

Study on *Hieracium* s.str. (Asteraceae) in North Macedonia, I.

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Abstract

The author's further study of *Hieracium* s.str. (Asteraceae) revealed some additional new data and confirmations regarding the diversity and chorology of this genus in North Macedonia. This paper deals with six species of which two are reported for the first time in the country - *Hieracium macropannosum*, found near Delčevo (Dzvegor village), and *Hieracium oxyodon*, found in Šar Mountains (Plat, Brezno village). The present occurrence of the following three species in the country, reported in the literature from a single locality 85 years ago or earlier, is confirmed by their records in one or more additional locations: *Hieracium lachenalii*, *Hieracium prenanthoides*, and *Hieracium pseudofastigiatum*. *Hieracium glabratum*, collected in the country only once in 1918, in Šar Mountains (Ljuboten), is confirmed in the same locality. A photograph of a herbarium or live specimen, along with a map of its distribution in the country, is given for each presented taxa.

Key words: confirmation, first record, *Hieracium*, species, Macedonia.

Introduction

The diversity and distribution of the taxonomically problematic genus *Hieracium* s.str. (Asteraceae) in North Macedonia have not been comprehensively studied so far. Data regarding the presence of more than 65 broadly defined species are reported in the floristic literature to date. They do not satisfactorily depict the real diversity and chorology of the genus in the country, with part of them appearing to be unreliable. Additionally, the presence of many taxa, known only from a single or few localities published in the first half of the 20th century, lacks recent confirmations in the field. This, apparently insufficient knowledge regarding this genus, suggests the necessity for its further taxonomic and chorological studies in the country.

During the author's floristic fieldwork in various mountain regions of North Macedonia over the past two decades, special attention has been paid to the genus *Hieracium* s.str. Thereby, an abundant collection of herbarium material and photographs of live specimens has been provided, part of which have already been studied and published. As the most noteworthy published data could be mentioned the

first record of six species in the country [*H. jurassicum* Griseb., *H. jankae* R. Uechtr., *H. maculatum* Schrank, *H. camkorijense* Zahn, *H. paniculatisimum* (Zahn) Teofilovski and *H. pellense* Gottschl. & Dunkel.] and the description of one species new to science (*H. micevskii* Teofilovski) (Teofilovski 2011, 2019, 2021, 2022). The more recent author's studies have revealed some additional *Hieracium* species that were previously unknown in the country or were little known in the literature, often by a single, very old record. Aiming to update the present knowledge regarding the diversity and chorology of this genus in the country and in general, a part of such new data is presented in this article.

Material and methods

The fieldwork was conducted in the period 1998 – 2023, mainly in the mountains of western, southern, and eastern parts of North Macedonia. It was carried out in the frame of enthusiastic floristic studies, some professional engagements, and engagements in some applicative projects. Appropriate, mostly abundant, plant material was herbarized and photographed. Herbarium material is stored in the herbarium of the

author. Relevant treatments of the *Hieracium* s.str. were used for identification of the collections and providing data for their distribution in North Macedonia (when present) and their general distribution: Boissier 1875, Frain 1895, Zhan 1921-1923, 1931-1935, 1936-1938, Hayek 1928-1931, and Nyárády 1965. Scans of the type or other specimens belonging to the studied or some other relevant taxa, from various European public herbaria, are used as comparative material. All the presented herbarium collections are collected and identified by the author of this article (A.T.).

Results and discussions

Hieracium glabratum subsp. *nudum* Nägeli & Peter

(Figures 1, 2)

= *H. glabratum* subsp. *glabrescens* (F. W. Schultz)

Dalla Torre & Saroth.

Šar Mountains: Ljuboten, grassy place, limestone, 2180 m, 42.204252°N, 21.114246°E, 28.7.2014, leg. & det. A.T.

This is the first confirmation of the presence of this species and subspecies in North Macedonia. The



Figure 1. *Hieracium glabratum* subsp. *nudum* - herbarium specimen from Ljuboten peak, Šar Mountains, scale bar 2 cm.



Figure 2. *Hieracium glabratum* subsp. *nudum* - distribution in North Macedonia (confirmed locality from literature).

previous reports were based on a single collection gathered by J. Bornmüller in 1918, also in Ljuboten (Šar Mountains) (Bornmüller 1926, Zhan 1931-1935, as *H. glabratum* subsp. *glabrescens*). In Euro+Med Plantbase the presence of *H. glabratum* in North Macedonia is considered questionable (Greuter 2006+). *H. glabratum* subsp. *nudum* is distributed in the southern Alps, Dinarides, and Romanian Carpatians, extending southward to the Ljuboten peak, in the Šar Mountains. The nearest localities to the one in the Šar Mountains are situated in North Albania (Prokletije Mts.) (Zhan 1931-1935), ca. 110 km northwest.

Hieracium lachenalii Suter s.l. (Figures 3, 4)

Jakupica Mt.: road to Begovo Pole, shrubby place, 1796 m, 41.737802°N, 21.433354°E, 27.7.2023. leg. & det. A.T.

This is the first confirmation of the presence of this species in the country, previously known only by a single and doubtful data from the vicinity of Valandovo (Kajali) (Stojanoff 1928, as *H. vulgatum* Fr.). This old literature data requires confirmation, particularly as the xerothermic habitats, widely prevailing in the locality, seem to be not well appropriate for this species.

H. lachenalii s.l. is among the most polymorphic complexes of *Hieracium* s. str., with more than 150 recognized subspecies so far (Zhan 1921-1923, as *H. vulgatum*, 1931-1935; Greuter 2006+). It is distributed throughout much of Europe (northward up to the subarctic parts while becoming rare in the Mediterra-

nean) and central and temperate parts of W Asia. It inhabits forest clearings and margins, shrubby places, and sparse forests (Zhan 1921-1923). It is known to occur, although with a scattered distribution, in all



Figure 3. *Hieracium lachenalii* s.l. - herbarium specimen from Jakupica Mt., scale bar 2 cm.

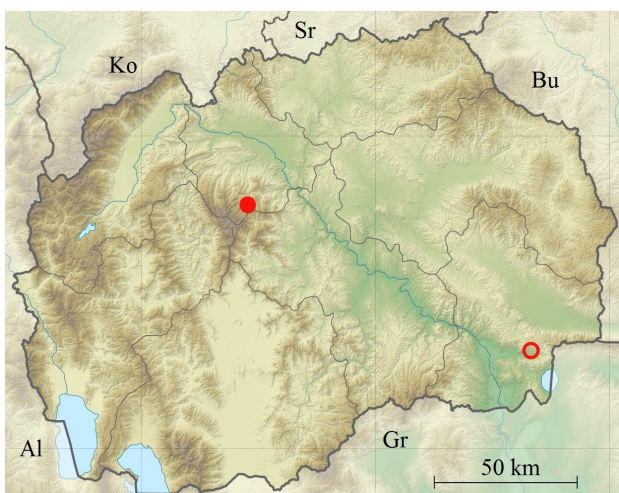


Figure 4. *Hieracium lachenalii* s.l. - distribution in North Macedonia

(● - new locality, ○ - doubtful locality from literature).

countries neighboring North Macedonia (Stojanov & al. 1966, Gajić 1975, Josifović 1986, Gottschlich & al. 2011, Gottschlich & Barina 2017).

***Hieracium macropannosum* (Rech. f. & Zahn)**

Greuter (Figures 5, 6)

≡ *H. pilosissimum* subsp. *macropannosum* Rech. f. & Zahn, ≡ *H. chalcidicum* subsp. *macropannosum* (Rech. f. & Zahn) Greuter.

Delčevo: NE of Dzvegor vill., black pine forests, limestone, 930-1110 m, 41.980224°N, 22.838173°E, 24 & 25.6.2021, 14.7.2021, 30.7.2022, leg. & det. A.T.

This is the first record of this species in North Macedonia. It was described from Leila Mt. in Northern Greece (Rechinger 1939, as *H. pilosissimum* subsp. *macropannosum*), and has not been found elsewhere since then. The data regarding its distribution in the northeastern floristic region of Greece (Dimopoulos & al. 2013, as *H. chalcidicum* subsp. *macropannosum*) is most likely based on the protologue.

The rank of a separate species of *H. macropannosum* was initially proposed by Greuter (2005), who, however, two years later accepted its original rank of subspecies, proposing a new combination - *H. chalcidicum* subsp. *macropannosum* (Rech. f. & Zahn) Greuter (Greuter 2007). Szeląg (2018), included *H. macropannosum* in the newly extended *H. heldreichii* agg., which, includes all species intermediating between *H. pannosum* s.l. and *H. racemosum* s.l. Such intermediate species occur within the range of *H. pannosum* s.l., which includes the Balkan Peninsula, Turkey, and Armenia (Greuter 2006+). In North Macedonia, only two additional species of *H. heldreichii* agg. are known to be present - *H. chalcidicum* Boiss. & Heldr. and *H. heldreichii* Boiss., both reported from the locality Markovi Kuli near Prilep [see Zhan 1936-1938, as *H. pilosissimum* ssp. *chalcidicum* (Boiss. & Heldr.) Zahn and *H. heldreichii* Boiss. subsp. *heldreichii*].

H. macropannosum is a common species throughout the *Pinus nigra* forests in the vicinity of Zvegor village, which covers a limestone area of nearly 200 ha. This area is the only enclave of limestone geological substrate in the eastern parts of North Macedonia which is situated c. 110 km northeast of the type locality, Leila Mt. in N Greece. According to the labels of the specimens in the type collection [100001170 (B); 1046709 (LD), 000648180 (BM), 2138 (Herb. Mus. Hist. Natur. Vindob.)], in Leila Mt. this species grows in pine forests on a siliceous substrate.



Figure 5. *Hieracium macropannosum* - specimen from Dzvegor village, Delčevo (Photo A. Teofilovski).

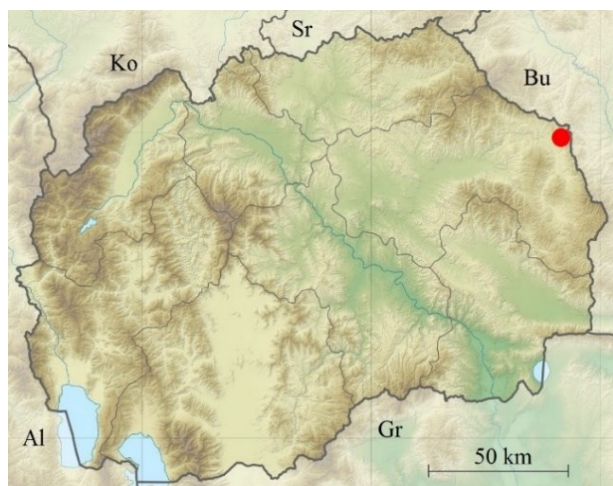


Figure 6. *Hieracium macropannosum* - distribution (first record) in North Macedonia.

Hieracium oxyodon* Fr. subsp. *oxyodon (Figures 7, 8)

Šar Mountains: Brezjanski Kuli, stony places, limestone, 1800-1850 m, 42.101134°N, 20.993418°E, 19.6.2018, 12.7.2018, leg. & det. A.T.; **Šar Mountains:** Plat, limestone rocks, 2060 m, 42.028600°N,

20.814596°E, 21.7.2012, leg. & det. A.T.; **Šar Mountains:** Plat, limestone rocks, 1850 m, 42.030188°N, 20.828876°E, 7.6.2018, leg. & det. A.T.

These are the first records of this species and subspecies in North Macedonia. *H. oxyodon* is distributed in the mountains of C Europe (Alps, Jura) and the Balkan Peninsula (Dinarides, Šar Mountains). It is considered a hybrid species, presumably originating from *H. glaucum* (or *H. bubpleuroides*) and *H. bifidum* (*H. glaucum* > *H. bifidum* or *H. bubpleuroides* > *H. bifidum*) (Zhan 1931-1935). The cited author accepted 22 subspecies in its frame. *H. oxyodon* subsp. *oxyodon* has a similar range of distribution with *H. oxyodon* s.l. but missing in Germany and Croatia (Zhan 1931-1935, Greuter 2006+, Niketić & al. 2021). In the Balkan Peninsula, it is known for Montenegro (Durmitor Mt., Komovi Mt.), Serbia (Mučanj Mt.), and Kosovo (Prokletije Mt., Šar Mountains) (Niketić 1999, Niketić &



Figure 7. *Hieracium oxyodon* subsp. *oxyodon* - herbarium specimen from Brezjanski Kuli, Šar Mountains, scale bar 2 cm.



Figure 8. *Hieracium oxyodon* subsp. *oxyodon* - distribution (first records) in North Macedonia.

al. 2021).

***Hieracium prenanthoides* Vill. s.l.** (Figures 9, 10)

Bistra Mt.: Careva Češma, limestone, 1700-1720 m, 41.64639°N, 20.70913°E, 17.7.2022, leg. & det. A.T.

Until now, information on this striking species in North Macedonia was limited to a single report from the locality Vojtina in Galičica Mt., which was based on material collected more than a century ago by K. Vandas [Zhan 1936-1938, as *H. prenanthoides* subsp. *bupleurifolium* (Tausch) Zahn]. In the new locality in Bistra Mt. only a small population of c. 20 specimens were observed, growing just near the road Mavrovo-Galičnik, on shallow soil with abundant herbaceous plant cover (*Anthyllis vulneraria*, *Calamagrostis* sp., *Chamaenerion dodonaei*, *Lathyrus pratensis*, *Helianthemum nummularium*, *Onobrychis scardica*, *Sedum ochroleucum*, *Achillea holosericea*, *Leontodon hispidus*, *Lactuca muralis*, etc.).

H. prenanthoides s.l. is a polymorphic complex, in which Zhan (1921-1923) recognized 40 subspecies many of them originally described as separate species. It has a wide distribution in much of Europe and N & W Asia but is rare in the Balkan Peninsula. In the neighboring countries to North Macedonia, it has only been reported from Korab Mt. (Albania) (Gottschlich & Barina 2017), Kruševac (Serbia) (Zhan 1936-1938, Gajić 1975), W & C Stara Planina Mt., Rila Mt. (Bulgaria) (Stojanov & al. 1966), and Chelmos Mt. (Greece) (Gottschlich & Raabe 2011).

***Hieracium pseudofastigiatum* Degen & Zahn**
(Figures 11, 12)

≡ *H. umbrosum* subsp. *pseudofastigiatum* (Degen &



Figure 9. *Hieracium prenanthoides* s.l. - herbarium specimen from Careva Češma, Bistra Mt., scale bar 3 cm.

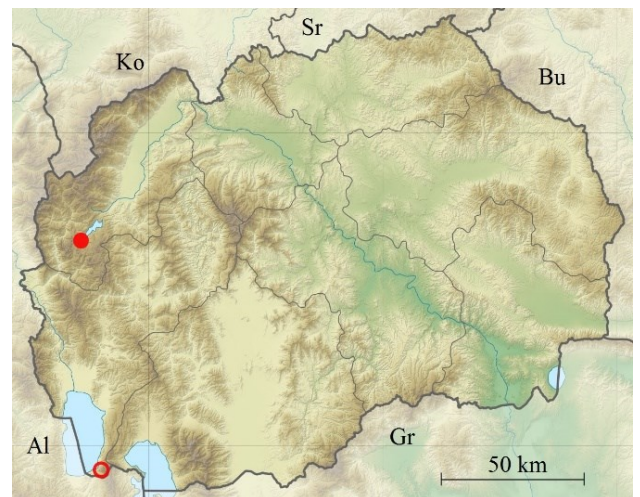


Figure 10. *Hieracium prenanthoides* - distribution in North Macedonia

(● - new locality, ○ - locality from literature).

Zahn) Zahn.

Šar Mountains: Selce Keč vill., beech forest, 1010 m, 41.933263°N, 20.866613°E, 24.9.2015, leg. & det. A.T. (Teofilovski 2016, as *H. umbrsum* s.l.); **Šar Mountains:** Novo Selo vill., forest treeline, 1640 m, 41.942244°N, 20.837925°E, 5.9.2015, leg. & det. A.T. (Teofilovski 2016, as *H. umbrsum* s.l.); **Suva Gora Mt.:** Trnovo vill., deciduous forest, limestone, 1360 m, 41.768333°N, 21.004730°E, 28.6.2023, leg. & det. A.T.; **Bistra Mt.:** NW-W of Straža, roadside, limestone, 1418 m, 41.673187°N, 20.844388°E, 14.6.2022, leg. & det. A.T.; **Ilinska Mt.:** above Prostranje vill., roadside in beech forest, 7.2020, leg. & det. A.T.; **Jablanica Mt.:** Gorna Belica vill., beech forest, 41.223712°N, 20.544648°E, 1540 m, 3.7.2017, leg. & det. A.T.; **Galičica Mt.:** Evla vill., sparse mixed *Fagus* and *Ostrya* forest, 1400 m, 15.7.2010, leg. & det. A.T. (Teofilovski 2011, as *H. umbrosum* s.l.).

The only previously reported locality of this species in the country was Korab Mt. (Zahn 1938, as *H. umbrosum* subsp. *pseudofastigiatum*). Besides North Macedonia, this species is also present in Albania, Serbia, Bulgaria, and Romania (Zahn 1938, Greuter 2006+, Niketić & al. 2020). The locality near Evla village in Galičica Mt. marks the new southernmost point of its known distribution, with the previously known one being situated c. 85 km NW-N, in Korab Mt.

H. pseudofastigiatum belongs to the hybridogenic complex *H. umbrosum* whose origin is interpreted by Zhan (1936-1938) as "*H. murorum* > *H. prenanthoides*". In this complex, which is distributed throughout much of Europe, the cited author included 20 subspecies, some of them originally being described as distinct species. In North Macedonia, there is a literature report also for *H. umbrosum* Jord. subsp. *umbrosum* (Jakupica Mt. - Pepelak, Behr & al. 1938).

Conclusions

1. Two *Hieracium* s.str. species are reported for the first time in North Macedonia:

- *H. macropannosum*, previously known only from the type locality in NE Greece (Leila Mt.), is recorded near Delčevo (Dzvegor village), 110 km northwest. Here it grows abundantly, in black pine forests, on limestone.

- The mainly central European species *H. oxyodon* is recorded in the subalpine zone of Šar Mountains (Plat, Brezno village). The collected specimens belong to subsp. *oxyodon*, known also from the Kosovo part of this mountain.



Figure 11. *Hieracium pseudofastigiatum* - herbarium specimen from Gorna Belica vill., Jablanica Mt., scale bar 4 cm.

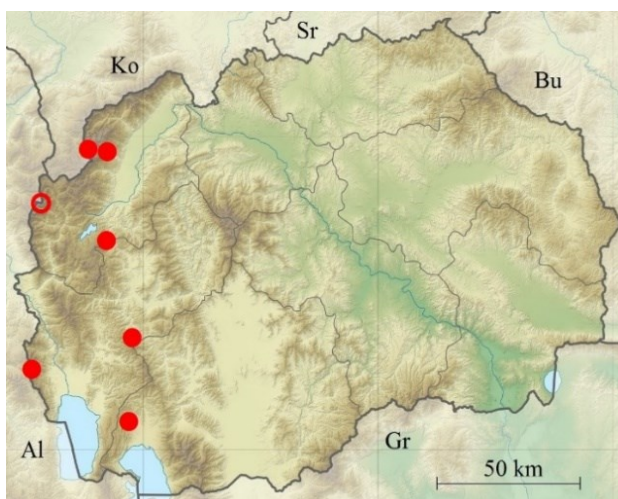


Figure 12. *Hieracium pseudofastigiatum* - distribution in North Macedonia, (● - new locality, ○ - locality from literature).

2. The presence of three *Hieracium* s.str. species in North Macedonia, in literature known only from a single, old report, is confirmed with its findings in one or more additional locations:

- *H. lachenalii* s.l. is recorded in the upper montane zone of Jakupica Mt. (road to Begovo Pole). The only, almost a century-old literature report in the country, from the vicinity of Valandovo is doubtful, requiring confirmation.

- *H. prenanthoides* s.l. is recorded in Bistra Mt. (Careva Češma). The only previous literature report is based on a single, more than a century-old collection from Galičica Mt.

- The Balkan-Romanian species *H. pseudofastigiatum*, previously reported only from Korab Mt. 85 years ago, has now been confirmed to be more widespread in the country. It is recorded in Šar Mountains, Suva Gora Mt., Bistra Mt., Ilinska Mt., Jablanica Mt., and Galičica Mt. The southernmost point of its distributional range is shifted from Korab Mt. to Galičica Mt., c. 85 km SE-E.

3. The record of *H. glabratum* subsp. *nudum* in Šar Mountains (Ljuboten) confirms the current occurrence of the species and subspecies in the locality and the country, 105 years after its initial finding.

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