

RUDBECKIA TRILOBA L. (ASTERACEAE) – NEW (?) ALIEN SPECIES IN THE FLORA OF CROATIA

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During the summer of 2022 *Rudbeckia triloba* L. was recorded outside cultivation at four localities in the inland part of Croatia (Korana Selo, Vukova Gorica, Vugrovec and Slivonja Jarek) growing in anthropogenic habitats. This species, native to North America, was introduced to Europe as an ornamental and in several European countries is spreading mostly as garden escapee. The time of introduction into Croatia is not known. It can be considered a casual alien or a garden escapee ephemerophyte with an as yet unknown invasive potential.

Key words: ephemerophyte, garden escapee, SE Europe

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Tokom ljeta 2022. *Rudbeckia triloba* L. zabilježena je na četiri lokaliteta u kontinentalnoj Hrvatskoj (Korana Selo, Vukova Gorica, Vugrovec i Slivonja Jarek) gdje je rasla na antropogenim staništima. Vrsta autohtona za Sjevernu Ameriku unesena je u Europu kao ukrasna, a u nekoliko europskih zemalja rasprostranjuje se uglavnom kao prebjeg iz kulture. Vrijeme unosa u Hrvatsku nije poznato. Može se smatrati povremenom vrstom ili efemerofitnim vrtnim prebjegom s još nepoznatim invazivnim potencijalom.

Ključne riječi: efemerofit, vrtni prebjeg, JI Europa

INTRODUCTION

The genus *Rudbeckia* L. (Asteraceae) includes 23 annual, biennial, but mostly perennial herbaceous species, all native to North America and Mexico (MABBERLEY, 2008; URBATSCH & COX, 2020). Due to their attractive flower heads, several species are cultivated as ornamentals outside their native area of distribution. The Euro+Med PlantBase (GREUTER, 2006+) lists six species for Europe, but the number is certainly higher when the species that are still found only in cultivation are considered (e.g. JÄGER *et al.*, 2008). Only two species, *R. laciniata* L. and *R. hirta* L. are considered to be widely naturalized in Europe (GREUTER, 2006+).

In Croatia, three species were recorded outside cultivation so far: *R. laciniata*, *R. hirta*, and *R. sullivantii* C. L. Boynton et Beadle (FLORA CROATICA DATABASE, 2022), but

only the first demonstrates invasive behaviour, spreading mainly alongside watercourses in the inland part of Croatia (BORŠIĆ, 2014; FLORA CROATICA DATABASE 2022).

Rudbeckia triloba is either a biennial or a short-lived perennial. Stems are glabrate to hirsute or strigose. Leaves ovate to subcordate or elliptic, margins serrate; basal petiole usually 3(–5)-lobed; cauline petiole or sessile, subentire or entire. Heads (10–30) in paniculiform arrays. Receptacles conic to subhemispheric; paleae 5–6.5 mm, apices cuspidate, glabrous. Ray florets 8–15; laminae (corollas yellow to yellow-orange with basal maroon splotches) linear to oblanceolate, 8–30 × 3–8 mm. Discs 8–15 × 10–20 mm. Disc floret corollas yellowish green basally, otherwise brown-purple. Cypselae 1.9–2.8 mm; pappi coroniform, to 0.2 mm (cf. URBATSCH & COX, 2020). *Rudbeckia triloba* is easily distinguished from the other three species in Croatia by multiple branched stem bearing comparatively larger number of distinctly smaller heads and by deeply trilobed lower stem leaves.

The species, called the three-leaved coneflower, is native to the Eastern USA, where it grows in mesic to wet woodlands, thickets, pastures, roadsides, and meadows in the elevation range of 20–300 m (URBATSCH & COX, 2020). In Europe, it is cultivated as a short living ornamental, which occasionally escapes. This is well documented in Central Europe: Bavaria, Carinthia, Lower and Upper Austria, Salzburg, Styria and Vienna (FISCHER et al. 2008; GRIEBEL, 2020) and in Great Britain (CLEMENT & FOSTER, 1994). According to Euro+Med PlantBase (GREUTER, 2006+) for Great Britain and Austria it is classified as casual, for Germany, Hungary and Slovenia as introduced and for Ukraine as cultivated. Meanwhile, it was reported also for Montenegro (STEŠEVIĆ & JOVANOVIĆ, 2008), Romania (SIRBU & OPERA, 2010) and Bosnia and Herzegovina (MASLO & ŠARIĆ, 2018).

MATERIAL AND METHODS

During the various floristic surveys in the late summer of 2022 *R. triloba* was found at four localities outside cultivation. Digital photographs and GPS coordinates were taken in the field. Identification of specimens was made according to URBATSCH & COX (2020), JÄGER et al. (2008), JOGAN (2013) and MASLO & ŠARIĆ (2018). The nomenclature of plant taxa follows the Euro+Med PlantBase (2006+). The collected specimens were deposited in *Herbarium Croaticum* (ZA).

RESULTS AND DISCUSSION

Rudbeckia triloba (Fig. 1) was found at four localities, distant from each other, all situated in the continental part of Croatia (Fig. 2):

- 1) Korana Selo village at the edge of Plitvice Lakes National Park (August 11th 2022; 44° 55' 24.36'' N, 15° 36' 48.47'' E, leg. A. Alegro & V. Šegota). Several hundred individuals were growing on an abandoned arable field at the edge of the village covering ca. 500 m². The abundant presence of *Rubus caesius* L. and young shoots of *Cornus sanguinea* L. indicate that the field has been abandoned for several years. Other abundant species were *Pastinaca sativa* L., *Achillea millefolium* L., *Erigeron annuus* (L.) Desf., *Dactylis glomerata* L., *Artemisia vulgaris* L., *Carex hirta* L. and *Equisetum arvense* L. The field is situated near the Korana River, in a valley surrounded by hillsides, which ensures a cooler and moister microclimate, especially during the summer months. Individuals were up to 150 cm high and in full flower. This is the largest population found in Croatia. Interestingly, the species was not recorded as an ornamental in the village.



Fig. 1. *Rudbeckia triloba* L. in Korana Selo (A, D), Vukova Gorica (B) and Slivonja Jarek (C, E).

- 2) Vukova Gorica village in the western part of central Croatia (August 30th 2022; 45° 27' 02.83'' N, 15° 20' 41.06'' E, leg. A. Alegro). The species was found as an escapee alongside the road next to an abandoned house and inhabiting its yard as an ornamental, in both cases together with *Symphytotrichum novi-belgii* (L.) G. L. Nesom. During our visit, ca. 100 individuals were recorded over a linear distance of ca. 50 m. The species is not confined strictly to the road margin, but it penetrates the neighbouring grassland vegetation, which is irregularly mowed. The habitat is in full sun, relatively dry and on shallow soil. Individuals were up to 100 cm high and in full flower.
- 3) Vugrovec village in central Croatia (August 28th 2022; 45° 53' 10.9'' N, 16° 06' 41.6'' E, leg. J. Topić). One cluster of several individuals was found in a vineyard on the edge of the village. In a village yard 400 m away, the species is cultivated as an ornamental, so in this locality it is an obvious garden escapee.
- 4) Slivonja Jarek (2 km SE from Krapinske Toplice) in Northern Croatia (August 24th 2022; 46° 06' 31.36'' N, 15° 51' 13.68'' E, leg. Lj. Borovečki Voska). This locality is situated in a shady and wet gorge, with slopes overgrown with forest. Next to

the stream, there is a family house where several individuals of *R. triloba* grow in the yard, but many more have spread along the stream and the road on fresh, humus soil as part of nitrophilous, schiophilous ruderal vegetation. The plants have spread on a plot of ca. 200 m² with several old fruit trees alongside the road. So, also in this locality, the species could be considered a garden escapee. Some individuals were about 150 cm tall and in full flower. The vegetation is characterized by high number of alien species: *Conyza canadensis* (L.) Cronquist, *Duchesnea indica* (Andrews) Focke, *Echinocystis lobata* (Michx.) Torr. et A. Gray, *Erigeron annuus* (L.) Desf., *Galinsoga ciliata* (Raf.) S. F. Blake, *Helianthus tuberosus* L., *Impatiens balfourii* Hook. f., *Rudbeckia laciniata* L. and *Solidago gigantea* Aiton.

It is unknown when *R. triloba* was introduced to Croatia. The oldest but unpublished Croatian garden flora prepared by SCHLOSSER (1870-72) quotes *R. triloba* as a species introduced into Europe, but without any specific reference for Croatia. BIANKINI (1888) in the first Croatian garden manual did not mention *R. triloba*. However, it can be assumed it has been in cultivation for quite a long time, which is supported also by its occurrence in abandoned house. At the moment it can be considered as a casual alien or ephemrophyte present outside cultivation, more precisely a garden escapee. A similar situation can be found in neighbouring countries: Slovenia (JOGAN, 2013), Bosnia and Herzegovina (MASLO & ŠARIĆ, 2018), Montenegro (STEŠEVIĆ & JOVANOVIĆ, 2008) and Hungary (KIRÁLY *et al.*, 2009). To estimate its invasive potential in Croatia monitoring over several years is needed.

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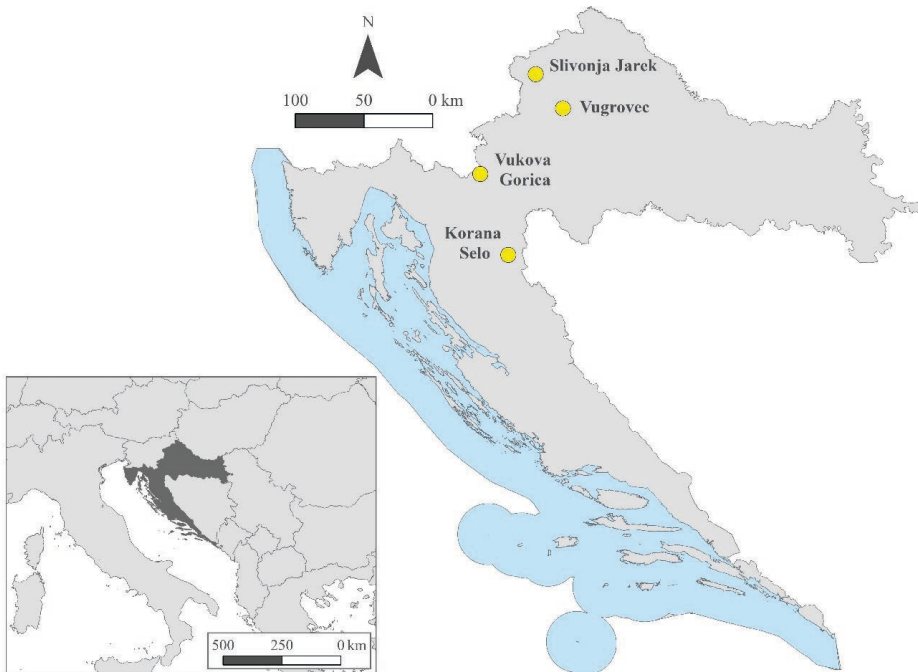


Fig. 2. Distribution of *Rudbeckia triloba* L. in Croatia.

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