Additions to the flora of North Albania

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Abstract. The rare plant taxa occurring in the western and eastern parts of the Albanian Alps were investigated with emphasis on their distribution. Three species are reported as new for Albania (*Heliosperma oliverae*, *H. retzdorffianum*, *Tulipa kosovarica*) and additional localities listed for two other rare species (*H. nikolicii*, *T. albanica*), thus extending their known distribution areas. Photographs of the plants, their habitats and a distribution map are provided.

Key words: *Heliosperma* (*Silene*), *Tulipa*, new floristic records, Albanian Alps, Balkan Peninsula

Introduction

The southernmost part of the Dinarides (a mountain range in western Balkans) is known as the Albanian Alps (Alpet Shqiptare in Albanian) or Accursed Mountains (Bjeshkët e Namuna). It lies on the border between Albania, Kosovo and Montenegro and includes *ca*. 40 peaks over 2000 m and 17 peaks over 2500 m. It is the richest floristic region in the country and characterized by a high number of endemic taxa (Ruci 1986, Rakaj 2009).

The first floristic records from the Albanian Alps date back to 1841 with Grisebach's collections from the Drini Valley. Between 1893–1903 the area was visited by Dörfler and Baldacci whose collections and publications aroused the interest of other foreign botanists who then visited the Albanian Alps between 1910–1990. During the long period of self-imposed isolation from other European countries (1945–1992), Albania, including its northern part, was rarely visited by botanists.

The opening of Albania to other countries after 1995 was accompanied by an increase in floristic studies across the country. Many expeditions were undertaken in the Albanian Alps resulting in several publications (Caković & al. 2018, Mersinllari & al. 2008, Rakaj & al. 2013, Shuka & al. 2007, Shuka & Malo 2010, Surina & al. 2009). During these years, approximately 30 species new for the flora of Albania were documented from the Albanian Alps (Barina & Pifko 2011, Barina & al. 2013, 2015, Frajman & al. 2013, 2014, Rakaj & Kashta 2007, Rakaj 2009, Shuka & al. 2011, Shuka & al. 2019). However, the flora of the Albanian Alps cannot be dismissed as well known, since large areas remain unexplored due to the terrain and notorious name of the Accursed Mountains (Bjeshkët e Namuna).

During the last three years, we have undertaken six floristic expeditions to the border area of the western and eastern part of the Alps in order to investigate distribution of the rare plants occurring in the area. Two species of *Heliosperma* and a Tulip were found new for Albania and additional localities recorded for two other rare species.

Results: documentation of taxa

Caryophyllaceae

Heliosperma oliverae Niketić & Stevanović
(Figs. 1& 2, 6)

Al Tropoja district: Albanian Alps, Sulbica valley, below Stani i Halil Qerimit, in crevices of siliceous flysch above stream, 1670 m, 42°30'N, 20°07'E, 22.06.2019, *D. Shuka* & *B. Hallaçi* s.n. (TIR); Stanet e Sulbicës, rocky granitic slopes of Sulbica waterfall, 1935 m, 42°31'N, 20°06'E, 22.06.2019, *D. Shuka* & *B. Hallaçi* s.n. (TIR); Doberdol, in crevices of granitic rock below Kërshi i Kocajve Peak, above Dashi Lake, 2315 m, 42°31'N, 20°04'E, 23.07.2019, *D. Shuka* & *B. Hallaçi* s.n. (TIR); southern slopes below the Black peak in the upper part of Gashi valley, 2100–2270 m, 42°31'N, 20°04'E, 23.07.2019, *D. Shuka* & *B. Hallaçi* s.n. (TIR).

The species has previously been reported from Maja Šćapica (Peak of Scapica) and Mt Gusinjaske (Prokletije) in Montenegro, and from Gjeravica (Deravica peak) and Mt Juničkae Planine in Kosovo (Niketić & Stevanović 2007). In Albania, it was observed and collected in Sulbica valley and upper parts of the Gashi valley, from 1650 m up to 2350 m, mainly on siliceous rock sprayed by stream tributaries, or at higher altitude shrouded in fog mist (see Fig. 2). Accompanying species include *Asplenium adiantum-nigrum*, *Asplenium septentrionale*, *Alchemilla* spp., *Achillea* sp., *Cerastium dinaricum*, *Draba korabensis, Edraianthus montenegrinus*, *Heliosperma pusillum* subsp. *albanicum*, *Huperzia selago*, *Pulsatilla alpina*, *Saxifraga aizoides*, *Saxifraga paniculata*, *Valeriana bertiscea*, etc.

New for Albania.

Fig. 1. *Heliosperma oliverae* (photo L. Shuka).

Fig. 2. *Heliosperma oliverae*: habitat at Sulbica waterfall (photo L. Shuka).

Heliosperma retzdorffianum K. Malý
(Figs. 3 & 6)

Al Malësia e Madhe district: Albanian Alps, 0.7 km below Rahovic village, *ca*. 1.5 km from Grabom village on the road to Tamara village, in a shallow cave on the left side of Cemi River, 204 m, 42°25'N, 19°31'E, 09.06.2019, *D. Shuka* s.n. (TIR).

Heliosperma retzdorffianum [= *Silene retzdorffiana* (K. Malý) Neumayer] has been included in all Albanian floras since the publication of Csiki & al. (1926). That report was based on the Kümmerle collections "M. Djalica e Lums ad pedes declivius borealium adversus pag. Podbregja, solo calc., alt. 450 m, 27.07.1918" and "…. ad lateria rupium convallis "Skala Bicajt", alt 1000 m, 16.07.1918". Meyer (2011) also published two new localities for *S. retzdorffiana* in the

Fig. 3. *Heliosperma retzdorffianum* and habitat at shallow cave near Cemi river (photo D. Shuka).

Albanian Alps, viz., below Qafa e Thores above Shala River, coll. 26.07.1959 and from Mali i Skenderbegut, near Qaf Shtama, *ca*. 1400 m, coll. 09.08.1959. However, recent investigation by L. Shuka revealed that the plants from both these localities do not belong to *H. retzdorffianaum*. In 1987, Seliger & Wraber had compared plants collected in the Prizreni Gorge, Kosovo with material of *S. retzdorffiana* from "Doljanka-Brucke bei Jablanica in der Hercegovina" and had published a new taxon *S. retzdorffiana* subsp. *nikolicii* Seliger & T. Wraber (Seliger & Wraber 1987). It was combined and elevated to species rank, *Heliosperma nikolicii* by Niketić & Stevanović (2007). The reports by Shuka & al. (2008) and Barina & al. (2018) both refer to *H. nikolicii* (=*Silene retzdorffiana* subsp. *nikolicii*) and not to *H. retzdorffianum* s. str.

We were indeed surprised that our present collections from the Cemi river matched *H. retzdorffianum,* which is an endemic species restricted to the Neretva river area in Bosnia and Herzegovina. We have compared our material with authentic vouchers — *Flora der Hercegovina*, 26.05.1903, leg. *W. Retzdorff* 29629 (BP), *Flora Hercegovinae*, 29.05.1904, leg. *K. Malý* s.n. (BP), 09.07.1906, leg. *K. Malý* 124622 (BP), *Flora Bosniaca*, 09.07.1906, leg. *K. Malý* 124627 (BP), and there is no doubt. Thus, our record represents a new locality *ca*.195 km distant from the known localities at Doljanka Brucke, Jablanica in Hercegovina and is also the easternmost locality of the species distribution range.

New for Albania.

Heliosperma nikolicii (Seliger & T. Wraber) Niketić & Stevanović (Fig. 6)

Al Kukësi district: Gjallica Mt, in crevices and screes of the calcareous rocky slopes of Bicaj Canyon (Shija gorge), 450–560 m, 41°59'N, 20°25'E, 01.06.2018, *D. Shuka* & *L. Shuka* s.n. (TIR); *loc. ibid*., fruiting, 28.10.2017, *D. Shuka* & *L. Shuka* obs.; Bushtrica area, Çaja Canyon, 80 m above the Lapaj bridge, on the left side of the river, 650 m, 41°53'N, 20°25'E, 22.06.2013, *L. Shuka* & B. *Hallaçi* obs.; *loc. ibid*., 13.05.2020, *D. Shuka* & *L. Shuka* s.n. (TIR).

— **Ko** Kosovo: Prizreni Gorge, in crevices of limestone rock, 610 m, 42°11'N, 20°46'E, 28.10.2017, *D. Shuka* & *L. Shuka* s.n. (TIR).

The two new localities in Albania increase the number of known occurrences of this species on the Balkan Peninsula to five, and the collection from Kosovo confirms the report of Seliger & Wraber (1987). The other localities in Albania (Podbregja and Shkalla e Bicajve) are documented in Shuka & al. (2008) and Barina & al. (2018). The new records extend the distribution range of *H. nikolicii* further to the south.

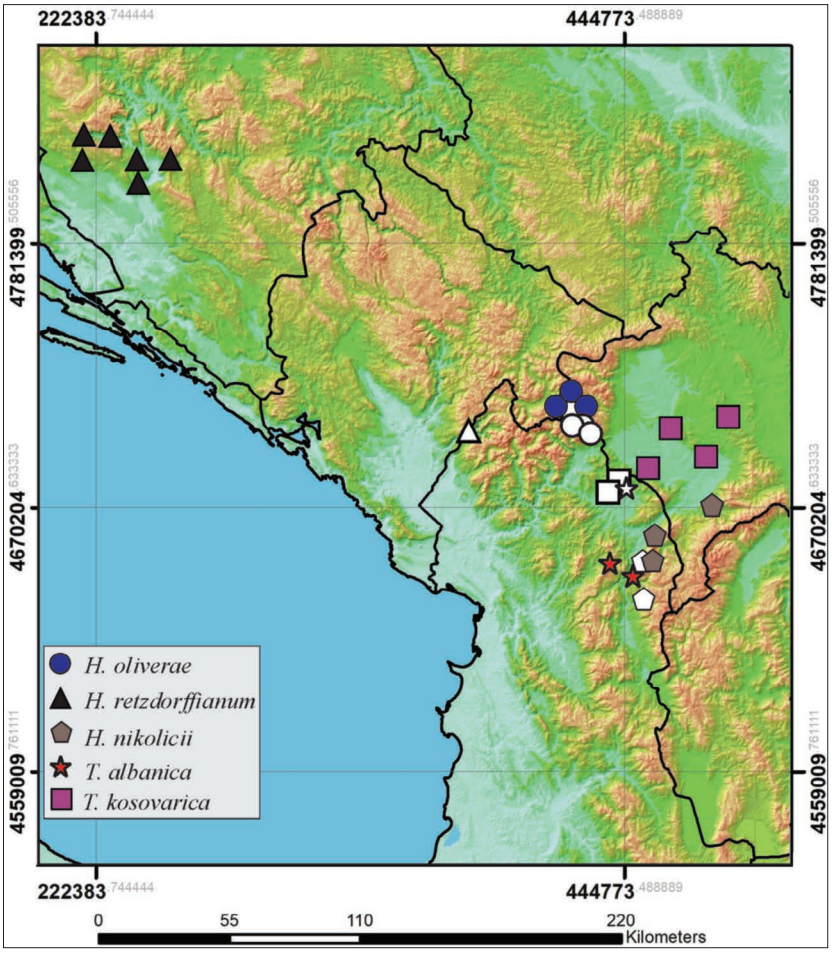

Fig. 6. Distribution map: new localities are indicated by the corresponding symbols in white.

Although the area covered by the two new localities is less than 0.005 km^2, the following rare and endangered taxa were found together with *H. nikolicii* — *Asperula scutellaris*, *Athamanta turbith* subsp. *haynaldii*, *Campanula versicolor* subsp. *korabensis*, *Hayekia comosiformis*, *Hieracium waldsteinii*, *Siler zernyi*, *Ramonda serbica*, *Saxifraga federici-augusti* subsp. *grisebachii*, *Saxifraga paniculata*, *Hylotelephium telephium*, *Teucrium arduinii*, etc.

Liliaceae

Tulipa albanica Kit Tan & Shuka (Figs. 4 & 6)

Al Kukësi district: Hasi Municipality, Maja e Sukës, 1.6 km near Letaj village, serpentine grassland surrounded by *Quercus* forest, 730–780 m, 42°16'N, 20°22'E, 26.05.2019, *D. Shuka* & *B. Hallaçi* s.n. (TIR).

According to Shuka & al. (2010), *T. albanica* occurs only in the lower part of the Black Drin (river). The new locality is *ca*. 32 km distant from the *locus classicus* with a population of approximately 30 individuals. *Tulipa albanica* exists in red and yellow flower forms, both of which occur on serpentine and limestone substrates in the recorded localities (see Fig. 4), whereas *T. kosovarica* has so far only been found on serpentine. However, in the new locality, only the red-flowered form of *T. albanica* was noted. The red-flowered forms with a yellow perianth base show some similarity to *T. scardica* Bornm. from neighbouring North Macedonia and Southeast Kosovo; the latter is a species also with red flowers but with the yellow perianth base blotched black. *Tulipa albanica* has likewise rather similar flowers to *T. schrenkii* Regel, which is distributed far away in the steppe or semi-desert areas of Ukraine, Caucasus, Central and Southwest Asia. We have noted in the geographical areas between *T. albanica*, *T. kosovarica* and *T. scardica* many intermediate forms for which studies at the molecular level are required.

Fig. 4. *Tulipa albanica*, red and yellow-flowered forms in Kukësi district (photo B. Hallaçi).

Tulipa kosovarica Kit Tan, Shuka & Krasniqi (Figs. 5 & 6.)

Al Kukësi district: Hasi Municipality, Mali i Oplasit (Oplasi Mt), *ca*. 3 km NE of Perollaj village, in dry open serpentine grasslands dominated by *Euphorbia glabriflora* and *Halacsya sendtneri*, 950–1000 m, 42°16'N, 20°19'E, 18.05.2019, *D. Shuka, L. Shuka* & *B. Hallaçi* s.n. (TIR); *loc. ibid*.,16.05.2020, *D. Shuka, L. Shuka* & *B. Hallaçi* obs.; Hasi Municipality, Maja e Sukës (Suka peak), 1.7 km near Letaj village, in open places dominated by *Genista hassertiana*, *Centaurea kosaninii* and *Thymus* spp., 870–900 m, 42°16'N, 20°21'E, 26.05.2019, *D. Shuka* & *B. Hallaçi* s.n. (TIR).

T. kosovarica is so far known as endemic to the serpentine areas of SW Kosovo (Shuka & al. 2012; Millaku & al. 2018). The recently discovered localities in Albania are in openings of thermophilous oak forest or in *Juniperus oxycedrus* scrub. Other interesting serpentine obligates are *Aristolochia merxmuelleri*, *Aster albanicus*, *Centaurea candelabrum, Euphorbia glabriflora*, *Forsythia europaea*, *Halacsya sendtneri*, *Minuartia baldaccii* subsp. *baldaccii, Sedum album* subsp. *serpentini*, *Serratula radiata* subsp. *cetinjensis,* and *Stipa mayeri*. Both new localities extend the distribution of *T. kosovarica* from Central Kosovo to the southwest, towards the serpentine massifs of Albania.

New for Albania.

Bearing in mind that three new species for the flora of Albania were found, as well as several other important chorological extensions documented, there is a necessity for further floristic studies in the border areas of the Albanian Alps. This region has always been botanically the most attractive part of the country due to its geomorphology and orography, with traces of former

Fig. 5. *Tulipa kosovarica* in open serpentine grassland on Mt Oplasi (photo D. Shuka).

glaciers, fluvial-glacial erosion and deposits, as well as its being the southernmost extension of the Dinaric Alps. The terrain (from depths of 200–400 m in valley gorges, ascending directly up to 2000–2764 m on the 75 highest peaks) is a perfect shelter for many refugial post-glacial species, many of which are endemics or subendemics. The area's geographical position, climate range, diverse habitats and ecosystems all contribute to a floristic count of no less than 1611 taxa (Rakaj 2009) to 1900 taxa (Ruci 1986) in the Albanian Alps.

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