



Rubus laciniatus Willd. (Rosaceae), an introduced species new in the flora of Serbia and the Balkans

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ABSTRACT: *Rubus laciniatus* has been found as a species new for the flora of Serbia during floristic investigation in the Ibar river valley. It was found on serpentine terrains near the town of Raška (SW Serbia). This is the single known locality of the given species on the Balkan Peninsula. Data on morphology, distribution, and habitat preferences of the species are provided, and the possible pathways of its introduction in Serbia are assessed.

KEYWORDS: *Rubus laciniatus*, blackberry, new record, Ibar river valley

Received: 20 March 2018

Revision accepted: 11 July 2018

UDC: 634.71:581.95(497.11) (292.464)

DOI: 10.5281/zenodo.1468362

One of the largest of plant genera, *Rubus* L. (Rosaceae) has worldwide distribution and is variously classified into 12 or 15 subgenera (JENNINGS 1988). According to THE PLANT LIST (2013), 1568 species are accepted on the global level and there are also 5162 unresolved names. With more than 760 species in Europe (KURTOO *et al.* 2010), this genus constitutes a group within the family Rosaceae (Rosoidae) that is extraordinarily interesting from the taxonomic point of view. It consists of several hundred sexual species and perhaps thousands of apomictic micro-species (MORDEN *et al.* 2003). Frequent hybridisation and reproduction through apomixis have made the designation of distinct species difficult in the genus (KRAFT & NYBOM 1995). One of the groups in northwest Europe with a predominantly apomictic type of reproduction is the genus *Rubus* L. subgenus *Rubus* (bramble) (HAVEMAN 2017).

Rubus species are found on all continents (THOMPSON 1995) except Antarctica, from the lowland tropics to sub-Arctic regions, at elevations ranging from sea level to 4500 m (RAYA 2005). The origin of the widespread genus *Rubus* has been speculated to be the western part of North America or Far Eastern Asia (ALICE & CAMPBELL 1999), although the centre of origin of the genus could

be in Southwest China (LU 1983), since it is geologically archaic and was not seriously covered by glaciers during the Quaternary (GU *et al.* 1993). In Europe, the genus *Rubus* has its centre of diversity in the Atlantic and sub-Atlantic parts, viz., northwest Germany, the Benelux countries, and France (HAVEMAN 2017), and the number of species diminishes naturally towards the east (KOSIŃSKI & ZIELIŃSKY 2013).

Most *Rubus* species are perennial shrubs with biennial canes. The plant habit varies from erect to trailing. Most species are deciduous, but some are evergreen (HUMMER 1996). The ranges of morphological variation of particular species of *Rubus* are rather poorly recognised (KLUZA-WIELOCH *et al.* 2013). Stem armature and leaf morphology are key characteristics in *Rubus* taxonomy (WADA & REED 2008). On the other hand, many closely related species of brambles differ only in very subtle morphological characters, and phenotypic plasticity is clearly expressed in *Rubus* (KLUZA-WIELOCH *et al.* 2013).

Rubus laciniatus Willd. is the only blackberry that has leaflets so deeply lobed and dissected, which makes it distinguishable from native blackberries. According to Mansfeld's Encyclopedia of Agricultural and Horticultural Crops (HANELT 2001), *R. laciniatus* was first culti-

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Fig. 1. *Rubus laciniatus* Willd.: A) general appearance of the species, B) shoot with young leaves (photos D. Prodanović).

vated in England (since the late 17th century) and most probably derived from *R. nemoralis* (WEBER 1993).

This paper records the occurrence of *R. laciniatus* as an introduced species new in the flora of Serbia, where it is registered for the first time. It is also a novelty for the flora of the Balkan Peninsula.

The results are based on field work on serpentine terrains in the Ibar river valley during the year 2014, as well in the years 2015 and 2017. Besides the field survey, specimens in the herbarium of the Institute of Botany and Botanical Garden "Jevremovac", University of Belgrade (BEOU) were checked and relevant literature sources consulted in presenting the overall distribution of the newly discovered taxon. Identification of the collected *R. laciniatus* plants was made according to Flora Europaea 2 (HESLOP-HARRISON 1968). The morphological descriptions of the species *R. laciniatus* follow TAYLOR (1973) and PHIPPS (2014). The nomenclature used for all species noted at the locality was adjusted to conform with EURO+MED PLANTBASE (2006) and THE PLANT LIST (2013). The geo-coordinates of the location where

we collected plant material were determined using a Garmin eTrex personal navigator in WGS 84 projection. The location where the species was discovered is given on a map of Serbia with a 10 × 10 km² UTM grid system (UTM Zone 34T) (LAMPINEN 2001).

The species *R. laciniatus* is classified into the subgenus *Rubus*, subsection *Hiemales* E.H.L. Krause, Ser. *Rhamnifolii* (Bab.) Focke. (KURTTO *et al.* 2010). Members of the subgenus *Rubus* are found in almost all of temperate and Mediterranean Europe (HAVEMAN 2017), as well as in Asia, America, etc.

Description. Deciduous shrub, growing up to 3 m high. Leaves evergreen to late-deciduous, ternate or palmately compound; stipules filiform, 5–15 mm; leaflets 3–5, terminal ovate to elliptical, 6–12 × 7–12 cm, base rounded to cordate, usually deeply (rarely shallowly) lobed, margins coarsely serrate to doubly serrate, apex acuminate to short-attenuate, abaxial surfaces with hooked prickles primarily on midvein, moderately to densely hairy, eglandular or moderately sessile- to short-stipitate-glandular primarily on midvein. Inflorescences terminal, 5–25-flowered, thyriform. Flowers bisexual; petals white to pink, elliptical to obovate, 8–15 mm; the petals deeply cut into three lobes at the tip; filaments filiform; ovaries usually apically hairy. Pedicels: prickles moderate to dense, erect to reflexed, densely hairy, moderately to densely sessile- to short-stipitate-glandular. Flowering VI–IX (X). Fruits black, globose to subcylindrical, 1–1.5 cm; drupelets 25–60, strongly coherent, separating with torus attached (Fig. 1).

General distribution. *Rubus laciniatus* is a species known as a cultivated and naturalised plant that has been introduced to many parts of the world. In North America this species is more frequent in regions with the influence of oceanic climate (LAIVINŠ 2015).

Distribution in Europe. Belgium, Great Britain, Czech Republic, Denmark, Finland, France, Germany, Ireland, Netherlands, Norway, Sweden, Poland, Italy, Romania, Spain) (KURTTO & WEBER 2009); Switzerland (LAUBER & WAGNER 2007).

Distribution in Serbia. *Rubus laciniatus*, a species previously unrecorded for the Serbian flora, was collected in the area of the village of Rvati at a distance of 3 km north of Raška along the slopes of Mt. Kopaonik on the right bank of the Ibar River (43° 18' 2.95" N, 20° 37' 8.34" E; 521 m a.s.l.; UTM 34TDN79; leg./det. Krivošej, Z., Prodanović, D., Preljević, N. & Veljković, B., 20 July 2014) (Fig. 2). The collected herbarium specimens are deposited in the Herbarium of the Institute of Botany and Botanical Garden "Jevremovac", University of Belgrade (BEOU, No. 17136 and No. 17137).

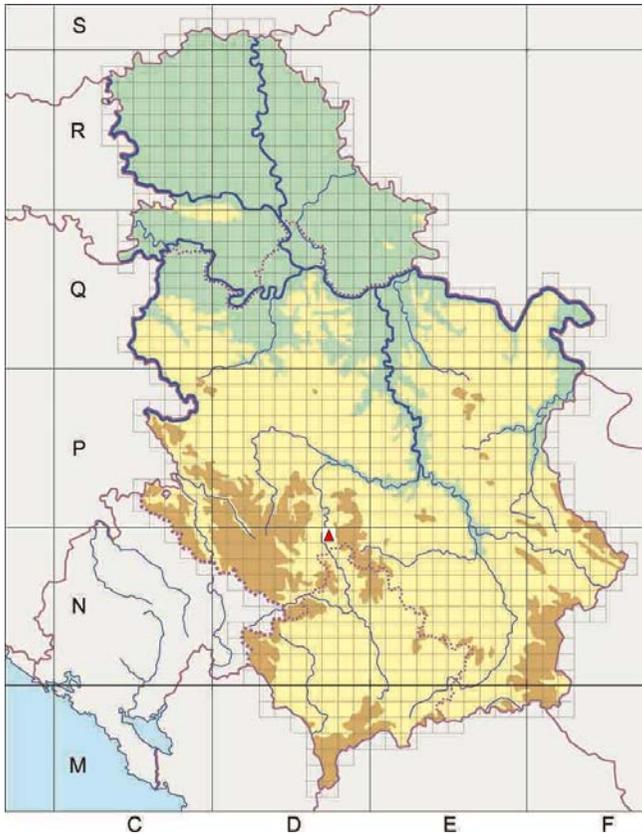


Fig. 2. Distribution of *Rubus laciniatus* Willd. in Serbia.

Habitat. *Rubus laciniatus* grows on a wide range of sites; it is most commonly naturalised on waste grounds, on the edges of woodlands, in semi-open woods, on rocky and/or moist soil, in open areas, and often on disturbed roadsides (PHIPPS 2014). In many areas, this type of blackberry has escaped from cultivated gardens. However, our research shows that the given species is not cultivated in the vicinity of the locality where it was discovered, nor is it grown on the territory of Serbia, so this manner of species occurrence is excluded.

Our specimens were collected in foothills wooded with 35-year-old Austrian pine (*Pinus nigra* Arnold) at a locality between the town of Raška and village of Rvati on poorly developed dry serpentine soil. The remains of former oak groves (*Quercus cerris* L.) are reduced to heavily devastated, low-growing shrubs not more than 3 m high and a small number of herbaceous plants. The habitat of the species is dominated by the following plant taxa: *Quercus pubescens* Willd., *Fraxinus ornus* L., *Acer tataricum* L., *Prunus avium* (L.) L., *Prunus mahaleb* L., *Prunus spinosa* L., *Crataegus monogyna* Jacq., *Ligustrum vulgare* L., *Cornus sanguinea* L., *Viburnum lantana* L., *Rubus ulmifolius* Schott, *Juniperus oxycedrus* L., *Clematis vitalba* L., *Silene italica* (L.) Pers., *Carex filiformis* L., *Brachypodium sylvaticum* (Huds.) P. Beauv., *Dactylis glomerata* L., *Helictotrichon planiculme* (Schrad.) Pilg,

Geum urbanum L., *Fragaria vesca* L., *Sanguisorba minor* Scop., and *Viola mirabilis* L. On the periphery of the pine forest, where more light and heat is available, we identified several weeds and ruderal plants: *Lepidium campestre* (L.) R. Br., *Chelidonium majus* L., *Ballota nigra* L., and *Urtica dioica* L.

Even though the number of individuals of *R. laciniatus* is small (an estimated 10 individuals), this plant with its large and characteristically structured leaves and robust stalk arching almost to the ground and 2 m long leaves the impression of a dominant and conspicuous species compared to the other shrubs surrounding it in the above-described habitat. In September of 2015, the locality was inspected again and the state was unchanged. As only a small number of samples have been detected, it is presumed unlikely that the shrub's seeds could have reached the field along with the planting materials used in forestation (it is known that the pine woods are 35 years old). It is possible that the presence of the species at the site is the result of natural colonisation caused by endozoic oriasis. The nearest occurrences to Serbia are situated in Romania, where the species is cultivated (KURTTO & WEBER 2009). The new record in Serbia represents the southernmost locality for this species in Europe.

When we revisited the mentioned locality in June of 2017, we noticed several young blackberry sprouts a few metres ahead of us, from which we infer that the existing edaphic and climatic conditions suited this species and enabled it to spread over a larger area in the habitat. We assume that the species reported at the newly discovered locality in Serbia for the time being presents no threat to the autochthonous blackberry flora. However, its development should be monitored here in what is for now the only registered locality in Serbia and the Balkans in order to detect potential spreading of it into new habitats.

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REZIME

***Rubus laciniatus* Willd. (*Rosaceae*), nova alohtona vrsta u flori Srbije i na Balkanu**

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Tokom florističkih istraživanja na serpentinitskim terenima Ibarske doline, u blizini varošice Raška (JZ Srbija), otkrivena je nova vrsta kupine za floru Srbije - *Rubus laciniatus* Willd. (*Rosaceae*). To je ujedno i jedini do sada poznat lokalitet ove vrste na Balkanskom poluostrvu. Navedeni su podaci o morfološkim karakteristikama vrste, rasprostranjenju, osobinama staništa i data je procena mogućih načina introdukcije vrste na teritoriju Srbije.

KLJUČNE REČI: *Rubus laciniatus*, novi nalaz, Ibarska dolina, Srbija