



ORIGINAL RESEARCH PAPER

***Pulsatilla halleri* (All.) Willd. AND *Viola schariensis* Erben, NEW SPECIES
FOR THE FLORA OF KOSOVO**

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SYNOPSIS

Key words:

Kosovo,
new species,
Koritnik,
Vraca,
Kallabak,
calcareous,
silicate substrate.

In this paper, *Pulsatilla halleri* (All.) Willd. and *Viola schariensis* Erben are recorded for the first time in Kosovo. Both species were collected in the mountains of Koritnik, Vraca and Kallabak, located along the border of Kosovo, Albania and FYR of Macedonia. These species inhabit different habitat types in the calcareous and silicate substrates. For the identification, the new species have been compared with their closest relatives in the Balkans. In addition, morphological and taxonomic data for both species and illustrations of the entire plants are given. Finally, their distribution in Kosovo and neighboring countries is mapped, too.

INTRODUCTION

Kosova surface comprises about 2.3% of the Balkan area. It is characterized by richness and diversity of flora and fauna, natural habitats and landscapes. Its geographical position, geological, pedological, hydrological, topographical surface and climate are some of the factors that have allowed Kosovo to have a rich biological and landscape diversity (KEPA/MESP, 2010).

Based on previous flora research, in the territory of Kosovo have been identified about 2.500 species of vascular plant flora, of which about 200 species are endemic, relict and subendemic of the Balkans and 20 species are considered as endemic species of Kosovo (Rexhepi, 1986; Vangjeli et al., 1994; Maxhuni et al., 2012).

Among the richest floristic areas, not only in Kosovo but also in the Balkans, is the Sharri Mt range, which is known for its high plant diversity with a large number of endemic, rare and endangered relicts (Millaku et al., 2013). Below is described the current situation as well as distribution range of two species for the flora of Balkans like *Pulsatilla halleri* in the Koritniku mountain and *Viola schariensis* in southern part of

Sharri Mountains range, increasing the number of new and important species of Flora in Kosovo and Balkan.

MATERIAL AND METHODS

The study of distribution of plant species, based on substrate preference, in the Dragashi Commune was done by direct observation carried out during the period May, June, July, August and September of 2011-2013. It is realized based on transects method using randomly sampling plots (Braun-Blanquet, 1964; Reiss et al., 2000), up in the main mountains of the Dragashi municipality and neighbouring parts of it in Albania.

During expeditions conducted in Koritnik Mt Sharr Mts and Kallabaku Mt were collected and herborized about 450 plant species. In these expeditions have been observed the substrate composition, its rare and endangered flora, soil quality, and described size of populations and endangered status for certain plant species. All the collected data are analysed and documented. The real threats status for *Pulsatilla halleri* and *Viola schariensis*, as new species for the flora of Kosovo, was calculated, too.

Localization of species and their positioning was recorded by GPS instrument, Garmin eTrex.

Determination of species was done using Tutin et al. (1964), Qosja et al. (1996), Vangjeli et al. (1994) and Micevski (1985). The collected plants are dried and herbarised according to the procedure and are deposited in the National Herbarium of Tirana, Albania (TIR).

RESULTS AND DISCUSSION

During expeditions carried out on 2011-2013 in Koritnik Mt. at altitude above 2000 m was found *Pulsatilla halleri*, within a restricted area, in limestone substrate, along the northern ridge of the mountain above the village of Rapça.

The second new species for the Flora of Kosovo, *Viola schariensis*, were observed in siliceous substrates of the south parts of Sharri Mts. range, above Hotel Argjena in Brodi village and during the road from Restelica village to Kallabaku Mt. and in the north-eastern slopes of Kallabaku Mt. near its summit, all in the altitudes from 1600 m up to 2100 m a.s.l. (Figure 1)

Pulsatilla halleri is a completely hardy and reliable plant which is improved over the year. Hence, it is one of the rarest spring plants and is widespread in full sunshine sites. This species easily falls under special weather conditions and is proliferated by spread seeds and is quite resistant.



Figure 1:
V. schariensis (A-B)
and *P. halleri* (C-D).

Pulsatilla halleri* (All.) Willd. subsp. *Halleri

Is an herbaceous perennial cylindrical rhizomes plant, with an axial root system (strong taproot). The maximum height at bloom phase is 10-15 cm. Stem's growth reaches 15-40 cm in fruitfulness, and is covered by dense floss silk.

Base leaves are hairy, pinnate and simple cleft in 3-5 initial segments or lobes, which arise after blooming and fade in late summer after fruitfulness. Its flowers are of campanula form 5-8 cm. Flowering time is the end of May and beginning of June in Koritnik Mountain, depending on snow melting.

DISTRIBUTION: In Kosovo the species were recorded in Dragashi Municipality Koritnik Mt., on the northern ridge of the Mt., above the Rapça village at 2053 m a.s.l.,

42°05'53 N 20°34'86 E; Date: 21.05.2011; Coll. *L. Shuka & Z. Hashani*, 3153-3155 (TIR). According to Tutin et al. (1964), the species is restricted in S, W and C Alps.

HABITAT AND ECOLOGY: It prefers dry alpine pastures, with grass and rocks or near bushes like *Juniperus nana* or *Dryas octopetala* or in clearings of *Pinus leucodermis* woods.

The population of *P. halleri* in Koritnik Mt. is very small with about 25 individuals. The species habitat in its occurrence is endangered from the fires and construction of new road to the peak of the mountain. According to the estimate from the population size, area of occurrence and area of occupancy as far as their threats, the species can be classified as Critically Endangered (CR) in the red list of endangered plant species of Kosovo.

***Viola schariensis* Erben**

Viola schariensis was known so far to occurs in Sharri Mts. range and considered as endemic of this mountain. (Erben, 1985).

Perennial flower with dense stems branched at the base, erected or semi- erected from the ground, 2-7 cm long in the blooming phase and 15-20 (-30) cm in fruitfulness.

According to Erben (1985) the leaves are dark green of wide and elliptical form generally large. They have small shoots from 2 to 10 cm, straight erected and very hairy, spur substantially, depending on the length of the shoots dense by leaf density, each branch (sapling, shoot) carries 1-3 (-4) flowers, the lowest are 8-16 x 4-8 mm.

Side leaves consist of a small, oblong, hastate, and extended inseparable tail, which have only a small scattered cog on the outer side. The feathers approach to medium and upper stem leaves, often divided by a wide space.

Wide, grassy (grey leaves) oblong oval shaped sepal, at the upper end with a rundown apex, narrowing at the touching point (in the neck position), white (color) basis carrying some small resin granules in the area of the touch point which are also grown greatly and disappear differently. Their apex is stationary, not bushy scattered at their (dissected) edge (Erben, 1985).

The flowers are dark purple or yellow and cannot be confused with any other type. They are 23-28 mm x 14-18 mm large, and often without scent.

DISTRIBUTION: In Kosovo the species was observed above the ski-trackway of Brodi village, 1760 m a.s.l., 41°57'47 N 20°42'76 E; Date: 20.05.2011; Coll. *L. Shuka & Z. Hashani*, 3043-3045 (TIR). On the road from the Restelica village towards the Macedonian border, 1698 m a.s.l., 41°55'43 N; 20°38'58 E, 19.07.2011, coll. *L. Shuka & Z. Hashani*, 3274-3275 (TIR). Northeastern slopes of the Kallabaku Mt, 2.050 m,

41°55'03 N; 20°34'62 E, 20.06.2012, coll. L. Shuka, 4182-4185 (TIR), all in Dragashi Municipality.

HABITAT AND ECOLOGY: The species grow in subalpine and alpine pastures or between shrubs, in silicious substrate. In Albania and Macedonia it is also found in limestone substrates, in altitudes from 1500 to 2400 m. Since the species has a wide distribution range in Albania and Macedonia as far as from its population size and threats in Kosovo *V. schariensis* must included in the Kosovo Red List of Flora with endangered status Vulnerable (V). (Figure 2)

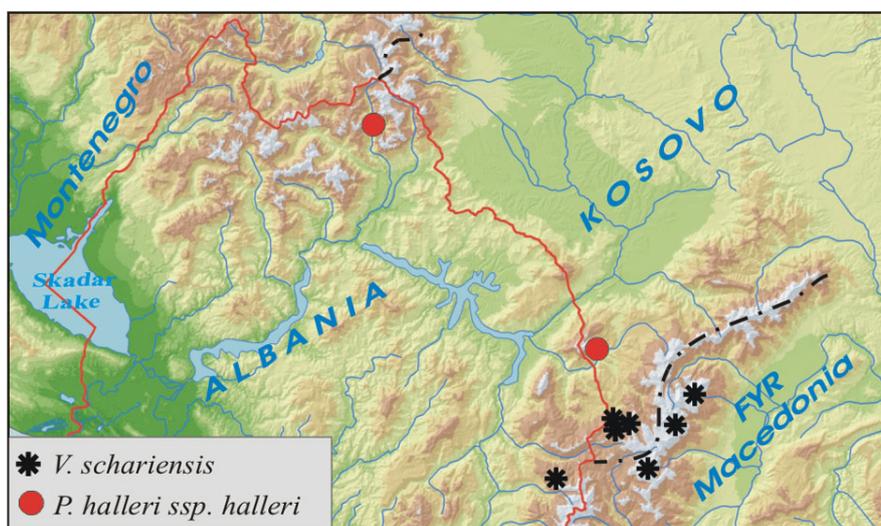


Figure 2: Distribution of *P. halleri* (A-B) and *V. schariensis* (C-D) in Kosovo and Albania.

CONCLUSIONS

- Two recorded species, *Pulsatilla halleri* and *Viola schariensis* are new for the flora of Kosovo, and represent phyto-geographical and scientific interest because of its isolation in south-eastern Europe countries.
- *Pulsatilla halleri* and *Viola schariensis* have a limited areal of distribution and their populations are under negative pressure of humans and overgrazing. For these reasons they fulfil standards for included in the red list of protected species for Kosovo.
- Rarity of individuals of these species to extinction stipulates specific care measures for their legal protection. The sites of their distribution should be declared as protected areas. Such species can be cultivated as ornamental plants.

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RECEIVED: 10 September 2013.