

## ***Rubus laciniatus* Willd. (Rosaceae), an introduced species new in the flora of the Republic of North Macedonia**

*Rubus laciniatus* Willd. (Rosaceae), нов интродуциран вид во флората на Република Северна Македонија

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### **Abstract**



Allochthonous species *Rubus laciniatus* Willd. is mentioned for the first time for the flora of the Republic of North Macedonia and represents its second finding in the Balkan Peninsula. The species was found during phytocenological research at the shores of the Prespa Lake. A brief description of the species with the more important morphological features, a description of the habitat where it was found, as well as a discussion of possible routes of introduction are given.

**Keywords:** *Rubus laciniatus*, allochthonous species, new record, Prespa Lake

### **Апстракт**

Алохтониот вид *Rubus laciniatus* Willd. се споменува за прв пат за флората на Република Северна Македонија и претставува второ наоѓалиште на Балканскиот Полуостров. Видот е пронајден за време на фитоценолошкото истражување на брегот на Преспанското Езеро. Даден е краток опис на видот со поважните морфолошки карактеристики, опис на живеалиштето, каде е пронајден, како и дискусија за можните патишта за дистрибиција.

**Клучни зборови:** *Rubus laciniatus*, алохтон вид, нов податок, Преспанско Езеро

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Submitted: 30.07.2020

Accepted: 26.10.2020

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## Introduction

According to Randall (2017), 1522 weed species are present in the Rosaceae family, which ranks fourth in the list of weed families, right after the Asteraceae, Poaceae and Fabaceae families. The genus *Rubus*, with 236 species, ranks 10<sup>th</sup> in the list of weeds in the Randall's Compendium of Weeds (2017). Alien brambles (*Rubus*, Rosaceae) generate significant ecological and nature conservational threats worldwide, however, the European flora and vegetation is not seriously affected by their impacts (Király 2018). In this study, we report on the distribution and habitat of the first time registered alien bramble in Macedonia – *Rubus laciniatus* Willd., on the basis of comprehensive field studies and complete herbarium revision. The genus *Rubus* L. of the family Rosaceae consists of 1568 species (Pyšek et al., 2017), of which about 760 species are present in Europe (Kurtto et al., 2010). In the floristic literature for R. North Macedonia many authors cite data for 18 species of the genus *Rubus*. The revision of this genus for the "Flora of the Republic of Macedonia" (Micevski and Matevski, 1998) determined the presence of only 12 of them, while additionally another new species was discovered – *Rubus wahlenbergii* (Teofilovski, 2011).

Among the species of the genus *Rubus* in R. North Macedonia, only the species *R. caesius* L. has the status of an agricultural weed (Randall, 2018; Kostov & Pacanoski, 2007). During the phytocenological research on the shores of the Prespa Lake, we had the opportunity to register the invasive species *Rubus laciniatus* Willd., which has not been known for the allochthonous flora of R. North Macedonia.

## Material and methods

Herbarium material of *R. laciniatus* was collected during field research on the shores of the Prespa Lake. The collected plant material is stored in the herbarium of the Institute of Biology (MKNH) at the Faculty of Natural Sciences and Mathematics, Ss. Cyril and Methodius, in Skopje. For the identification of the plant material Flora Europaea 2 (Heslop-Harrison 1968) was used. Data on species distribution were compiled by using Heslop-Harrison (1968), Kurtto & Weber (2009), and GBIF (<https://www.gbif.org/species/2992543>). The nomenclature and

taxonomy is consistent with Kurtto & Weber (2009).

Georeferencing is done with Garmin eTrex personal navigator. To display the location, a topological map of the Republic of Macedonia with 10 × 10 km<sup>2</sup>, UTM grid system (UTM Zone 34T) was used (Lampinen 2001).

Original photographs were made from the locality where the plant was discovered.

## Results

Nomenclature: *R. laciniatus* Willd., Hort. Berol. 2 (7): 82 (1806)

New locality:

Republic of North Macedonia Resen: Prespa, on the shores of Prespa Lake, between the villages Slivnica and Pretor (40.96627817; 21.06715187; 843 m a.s.l.; 03.07.2019; Habitat 6420 - Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion, UTM 34TEL03) (Voucher No 034553 A, leg. M. Kostadinovski & R. Ćušterevska) (MKNH)

## Description

Stems of the plant are woody, sulcate, usually not pruinose, often hairy, with equal falcate prickles, mainly on the stem-angles. Leaves green, or only the upper grey-white tomentose beneath, compound, with 3-7 leaflets, divided into pairs of lacinate segments, glabrescent or hairy beneath; stipules united with petiole (Fig. 1). Inflorescence broad and leafy panicle, with numerous short, falcate prickles, usually eglandular, or with only sessile glands (Fig. 2). Receptacle of the flowers convex, sepals deflexed, grey-tomentose; petals incised at the apex, white or pink. Drupelets usually more than 20, ripe fruit blackish, adhering to the receptacle.



**Fig. 1.** *Rubus laciniatus*, leaf



**Fig. 2.** *Rubus laciniatus*, inflorescence

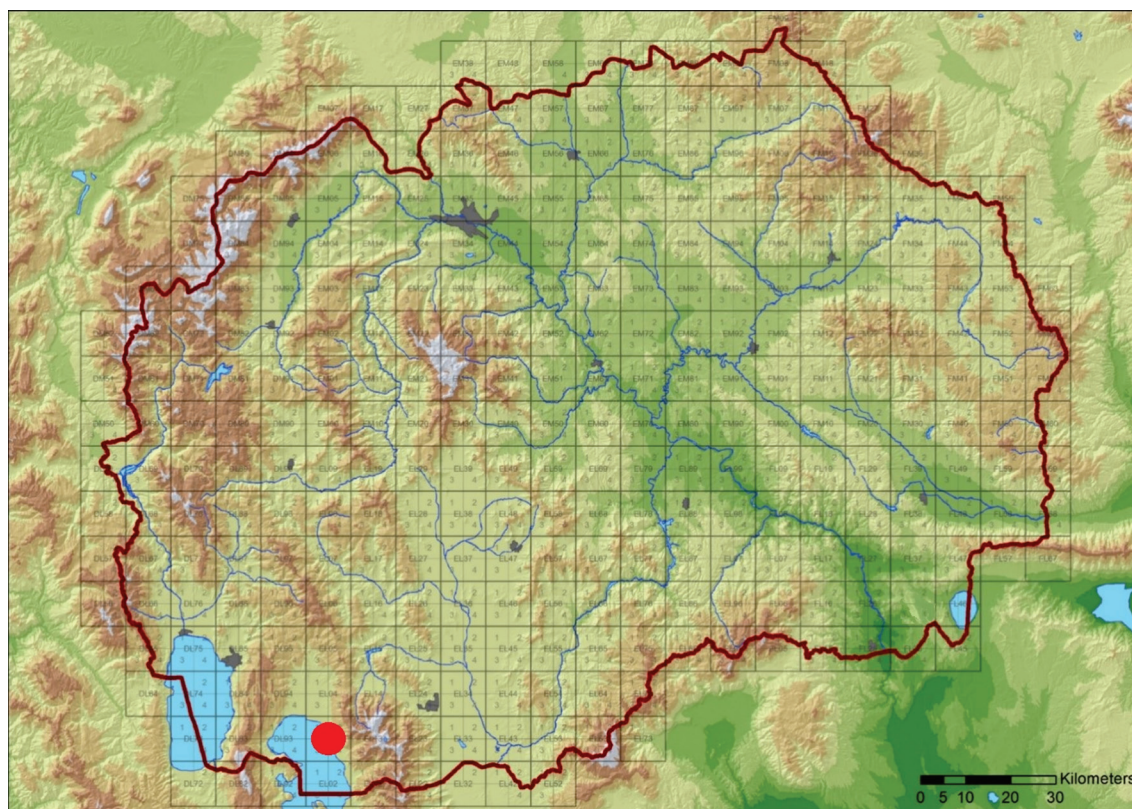
### Distribution

According to the Flora Europaea (Heslop-Harrison, 1968), *R. laciniatus* as an allochthonous species is distributed in Belgium, Britain, the Czech Republic, Denmark, Finland, France, Germany, the Netherlands, Romania, and Sweden, with the explanation that its origin is unknown. According to Euro + Med Plant Base (Kurtto & Weber 2009), in addition to the listed countries, it is also indicated for Ireland, Northern Ireland, Spain, Italy, Norway, Poland and Romania. It has been also recently reported for Hungary (Király 2018)

and Serbia (Krivošej et al., 2018).

This allochthonous species was registered for the first time for the territory of R. North Macedonia on a site in its southwestern parts, - Resen: Prespa, on the shores of Prespa Lake, between the villages Slivnica and Pretor (40.96627817; 21.06715187; 843 m a.s.l.; UTM 34TEL03) (Fig. 3). It grows in the habitat 6420 Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion which is dominated by meadow communities with tall grasses and appears locally in wet places. This habitat type in Prespa occurs along the outer periphery of the reed belt, on flat or slightly sloping alluvial terrain, which is humid for almost nine months of the year. One of the more significant features of the habitat is its pronounced dynamics, as a result of the oscillations of the water level on Lake Prespa. In periods when the water from the Lake recedes (the current situation), the habitat areas expand. No less important for the dynamics of the habitat is the natural succession of vegetation, with which the grassy vegetation is unstopably replaced by shrubs, and then with appropriate forest vegetation

*Calamagrostis epigejos* (L.) Roth. dominates the area where allochthonous species *R. laciniatus* was registered. Several



**Fig. 3.** *Rubus laciniatus*, distribution in the Republic of North Macedonia (red dot)



**Fig. 4.** Prespa, v. Slivnica, habitat 6420 Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion

other species have also been recorded: *Galium verum* L., *Lotus corniculatus* L., *Poa pratensis* L., *Cirsium vulgare* (Savi) Ten., *Scirpoides holoschoenus* (L.) Soják, *Trifolium repens* L., *Equisetum palustre* L., *Agrimonia eupatoria* L., *Artemisia vulgaris* L. and others (Fig. 4).

## Discussion

According to Randall (2017), most species (432) of the genus *Rubus* are "naturalized" (allochthonous species that can spread without human assistance), about 400 are "weeds" (i.e. pests in different agricultural crops), 118 species have the status of invasive species, while a much smaller number of species are connected to other status categories (agricultural weed, environmental weed and noxious weed). In European countries, the status of *R. laciniatus* is mainly "introduced", with the exception of the Netherlands and Romania, where it has the status of a cultivated species. In Finland and France, it appears with a dual status - as induced and as cultivated.

*Rubus laciniatus* is an allochthonous species that can start spreading through different paths, either by accident (as contamination in crop seeds, livestock, vehicles, etc.) or as a species that finds different uses (primarily, such as medicinal or ornamental plant). The main factors that helps in further spreading of this species are humans, animals and water. This species is usually a weed on grassy habitats (Randall, 2017).

*Rubus laciniatus* is mainly found in Western and Central Europe. The closest country where this species has recently been found is Serbia, 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, where this species was first registered for the Balkan Peninsula (Krivošej, et al., 2018). Finding the species, just one year later, 500 km south from the previous locality, at a location far from the main transport routes, raises the question of the mechanisms and routes of spreading of this species in Macedonia. One possibility is that the plant has "escaped" from a neighboring garden, while the second is that it was brought by birds. It is probable that the habitat where this plant is registered is an unstable and pioneer site, which has facilitated the establishment of this allochthonous species. According to Randall (2016, 2017) Global Risk Score, which takes into account the ways and means of invasive species to conquer new areas, *Rubus lacinatus* has a high Global Risk Score of 24. Thus, it is included in the category of plants with high global risk score.

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