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New floristic data of vascular plants from Bosnia and Herzegovina

Semir Maslo¹

prethodno priopćenje (preliminary communication)

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Abstract

Based on the field, herbarium and bibliographic research, I report distributional data for four rare plant taxa native for the sub-Mediterranean region of Bosnia and Herzegovina. It includes new records and confirmations for taxa in the genera *Campanula*, *Cardamine*, *Pisum* and *Teucrium*. New localities for *Campanula portenschlagiana* and *Cardamine fialae* are listed and the presence of two taxa *Pisum sativum* subsp. *elatius* and *Teucrium flavum* are confirmed for the country. In addition, a brief morphological description and photographs of these taxa are presented. The special attention was paid to the conservation categories of these taxa. *C. portenschlagiana* and *C. fialae* should be placed in the endangered category (VU) in Bosnia and Herzegovina, while *P. sativum* subsp. *elatius* and *T. flavum* should be classified under the Data Deficient category (DD).

Key words: Bosnia and Herzegovina, *Campanula*, *Cardamine*, distribution, *Pisum*, *Teucrium*, rare taxa.

Introduction

Campanula portenschlagiana Schult.

The genus *Campanula* L. is a genus of 350 to 450 species mainly distributed in the temperate and subtropical zones of the northern hemisphere, of which approximately 200 to 250 species and subspecies have been listed for Europe (Kovačić, 2004). About 30 species of the genus *Campanula* have been recorded in the flora of Bosnia and Herzegovina (Bjelčić, 1983, Šoljan, 2001 and Maslo and Boškailo, 2015).

Campanula portenschlagiana Schult. in Roemer & Schultes, Syst. Veg. 5: 93. 1819 (Figure 1a) is the Eastern Adriatic endemic species, distributed only in Bosnia and Herzegovina and Croatia (Nikolić et al., 2015). The species has limited distribution in Bosnia and Herzegovina; its habitats are located only in the sub-Mediterranean part of the country, in fragmented population in SW Herzegovina.

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² Maslo, S. (2023). New floristic data of vascular plants from Bosnia and Herzegovina. *Glasilo Future*, 6(5-6), 65–81.

In the Herbarium of the National Museum of Bosnia and Herzegovina (SARA), only five specimens of *C. portenschlagiana* are stored. Four specimens were collected by Fiala, in the area of Ljubuški, between 1890 and 1897. One specimen was collected by Šoljan in 1986 on the locality Peć Mlini. On the other hand, one specimen of the species was deposited in the ZAGR herbarium (collected by Bogdanović in 2012 on Fortress of Herceg Stjepan Kosača, near Ljubuški). (Table 2.). Sagorski's alleged finding for the area of Mostar is certainly wrong and probably refers to the species *Campanula hercegovina* Degen & Fiala which was recorded in the Neretva River canyon north of Mostar. "*Campanula Portenschlagiana* R. et S. Syst. veg. 5. p 93. A specimen in a rock crevice in a grotto formation on the banks of the Narenta north of Mostar, approx. 70 m" (Sagorski, 1901). More information on distribution as well as ecological-morphological differentiation of the species' populations can be found in Šoljan (1987, 1990, 2001).

Cardamine fialae Fritsch

The genus *Cardamine* L. is a genus of approximately 200 species, of which ca. 54 taxa are listed for Europe (Kučera et al., 2005, 2010). In the flora of Bosnia and Herzegovina, ca. 20 species of the genus *Cardamine* have been recorded (Beck-Mannagetta, 1916). *Cardamine fialae* Fritsch belongs to the *C. maritima* complex, which includes seven endemic species, four of which are represented in Bosnia and Herzegovina: *C. maritima* Port. ex DC., *C. serbica* Pančić, *C. fialae* Fritsch, and *C. rupestris* (O.E. Schulz) K. Malý (Kučera et al., 2010).

Cardamine fialae Fritsch in Oesterr. Bot. Z. 47: 44. 1897 (syn. *Cardamine maritima* var. *fialae* (Fritsch) Sagorski, *Cardamine maritima* subsp. *fialae* (Fritsch) Trinajstić) (Figure 1 b) is Adriatic endemic species, distributed only in Bosnia and Herzegovina and Croatia. *C. fialae* has long been known as a narrow endemic species of the Ljubuški district in Bosnia and Herzegovina, where it was collected by Fiala back in 1892 (Two specimen from the actual locality were stored in the Herbarium GZU of the University of Graz like Isotypus) (Figure 2). Only recently it was also recorded as a new endemic species in neighboring Croatia, in the vicinity of Vrgorac, about ten kilometers distance from the *locus classicus* near Klobuk, Herzegovina (Vukojević et al., 2016, Vitasović Kosić et al., 2020). The species has limited distribution in Bosnia and Herzegovina; its habitats are located only in the sub-Mediterranean part of the country, in a fragmented population in SW Herzegovina. Only one specimen of *C. fialae* is stored in the Herbarium of the National Museum of Bosnia and Herzegovina (SARA). It was collected by Šilić in 1978 in the vicinity of Klobuk near Vitina. On the other hand, three specimens of the species were deposited in the SAV herbarium (collected by Kučera & Kolnik in 2003 near Grude and Ljubuški) (Table 2).

Pisum sativum subsp. *elatius* (M. Bieb.) Asch. & Graebn.

The genus *Pisum* L. contains only two species, Eastern Mediterranean *Pisum fulvum* Sm. and *Pisum sativum* L. The latter is divided into two subspecies: the domesticated pea *P. sativum* L. subsp. *sativum*, and wild taxon *P. sativum* subsp. *elatius* (M. Bieb.) Asch. & Graebn.

Pisum sativum subsp. *elatius* (M. Bieb.) Asch. & Graebn., Syn. Mitteleur. Fl. 6(2): 1064. 1910 (syn. *Pisum elatius* M. Bieb., *Pisum biflorum* Raf., *Pisum humile* Boiss. & Noë) (Figure 7 a) belongs to steno-Mediterranean floral element (Pignatti, 1982) and its native distribution range is from the Iberian Peninsula in the west, throughout France, Italy and the Balkans, to the eastern Mediterranean countries, and in the north of Africa. *P. sativum* subsp. *elatius* occurs throughout the Balkan Peninsula (Kosterin, 2023). According to the same author, the wild pea has not been reported from Bosnia and Herzegovina, although it is highly expectable from there.

Teucrium flavum L.

Teucrium L. (Lamiaceae Martinov) is a cosmopolitan genus of about 250 species distributed from the Mediterranean region to Australia, America, SE Asia and Japan. (Navarro, 2010). It is represented by ca. 195 taxa in the Euro-Mediterranean region (EURO+MED, 2006). In the flora of Bosnia and Herzegovina, eight species of the genus *Teucrium* have been recorded (Beck-Mannagetta and Malý, 1950).

Teucrium flavum L., Sp. Pl.: 565. 1753 (syn. *Chamaedrys flava* (L.) Moench) (Figure 7 b) belongs to steno-Mediterranean floral element (Pignatti, 1982) and its native distribution range is from Spain in the west, across France, Italy and the Balkans, to Turkey in the east, and in the north of Africa in Algeria, Tunisia and Morocco (EURO+MED, 2006). It grows mostly on rocks and stony slopes, 0 and 300 m. Up to date, *T. flavum* was reported in the Balkans in Albania (Barina et al. 2018), Bosnia and Herzegovina (Pichler, 1898/9), Croatia (Nikolić, 2005-onwards), Greece (Dimopoulos et al., 2013), Montenegro (Lakušić et al., 2005, 2010), and Slovenia (Ravnik, 1999).

Table 1. First literature and herbarium records

Taxon	Literature records	Herbarium records
<i>Campanula portenschlagiana</i>	Ljubuški, Vitina and Klobuk, Fiala 1893	Ljubuški, leg. Fiala 06.1890 (SARA 40217), Klobuk, leg. Fiala 06.1890
<i>Cardamine fialae</i> Fritsch	Ljubuški, Klobuk, Fritsch 1897	Ljubuški, Klobuk, leg. Fiala as <i>C. maritima</i> Port., rev. Fritsch 1897,
<i>Pisum sativum</i> subsp. <i>elatius</i> (M. Bieb.)	Mostar, Vrelo Radobolje, Malý 1908	Neum, Kiševo, leg. Maslo 15.04.2022 (SARA 53228)
<i>Teucrium flavum</i> L.	Mostar, Pichler 1898/9	Ravlića cave near Drinovci, leg. Maslo 11.04.2023 (SARA 53737)



Figure 1. *a. Campanula portenschlagiana b. Cardamine fialae* in the crevices of the rocks at the entrance to the Ravlića cave near Drinovci (Photos S. Maslo)

Material and methods

The study was carried through field studies in SW Herzegovina conducted between 2016 and 2023, analysis of herbarium material deposited at SARA and ZAGR (Thiers, 2023), as well as literature data. The specimens were collected and stored in the Herbarium SARA and in the private collection of the author. Digital photographs were taken in the field. The nomenclature follows the Euro-Med checklist (EURO+MED 2006). The distribution of the species in Bosnia and Herzegovina is shown on the map using standard UTM grid 10x10 km. A list of all localities representing the distribution of *C. portenschlagiana*, *C. fialae*, *P. sativum* subsp. *elatius* and *T. flavum* in Bosnia and Herzegovina is given in the Table 2. with WGS1984 coordinates. The IUCN guidelines were used for the classification of taxa into IUCN categories (IUCN 2014).

Study species

C. portenschlagiana is a finely downy, tufted perennial with a fleshy rootstock and creeping, leafy stems. Stems are decumbent or ascending, up to 25 cm long. Leaves are downy to almost hairless, forming a rosette, heart-shaped to more or less circular, toothed, long-staked. The flowers are terminal and axillary, long-staked, in the branched, loose panicle. Calyx-lobes are lanceolate, much shorter than the corolla. Corolla to 2 cm, funnel-shaped to campanulate, incised to halfway, lobes short, deep lavender or violet. The style is included. Capsule opening by median pores. Detailed description of the taxon can be found in Šilić (1984) and Nikolić et al. (2015).

C. fialae is an annual or biennial plant. Stems are hairy, erect and branched, up to 50 cm long, with auricles on the base of stem leaves. Rosette and stem leaves are bipinnate, with serrate margin of leaflets. Leaflets are deeply lobed with obtuse segments. The flowers are white and long-staked. Sepals are hairy, mucronate, 5-9 mm long. Petals are 12-20 mm long with long unguis. Siliqua is linear, glabrous, flat, light brown when ripe, 40-55 mm long with 8-15 mm long beak. Seeds are brown, ca. 5 mm long. Detailed description of the taxon can be found in Fritsch (1897), Sagorski. (1911), Beck-Mannagetta (1916) and Šilić (1984), and identification key for *C. maritima* complex in Kučera et al. (2010).

P. sativum is a glabrous, glaucous annual plant, with a weak, often liana-like climbing stem up to 2 m long. The leaves are alternate, pinnate. Leaflets are 1-4-paired, entire or dentate, ending in a branched tendril. Stipules are 1.5–8 cm long; petiole shorter or even much longer than stipules. The flowers borne in long-stalked, 1–3-flowered racemes, longer than supporting leaves. Calyx is tubular, 8–15 mm long, with lobes of unequal length. Legume are oblong to linear, 6–10 cm long with 3–10 seeds, the seeds are spherical, papillate, about 5 mm in diameter. Seeds are brown, ca. 5 mm long. Detailed description of the species can be found in Romero Zarco (1999).

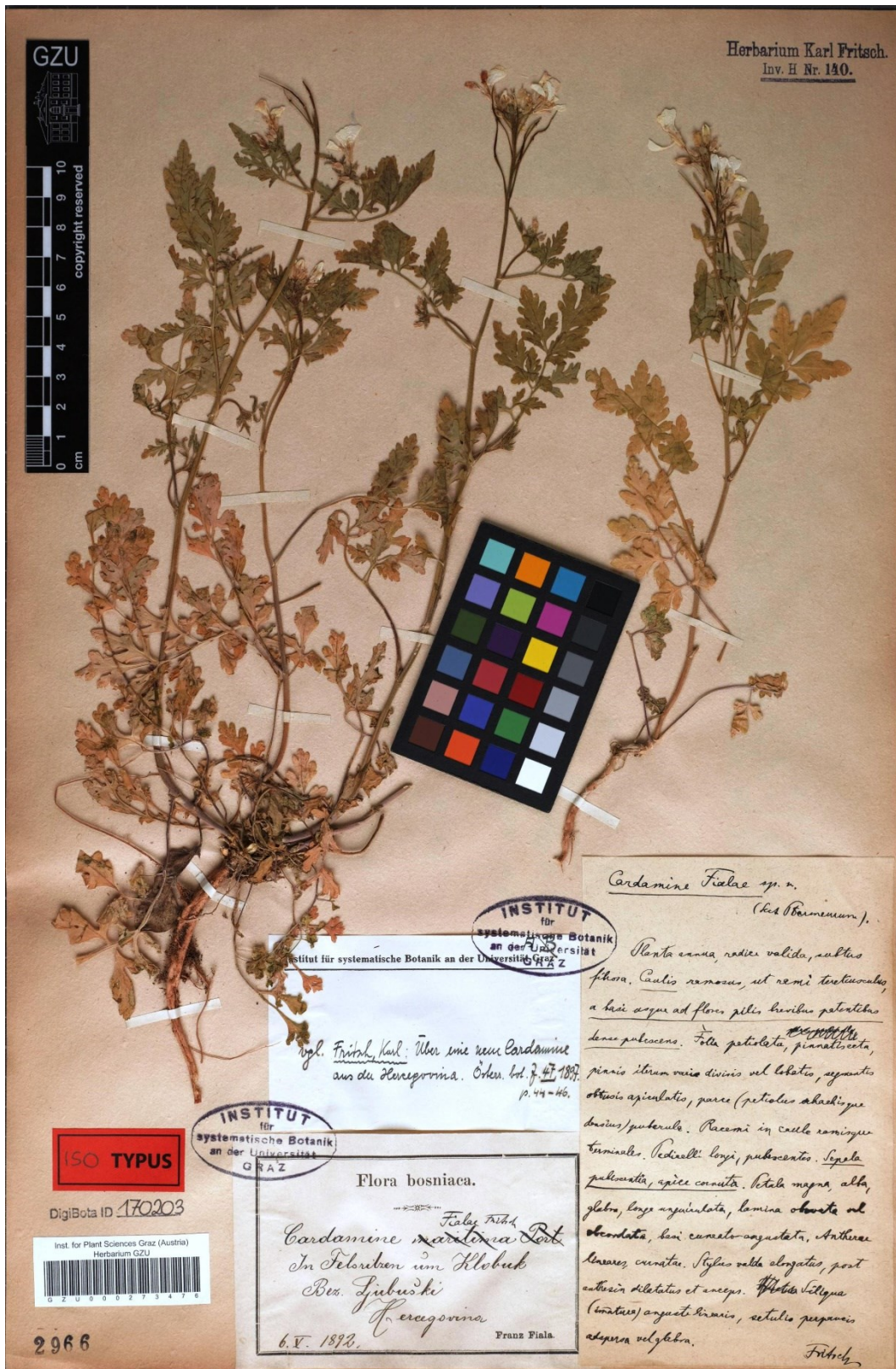


Figure 2. Herbarium specimen of *Cardamine fialae* Fritsch (Herzegovina, Klobuk near Ljubuski, collected by Fiala on 06.05.1892 as *C. maritima* Port., rev. Fritsch 1897. Isotypus, Herbarium GZU 2966.

P. sativum L. is divided into two subspecies, namely the domesticated pea *P. sativum* L. subsp. *sativum*, and wild taxon *P. sativum* subsp. *elatius* (M. Bieb.) Asch. & Graebn. Both subspecies are very similar, but subsp. *elatius* has racemes which exceeding the leaves, lilac or purple corolla and papillose seeds while subsp. *sativum* has racemes which are not exceeding the leaves, corolla is white or purple and seeds are alveolate, smooth or rugose. Detailed identification key can be found in Romero Zarco (1999).

T. flavum is an evergreen, branchy, semi-woody shrub, 25- 65 cm tall. Stems are erect or erect-ascending, densely hairy and distinctly woody at least at the base. Leaves are 10-35 × 8-30 mm, ovate or ovate-oblong, leathery, shallowly scalloped and stalked. Inflorescence c. 20 cm, simple or branched, lax, with 6-20 whorls of 6 flowers each. Calyx 7-9 mm long, not 2-lipped, tubular-campanulate, curved; teeth more or less equal. Corolla 12-20 mm, unilabiate, yellowish-white or yellowish. Detailed description of the taxon can be found in Navarro (2010).

T. flavum L. is divided into four subspecies, of which only two are represented in the territory of the former Yugoslavia, namely *T. flavum* L. subsp. *flavum* and *T. flavum* subsp. *glaucum* (Jord. & Fourr.) Ronniger. Both subspecies are very similar, but subsp. *flavum* has leaves which are hairy or pubescent on both sides while in subsp. *glaucum* they are glabrous or only with long hairs at the base. Detailed identification key can be found in Navarro (2010).

Results and discussion

The oldest records of *Campanula portenschlagiana* from Bosnia and Herzegovina are those from Fiala 1890 near Ljubuški and Klobuk (Fiala, 1893) (see Table 1). Subsequently, the species has been recorded in other localities, all in SW Herzegovina: Vitina, Ljubuški (Fortress of Herceg Stjepan Kosača) and Peć Mlini (Šoljan, 2001) (see Table 2). During the field research conducted between 2016 and 2023, the presence of the species has been confirmed in three localities, and the species was also found at one new locality near Drinovci (see Table 2). *C. portenschlagiana* is known only from a few restricted populations in Bosnia and Herzegovina and is currently known only from four grid-cell quadrants (Figure 3). According to the standards of IUCN (2014) it should be classified in the category of Vulnerable (VU) species, the criterion D2 being adopted. Approximately 1000 mature individuals were counted within the complete range of the species in Bosnia and Herzegovina. The threat status is based on number of mature individuals, which is below 1000, as well as on the area of occupancy (AOO) which is less than 20 km², while extent of occurrence (EOO) is less than 90 km². In addition the habitat of the species may be affected by anthropogenic factors such as road construction or forest fires in the near future.

Confirmed and new localities: Locality 1: Ljubuški, Buturovica hill, (43°12'04"N 17°33'30"E).
Material: observation by S. Maslo, 17 April 2019, leg. S. Maslo (SARA 53245); Population: twenty

flowering individuals have been recorded. The population was found on the walls of the fortress of Herceg Stjepan and in the crevices of the surrounding rocks at an altitude of 314 m.

Locality 2: Ljubuški, Klobuk, (43°16'22"N 17°27'08"E). Material: observation by S. Maslo, 17 April 2019, leg. S. Maslo (SARA 53244); Population: five flowering individuals have been recorded in rock crevices on the left side of the main road M 6, between Klobuk and Vitina, ca 900 m S of the village of Klobuk at an altitude of 134 m.

Locality 3: Peć Mlini, (43°20'10"N 17°19'25"E). Material: observation by S. Maslo, 11 April 2023, leg. S. Maslo (SARA 53728); Population: numerous (several hundred) individuals have been recorded in rock crevices and ruins of the old mills at the source of the river Tihaljina at an altitude of 205 m.

Locality 4: Ravlića cave near Drinovci, (43°20'21"N 17°19'23"E). Material: observation by S. Maslo, 11 April 2023, leg. S. Maslo (SARA 53727); Population: a dozen flowering individuals were recorded in the crevices of the rocks at the entrance to the cave at an altitude of 258 m.

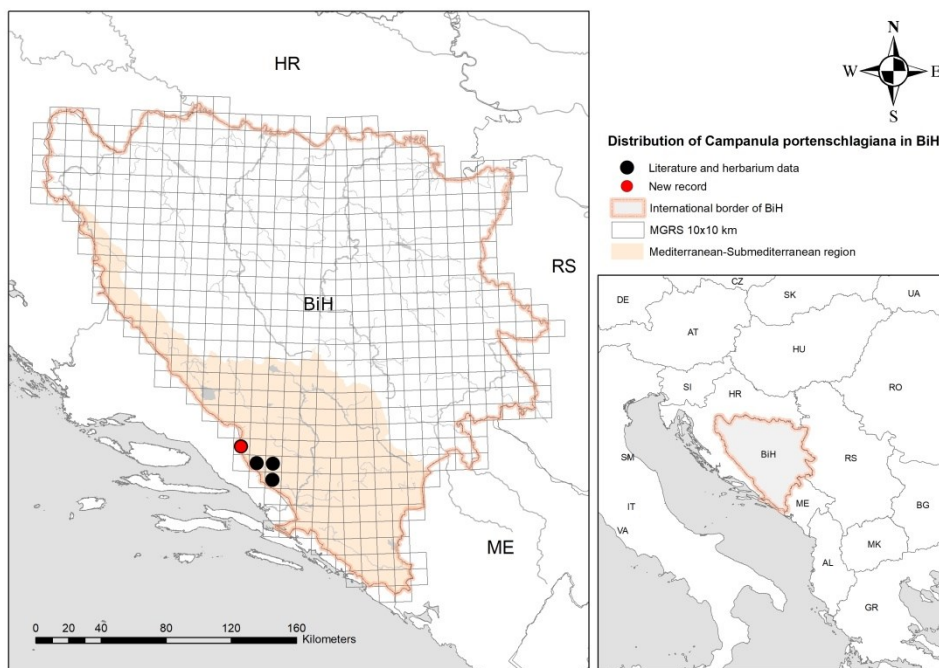


Figure 3. Distribution of *Campanula portenschlagiana* in BiH

The first finding of *Cardamine fialae* is that from Fiala 1892 in the vicinity of Klobuk near Ljubuški in SW Herzegovina as *C. maritima* DC, revised by Fritsch (1897), and described as new species *C. fialae* Fritsch (see table 1). Only recently, the species has been recorded in other localities, all in SW Herzegovina: Ljubuški (Klobuk near Vitina), Grude (near the village of Ružići), and Grude (near the town of Grude) (Kučera et al., 2010) (see Table 2). During the field research conducted between 2016 and 2023, the species was also found at two new localities near Klobuk and Drinovci (see table 2).

C. fialae is known only from a few restricted populations in Bosnia and Herzegovina and Croatia and is currently known only from three grid-cell quadrants in Bosnia and Herzegovina (Figure 4). According to the standards of IUCN (2014) it should be classified in the category of Vulnerable (VU) species, the criterion D2 being adopted. Approximately 900 mature individuals were counted within the complete range of the species including Bosnian and Herzegovinian and Croatian locations. The threat status is based on the number of mature individuals, which is below 1000, as well as on the area of occupancy (AOO) which is less than 20 km², while the extent of occurrence (EOO) is less than 90 km² (Vukojević et al., 2016). In addition, the habitat of the species may be affected by anthropogenic factors such as road construction or forest fires in the near future.

New localities: Locality 1: Ljubuški, Klobuk, (43°16'22"N 17°27'08"E). Material: observation by S. Maslo, 17 April 2019, leg. S. Maslo (SARA 53729); Population: two flowering individuals have been recorded in rock crevices on the left side of the main road M 6, between Klobuk and Vitina, ca 900 m S of the village of Klobuk at an altitude of 134 m, together with *Campanula portenschlagiana* with which it co-occurs in places.

Locality 2: Ravlića cave near Drinovci, (43°20'21"N 17°19'23"E). Material: observation by S. Maslo, 11 April 2023, leg. S. Maslo (SARA 3730); Population: seven flowering individuals were recorded in the crevices of the rocks at the entrance to the cave at an altitude of 258 m, together with *Campanula portenschlagiana* with which it co-occurs in places.

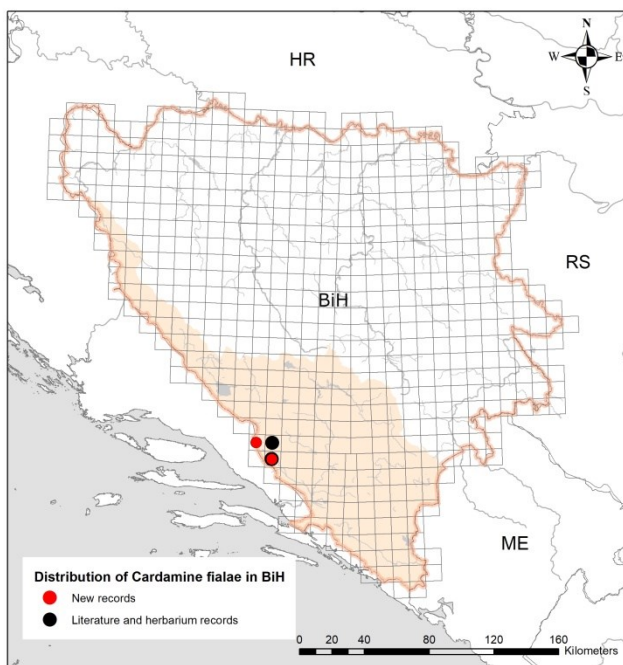


Figure 4. Distribution of *Cardamine fialae* in BiH

The occurrence of *Pisum sativum* subsp. *elatius* in the flora of Bosnia and Herzegovina was firstly noted by Malý, which was thereafter reported by Beck-Mannagetta (1927). It was recorded at only one

locality in southern Herzegovina, where it was found in karstic canyons near the source of the river Radobolja in Ilići near Mostar (Malý, 1908) (see table 1). There are no voucher specimens of this taxon in the herbarium collection of SARA and this record was never confirmed afterwards. During the field research conducted between 2016 and 2023, the subspecies was also found at three new localities (see table 2). Considering the low number of individuals and small extent occurrence *P. sativum* subsp. *elatius* should be treated as a data deficient (DD) species in the flora of Bosnia and Herzegovina. It is currently known only from four grid-cell quadrants in Bosnia and Herzegovina (Figure 5).

New localities: Locality 1: Hutovo, Hadžibegov grad (42°57'03"N 17°39'26"E). Material: observation by S. Maslo, 03 April 2016; Population: two individuals have been recorded in rocky and grassy slopes near the ruins of the medieval town at an altitude of 415 m.

New localities: Locality 2: Neum, Kiševo (42°55'51"N 17°48'11"E). Material: observation by S. Maslo, 15 April 2022, leg. S. Maslo (SARA 53228); Population: two small populations were recorded on the outcrops of limestone rocks, along the right side of the main road M 17.3 Neum - Stolac at an altitude of 175 m.

Locality 3: Ravlića cave near Drinovci, (43°20'21"N 17°19'23"E). Material: observation by S. Maslo, 11 April 2023, leg. S. Maslo (SARA 53734); Population: two flowering individuals were recorded on the rock surfaces and road cuttings on the left side of the road leading to Peć Mlini at an altitude of 258 m.

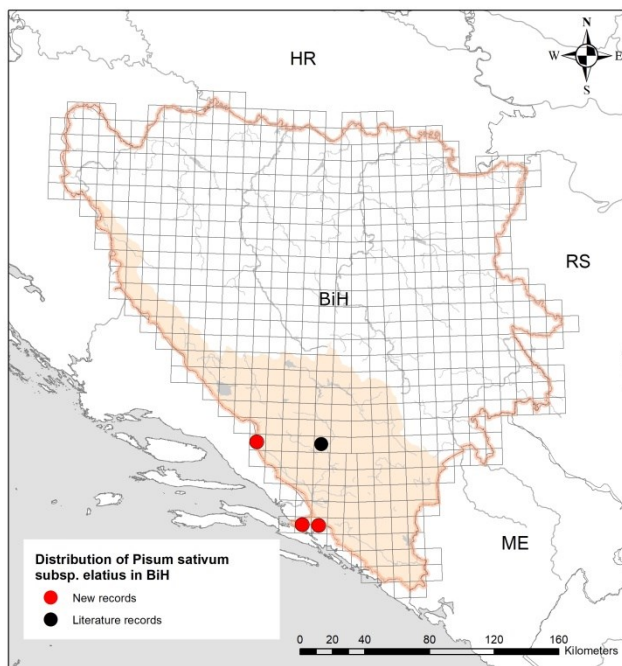


Figure 5. Distribution of *Pisum sativum* subsp. *elatius* in BiH

The oldest record of *Teucrium flavum* from Bosnia and Herzegovina is that of Pichler (1898/9) for Mostar, which was thereafter reported by Beck-Mannagetta and Malý (1950) about half a century later (see table 1). This record was never confirmed afterwards despite recent extensive research conducted in the area of Mostar (Maslo, 2014), therefore, 125 years later, the sites near Drinovci are the first and only confirmed records in Bosnia and Herzegovina. There are no voucher specimens of this species in the herbarium collection of SARA. During the field research conducted between 2016 and 2023, the species was also found at new localities (see table 2). The species is much localized and isolated growing up with two small colonies on limestone rocky spurs in vicinity of Drinovci and is currently known only from two grid-cell quadrants in Bosnia and Herzegovina (Figure 6). This species is known from numerous localities along the Adriatic coast, so the occurrence of the species in this region is to be expected and lies within their natural distribution. The species should be widely distributed in the coastal zone of Herzegovina. Data Deficient (DD).

Locality 1: Ravlića cave near Drinovci, (43°20'21"N 17°19'23"E). Material: observation by S. Maslo, 11 April 2023, leg. S. Maslo (SARA 53737); Population: two individuals were recorded in the crevices of the rocks at the entrance to the cave at an altitude of 258 m, together with *Campanula portenschlagiana* and *Cardamine fialae* with which it co-occurs in places.

Locality 2: Drinovačko brdo near Drinovci, (43°20'16"N 17°19'15"E). Material: observation by S. Maslo, 11 July 2023; Population: six individuals were recorded on rocks and stony slopes at an altitude of 285 m.

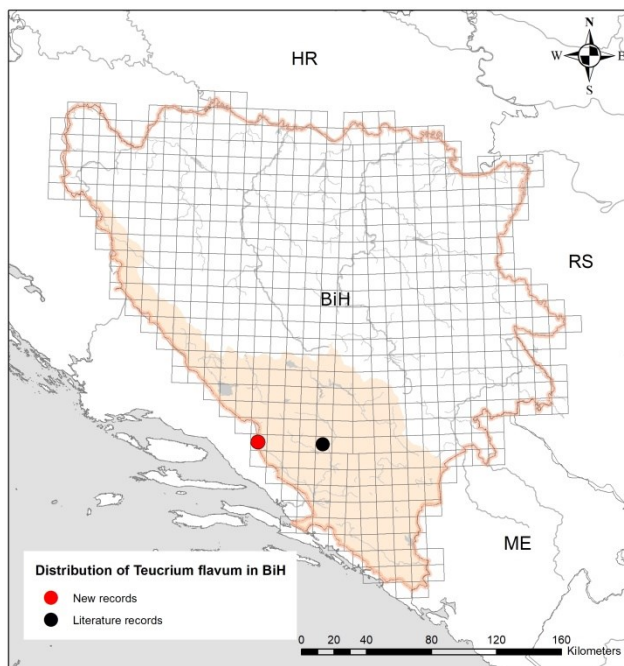


Figure 6. Distribution of *Teucrium flavum* in BiH

Conclusion



Figure 7. a. *Pisum sativum* subsp. *elatius* Neum, Kiševo **b.** *Teucrium flavum* Drinovci, Drinovačko brdo (Photos S. Maslo).

The area of SW Herzegovina is among the regions of Bosnia and Herzegovina that have been poorly botanically explored. During the latest field research in the area new localities for *Campanula portenschlagiana* and *Cardamine fialae* were recorded and the presence of *Pisum sativum* subsp. *elatus* and *Teucrium flavum* are confirmed for the country. *C. portenschlagiana* and *C. fialae* are narrow endemic species distributed only in Bosnia and Herzegovina and Croatia. On the other hand *P. sativum* subsp. *elatus* and *T. flavum* have a much wider distribution throughout the Mediterranean, but their presence in Bosnia and Herzegovina was little known until now. New field research needs to be conducted in order to monitor the population size and potentially new localities of these taxa within similar habitats in this region.

Table 2. Georeferenced data on the distribution of *Campanula portenschlagiana*, *Cardamine fialae*, *Pisum sativum* subsp. *elatus* and *Teucrium flavum* in Bosnia and Herzegovina (new records are marked in bold).

Taxon	Number and name of the locality, observers (collectors) and dates for the observations (Herbarium/collection number)	WGS coordinates	Altitude	UTM quadrant
<i>Campanula portenschlagiana</i> Schult	1 Ljubuški, Grad, leg. Fiala 06.1890 (SARA 40217), Fiala	43°12'04"N, 17°33'30"E	321 m	YH08
<i>Campanula portenschlagiana</i> Schult	2 Ljubuški, Klobuk, leg. Fiala 06.1890 (SARA 40216), Fiala 1893, Bjelčić 1983	43°16'22"N, 17°27'08"E	134 m	XH99
<i>Campanula portenschlagiana</i> Schult	3 Ljubuški, Vitina, Fiala 1893.	43°14'29"N, 17°28'57"E	110 m	YH09
<i>Campanula portenschlagiana</i> Schult	4 Ljubuški, Grad, leg. Fiala 13.05.1894 (SARA 40219)	43°12'04"N, 17°33'30"E	321 m	YH08
<i>Campanula portenschlagiana</i> Schult	5 Ljubuški, Grad, leg. Fiala 06.1897 (SARA 40215)	43°12'04"N, 17°33'30"E	321 m	YH08
<i>Campanula portenschlagiana</i> Schult	6 Peć Mlini, Tihaljina River, leg. Šoljan 26.05.1986 (SARA 51788), Šilić 1984	43°20'10"N, 17°19'25"E	250 m	XJ80
<i>Campanula portenschlagiana</i> Schult	7 Ljubuški, Buturovića brdo, Tvrdava Herceg Stjepana, leg. Maslo 17.04.2019 (SARA 53245)	43°12'04"N, 17°33'30"E	321 m	YH08
<i>Campanula portenschlagiana</i> Schult	8 Ljubuški, Klobuk, leg. Maslo 17.04.2019 (SARA 53244)	43°16'22"N, 17°27'08"E	134 m	XH99
<i>Campanula portenschlagiana</i> Schult	9 Ljubuški, Tvrdava Herceg Stjepana, leg. Bogdanović 23.06.2012 (ZAGR 32610)	43°12'04"N, 17°33'30"E	321 m	YH08
<i>Campanula portenschlagiana</i> Schult	10 Peć Mlini, Tihaljina River, leg. Maslo 11.04.2023 (SARA 53728)	43°20'10"N, 17°19'25"E	205 m	XJ80
<i>Campanula portenschlagiana</i> Schult	11 Ravlića Cave near Drinovci, leg. Maslo 11.04.2023 (SARA 53727)	43°20'21"N, 17°19'23"E	258 m	XJ80

Taxon	Number and name of the locality, observers (collectors) and dates for the observations (Herbarium/collection number)	WGS coordinates	Altitude	UTM quadrant
<i>Cardamine fialae</i> Fritsch	1 Ljubuški, Klobuk, leg. Fiala as <i>C. maritima</i> Port., rev. Fritsch 1897, 06.05.1892 (GZU 2966) Isotypus	43°18'43"N, 17°26'00"E	285 m	XH99
<i>Cardamine fialae</i> Fritsch	2 Ljubuški, Klobuk, leg. Fiala as <i>C. maritima</i> Port., rev. Fritsch 1897, 06.05.1896 (GZU 2966) Isotypus	43°18'43"N, 17°26'00"E	285 m	XH99
<i>Cardamine fialae</i> Fritsch	3 Ljubuški, Klobuk near Vitina, leg. Šilić 14.05.1978 (SARA 51502)	43°18'43"N, 17°26'00"E	285 m	XH99
<i>Cardamine fialae</i> Fritsch	4 Grude, near the village of Ružiči, leg Kučera & Kolnik 23.04.2003 (SAV), Beck-Mannagetta 1916	43°19'10"N, 17°26'09"E	287 m	XH99
<i>Cardamine fialae</i> Fritsch	5 Ljubuški, near the village of Klobuk, leg Kučera & Kolnik 23.04.2003 (SAV), Beck-Mannagetta 1916	43°18'43"N, 17°26'00"E	285 m	XH99
<i>Cardamine fialae</i> Fritsch	6 Grude, near the town of Grude, leg Kučera & Kolnik 23.04.2003 (SAV)	43°20'38"N, 17°25'45"E	298 m	XH90
<i>Cardamine fialae</i> Fritsch	7 Ljubuški, Klobuk, leg. Maslo 15.04.2022 (SARA 53729)	43°16'22"N, 17°27'08"E	134 m	XH99
<i>Cardamine fialae</i> Fritsch	8 Ravlića Cave near Drinovci, leg. Maslo 11.04.2023 (SARA 53730)	43°20'21"N, 17°19'23"E	258 m	XJ80
<i>Pisum sativum</i> subsp. <i>elatius</i> (M. Bieb.) Asch. & Graebn	1 Mostar, Vrelo Radobolje, Malý1908	43°21'19"N, 17°45'31"E	135 m	XJ20
<i>Pisum sativum</i> subsp. <i>elatius</i> (M. Bieb.) Asch. & Graebn	2 Hutovo, Hadžibegov grad, obs. Maslo 03.04.2016	42°57'03"N, 17°48'11"E	415 m	YH25
<i>Pisum sativum</i> subsp. <i>elatius</i> (M. Bieb.) Asch. & Graebn	3 Neum, Kiševo, leg. Maslo 15.04.2022 (SARA 53228)	42°55'51"N, 17°39'26"E	175 m	YH15
<i>Pisum sativum</i> subsp. <i>elatius</i> (M. Bieb.) Asch. & Graebn	4 Ravlića cave near Drinovci, leg. Maslo 11.04.2023 (SARA 53734)	43°20'21"N, 17°19'23"E	258 m	XJ80
<i>Teucrium flavum</i> L.	1 Mostar, Pichler 1898/9	43°21'19"N, 17°45'31"E	135 m	YJ20
<i>Teucrium flavum</i> L.	2 Ravlića cave near Drinovci, leg. Maslo 11.04.2023 (SARA 53737)	43°20'21"N, 17°19'23"E	258 m	XJ80
<i>Teucrium flavum</i> L.	3 Drinovci, Drinovačko brdo, obs. Maslo 11.07.2023	43°20'16"N, 17°19'15"E	285 m	XJ80

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