

## New distribution data of twenty rare or insufficiently recorded species in the flora of North Macedonia

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### Abstract

New distribution data are presented for twenty species in the vascular flora of North Macedonia: *Ambrosia artemisiifolia*, *Artemisia annua*, *Crepis paludosa*, *Jacobaea erucifolia*, *Lactuca quercina*, *Petasites albus*, *Pilosella onegensis*, *P. rothiana*, *Senecio sylvaticus*, *Tephrosia wagneri*, *Urospermum picroides* (Asteraceae); *Carex paniculata* (Cyperaceae); *Danthonia alpina* (Poaceae); *Epilobium alpestre* (Onagraceae); *Euphorbia oblongata* (Euphorbiaceae); *Linum elegans* (Linaceae); *Melampyrum cristatum* (Scrophulariaceae); *Myosotis nemorosa* (Boraginaceae); *Rubus wahlbergii* (Rosaceae); *Succisa pratensis* (Dipsacaceae). Most of the listed plants are rare in the country, while others, although having a wider distribution in certain regions, were poorly known due to being largely overlooked in floristic studies. A distribution map for each treated taxon and photographs of live or herbarium specimens for most of them are provided.

**Keywords:** distribution data, localities, North Macedonia, species, vascular flora.

### INTRODUCTION

Macedonian flora has been continuously studied for nearly two centuries, beginning with the pioneering work of A. Griesbach, published in 1844. To date, the estimated number of recorded species exceeds 3,200, making the flora of this small country among the richest in Europe. In addition to taxa with a well-known broad distribution, numerous others are known only from one or a few localities mentioned in the literature. These include various categories, ranging from rare plants to those with broader distributions, which have been overlooked in floristic studies. Such oversights have occurred for various reasons, including the limited focus of botanists on certain regions or taxonomic groups and difficulties in detecting and identifying specific taxa. Based on the author's fieldwork and laboratory studies, this article aims to enhance the understanding of the distribution of some of these plants in the country. Eleven of the discussed species belong to the family Asteraceae, while the families Boraginaceae, Cyperaceae, Dipsacaceae, Euphorbiaceae, Linaceae, Onagraceae, Poaceae, Rosaceae, and Scrophulariaceae are each represented by one species. All but one species are native to North Macedonia.

### MATERIALS AND METHODS

Fieldwork was conducted from 2012 to 2024 across various regions of North Macedonia. Plant material was collected from each reported locality and herbarized using standard procedures, often accompanied by photographs of live specimens. Herbarium specimens are labeled with data on location (usually including GPS coordinates), habitat types, and population characteristics and are stored in the author's private herbarium collection. Species identification was performed according to Matevski & Melovski (2010), Micevski (2001, 2005), Tutin et al. (1964–1980), Weber (1995), and Zahn (1921–1923, 1932–1930). Relevant floristic literature on North Macedonia was reviewed to compile published distribution data on the studied species.

### RESULTS AND DISCUSSION

***Ambrosia artemisiifolia* L. (Asteraceae) (Figs. 1, 2)**  
Bitola, railway station, 16.8.2019, 41.020096°N, 21.342547°E, leg. & det. A. Teofilovski.

Native to North America, this species is globally recognized as highly invasive, but fortunately, it has only limited occurrences in North Macedonia so far.

Two previous records include Skopje (Ilinden) (Milkovska et al. 2013) and Tetovo (railway station) (Teofilovski 2017, leg. A. Teofilovski, 30.8.2009). The status of the small population recorded in Bitola has not been recently reassessed, while the Tetovo population has declined.



Fig. 1. *Ambrosia artemisiifolia*, habitus, Bitola, photo. A. Teofilovski.



Fig. 2. Distribution of *Ambrosia artemisiifolia* in North Macedonia, ● - new data, ● - author's published data, ○ - other literature data.

***Artemisia annua* L. (Asteraceae) (Figs. 3, 4)**

Gostivar, Stenče village, near house wall, 560 m, 41.876102°N, 21.001336°E, 3.11.2016 leg. & det. A.

Teofilovski; Tetovo, waste place in the urban area, 42.003280°N, 20.973920°E, 24.10.2016, leg. & det. A. Teofilovski.

In the flora of North Macedonia, this annual species is quite rare. After the first reports of Urumov (1923) for Kriva Palanka and Kratovo, the only subsequent report was from a waste place in the vicinity of Tetovo (Kljukovo) (Matevski & Teofilovski 2004).



Fig. 3. *Artemisia annua*, habitus, Stenče village, Gostivar, photo A. Teofilovski.

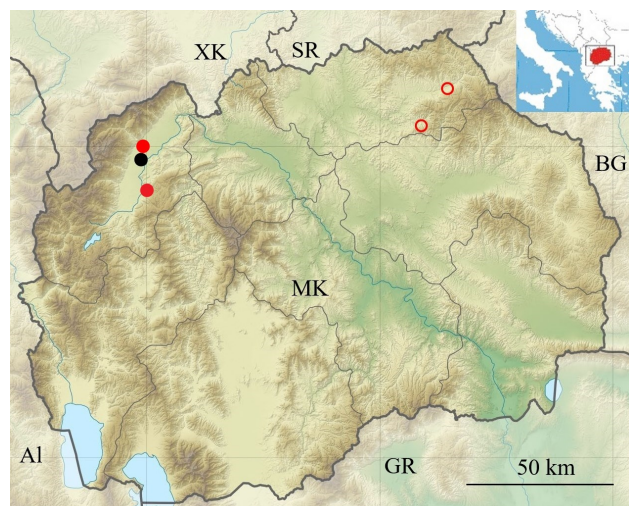
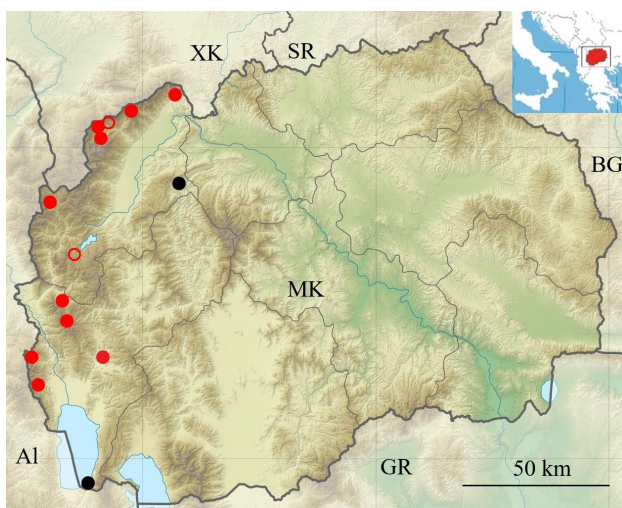


Fig. 4. Distribution of *Artemisia annua* in North Macedonia, ● - new data, ● - author's published data, ○ - other literature data.

***Carex paniculata* L. (Cyperaceae) (Fig. 5)**

Ohrid, Belčiško Blato, 773 m, 41.317992°N, 20.820892°E, 9.6.2019, leg. & det. A. Teofilovski; Jablanica Mt., Lakavica village, 1380 m, 41.324661°N, 20.519831°E, 13.7.2016, leg. & det. A. Teofilovski; Jablanica Mt., Gorna Belica village, 1630 m, 41.225853°N, 20.538272°E, 12.7.2017, leg. & det. A. Teofilovski; Stogovo Mt., Gari village, 1710 m, 41.453487°N, 20.674837°E, 30.8.2014, leg. A. Teofilovski & Z. Nikolov, det. A. Teofilovski; Stogovo Mt., Ehloec village, 1670 m, 41.435150°N, 20.732419°E, 30.7.2020, leg. & det. A. Teofilovski; Šar Mts., Ljuboten, 1640 m, 42.185556°N, 21.127486°E, 24.7.2013, leg. A. Teofilovski & Z. Nikolov, det. A. Teofilovski; Šar Mts., Bistrica River gorge, 1650 m, 42.122322°N, 20.977392°E, 18.6.2018, leg. & det. A. Teofilovski; Šar Mts., Ceripašina, 1960 m, 42.021541°N, 20.836024°E, 16.8.2012, leg. & det. A. Teofilovski; Šar Mts., Bozovce village, 1625 m, 42.037656°N, 20.788461°E, 20.9.2012, leg. & det. A. Teofilovski; Korab Mt., Štirovica, 41.809386°N, 20.615508°E, 1489 m, 23.7.2023, leg. A. Teofilovski & D. Mandzukovski, det. A. Teofilovski.

This *Carex* species is sporadically distributed in the western parts of North Macedonia, occurring in wetlands from the lowlands to the subalpine belt. In the floristic literature, it has been largely overlooked, with only the following few localities mentioned: Šar Mountains (Kobilica) (Bornmüller, 1928), Bistra Mt. (Toni Voda) (Micevski, 1994), Suva Gora Mt. (Lukovica), and Ohrid (Sveti Naum) (Teofilovski, 2011).

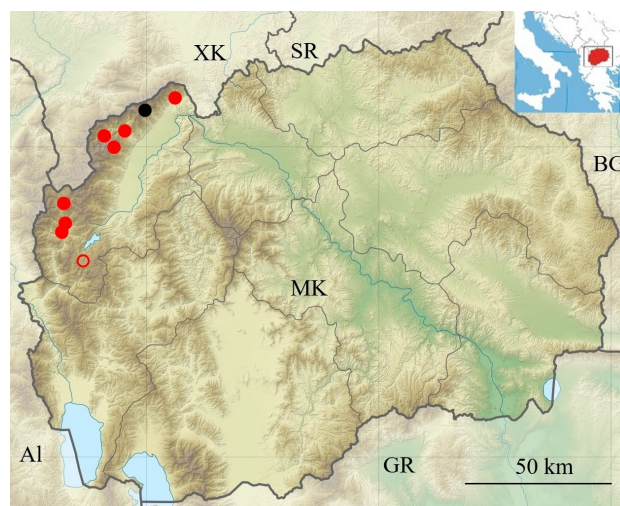


**Fig. 5.** Distribution of *Carex paniculata* in North Macedonia, ● - new data, ● - author's published data, ○ - other literature data.

***Crepis paludosa* (L.) Moench (Asteraceae) (Fig. 6)**

Korab Mt., Ribnička River gorge, wet place, 904 m, 41.712485°N, 20.645964°E, 1.7.2023, leg. A. Teofilovski & D. Mandzukovski, det. A. Teofilovski; Radika River gorge, wet place, 970 m, 41.735404°N, 20.671964°E, 12.7.2023, leg. & det. A. Teofilovski; Šar Mts., Adžina Reka, forest margin, 1477 m, 41.819863°N, 20.654204°E, 12.7.2023, leg. & det. A. Teofilovski; Šar Mts., Kaptaza Jelovjane, wet place, 1385 m, 12.6.2015, observ. A. Teofilovski; Šar Mts., near Pena River, wet rocky place, 855 m, 42.055300°N, 20.908098°E, 17.7.2018, leg. & det. A. Teofilovski; Šar Mts., south of Bozovce village, near stream, 1408 m, 42.042576°N, 20.819180°E, 6.7.2024, leg. A. Teofilovski, V. Matevski & Z. Nikolov, det. A. Teofilovski; Šar Mts., Vratnička River, moist place, 800 m, 42.155237°N, 21.119454°E, 4.6.2015, leg. & det. A. Teofilovski.

In the literature, this species was reported only from Bistra Mt. (Moliter) (Micevski 1994), and Šar Mts. (Čaušica) (Teofilovski 2011, as *C. paludosa* var. *glabra* Diklić & Nikolić). All examined plants from the Macedonian populations deviate from typical *C. paludosa* by consistently having glabrous involucre, a characteristic also observed in Albanian and Serbian populations (Diklić & Nikolić 1986, Meyer 2011).



**Fig. 6.** Distribution of *Crepis paludosa* in North Macedonia, ● - new data, ● - author's published data, ○ - other literature data.

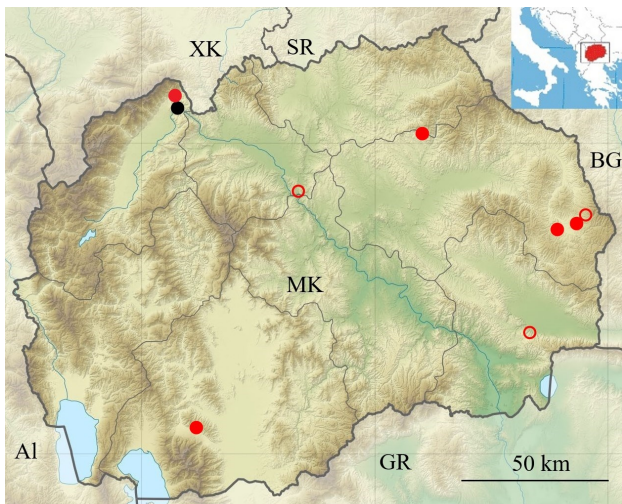
***Danthonia alpina* Vest (Poaceae) (Fig. 7)**

= *D. calycina* (Vill.) Reichenb. = *D. provincialis* DC.

Bitola, Gorno Srpce village, 1060 m, 41.090419°N, 21.223383°E, 20.6.2019, leg. & det. A. Teofilovski;

Maleševo Mts., Vladimirovo village, 971 m, 41.695475° N, 22.779917°E, 25.5.2017, leg. & det. A. Teofilovski; Maleševo Mts., Smojmirovo village, 920 m, 41.735431° N, 22.856428°E, 22.5.2017, leg. & det. A. Teofilovski; Osogovo Mt., Dobrevo village, 771 m, silicate, 42.036322°N, 22.201253°E, 26.6.2017, leg. & det. A. Teofilovski; Tetovo, Rogačevo village, serpentine, 751 m, 42.144181°N, 21.156039°E, 22.5.2015, leg. & det. A. Teofilovski.

This South European and Southwest Asian species has a sporadic distribution in the country and is mentioned in the literature from the following localities: Katlanovo (Šmarda 1968, as *D. provincialis*), Strumica (Soška 1953, as *D. calycina*), Pehčevo (Micevski 1978, as *D. calycina*), and Tetovo (Orašje) (Teofilovski 2011). In the recorded localities, it inhabits dry, grassy areas, exclusively on non-calcareous geological substrates.



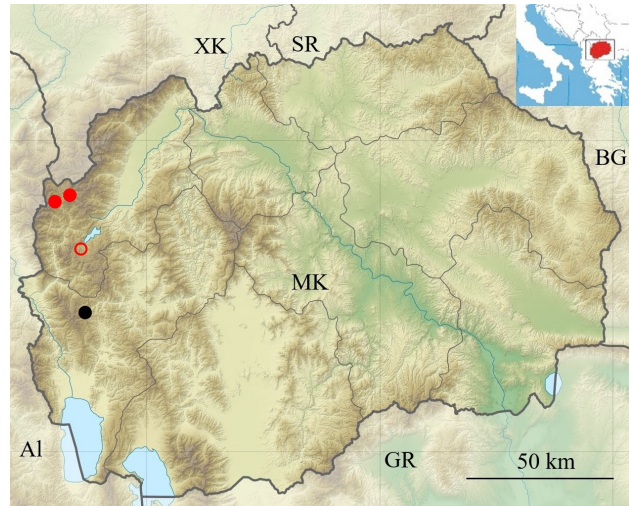
**Fig. 7.** Distribution of *Danthonia alpina* in North Macedonia, ● - new data, ● - author's published data, ○ - other literature data.

***Epilobium alpestre* (Jacq.) Krock. (Onagraceae) (Fig. 8)**

Šar Mountains, Adžina Reka, moist place, 1477 m, 41.821380°N, 20.664053°E, 12.7.2023, leg. & det. A. Teofilovski; Korab Mt., Štirovica, wet place, 1485 m, 41.809801°N, 20.615502°E, 23.7.2023, leg. & det. A. Teofilovski.

A rare *Epilobium* species in the Macedonian flora, previously reported only from Bistra Mt. (Careva Češma) (Micevski 2001) and Stogovo Mt. (Ehloec) (Teofilovski 2021).

***Euphorbia oblongata* Griseb. (Euphorbiaceae) (Figs. 9, 10)**



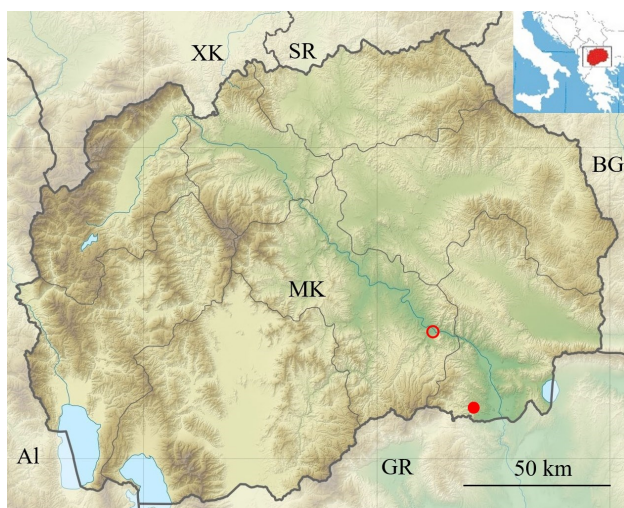
**Fig. 8.** Distribution of *Epilobium alpestre* in North Macedonia, ● - new data, ● - author's published data, ○ - other literature data.

Gevgelija, Novo Konsko, near road to Konsko village, 187 m, 41.156161°N, 22.431531°E, 2.6.2023 leg. & det. A. Teofilovski.

This Balkan-Suothwest Asian perennial *Euphorbia* is a rare species in the flora of North Macedonia. The only previously reliable report of its presence in the country comes from Micevski (1998), who cited it from the vicinity of Demir Kapija. This author deemed the report from Skopska Crna Gora Mt. (Pržalj) (Grupče, 1958) doubtful due to the absence of supporting



**Fig. 9.** *Euphorbia oblongata*, habitus with details of fruits and indumentum of the stem, Novo Konsko vilage, Gevgelija, photo A. Teofilovski.



**Fig. 10.** Distribution of *Euphorbia oblongata* in North Macedonia, ● - new data, ○ - literature data.

specimens in Grupče's herbarium. The recorded population grows in a shrubby area dominated by *Carpinus orientalis*.

***Jacobaea erucifolia* (L.) G. Gaertn. & al. (Asteraceae) (Figs. 11, 12)**

Osoj Mt., southeast of Merovo village, forest clearing, limestone, 1190 m, 41.916737°N, 21.173282°E, 13.9.2022, leg. & det. A. Teofilovski.

This Euro-Siberian species is rare in the flora of North Macedonia and has not been recently confirmed. The literature references include Bitola (Grecescu, 1897), Kavadarci (Resava) (Jurišić, 1923), and Skopska Crna Gora Mt. (Pešter, Ramno) (Grupče, 1958).

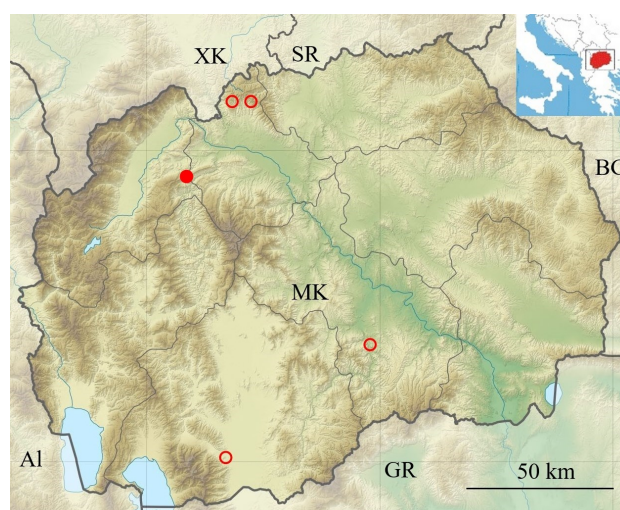
***Lactuca quercina* L. (Asteraceae) (Figs. 13, 14)**

Berovo, south of Avramski Kolibi, roadside, 1150 m, 41.608668°N, 22.845612°E, 23.7.2016, leg. & det. A. Teofilovski; Belasica Mt., Bansko village, 1367 m, 41.330537°N, 22.782694°E, 22.09.2018, leg. & det. A. Teofilovski; Suva Gora Mt., Lukovica village, meadow margins, 1030 m, 15.7.2020, 41.889769°N, 21.153719°E, leg. & det. A. Teofilovski; Makedonski Brod, Zvečan village, shrubby place, silicate, 1070 m, 41.701753°N, 21.122553°E, 16.8.2020, leg. & det. A. Teofilovski; Bistra Mt., northwest of Ivančišta village, roadside, 1310 m, 41.482066°N, 20.776505°E, 11.8.2020, leg. & det. A. Teofilovski; Karaorman Mt., 41.356817°N, 20.799017°E, 17.8.2021, photo. A. Teofilovski; Baba Mt., Palisnopje, roadside, 41.036358°N, 21.190774°E, 10.7.2024, leg. & det. A. Teofilovski.

This species likely has a sporadic distribution across



**Fig. 11.** *Jacobaea erucifolia*, habitus, Merovo village, Osoj Mt., photo. A. Teofilovski.



**Fig. 12.** Distribution of *Jacobaea erucifolia* in North Macedonia, ● - new data, ○ - literature data.

much of the country but seems to have been overlooked in recent floristic studies. In the literature, it is reported from Golešnica Mt. (Crvena Voda) (Bornmüller 1926, sub. *L. sagittata* Waldst. & Kit.), Žeden Gorge (Orašje) (Soška 1938), Skopska Crna Gora Mt. (Sastance) (Grupče 1958), between Veles and Demir Kapija (Nikolovski & Cirimotić 1958), and Bitola (Brusnik) (Todorovski 1969). The new records near Berovo and in Belasica Mt. are the first from the eastern part of the country.

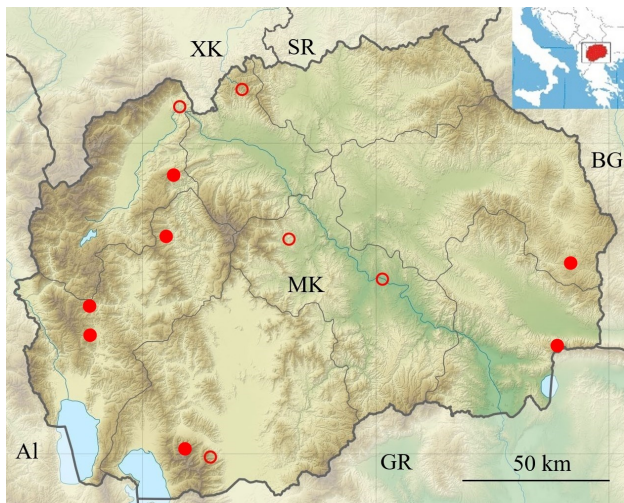


**Fig. 13.** *Lactuca quercina*, part of synflorescence, Lukovica village, Suva Gora Mt., photo. A. Teofilovski.

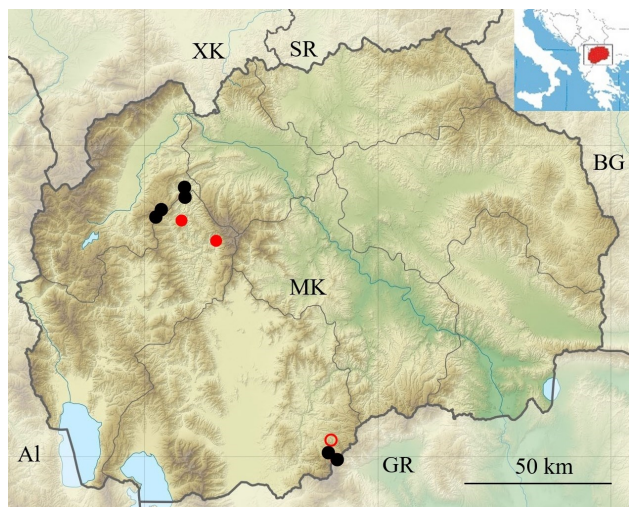
from Nidže Mt. (Zmejca, Suvi Dol, Belo Grotlo) (Micevski 2005, as *L. elegans* var. *iberidifolium*; Teofilovski 2011) and Suva Gora Mt. (Dupen Kamen, Taul, Lukovica, Gurgurnica) (Teofilovski 2011).



**Fig. 15.** *Linum elegans*, habitus, Trebovle village, Makedonski Brod, photo. A. Teofilovski.



**Fig. 14.** Distribution of *Lactuca quercina* in North Macedonia, ● - new data, ○ - literature data.



**Fig. 16.** Distribution of *Linum elegans* in North Macedonia, ● - new data, ● - author's published data, ○ - other literature data.

***Linum elegans* Spruner ex Boiss. (Linaceae) (Figs. 15, 16)**

= *L. elegans* var. *iberidifolium* (Aucher) Hayek  
Makedonski Brod, Trebovle village, *Pinus nigra* forest, limestone, 1000-1100 m, 41.773167°N, 21.126578°E, 25.5.2016, leg. A. Teofilovski; Dautica Mt., sources of Belička River, *Pinus nigra* forest, limestone, 650 m, 41.677753°N, 21.312714°E, 15.6.2016, leg. & det. A. Teofilovski.

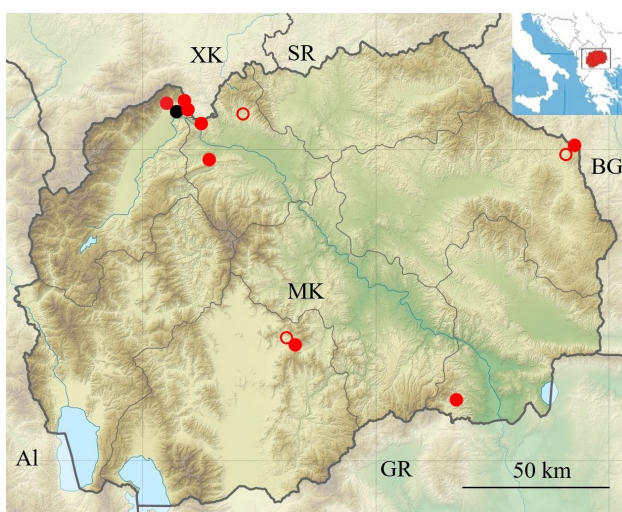
This Balkan endemic has a narrow distribution in North Macedonia and was previously reported only

***Melampyrum cristatum* L. (Scrophulariaceae) (Fig. 17)**

Šar Mts., Belovište village, grassy place, silicate, 820 m, 42.140953°N, 21.099353°E, 26.6.2013, leg. & det. A. Teofilovski; Tetovo, Jažince village, shrubby place, serpentine, 748 m, 42.152818°N, 21.180707°E,

1.7.2013, leg. & det. A. Teofilovski; Skopje, Raduša village, grassy place, serpentine, 510 m, 16.6.2013, leg. & det. A. Teofilovski; Skopje, Karaula Čaška, 524 m, 42.076719°N, 21.276572°E, 13.6.2013, leg. & det. A. Teofilovski; Osoj Mt., between Matka and Arnakija villages, shrubby place, 540 m, 41.975237°N, 21.286319°, 6.7.2013, leg. & det. A. Teofilovski; Berovo, Smilanci village, forest clearing, silicate, 940 m, 41.664816°N, 22.666401°E, 16.5.2017, leg. A. Teofilovski; Delčevo, Zvegor village, black pine forest, limestone, 870 m, 41.964089°N, 22.818461°E, 24.6.2020, observ. & photo. A. Teofilovski; Prilep, Pletvar, grassy place, 17.6.2019, leg. & det. A. Teofilovski; Gevgelija, Konsko village, oak forest, 41.183809°N, 22.341042°E, 586 m, 2.6.2023, leg. & det. A. Teofilovski.

A Eurasian species with a limited distribution in North Macedonia, absent from much of its territory. In the literature it is cited from Skopska Crna Gora Mt. (between Radišani and Pobužje) (Grupče, 1958), Prilep (Sivec) (Todorovski, 1969), Delčevo (Arnautski Grob) (Džekov & Rizovski, 1978), and Tetovo (Gorno Orašje) (Teofilovski, 2011).



**Fig. 17.** Distribution of *Melampyrum cristatum* in North Macedonia, ● - new data, ● - author's published data, ○ - other literature data.

***Myosotis nemorosa* Besser (Boraginaceae) (Figs. 18, 19)**

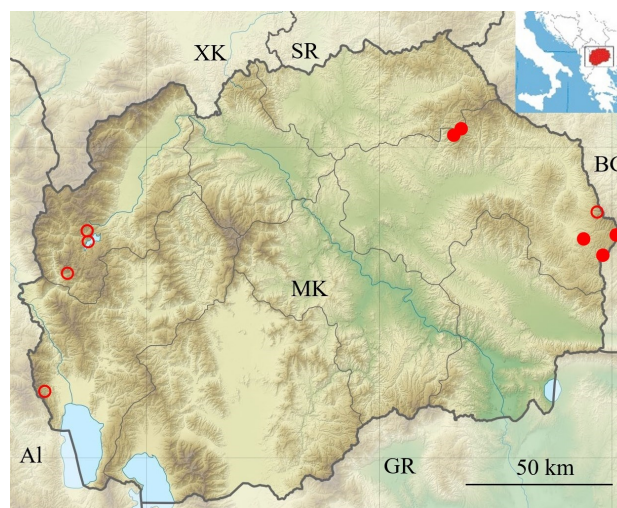
Berovo, northwest of Berovo Lake dam, 980 m, 41.683209° N, 22.890492°E, 30.5.2017, leg. & det. A. Teofilovski; Berovo, Čengino Kale, 41.720864°N, 23.028832°E, 1690 m, leg. A. Teofilovski & D. Mandzu-

kovski, det. A. Teofilovski; Berovo, Klepalo, 1340 m, 41.650762°N, 22.981502°E, 13.6.2019, leg. A. Teofilovski & D. Mandzukovski, det. A. Teofilovski; Osoгово Mt., northeast of Ponikva, wet place, 1452 m, 42.043966°N, 22.359048°E, 15.6.2021, leg. & det. A. Teofilovski; Osoгово Mt., west of Ponikva, 1421 m, 42.040125°N, 22.338401°E, 16.6.2021, leg. & det. A. Teofilovski.

A rare wetland *Myosotis*, previously reported from Kavadarci (Alšar) (Degen & Döerfler, 1897), Mavrovo (Mavrovi Anovi, Vrben, Mavrovsko Pole), Bistra Mt. (Galičnik), Jablanica Mt. (Gorna Belica), and Pehčevo (Buković) (Matevski & Melovski 2010).



**Fig. 18.** *Myosotis nemorosa*, habitus, Ponikva, Osogovo Mt., photo. A. Teofilovski.



**Fig. 19.** Distribution of *Myosotis nemorosa* in North Macedonia, ● - new data, ○ - literature data.

***Petasites albus* (L.) Gaertn. (Asteraceae) (Figs. 20, 21)**

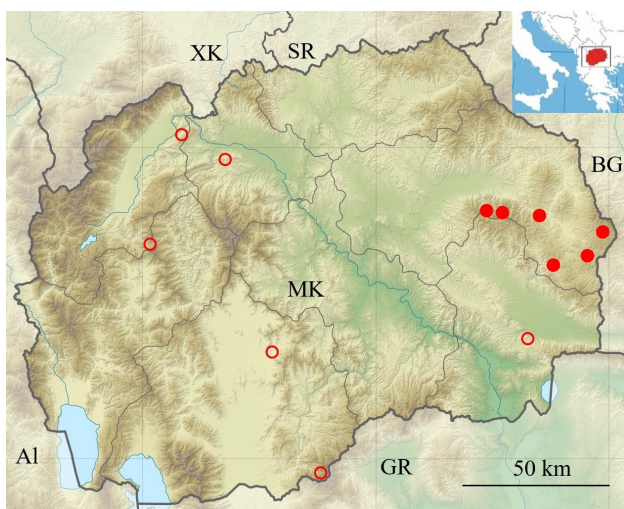
Berovo, near Bezgaštevka River, 765 m, 41.608411°N, 22.760717°E, 15.10.2016, leg. & det. A. Teofilovski; Berovo, near Zamanička River, 1085 m, 41.646479°N, 22.914991°E, photo. A. Teofilovski;

Pehčevo, Ramna Reka, 1150 m, 12.6.2019, leg. & det. A. Teofilovski; Vinica, near Osojnica river, alder forest, 785 m, 41°47'49.09"N, 22°40'33.59"E, 18.6.2018, photo. A. Teofilovski; Plačkovica Mt., near road to Lisec, 1200 m, 16.6.2018, leg. & det. A. Teofilovski; Plačkovica Mt., near road to Momin Preslap, 1200 m, 17.6.2018, photo. A. Teofilovski.

This species has a sporadic distribution in some parts of North Macedonia, with several localities mentioned, mostly in older literature: Vodno (Vandas 1909), Nidže Mt., Prilep (Velenovski 1922), Strumica (Sv. Ilija) (Rudski 1943), Žeden Mt. (Matvejeva 1965), and Dobra Voda Mt. (Matevski 1995).



**Fig. 20.** *Petasites albus*, habitus, Ramna Reka, Pehčevo, photo. A. Teofilovski.



**Fig. 21.** Distribution of *Petasites albus* in North Macedonia, ● - new data, ○ - literature data.

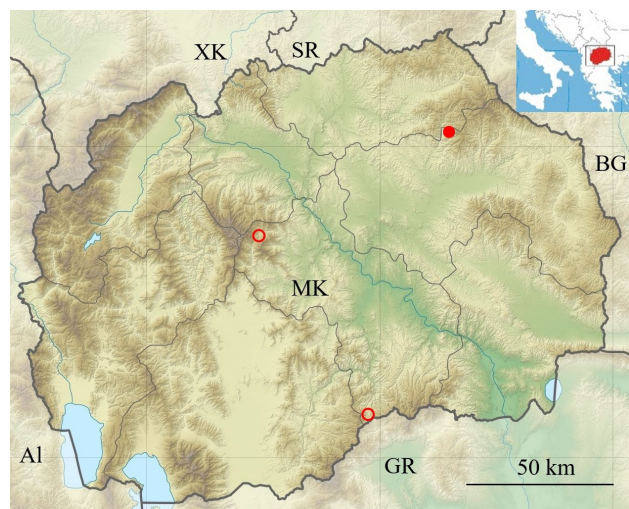
***Pilosella onegensis* Norrl. (Asteraceae) (Figs. 22, 23)**  
 ≡ *Hieracium pratense* subsp. *silvicola* (Fr.) Zahn

Osogovo Mt., east of Jamište village, grassy place, silicate, 42.052970°N, 22.318338°E, 1465 m, 10.6.2021, leg. & det. A. Teofilovski; Osogovo Mt., northeast of Jamište village, grassy place, silicate, 1272 m, 42.063327°N, 22.314169°E, 10.6.2021, 1.7.2021, leg. & det. A. Teofilovski.

This species has a wide Eurasian distribution but is rare and recently not confirmed in North Macedonia. The only, literature data refer to the localities of Alšar (Zahn 1921–1923, as *Hieracium pratense* subsp. *eu-silvicolum* f. *alcharicum* Zahn), and Golešnica Mt. (Pepelak) (Behr et al., 1937, as *H. pratense* subsp. *eu-silvicolum* Zahn).



**Fig. 22.** *Pilosella onegensis*, plants collected near Jamište village, Osogovo Mt., photo. A. Teofilovski.



**Fig. 23.** Distribution of *Pilosella onegensis* in North Macedonia, ● - new data, ○ - literature data.



***Pilosella rothiana* (Wallr.) F. W. Schultz & Sch. Bip.** (Asteraceae) (Figs. 24, 25)

≡ *Hieracium rothianum* Wallr. ≡ *H. setigerum* subsp. *rothianum* (Wallr.) Nyman

Dautica Mt., Belica village, 630 m, limestone, 41.677588°N, 21.312392°E, 15.6.2016, leg. & det. A. Teofilovski; Makedonski Brod, Kalugjerec village, dry abandoned meadow, 470 m, 41.668191°N, 21.251543°E, 7.6.2016, leg. A. Teofilovski; Ogražden Mt., Drvoš village, 770 m, 41.524067°N, 22.766237°E, 29.5.2020, leg. & det. A. Teofilovski.

Broadly distributed across much of Europe and Asia Minor, this species is rare in the Balkan Peninsula, where it has been reported from only a few localities in North Macedonia, Serbia, and Bulgaria (Zahn 1922–1930, Stojanov et al. 1966, Gajić 1975, as *Hieracium rothianum*). In North Macedonia, it has not been recently reported, although in the older literature is mentioned from several locations: Skopje (Treska River gorge), Skopska Crna Gora Mt., Bitola (Crničani), Mariovo (Labinica), and Demir Kapija (Kalugjer, Bel



Fig. 24. *Pilosella rothiana*, herbarium specimen from Kalugjerec village, Makedonski Brod.

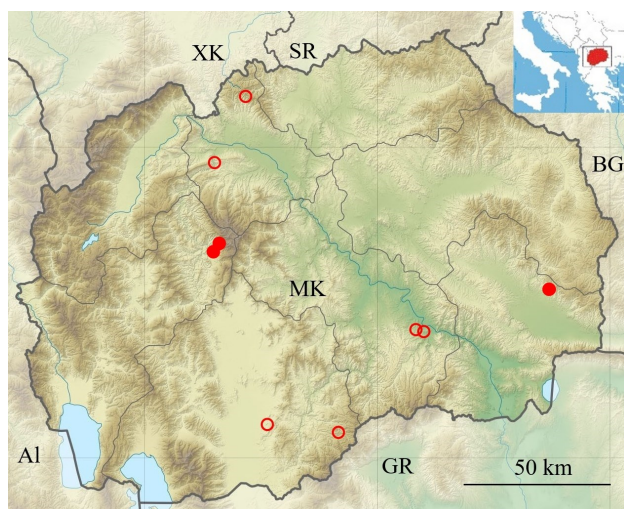


Fig. 25. Distribution of *Pilosella rothiana* in North Macedonia, ● - new data, ○ - literature data.

Kamen) (Vandas 1909, as *Hieracium setigerum* subsp. *pseudechioides* Nägeli & Peter, Behr & al. 1937, Zahn 1922–1930, as *H. rothianum* subsp. *rothianum*, Soška 1939, as *H. setigerum*).

***Rubus wahlbergii* Arrh.** (Rosaceae) (Figs. 26, 27)

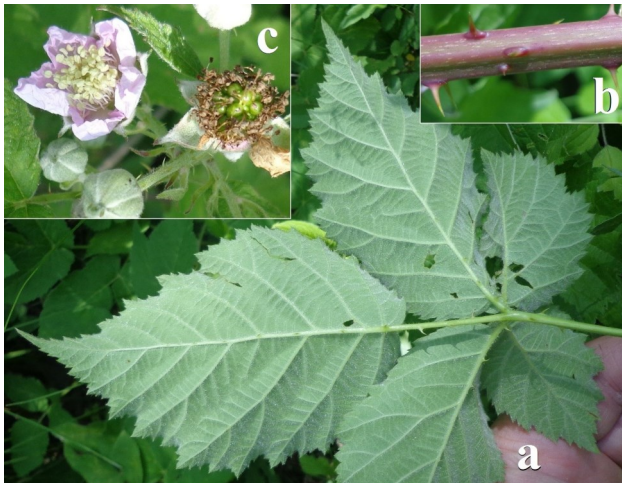
Šar Mts., Setole village, beech forest clearings, 1050 m, 42°3'18.65"N, 20°59'27.71"E, 11.7.2013 leg. & det. A. Teofilovski; Makedonski Brod, Kovče village, walnut plantation, 555 m, 41°39'45.13"N, 21°10'6.87"E, 8.6.2016, leg. & det. A. Teofilovski; Makedonski Brod, near road to Trebovle village, 790 m, 41°44'48.05"N, 21°6'39.15"E, 9.6.2016, leg. & det. A. Teofilovski; Makedonski Brod, Dolna Belica village, meadow margin, 480 m, 41°40'23.70"N, 21°10'23.70"E, 31.6.2016, leg. & det. A. Teofilovski; Kruševo, between Pusta Reka and Dolno Divjaci villages, roadsides, sparse forests and shrubby places, 940 m, 41°23'51.93"N, 21°10'6.46"E, 5.9.2018, leg. & det. A. Teofilovski; Kruševo, between Dolno Divjaci and Kočište villages, roadside, 790 m, 41°22'15.17"N, 21°10'45.90"E, 5.9.2018, photog. A. Teofilovski; Baba Mt., Resen, southeast of Kozjak village, oak forest, 1170 m, 41°2'49.29"N, 21°4'55.82"E, 22.10.2014, leg. & det. A. Teofilovski.

The main geographical range of this species (or possibly an aggregate of microspecies) includes northern and central Europe, from southern Sweden and Norway to northern Bavaria and Moravian Silesia (Weber 1995, 2000). Its presence in North Macedonia was only recently discovered (Teofilovski 2011), but it has not yet been reported from other parts of southeastern Europe, likely due to a lack of studies. It is the only representative of *Rubus* sect. *Corylifolii* that occurs in the Balkan Peninsula.

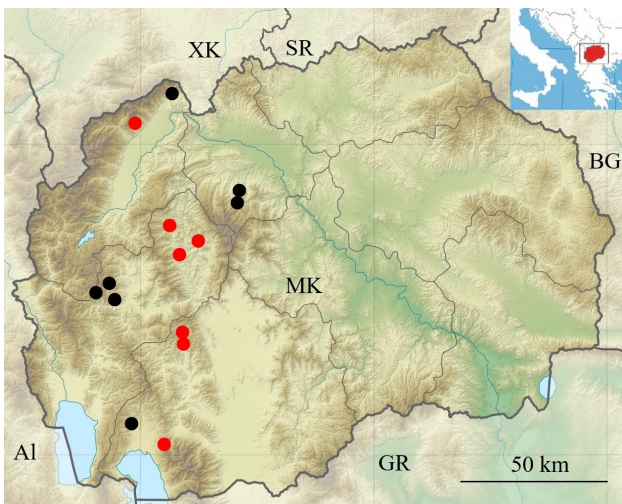
The previously reported localities of *R. wahlbergii* in North Macedonia include the Šar Mts. (Staro Selo), Jakupica Mt. (Mala Reka, Kitka, Crvena Voda), Kičevo (Javorec, Knežino, Dolno Dobrenoec), and Galičica Mt. (Istočka Reka) (Teofilovski 2011). Although seven new localities have been added, *R. wahlbergii* is still considered a rare species in the country.

***Senecio sylvaticus* L.** (Asteraceae) (Fig. 28)

Osoгово Mt., Jamište village, 1428 m, 42.049841°N, 22.319651°E, 1.7.2021, leg. & det. A. Teofilovski; Pehčevo, Ramna Reka, 41.744903°N, 22.976366°E, 1300 m, leg. A. Teofilovski & D. Mandzukovski, det. A. Teofilovski; Berovo, Vladimirovo village, 970 m, 41.691713°N, 22.699306°E, 24.7.2020, leg. A. Teofilov-



**Fig. 26.** *Rubus whalbergii*, Makedonski Brod, Kovče vilage, **a.** leaf of sterile offshoot (dorsal surface), **b.** detail of sterile offshoot, **c.** part of inflorescence, photo. A. Teofilovski.

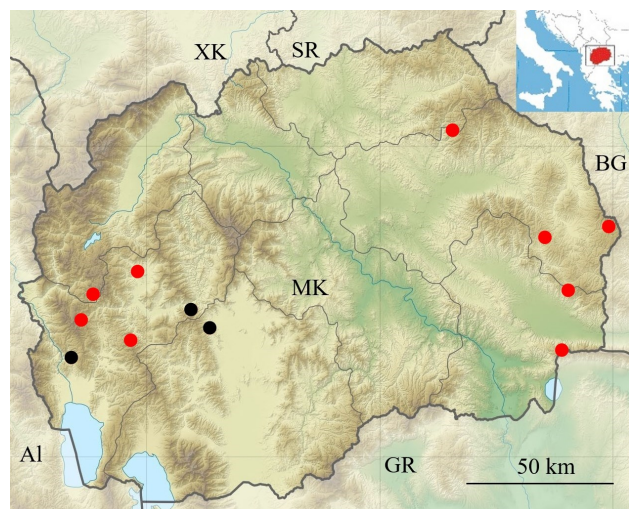


**Fig. 27.** Distribution of *Rubus whalbergii* in North Macedonia, ● - new data, ● - author's published data.

ski & D. Mandzukovski, det. A. Teofilovski; Ogražden Mt., Barbarevo village, 1500 m, 41.523870°N, 22.811730°E, 1.8.2020, leg. A. Teofilovski & D. Mandzukovski, det. A. Teofilovski; Belasica Mt., Bansko village, 1360 m, 41.331124°N, 22.782406°E, 22.09.2018, leg. & det. A. Teofilovski; Ilinska Mt., Belica village, 1010-1050 m, 41.378504°N, 20.930322°E, 8.7.2020, leg. & det. A. Teofilovski; Stogovo Mt., Ehloec village, 41°26'7.61"N, 20°44'29.00"E, 1610 m, 30.7.2020, leg. & det. A. Teofilovski; Bistra Mt., Gorna Dušegubica village, 1200 m, 41.500693°N, 20.776750°E, 23.8.2020, leg. & det. A. Teofilovski; Kičevo, above Oslomej village, 910 m, 41.583840°, 20.980270°,

6.6.2024, leg. & det. A. Teofilovski.

This species, native to much of Europe, was only recently reported in the flora of North Macedonia, from the vicinity of Kruševo (Pusta Reka, Vrboec) and Struga (Brčevo) (Teofilovski, 2018). New data indicate a wider, though not common, distribution in some parts of the country. The records from Osogovo Mt., Berovo, and Belasica Mt. are the first from the eastern part of the country. In North Macedonia, the habitats of *Senecio sylvaticus* are confined to beech and sessile oak forest zones, where it typically grows as a pioneer plant along newly constructed forest roads and in recently logged areas.



**Fig. 28.** Distribution of *Senecio sylvaticus* in North Macedonia, ● - new data, ● - author's published data.

***Succisa pratensis* Moench (*Dipsacaceae*) (Figs. 29, 30)**

Jablanica Mt., west of Lakavica village, dump places, 1430 m, 41.332535°N, 20.503183°E, 31.8.2016, leg. & det. A. Teofilovski; Berovo, south of Avramski Kolibi, wet place, 1200 m, 41.608186°N, 22.841613°E, 28.8.2016, leg. & det. A. Teofilovski; Berovo, southwest of Avramski Kolibi, wet place, 1210 m, 41.616826°N, 22.819412°E, 23.7.2016, leg. & det. A. Teofilovski.

*Succisa pratensis* is a rare wetland plant in Macedonian flora, with the following three localities previously mentioned in the literature: Osogovo Mt. (Sultan Tepe) (Urumov 1923), Ogražden Mt. (Suvi Laki) (Micevski 1978), and Ilinska Mt. (Janjić 1990).



**Fig. 29.** *Succisa pratensis*, habitus, Lakavica village, Jablanica Mt., photo A. Teofilovski.



**Fig. 30.** Distribution of *Succisa pratensis* in North Macedonia, ● - new data, ○ - literature data.

***Tephrosieris wagneri* (Degen) Holub (Asteraceae) (Figs. 31, 32)**

≡ *Senecio wagneri* Degen ≡ *Tephrosieris papposa* subsp. *wagneri* (Degen) B. Nord.

Šar Mts., Ljuboten, alpine meadow, limestone, 2400 m, 42.206554°N, 21.116997°E, 27.7.2014, leg. A. Teofilovski, Z. Nikolov, D. Mandzukovski, det. A. Teofilovski.



**Fig. 31.** *Tephrosieris wagneri*, synflorescense, Ljuboten, Šar Mts., photo A. Teofilovski.



**Fig. 32.** Distribution of *Tephrosieris wagneri* in North Macedonia, ● - new data, ○ - literature data.

***Urospermum picroides* (L.) F. W. Schmidt (Asteraceae) (Figs. 33, 34)**

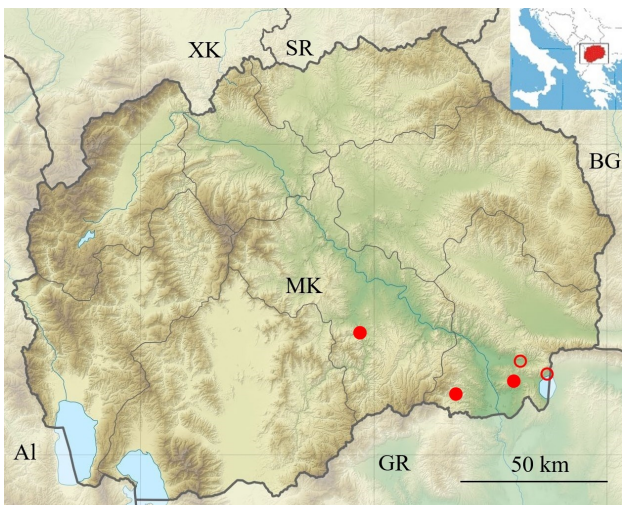
Kavadarci, Tikveš lake dam, shrubby place, 267 m,

41.403804°N, 21.939453°E, 2.6.2019, leg. A. Teofilovski & D. Mandzukovski, det. A. Teofilovski; Bogdanci, 2.7 km northeast, shrubby place, 290 m, 7.5.2020. leg. A. Teofilovski & Z. Nikolov, det. A. Teofilovski; Gevgelija, Novo Konsko village, near road to Konsko village, 221 m, 41.161863°N, 22.420180°E, 2.6.2023, leg. & det. A. Teofilovski.

The presence of this rare Mediterranean annual species in the Macedonian flora has not been confirmed for nearly a century. In the literature, it is reported only from Dojran (Nikolić) (Bornmüller, 1927) and Valandovo (Tatarli) (Stojanoff, 1928).



**Fig. 33.** *Urospermum picroides*, habitus, Novo Konsko village, Gevgelija, photo. A. Teofilovski.



**Fig. 34.** Distribution of *Urospermum picroides* in North Macedonia, ● - new data, ○ - literature data.

#### ACKNOWLEDGMENT

I thank Dr. Vlado Matevski (Skopje) and Dr. Bojan Zlatković (Niš) for reviewing the manuscript and useful suggestions.

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