



# *Convolvulus sabatius* subsp. *mauritanicus* (Boiss.) Murb. – just a new casual alien plant in Dalmatia or...?

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## Abstract

**Background and Purpose:** The genus *Convolvulus* (*Convolvulaceae*) is distributed worldwide. Several species are used as ornamental plants, and one of them is *C. sabatius*, a native species in Magreb (Africa) and Italy. For Croatia, it was reported just as a cultivated plant. After six years of continuous monitoring, we present here the first locality of its subspecies *C. sabatius* subsp. *mauritanicus*, outside of cultivation.

**Materials and Methods:** The floristic survey of the city of Kaštela was conducted during the summer of 2011 and 2016, and the site was geocoded by a GPS device. The population of the new alien *Convolvulus* taxon was continuously observed for six years.

**Results:** The new alien *Convolvulus* taxon was recorded in 2011 in the settlement Rudine of Kaštel Novi (Dalmatia), on an anthropogenic meadow. At first, it was determined as *C. sabatius*, and it was its first finding outside of cultivation. In 2016 the plant was more precisely determined as *C. sabatius* subsp. *mauritanicus*. From a few individuals observed in 2011, after six years the population of the new alien taxon enlarged its size, and in 2016 covers an area of approximately 6 m<sup>2</sup>.

**Conclusion:** Due to our observation that this plant on the surrounding areas of our locality Rudine is constantly planted, we assumed that *C. sabatius* subsp. *mauritanicus*, is just a casual alien plant. However, due to the enlargement of its population and weed „behaviour” in similar climatic areas of Europe and Australia, further monitoring of the locality is recommended, and possible eradication measures in the future, as well.

## INTRODUCTION

The cosmopolitan genus *Convolvulus* L. (*Convolvulaceae*) is distributed worldwide, on both the northern and southern hemispheres, and represented with approximately 200 taxa (1). The greatest diversity of the genus is in the Irano – Turanian and Mediterranean regions, with the largest number of species being found in Iran. The genus *Convolvulus* is generally of relatively small economic value (2), and just a few species are reported to have importance for grazing in desert conditions in Central Asia (3) and Arabia (4). Several species produce attractive flowers and are cultivated in suitable climates, and one of them is *C. sabatius* Viv. (Ground Morning Glory) (2), a native species of Magreb (northwest Africa) and Italy, popular for its beautiful funnel-shaped, violet-blue flowers (2).

In Croatian flora, seven taxa of the genus *Convolvulus* are presented (5). However, the alien plant *C. sabatius* is not among them, probably because it was reported once, just as a cultivated plant of the urban area of Omiš (6). Therefore, after six years of continuous monitoring, we present here the first locality of *C. sabatius* in Croatia outside of cultivation (the settlement Rudine of Kaštel Novi), with a precise plant description, taxonomical and distribution notes, habitat analysis and alien preferences.

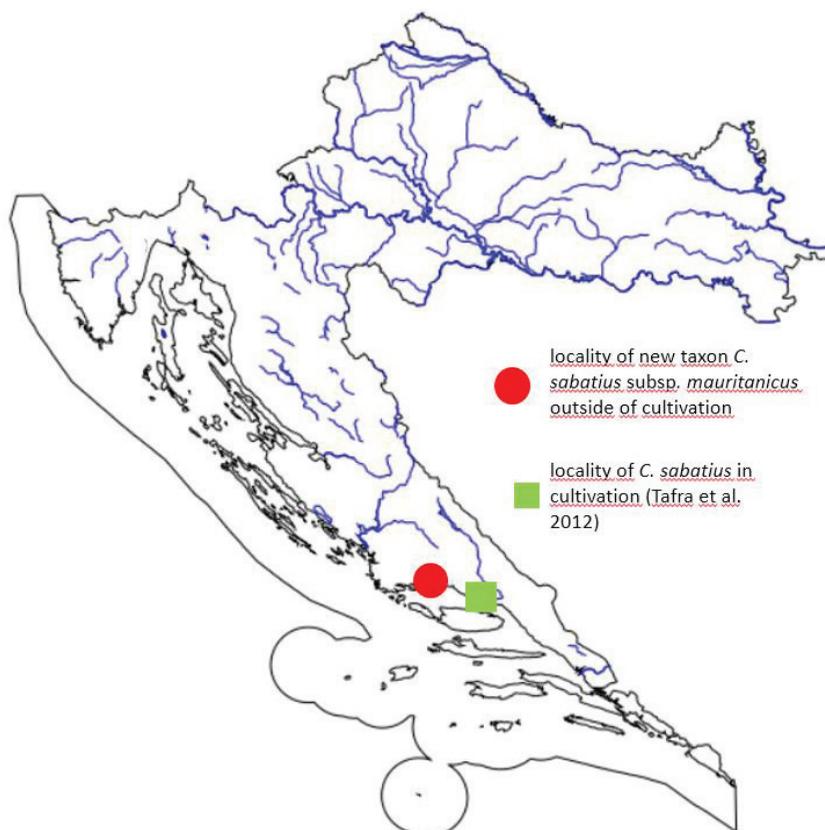
## MATERIAL AND METHODS

The floristic survey of the city of Kaštela was conducted during the summers of 2011 and 2016, and the site was geocoded by a GPS device. The population of the new alien *Convolvulus* taxon was observed continually for six years. Plant identifications were done by standard determination keys, e.g. Flora Europaea (7) and Flora d' Italia (8). However, more precise determination of the new *Convolvulus* taxon was performed in 2016, using the *Convolvulus* monograph (2), in which details about *C. sabatius* complex (1) were integrated. Plants that grew on the same site with the new taxon were also determined and quoted. The nomenclature of plant names follows the Flora Croatica Database (5). Collected plant specimens were deposited in the herbarium of the Natural History Museum Split (NHMS).

## RESULTS AND DISCUSSION

During the floristic survey of the Splitsko-dalmatinska County, conducted during the summer of 2011 in the city of Kaštela, in the settlement Rudine of Kaštel Novi, the small population of the new alien *Convolvulus* taxon was noted. At first, we determined it as *C. sabatius*. Before our finding, this alien species was reported just as an ornamental plant of the urban area of Omiš (6), without the ability to spread out. We recorded this species for the first time outside of cultivation. The coordinates of the site are 43° 33' 41" N and 16° 18' 43" E. A few individuals were observed in 2011, and since then the locality has been permanently monitored. After six years, during the early summer of 2016, the plants of *C. sabatius* were still growing, the population enlarged its size, and it now covers an area of approximately 6 m<sup>2</sup>. In 2016 the taxon was more precisely determined as *C. sabatius* subsp. *mauritanicus* (Boiss.) Murb. (Fig.1).

The plant is perennial, pubescent, with branched, woody stocks. Its flexuous stems are at least 10 cm long, and can sometimes reach up to 80 cm (7, 8). Leaves are orbicular to oblong, mostly 0.5–3 × 0.3–2.2 cm large (2) and abruptly narrowed into a distinct petiole. The lamina is cuneate to truncate at the base, 1–3 times as long as it is wide and 3–8 times as long as the petiole (7). Peduncles



**Figure 1.** Locations of *Convolvulus sabatius* in culture (Tafra et al. 2012) and of a new taxon *C. sabatius* subsp. *mauritanicus* outside of cultivation (our record).



**Figure 2.** *Convolvulus sabatius* subsp. *mauritanicus* on the meadow in the settlement Rudine of Kaštel Novi (Photo by D. Vladović).

are axillary, 0.5 to 3.5 cm long, 1-3 flowered in shortly pedunculate axillary dichasial cymes (2). Outer sepals are usually acute, inner usually acuminate, 5–7 × 2–2.5 mm large (7, 2). Corolla is mostly blue or pink-violet, 13-22 mm large. The blooming season is from April to June (8).

Although some authors considered the taxon *C. mauritanicus* Boiss. as a synonym of *C. sabatius* Viv. (9), Carine and Robba (1) distinguish two subspecies of the *C. sabatius* complex: *C. sabatius* subsp. *sabatius* and *C. sabatius* subsp. *mauritanicus* (Fig. 2).

The same taxonomy on the subspecies level is accepted by the World Checklist of Selected Plant Families (10)

and some other recent plant taxonomy bases, e.g. IOPI Global Plant Checklist (11) and GBIF Backbone Taxonomy (12), and was integrated in the monograph about the genus *Convolvulus* (2) as well. Those two subspecies are very similar in morphology and the most useful distinguishing features are hairs. Namely, in *C. sabatius* subsp. *sabatius* sepals are pubescent with appressed hairs and glabrous margins (2), while *C. sabatius* subsp. *mauritanicus* has prominent protruding hairs on the calyx and often also on the stem and leaves (Fig. 3).

The taxon *C. sabatius* subsp. *sabatius* naturally grows only in northwest Italy (10), or precisely on the Ligurian



**Figure 3.** *Convolvulus sabatius* subsp. *mauritanicus*: prominent protruding hairs on the stem, leaves, calyx and corolla (Photo by D. Hruševar).

coast (2, 13). However, as a cultivated plant it can be found escaped from cultivation in other parts of Italy, e.g. Lazio, Puglia and Sicily (13). The widely cultivated taxon *C. sabatius* subsp. *mauritanicus* is native in Algeria and Morocco (2), but it was also reported as an escaped plant in Sicily (2, 11), Australia (14), and Greece (15).

In natural habitats *C. sabatius* grows on dry, calcareous rocks, in Europe from the sea level up to 300 m a.s.l. (7, 8) and on Magreb (Northwest Africa) it can be found on high altitude, sometimes above 2300 m. a.s.l. (2). However, the Dalmatian population was found on the anthropogenic meadow where plants from the classes *Papavere-tea rhoeadis* S. Brullo et al. 2001 (syn. *Stellarietea mediae* R. Tx. et Preising in R. Tx. 1950) and *Artemisietea vulgaris* Lohm. et al. in R. Tx. 1950 prevail (cf. 16, 17). The taxon *Convolvulus sabatius* subsp. *mauritanicus* covers an area of approximately 6m<sup>2</sup>. Floristic composition of other accompanying plants on the researched habitat was represented by: (i) frequent taxa: *Cynodon dactylon* (L.) Pers., *Digitaria sanguinalis* (L.) Scop., *Cichorium intybus* L., *Lolium perenne* L., *Oxalis corniculata* L.; and (ii) less frequent and rare taxa: *Medicago lupulina* L., *Poa bulbosa* L., *Dactylis glomerata* L., *Sherardia arvensis* L., *Picris echioides* L., *Hedypnois cretica* (L.) Dum. Cours., *Taraxacum officinale* Weber, *Sonchus asper* (L.) Hill ssp. *glaucescens* (Jord.) Ball, *Reichardia picroides* (L.) Roth, *Pallenis spinosa* (L.) Cass., *Hypericum perforatum* L., *Ajuga chamaepitys* (L.) Schreb., *Anagallis arvensis* L., *Plantago lanceolata* L., *Diplotaxis tenuifolia* (L.) DC., *Avena barbata* Pott ex Link and *Torilis nodosa* (L.) Gaertn.

Due to our observation that this plant on the surrounding inhabited areas is constantly growing, and according to the definitions for alien flora (18), we assumed that *C. sabatius* subsp. *mauritanicus*, observed for the first time in the flora of Croatia, is just a casual alien plant, depending on the cultivation in the nearest settlement. However, due to the enlargement of its population and weed „behaviour” in similar climatic areas of Australia and Europe, it might become the first established population in Dalmatia. Namely, species *C. sabatius* (regardless of subspecies taxonomical level) has been recorded as weed, escaping from cultivation in Australia (14), and as naturalized alien plant in Greece (15), which has, at least partly, similar climatic conditions as Dalmatia. So, our caution is needed and further monitoring of the locality is recommended, and possible eradication measures in the future, as well.

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