plants for *O. pancicii* in North Macedonia: *Stachys tymphaea* Hausskn. for the populations from the mountains Korab (Fig. 3, a) and Jablanica and, *Valeriana montana* L. for the plants on Karadjica mountain (Fig. 3, b). While *V. montana* is already known as a host plant (Uhlich, Pusch & Barthel, 1995), *S. tymphaea*, in general, was recorded for first time, as a host plant of *O. pancicii*. Unfortunately, the host plants from the mountain Kozjak (Prilep), are unknown. Although the population of *O. pancicii*, from

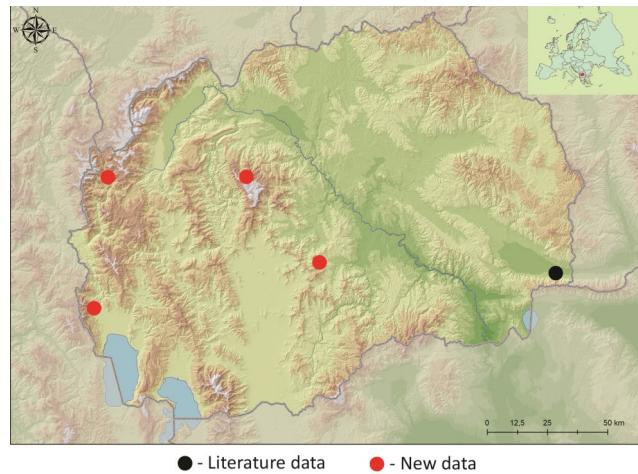


Fig. 2. The distribution of *Orobanche pancicii* in North Macedonia

this locality (Kozjak), was found in the middle of well-developed population of *Trifolium pignantii* Fauché & Chaub. (Fig. 4, a), still, we can speak only for "probable or supposed" host because of lack of a solid evidence for the connection parasite – host plant.

Conclusion

- The plants of *O. pancicii*, found in North Macedonia, completely match the description given by Beck (1890, 1930), Hartvig (1991), Delipavlov (1995), Pusch (2000, 2009), Stojanov (2020). The variabilities of the stem- and corolla color, noticed by plants from all localities (Kozjak, Karadjica, Korab, Jablanica), give them different appearance (Fig. 4–7) but the color has no taxonomical importance in this species (Pusch, 2009),



Fig. 3. *Orobanche pancicii* Beck with the hosts
a) *Stachys tymphaea* Hausskn. b) *Valeriana montana* L.



Fig. 4. *Orobanche pancicii* Beck
a, b) Kozjak mountain (Prilep)



Fig. 5. *Orobanche pancicii* Beck
a) Karadjica mountain b) Korab mountain



Fig. 6. *Orobanche pancicii* Beck

Korab: a) Kobilino pole, with the host *Stachys tymphaea* Ten. b) above the watchtower "Štirovica"



Fig. 7. *Orobanche pancicii* Beck

Jablanica: a) Lower (Big) Labuniško lake b) Podgorečko lake

- *O. pancicii* grows on meadows and mountain pastures in altitudinal range from 1300 (Kozjak mountain) to 2400 (Korab mountain) m a.s.l., on limestone. The flowering time is from mid. of June to mid. of August,

- The new findings extend the distribution area from eastern to central and western part of North Macedonia,

- Host plants, determined so far, are *Stachys tymphaea* and *Valeriana montana*. Also, another host plant species are probable.

Acknowledgement

I would like to express my sincerest thanks to Aco Teofilovski, Dejan Mandjukovski, Marko Naumovski and Mitko Sovkovski for all their help during the field researches. Also, my gratitude to the reviewers Simona Strgulc Krajšek and Kiril Stoyanov for their immense help in improving the manuscript. And, I am grateful to our Ministry of culture of North Macedonia for the financial support of the project "Taxonomy and chorology of the genus *Orobanche* in the Republic of Macedonia" (2011-2013).

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