

New localities of Thomas's saffron, autumn-flowering crocus (*Crocus thomasi* Ten., Iridaceae) in Bosnia and Herzegovina

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Crocus thomasi is a rare species in the vascular flora of Bosnia and Herzegovina, with a single location in southwestern Herzegovina. Two additional locations of *C. thomasi* were found in southwestern Herzegovina, but we have been unable to confirm the first finding by Fiala (1889). Occurring in so few populations, *C. thomasi* should be considered as endangered in Bosnia and Herzegovina. However, further data on its true distribution and population size, fluctuations and trends are required for a full assessment.

Key words: Bosnia and Herzegovina, distribution, *Crocus*, flora.

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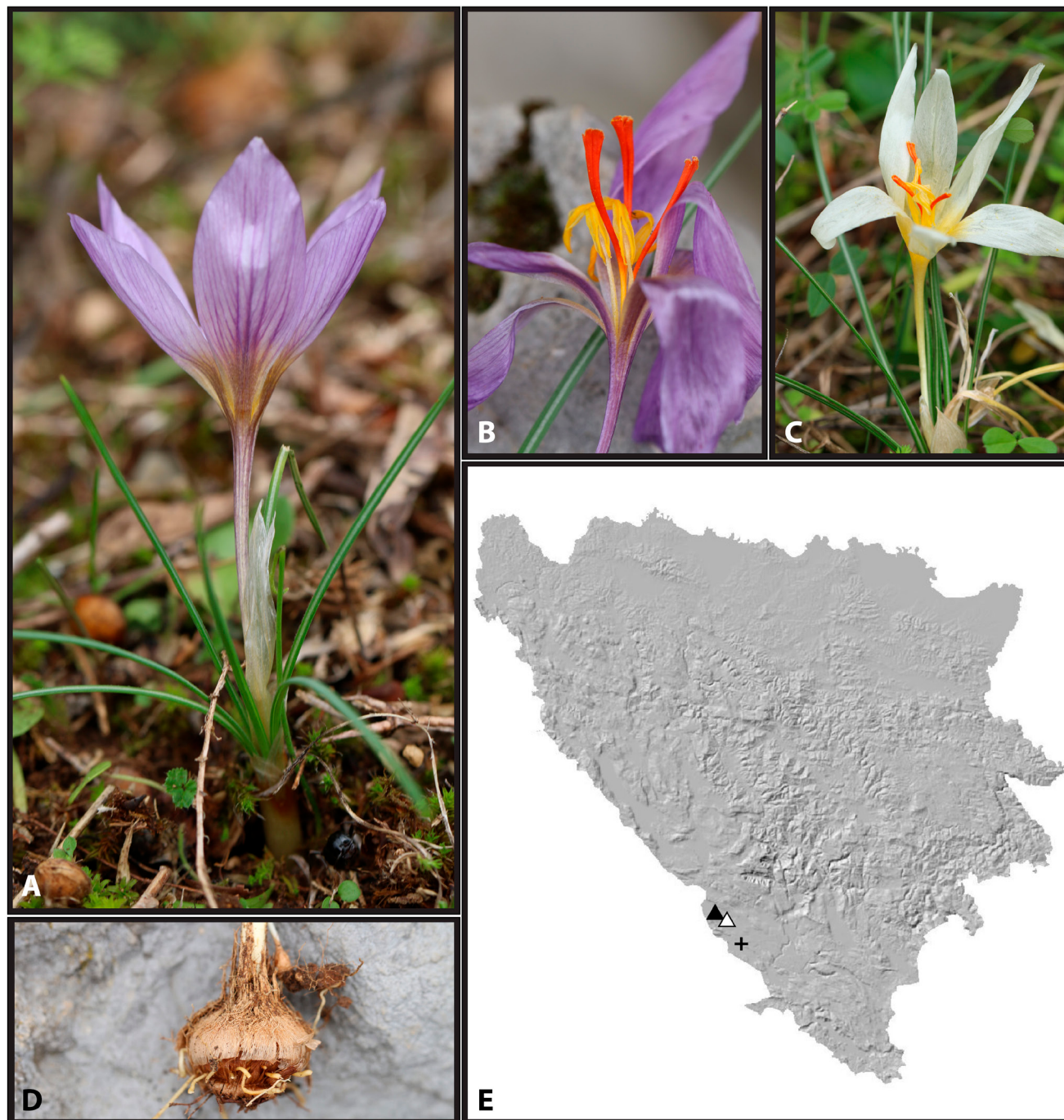


Figure 1. *Crocus thomasi* (a); details of filaments, anthers and stylus (b); pale yellow flowered individual (c); corm of *C. thomasi* (d); distribution of new populations (▲) and putative location of Fiala's site (+) (e)

INTRODUCTION

The Balkan peninsula represents one of the diversity hotspots for the genus *Crocus* L. (Mathew, 1980, 1982, Randelović et al., 1990, Petersen et al., 2008, Harpke et al., 2013, 2015). Bosnia and Herzegovina, as a part of the Western Balkans, hosts c. 11 taxa of the genus (Beck, 1903; Ritter, 1967). Current knowledge of this genus in Bosnia and Herzegovina is far from complete, and revision is necessary to bring it in line with recent taxonomic and nomenclature

schemes (Petersen et al., 2008, Harpke et al., 2013, 2015; Barker, 2016). While certain species are common, with a wide geographic distribution, others are restricted to a single occurrence (Beck, 1903; Ritter, 1967) and constitute botanical curiosities in the vascular flora of Bosnia and Herzegovina.

Crocus thomasi Ten. (= *C. odoratus* Visiani, *C. pallasi* auct. non. Goldb. nec Gris., *C. thomasi* Herb., *C. visianicus* Herb.) has its distribution in southern Italy, Croatia (Dalmatia) and Bosnia and Herzegovina (Herzegovina) (Pulević, 1976, 1978,

Milović, 2015, 2016). It mostly grows on grasslands and rocky habitats in the epimediterranean and submediterranean region (Pulević, 1977; Milović, 2015). There is a single record of this species for Bosnia and Herzegovina, collected by Franjo Fiala (1889) in the Ljubuški area. The specimens of *Crocus thomasi* were deposited in the Herbarium of National Museum of Bosnia and Herzegovina in Sarajevo (SARA), and since then no record of the species has been documented. However, Fiala designated this specimen as *C. pallasi* Goldbl. (Beck, 1903), which is a valid name for populations from the eastern Balkans (Brighton et al. 1977; Pulević, 1977; Barker, 2016). Given the occurrence of *C. thomasi* in the vascular flora of Bosnia and Herzegovina, its status on the Red List of FBiH (Đug et al., 2013) should be reviewed. This paper documents new sites of *C. thomasi* and proposes a preliminary assessment of its conservation status based on the observed data on its habitats.

MATERIAL AND METHODS

The study was based on a field survey in southwestern Herzegovina (the wider area of Ljubuški and Grude) designed to find the locality reported by Franjo Fiala. The geographic coordinates and altitude of the locations were recorded by GPS mobile device (MobilMapper 20). The geographic distribution of the populations was mapped in QGIS ver. 2.14. In addition, the number of individuals, the area of occupancy of the populations and potential threats were estimated for preliminary assessment.

Identification of the species was based on existing floristic descriptions and determination keys (Mathew, 1980; Pulević, 1977; Pignatti, 1982; Milović, 2016). The material was checked in the Herbarium, while taxonomy and nomenclature followed Barker (2016). The collected specimens were dried and deposited in the Herbarium of National Museum of Bosnia and Herzegovina in Sarajevo (SARA).

RESULTS AND DISCUSSION

Two new populations of *C. thomasi* were found in southwestern Herzegovina (Fig. 1a - e): Drinovci (43,361332 N, 17,298226 E, alt. 266 m a.s.l., 3rd November 2017) and Blaževići (43,377576 N and 17,346702 E, alt. 261 m a.s.l., 3rd November 2017). As well as the typical blue-violet flowered plants (1a, b), individuals with pale yellow perigons were observed (Fig. 1c).

The species occurs in submediterranean rocky grasslands and meadows (*Scorzonera villosae* – *Chrysopogon etalia grylli* Horvatić et Horvat in Horvatić 1963). Despite a thorough field survey of the wider area of Ljubuški, we were unable to confirm the finding by Fiala (1889). Several reasons might explain the failure to confirm *C. thomasi*. The

most plausible explanation is loss of habitat due to intensive urbanisation and the conversion of natural grasslands to farming lands, which was very intense in that region for more than a century (Đikić, 1957). At the same time, those habitats may be converted to different succession stages of forest vegetation, which is an unfavourable habitat for the species. There is also the simple possibility that the precise microsite was not found.

The area of occupancy in the Drinovci site is about 1 ha, and in Blaževići c. 0.5 ha. The number of mature individuals in the former population is estimated to be 2500 (possibly ranging from 2000 – 3000), and the latter 750 (ranging from 500 – 1000), based on detailed inventories. Currently there is no available information on threats to these two populations. With so few populations of *C. thomasi*, the species should be considered as endangered in the updated version of the Red List of FBiH. Following the criteria of IUCN (2012), this crocus should be designated as Endangered, corresponding to criterion C1 (the population size is estimated to be < 10 000 mature individuals) and D2 (the area of occupancy is very restricted, typically < 20 km², or existing at typically five or fewer locations). Certainly more information is needed on the species' true distribution in Bosnia and Herzegovina, and data on population size, fluctuations and trends are required for the full assessment. In neighbouring Croatia Thomasi's saffron is widespread and considered not endangered on the national Red List (Milović 2015, 2016), but it is strictly protected (Anonymous, 2008).

CONCLUSION

Crocus thomasi is a rare species in the vascular flora of Bosnia and Herzegovina, distributed in the country's sub-mediterranean region. As a such, it should be treated as an endangered taxon in Bosnia and Herzegovina in the future. However, detailed floristic investigation of the species is required to estimate its true distribution, population size, fluctuations and trends.

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BIBLIOGRAPHY

- Anonymous** 2008. Zakon o zaštiti prirode. Narodne novine, 70/05 i 139/08). Državni zavod za zaštitu prirode, Zagreb.
- Barker C.** 2016. World Checklist of Iridaceae. Facilitated by the Royal Botanic Gardens, Kew. <http://apps.kew.org/wcsp/> (accessed 15. 01. 2018.).
- Beck Mannagetta G.** 1903. Flora Bosne, Hercegovine i novopazarskog sandžaka. I. dio: Gymnospermae i Monocotyledones. Glasnik Zemaljskog muzeja u Bosni i Hercegovini, XV: 217 - 218.
- Brighton C. A.** 1977. Cytology of *Crocus sativus* and its allies (Iridaceae). Plant Systematics and Evolution, 128: 137-57.
- Đikić S.** 1957. Historijski razvoj devastacije i degradacije krša u Bosni i Hercegovini. Krš Bosne i Hercegovine, Savezno savjetovanje o kršu, knjiga 3, Split, pp. 137.
- Đug S., Muratović E., Drešković N., Boškailo A., Dudević S.** 2013. *Crvena lista flore Federacije BiH, knjiga 2*. Federalno ministarstvo okoliša i turizma, Sarajevo.
- Harpke D., Meng S., Rutten T., Kerndorff H., Blattner F. R.** 2013. Phylogeny of *Crocus* (Iridaceae) based on one chloroplast and two nuclear loci: Ancient hybridization and chromosome number evolution. Molecular Phylogenetics and Evolution 66: 617-627.
- Harpke D., Carta A., Tomović G., Randelović V., Randelović N., Peruzzi L.** 2015. Phylogeny, karyotype evolution and taxonomy of *Crocus* series *Verni* (Iridaceae). Plant Systematics and Evolution 301: 309-325.
- IUCN** 2012. Guidelines for Application of IUCN Red List Criteria at Regional and National Levels: Version 4.0. Gland, Switzerland and Cambridge, UK: IUCN. iii + 41pp.
- Mathew B. F.** 1980. *Crocus* L. In: Tutin T. G., Heywood V. H., Burges N. A., Moore D. M., Valentine D. H., Walters S. M., Webb D. A. (Eds.): *Flora Europaea*, Vol. 5, Cambridge University Press, Cambridge, 92-99.
- Mathew, B. F.** (1982): The *Crocus*, a revision of the genus *Crocus* (Iridaceae). B. T. Batsford Ltd., London.
- Milović M.** 2015. *Crocus* L. In: Nikolić T., Milović M., Jasprica N., Bogdanović S. (Eds.), *Endemi u hrvatskoj flori*, Alfa d.d., Zagreb, pp. 197 – 207.
- Milović M.** 2016. Rod *Crocus* L. (Iridaceae) u flori Hrvatske. Glasnik Botaničkog društva, 4(2): 4 – 20.
- Petersen G., Seberg O., Thorsoe S., Jorgensen T., Mathew B.** 2008. A phylogeny of the genus *Crocus* (Iridaceae) based on sequence data from five plastid regions. Taxon 57(2): 487-499.
- Pignatti S.** 1982. *Flora d'Italia III*. Edagricole, Bologna, pp: 419 - 423.
- Pulević V.** 1977. Revizija genusa *Crocus* L. u Jugoslaviji. Doktorska disertacija, Biotehniška Univerza v Ljubljani, Ljubljana – Titograd, pp. 1 – 129.
- Pulević V.** 1978. *Crocus thomasi* Ten. i *Crocus pallasii* Goldb. u flori Jugoslavije. Glasnik Republičkog zavoda za zaštitu Prirode - Prirodnjačkog muzeja Titograd, 11: 133 - 138.
- Ritter H.** 1967. *Crocus chrysanthus*, in SARA Herbarium
- Kerndorff H., Pasche E., Harpke D.** 2015. The genus *Crocus* (Liliiflorae, Iridaceae): lifecycle, morphology, phenotypic characteristics, and taxonomical relevant parameters. Stapfia, 103: 27-65.

SAŽETAK

Crocus thomasi predstavlja rijetku vrstu u bosanskohercegovačkoj flori sa jednim registriranim lokalitetom u jugozapadnoj Hercegovini. Pronađena su još dva nova lokaliteta, također, na području jugozapadne Hercegovine, ali nismo mogli potvrditi prvi nalaz ove vrste (Fiala, 1889). S obzirom na postojeći broj populacija, *C. thomasi* bi trebao imati status ugrožene vrste u Bosni i Hercegovini. Svakako su neophodna dodatna istraživanja koja će utvrditi stvarnu distribuciju, veličinu, fluktuaciju i trendove populacija za punu procjenu ugroženosti.

Ključne riječi: Bosna i Hercegovina, *Crocus*, distribucija, flora.