ACTA BOTANICA CROATICA

CODEN: ABCRA 25
ISSN 0365-0588
eISSN 1847-8476

ACCEPTED AUTHOR'S VERSION OF THE MANUSCRIPT

Stachys ocymastrum (Lamiaceae) - a new plant species in Croatia

DOI 10.37427/botcro-2025-021

Paper published on the occasion of the 100th anniversary of Acta Botanica Croatica

Dragica Purger[1], Jenő J. Purger[2], Marija Pandža[3], Nenad Jasprica[4]

[1] University of Pécs, Faculty of Pharmacy, Institute of Pharmacognosy, Rókus str. 6, HU-7624 Pécs, Hungary
[2] University of Pécs, Faculty of Sciences, Institute of Biology, Ifjúság str. 6, HU-7624 Pécs, Hungary
[3] Stjepan Radić St. 30, HR-22240 Tisno, Croatia
[4] University of Dubrovnik, Institute for Marine and Coastal Research, Dubrovnik, Kneza Damjana Jude 12, HR-20000 Dubrovnik, Croatia

Please cite this article as: Purger, D., Purger, J.J., Pandža, M., Jasprica, N. *Stachys ocymastrum* (Lamiaceae) - a new plant species in Croatia. Acta Botanica Croatica, DOI: 10.37427/botcro-2025-021.

Short communication

Stachys ocymastrum (Lamiaceae) - a new plant species in Croatia

Dragica Purger[1*], Jenő J. Purger[2], Marija Pandža[3], Nenad Jasprica[4]

[1] University of Pécs, Faculty of Pharmacy, Institute of Pharmacognosy, Rókus str. 6, HU-7624 Pécs, Hungary
[2] University of Pécs, Faculty of Sciences, Institute of Biology, Ifjúság str. 6, HU-7624 Pécs, Hungary
[3] Stjepan Radić St. 30, HR-22240 Tisno, Croatia
[4] University of Dubrovnik, Institute for Marine and Coastal Research, Dubrovnik, Kneza Damjana Jude 12, HR-20000 Dubrovnik, Croatia

* Corresponding author e-mail: dragica@gamma.ttk.pte.hu

Running title: *STACHYS OCYMASTRUM* IN CROATIA

Abstract – *Stachys ocymastrum* (L.) Briq. (Lamiaceae) is an annual species native to the Western Mediterranean. During fieldwork, it was found in a ruderal site in the village of Veli Iž on the island of Iž (Zadar archipelago, Croatia) in May 2024. Since there are no earlier records of this species in Croatia, it should be considered a new taxon of this country's flora and included in the current *Flora Croatica Database*. Additionally, this study reports *S. ocymastrum* for the first time on the eastern part of the Adriatic Basin.

Keywords: Dalmatia, Eastern Adriatic, island, Italian hedge nettle, vascular flora

Introduction

The genus *Stachys* is one of largest genera of Lamiaceae and includes 372 accepted species (POWO 2024). It is distributed mainly in the Mediterranean area and Southwest Asia, in North America, South America and southern Africa (Bhattacharjee 1980, Tundis et al. 2014, Salmaki et al. 2019). For the Euro-Mediterranean region 153 species of the *Stachys* genus have been listed (Euro+Med 2006-2024). They have different plant life forms, e.g. annual and perennial herbs and subshrubs (Bhattacharjee 1980).

The Italian hedge nettle, *Stachys ocymastrum* (L.) Briq. (syn.: *Galeopsis hirsuta* L., *Sideritis ocymastrum* L.) is an annual plant distributed in the western part of the Mediterranean region, i.e. is native to Portugal, Spain, the Balearic Islands, France including Corsica, Italy including Sardinia, Sicily, Malta, Greece including Crete, Morocco, Algeria, Tunisia, Libya, Madeira and the Canary Islands, as well as Lebanon and it is introduced to North America (New Jersey) (Hassler 1994-2024, POWO 2024).

Stachys ocymastrum is a scapose therophyte with an erect shoot (12-70 cm high) and simple or branched stems. The entire plant is covered with long silky, shiny hairs, with the indumentum consisting of both glandular and non-glandular trichomes. Leaves are from 1.6-6.5 cm long and 1.4-5 cm wide, oblong-ovate to broadly ovate, obtuse, and slightly cordate at base, with crenate-serrate margin. The leaves are opposite; the basal ones have a long (1.7-5.5 cm) petiole. The inflorescence consists of 4-18 verticillasters, with 2-6 flowers each, below rather remote but usually crowded above. Bracts are ovate (0.8-1.9 cm long and 0.4-1.1 cm wide) sessile, the upper ones entire, densely hairy on the margin; flowers have 1-1.5 mm long pedicel. Calyx is 8-12 mm long, hirsute, campanulate, with equal teeth (5-7 mm), as long as, or

slightly longer than the tube, long pointed, almost spiny, with yellow apices. Corolla is up to 16 mm long, white. Upper lip 4-8 mm long, bifid, its lobes 2–3 mm long, erect; lower lip with a large central lobe of 5-8 × 2.5-5.5 mm, spatulate, pale yellow with violet pattern. Stamens exserted from the tube, with thecae aligned with the filament. Mericarps 1.5-2 mm, smooth to warty, grey, or dark brown (Ball 1972, Morales and Pardo de Santayana 2010, Martin Mosquero et al. 2000).

According to the Flora Croatica Database (FCD, Nikolić 2024), 18 *Stachys* species and 9 subspecies currently occur in Croatia. The presence of *S. ocymastrum* has never been reported for the country, including the eastern coast and islands of the Adriatic Sea. Here we present the first record of *S. ocymastrum* for Croatia, discovered during fieldwork on the island of Iž in the Middle Adriatic (Dalmatia).

Materials and methods

The plant occurrence was documented with geographic coordinates, photographs as well as with herbarium sheets. Herbarium specimens were collected on 9 May 2024, and a voucher specimen was deposited in the Herbarium of the Faculty of Agronomy in Zagreb (ZAGR). For the identification we used Flora Europaea (Ball 1972), Flora d'Italia (Pignatti et al. 2017-2019) and Flora Croatica (Nikolić 2019).

Study area

The island of Iž is situated in the Zadar archipelago, surrounded by the islands of Ugljan, Rava and Dugi Otok (Fig. 1). It is 12.3 km long and up to 2.6 km wide, with an area of 16.51 km^2 and a coastline length of 35.22 km (Duplančić Leder et al. 2004). The main soil types are *terra rossa* developed above limestone and sandy soils developed on the dolomite substrate. The island has a typical Mediterranean climate: a moderately warm rainy winter climate with a dry warm summer. The annual average temperature is 15 °C and the annual average precipitation is 880 mm (Zaninović et al. 2008). According to Köppen's climate classification, the island lies within the Mediterranean climate zone of *Csa*-type, with hot-summers and mild winters (Köppen and Geiger 1954). According to the 2021 census, the island has 516 permanent residents, living in two settlements: Mali Iž and Veli Iž (Croatian Bureau of Statistics 2024). The island is a popular tourist destination in the summer.

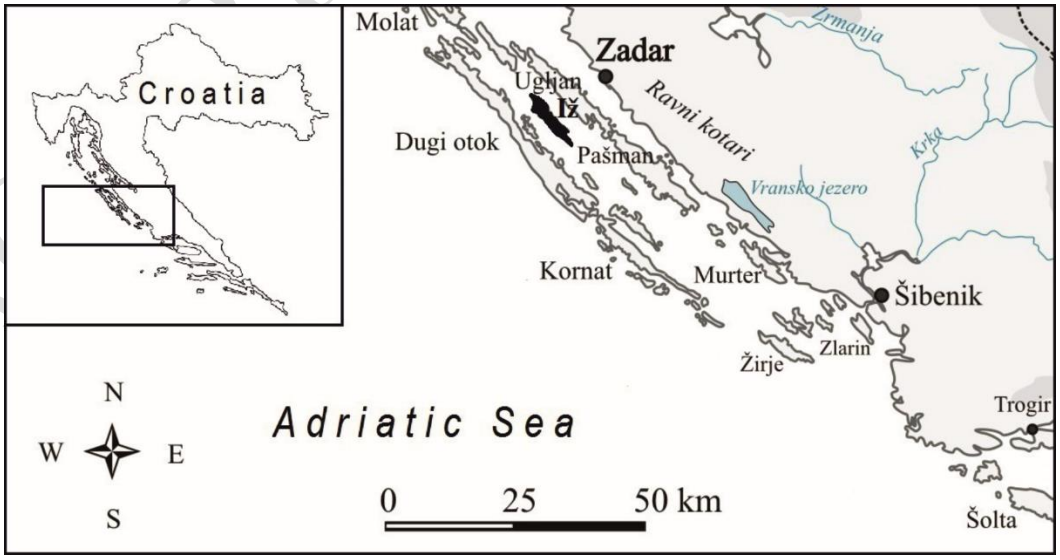

Fig. 1. The location of the island of Iž in the Zadar archipelago, Middle Adriatic (Dalmatia).

Results and discussion

During our fieldwork on the island of Iž, plant specimens were collected and identified as *Stachys ocymastrum* (Fig. 2). It was found as follows: Croatia, northern Dalmatia, Zadar County, Island of Iž, Veli Iž village, main street (riva), 44.051767 N, 15.109506 E, elevation 1 m, 9 May 2024, leg. et det. D. Purger, herbarium ID number: ZAGR-79697. The population consisted of six individuals in the late stages of blooming (Fig. 2A). The morphological features of the plants corresponded to the description in the literature (Ball 1972, Morales and Pardo-de-Santayana 2010, Martin Mosquero et al. 2000).

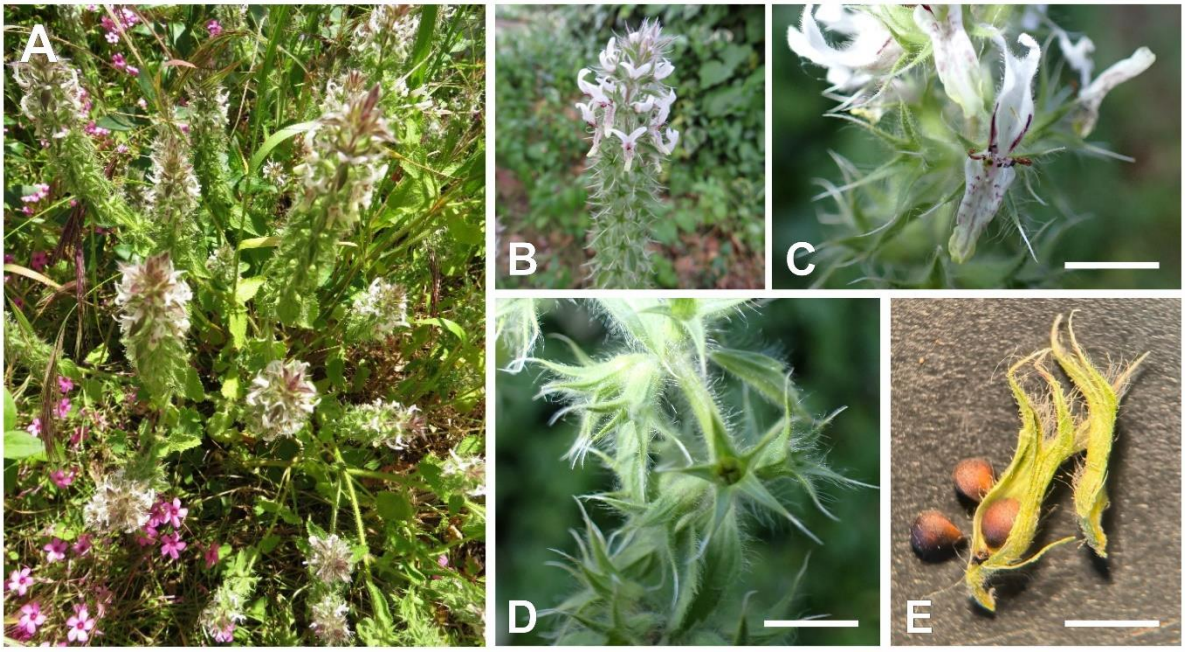

Fig. 2. *Stachys ocymastrum* in the Veli Iž village, the island of Iž, Zadar County, northern Dalmatia, Croatia. A – habitus, B – inflorescence, C – flower with a bifid erect upper lip and a violet pattern on the lower lip, D – calyx, E –mericarps and calyx. Scale bar: 5 mm (photos: A, B, E – D. Purger; C, D – M. Pandža).

The plants were growing over a total area of about 20 m^2 in grassland surrounded by shrubs near the path in the main street of the village of Veli Iž, maintained as the village's green area. In the immediate surroundings, *Oxalis articulata* Savigny, *Bromus sterilis* L. and *Geranium molle* L. were recorded. According to the first observations about circumstances on the field, we consider the occurrence of the species native. Nevertheless, the possibility that it is the result of recent introduction cannot be excluded, since the plants were discovered at a ruderal site in the village's main street, frequently visited by tourists. Indeed, the species occupies similar ruderal habitats and, in general, it is not frequent and abundant in its natural habitats. In its entire distribution area, *S. ocymastrum* is found from sea level up to lower mountains (up to 1000 m a.s.l.), along paths and roadsides, bordering paths, in grasslands, and scrublands. It grows on nutrient-rich soils and base-rich rocks, it is edaphic indifferent (Morales and Pardo-de-Santayana 2010, Acta plantarum 2024). In Spain and Italy, *S. ocymastrum* grows in dry and hot rocky places, mostly within dry grasslands and ruderal vegetation (Martin Mosquero et al. 2000, Biondi et al. 2012, Pignatti et al. 2017-2019). In the suburban environments of southern Italy, it is found within the vegetation of the *Chenopodietea* class (Laface et al. 2022). It is also found in the evergreen Mediterranean cork-oak forests (Wojterski 1990), in both human-influenced and natural Mediterranean grasslands, e.g. grasslands

dominated by *Asphodelus ramosus* L. (Zangari et al. 2023), as well as in agricultural land (e.g. in olive groves, Borkowsky 1994). *Stachys ocymastrum* flowers from February to June, rarely to July (Morales and Pardo-de-Santayana 2010). No estimation about status in its global range, but in Spain, this species is not rare; it belongs to the LC (Least concern) IUCN Category (Anonymous 2024).

Our find is the first record of *S. ocymastrum* on the eastern coast and islands of the Adriatic Sea. The northeastern limit of the distribution of this predominantly western Mediterranean species stretches to Italy (Pignatti et al. 2017-2019). The population recorded in this study is located between those reported from the province of Ancona in the central Adriatic side of the Italian peninsula (Biondi et al. 2012) and Ionian Islands (Greece) in the south (Borkowsky 1994). Since our survey was conducted on a botanically unexplored small island, this record reflects the lack of sufficient research on the Adriatic islands to date and highlights the need for further field surveys, which are essential for determining the actual distribution and ecology of *S. ocymastrum* in the eastern part of the Adriatic Basin.

Acknowledgments

The authors have contributed to the special issue of Acta Botanica Croatica on the occasion of its 100th anniversary issue.

Two anonymous reviewers are thanked for their helpful suggestions. Special thanks to Mr. Robert Strgačić for his hospitality during the fieldwork on Iž Island.

Author contribution statement

DP and JJP conceived the floristic study on the island of Iž, DP and MP collected and identified of plant samples, DP and NJ wrote the manuscript. All authors critically revised and approved its final version.

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