

New data for the 10 rare plant species of the Flora of the Republic of North Macedonia

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Abstract



This article provides new data on the chorology of 10 taxa for the Flora of the Republic of North Macedonia - *Ferulago macedonica* (Štip - v. Testemelci; Demir Kapija - between v. Prždevo and Besvica), *Ditrichia graveolens* (Makedonski Brod - between v. Zdunje et v. Taževo; Valandovo-Sobri), *Laphangium luteoalbum* (Vinica - between v. Laki and v. Mitrašinci), *Tolpis umbellata* (Prilep - v. Krivogaštani; Demir Kapija), *Dianthus ernesti-mayeri* (Kratovo - v. Šlegovo, Zdravci Kamen), *Euphorbia characias* subsp. *wulfenii* (Ohrid - St. Jovan Kaneo; v. Konjsko; Prespa - Oteševo), *Hypopitys monotropa* (Pehčevo - Pehčevska River), *Ranunculus lateriflorus* (Kratovo - v. Stracin-Suvo Ezero; Sveti Nikole - v. Crnilište), *Geum rivale* (Osogovo - Sultan Tepe; Markova Stapka; Maleševski Pl. - Strednjačka Reka; Ajdučki Kladenec - Stredna; Nešova Koliba, Strednjačka Reka; Kadiica - Kopanata Voda; Plačkovica - Turtel; Kožuf: Adžibarica - Momina Čuka) and *Potentilla supina* L. (Kavadarci - v. Resava, Begnište - Begnište; Bitola - v. Lera; Struga - v. Kalište). They belong to 8 families of angiosperms (Angiospermae-Dicotyledonae). New localities for the mentioned taxa are listed expanding their range on the territory of the country.

Keywords: flora, new data, chorology, angiosperms, Balkan Peninsula

Introduction

Floristic researches on the territory of Macedonia have a long tradition, starting from the middle of the 19th century (Grisebach, 1843-44). The results of the researchers have been published in a numerous scientific publications, but the interest on the flora of this part of the Balkan Peninsula is constantly present. The recent floristic field researches constantly leads to the discovery of new, unknown species for the territory of North Macedonia, as well as new localities of rare plant species.

This paper is part of a series of contributions that relate to the knowledge of the horology of some rare and less known taxa from the territory of the Republic of North Macedonia. In this our modest contribution to the Flora of North Macedonia, we list new localities for 10 taxa that have a limited distribution in its territory. They belong to 8 families of angiosperms (Angiospermae-Dicotyledonae).

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Material and methods

The new data are based on plant material collected during field research in different parts of Macedonia conducted by the authors of the current paper. Additionally, for each taxon, information on geographical distribution, location and habitat, GPS coordinates, together with the date of collection are provided. When determining the herbarium material, appropriate literature was consulted - Prodrumus Florae peninsulae Balcanicae, I-II (Hayek, 1924-1927), Flora Europaea, I-IV (Tutin, T.G. et al., 1964-1976), Flora of the Republic of Macedonia, 1(1,4,6) (Micevski, 1985, 1998, 2005) and other regional floras, as well as some special papers and databases dealing with taxonomy, nomenclature and chorology of the taxa studied. The nomenclature and taxonomy of the plant are consistent with the Euro + Med (2006-) database. Voucher specimens of all taxa are preserved in the Herbarium of the Institute of Biology, Faculty of Natural Sciences and Mathematics in Skopje (MKNH).

Results and discussion

Apiaceae



Ferulago macedonica Micevski & Mayer (Fig. 1, 2)

Localities from literature: Negotino - Krivolak, v. Pepelište, Sert Mt., Orlovo Brdo (Micevski & Mayer,

1985; Micevski, 2005), Orlovo Brdo, Karaodžali, v. Mušanci, Krivolak, Pepelište (Matevski et al., 2008).

New localities in Mk: Štip - v. Testemelci, dry grassland, 41.7316719°N; 22.11229993°E; 336 m s.m., 24.06.2018 (coll. V. Matevski & R. Čušterevska) (MKNH); Demir Kapija - between v. Prždevo and Besvica, dry grassland, 41,40969887°N; 22,17134619°E; 289 m a.s.m., 4.06.2022 (coll. V. Matevski & R. Čušterevska) (MKNH).

Ferulago macedonica is known as a local endemic species described from the Macedonian steppe (Micevski & Mayer, 1985). Until now, this endemic species was known for several localities from the steppe region in North Macedonia (the vicinity of Negotino-Krivolak, where the Locus classicus of the plant species is also found). This species is part of the ass. *Hedysaro-Convolutetum* Micevski 1970, an endemic community which occurs only in the steppe region of Macedonia (Matevski et al., 2008).

New localities of this endemic plant species were found around the Štip - v. Testemelci, on dry grasslands near the Bregalnica river and dry grasslands near Demir Kapija (between Prždevo and Besvica).

Asteraceae

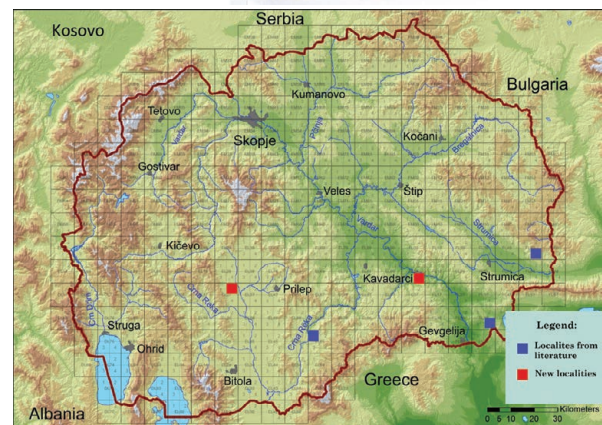


Ditrichia graveolens (L.) W. Greuter (Fig. 3, 4)
Syn.: *Inula graveolens* (L.) Desf.

Localities from literature in Mk: Bogdanci (Micevski & Matevski, 1983); Skopje, Makedonska Kamenica (Matevski et al. 1999)

New localities in Mk: Makedonski Brod - between v. Zdunje and v. Taževo, near the road, 22.09.2000 (V. Matevski); Valandovo: v. Sobri, 3.11.2016 (V. Matevski) (MKNH)

Dittrichia graveolens (L.) Greuter is a plant native to the Mediterranean region. For the territory of Macedonia, this plant was discovered for the first time about 40 years ago in its southernmost parts - Bogdanci (Micevski & Matevski, 1983). New localities of the species have been discovered in the gorge of the river Treska (between v. Zdunje and v. Taževo), as well as in the vicinity of Valandovo (v. Sobri).

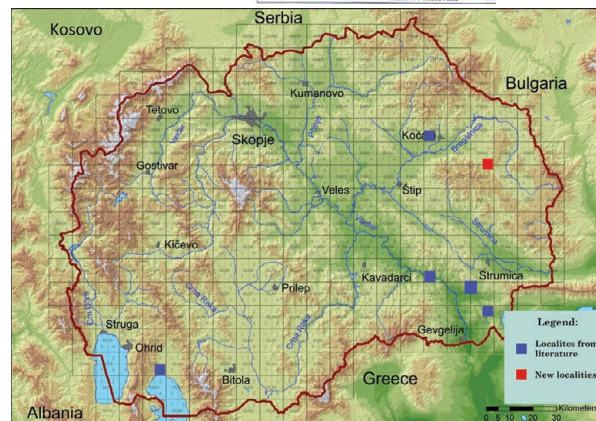


Tolpis umbellata Bertol. (Fig. 7, 8)

Localities from literature in Mk: Mariovo (Ramnište, Valot), Strumica (Sušica), Bogdanci (Paljurci) (Matevski et al., 1992, 2005)

New localities in Mk: Prilep - v. Krivogaštani (Krajni Rid), hilly pastures, 41.355156° N; 21.320847° E; 686 m a.s.m., 12.06.2017 (coll. S. Cvetanoska); Demir Kapija - dry grasslands, 41.39668183°N; 22., 23778112°E; 182 m a.s.m., 2.06.2022 (coll. V. Matevski & R. Čušterevska) (MKNH)

Tolpis umbellata is a Steno-Mediterranean element known so far only for the southernmost parts of the territory of Macedonia (Matevski et al., 1992, 2005). In the past period, this species was discovered in two new localities (Prilep-Krivogaštani and Demir Kapija). The newly discovered locality (Prilep-v. Krivogaštani) is currently the northernmost point of distribution of this species in North Macedonia.



Laphangium luteoalbum (L.) Tzvelev (Fig. 5, 6)
Syn.: *Gnaphalium luteo-album* L.

Localities from literature in Mk: Dojran - Kalučkovo (Bornmüller, 1926); Prespa (Vandas, 1909); Klisura, Kočani, Valandovo, Udovo (Soška, 1939, 1940).

New localities in Mk: Vinica-between v. Laki and v. Mitrasiñci, near the bed of the dried stream, 23.10.1993 (coll. V. Matevski) (MKNH)

The range of this species extends to the territories of Europe, Middle East and North Africa. A rare plant species in North Macedonia. New locality is discovered in its eastern parts, between Vinica and Berovo.

Caryophyllaceae



Dianthus ernesti-mayeri Micevski et Matevski (Fig. 9, 10)

Localities from literature in Mk: Kriva Palanka - Radibuš (Micevski & Matevski, 2001)

New locality in Mk: Kratovo - v. Šlegovo, Zdravci Kamen, dry grassland, silicate, 42.079010° N; 22.144995° E, 817 m a.s.m., 24.05.2019 (coll. V. Matevski) (MKNH).

Until now, this stenoendemic species was known only from the area of Kriva Palanka - v. Radibuš, which is the *Locus classicus* of this species (Micevski & Matevski, 2001). With the latest research, it was registered near the village of Šlegovo, between Kratovo and Probištip. It develops in community *Eryssimo-Trifolietum* Micev. (all. *Trifolion cherleri*) with *Festuca valesiaca*, *Trifolium pignanii*, *Silene italica*, *Ferulago sylvatica*, *Eryngium campestre*, *Erysimum cuspidatum*, *Cota tinctoria*, *Trifolium alpestre*, *Trifolium hybridum*, *Veronica jacquinii*, *Herniaria incana*, *Erysimum diffusum*, *Convolvulus cantabrica*, *Astragalus onobrychis*, *Teucrium capitatum*, *Stachys tymphaea*, *Sideritis montana*, *Ranunculus velutinus*, *Melampyrum arvense*, *Potentilla inclinata*, *Agropyron repens*, *Salvia amplexicaulis*, *Scabiosa triniifolia*, *Achillea coarctata* and other species from hilly pastures.

Euphorbiaceae



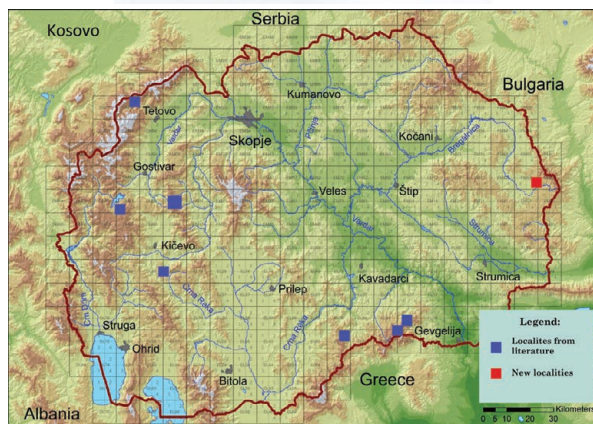
Euphorbia characias subsp. *wulfenii* (Hoppe ex W. D. J. Koch) Radcl.-Sm. (Fig. 11, 12)

Localities from literature in Mk: Prespa - v. Stenje, Island Golem grad [Micevski, 1998; sub *E. characias* subsp. *wulfenii* var. *sibthorpii* (Boiss.) E.S. Boiss.]

New localities in Mk: Ohrid - St. Jovan Kaneo, 41.111063° N; 20.789144° E; 707 m a.s.m., 10.05.2021 (coll. V. Matevski & O. Matevska); Ohrid - v. Konjsko, 41.063750° N; 20.802275° E; 724 m a.s.m., 23.06.2016, (coll. V. Matevski & O. Matevska); Prespa - Oteševo, near Hotel „Europa“, 40.978293° N; 20.915919° E; 860 m a.s.m., 30.07.1991 (coll. V. Matevski) (MKNH).

This eastern Mediterranean species was discovered in the city of Ohrid (St. Jovan Kaneo), in the village of Konjsko, at the foot of the Galičica Mountain (Ohrid side). Additional information on the presence of this species in the Prespa region (in the vicinity of Oteshevo) is also given.

Ericaceae



Hypopitys monotropa Crantz (Fig. 13, 14)
(Syn.: *Monotropa hypopitys* L. var. *hirsuta* Roth.)

Localities from literature in Mk: Šar Pl., Mavrovsko, Kičevo -Turla, Kavadarci-v. Majdan; Dudica i (Micevski, 1998); Adžibarica (Vandas, 1909). Suva Gora Mt. (Čam, Lukovica, Peklište) (Teofilovski 2011).

New locality in Mk: Pehčevo - along the Pehčevska River, on wet places, in the belt of *Pinus nigra* forest, 41.764261° N; 22.937542° E; 1299 m a.s.m., 5.09.2014 (coll. V. Matevski & M. Kostadinovski) (MKNH)

Hypopitys monotropa is a saprophytic plant. So far it is the only known locality of this species in the eastern parts of North Macedonia.

Ranunculaceae



Ranunculus lateriflorus DC (Fig. 15, 16)

Localities from literature in Mk: Strumica: Bansko, Kolesino (Rudski, 1943; Soška, 1953); Kavadarci: Mrežicko; Bitolsko (Micevski, 1985).

New localities in Mk: Kratovo: v. Stracin-Suvo Ezero, peat bog, 42.185000° N; 22.002778° E; 918 m a.s.m., 19.06.2004 (coll. V. Matevski); Sveti Nikole: v. Crnilište, 41.79573743° N; 21.94771288° E; 268 m a.s.m., on saline soils, 4.06.2020 (coll. V. Matevski & R. Čušterevska) (MKNH)

According to Cantemir et al. (2011), *Ranunculus lateriflorus* [*Buschia lateriflora* (DC.) Ovcz.] is halophilous Eurasian (Mediterranean) element. It prefers soils with neutral-alkaline reaction. The species area covers continental Eurasia and North Africa. Very rare plant in North Macedonia, discovered in two new localities (in the vicinity of Kratovo-Stracin and Ovče Pole - v. Crnilište).

Rosaceae



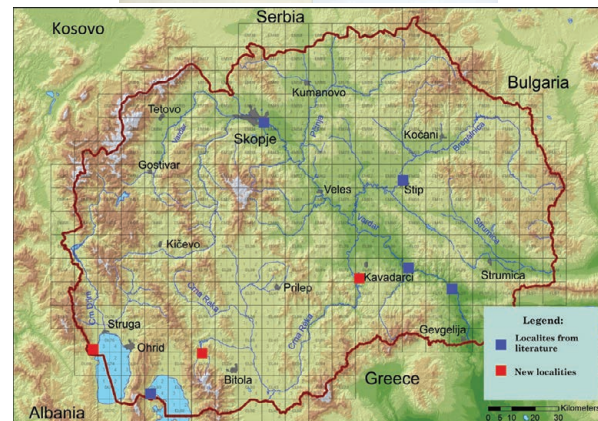
Geum rivale L. (Fig. 17, 18)

Localities from literature in Mk: Strumica-v. Smolare (Сроџнов, 1921); Gorge of the r. Treska (Petrović, 1940); Rudoka (Ade, 1954); Skopska Crna Gora (Grupče, 1958); Šar Planina, Korab, Gorna Radika, Gorno Lukovo Pole (Micevski, 1998: 930-931)

New localities in Mk: Osogovo - Sultan Tepe, on peat, 42.139593° N; 22.435034° E; 1721 m s.m., 19.08.2008 (coll. V. Matevski); Osogovo - Markova Stapka, 42.008835° N; 22.424411° E, 1747 m a.s.m., 5.7.2008 (coll. V. Matevski); Maleševski Pl. - Strednjačka Reka, in the belt of beech forest, 41.77377615° N; 22.9291749° E; 1548 m a.s.m., 9.07.2018 (coll. V. Matevski & R. Čušterevska); Ajdučki Kladenec - swamp with *Deschampsia caespitosa*, 41.766613° N; 22.988633° E; 1658 m a.s.m., 10.07.2018 (coll. V. Matevski & R. Čušterevska); Pehčevo - Maleševski Planini, Stredna,, beach forest, 41.7052750° N; 22.9970076° E; 1444 m a.s.m., 16.7.2019 (coll. V. Matevski & R. Čušterevska); Pehčevo - Maleševski Planini, Stredna, 41.70376214° N; 22.99770718° E; 1425 m a.s.m., 16.07.2019 (coll. V. Matevski & R. Čušterevska); Pehčevo - Maleševski Planini, Nešova Koliba, Strednjačka Reka, 41.70106425° N; 22.99765061° E; 1375 m a.s.m., 16.07.2019 (coll. V. Matevski & R. Čušterevska); Kadiica - Kopanata Voda, 41.786880581° N; 22.95112992° E, 1842 m a.s.m., 15.07.2019 (coll. V. Matevski & R. Čušterevska); Plačkovica - Turtel, 1475 m a.s.m., 27.06.2018 (coll. V. Matevski & R. Čušterevska); Kožuf - Adžibarica, Momina

Čuka, in the fir forest, 25.06.2005 (coll. V. Matevski & M. Kostadinovski) (MKNH).

Geum rivale is Eurosiberian Boreo-temperate element with wide distribution in continental parts of Europe, Asia and North America. For the territory of North Macedonia it has been cited for its southeastern, western and northwestern parts. This paper provides several new data on the distribution of this plant species in the eastern and southern parts of Macedonia (Osogovo Mt, Malešev Mt, Plačkovica Mt and Kožuf Mt).



Potentilla supina L. (Fig. 19, 20)

Localities from literature in Mk: Skopje: Petrovec, Štip-Čardaklija, Prespa-Stenje (Micevski, 1998); Valandovo-Udovo, Gevgelija-Miravci (Jurišić, 1923); Demir Kapija (Soška, 1939)

New localities in Mk: Kavadarci: v. Resava, on the shore of Lake Tikvesh 23.6.2000 (coll. V. Matevski); Kavadarci: v. Begnište-Begnište Bay, on the shore of Lake Tikveš, 21.06.2001 (coll. V. Matevski); Bitola: v. Lera, along the accumulation lake Streževo, 19.7.2001 (coll. V. Matevski); Struga: v. Kalište, near the Ohrid Lake, 12.7.2005 (coll. V. Matevski)

According to Ball et al. (1968: 42) it is a widespread plant through the central, south and east Europe, extending westwards to C. France and the Netherland. Later, Herrero-Borgoñón, & Crespo (1992) mentioned this species for Spain as well. It is known for several

localities on the territory of North Macedonia. It mainly grows in sandy, wet places, along rivers and lakes. Several new localities have been discovered, on similar habitats in the vicinity of Kavadarci, along Tikveš Lake, along the artificial accumulation Streževo, and near Ohrid Lake-Kališta.

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