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FIRST RECORD OF *Astragalus muelleri* Steud. & Hochst. IN BOSNIA AND HERZEGOVINA

PRVO NALAZIŠTE *Astragalus muelleri* Steud. & Hochst. U BOSNI I HERCEGOVINI

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Abstract

This paper presents the records of *Astragalus muelleri* Steud. & Hochst., new species for the flora of Bosnia and Herzegovina, found at two localities on the rocky, sub-Mediterranean pastures of the slopes of Žaba Mt in the municipality of Neum. Collected specimens belong to subsp. *muelleri*, which has considered endemic to western Balkans (Croatia and Montenegro) so far. With these records, the flora of Bosnia and Herzegovina is richer in one endemic Balkan taxon.

Key words: *Astragalus muelleri*, Bosnia and Herzegovina, endemic species, flora, new record

1. INTRODUCTION / UVOD

The genus *Astragalus* L. is distributed across all continents except Australia, and has centers of diversification in Southeast and Central Asia, and in the Andes in South America (Bartha et al., 2013). In the last twenty years, the number of species has increased from around 2,400 (Lock & Schrire, 2005) to just over 3,090 accepted species (POWO, 2025), which makes this genus one of the richest among angiosperms (Bartha et al., 2013). Among them, several new species of this genus have also been described recently from the Balkan Peninsula area (e.g. Alegro et al., 2009; Hardion et al., 2016).

In Bosnia and Herzegovina (BiH), 10 species of this genus were recorded: *A. cicer* L., *A. depressus* L., *A. fialae* Degen, *A. glycyphylloides* DC., *A. glycyphyllos* L., *A. hypoglottis* L. (subsp. *hypoglottis* and subsp. *gremlii* (Burnat) Greuter & Burdet), *A. monspessulanus* L. (subsp.

monspessulanus and subsp. *wulfenii* (W.D. J.Koch) Arcang.), *A. onobrychis* L., *A. sesameus* L., and *A. vesicarius* L. (subsp. *carniolicus* (A.Kern.) Chater, subsp. *pastellianus*? (Pollini) Arcang., and subsp. *vesicarius*?) (Beck-Manna-getta, 1927; Stupar et al., 2021). The records of *Astragalus leontinus* Wulfen (Beck-Manna-getta, 1927; Protić, 1902), *A. australis* (L.) Lam. (Rohlena, 1942) and *A. angustifolius* L. (Pančić, 1875) still haven't been surely confirmed from the territory of Bosnia and Herzegovina (Stupar et al., 2021). The species *A. hamosus* L., *A. sinaicus* Boiss and *A. angustifolius* L. were also mentioned for Bosnia (Euro+Med, 2006; Podlech, 2008), but without any exact locality. Consequently, further research on the species of this genus in Bosnia and Herzegovina is necessary, as already emphasized in Milanović et al. (2025).

Astragalus muelleri Steud. & Hochst. is an endemic Balkan-Apennine species (Peruzzi et al., 2014; Podlech, 2008). It was described from the island of Krk (orig. Veglia) (Höchstetter, 1827). The lectotype was designated by Podlech, based on the material collected by Müller in May 1826 and stored in herb. Höchstetter (Podlech, 1999). The typical subspecies is endemic to Croatia (Nikolić, 2005-

2025) and Montenegro (Čaković & Stešević, 2021; Rohlena, 1942; Stanković-Tomić, 1970), inhabiting rocky pastures of sub-Mediterranean mainland and some islands. The other subspecies (subsp. *etruscus* Peruzzi, Gestri & Pierini) is restricted to Italy with only two known disjunctions: on Monte Pisano and Monte Amiata in Tuscany in Central Italy (Peruzzi et al., 2014).

2. MATERIAL AND METHODS / MATERIJAL I METOD RADA

Field research was conducted in mid-May 2010 in the sub-Mediterranean part of Bosnia and Herzegovina (BiH), north of the city of Neum. Spatial data (elevation and coordinates in the WGS1984 coordinate system) were collected using a *Garmin GPSmap 60CSx* device. The collected herbarium material has been deposited in the herbarium collection of the Faculty of Forestry (BALU) and the private collection of the author (BALU DJM).

For the purpose of this study, all existing herbarium collections (SARA, BALU) were reviewed, and available literature was studied to confirm that the species had not previously been recorded or collected in the territory of Bosnia and Herzegovina.

Identification on species level was performed following *Flora Europaea* (Tutin et al., 2001) and Podlech (2008), while subspecies is identified according to Peruzzi et al. (2014). As comparative material, we used specimens collected from known localities near Obrovac and slopes of Mosor above the village of Duće in Croatia in the period 2017-2023, which are also stored in the author's private collection.

For the new species localities, we provided: the precise name of the locality with WGS coordinates, elevation, the MGRS (Military Grid Reference System) 10x10 km square, habitat type, date of collection, name of the collector (legator), number of voucher within herbaria, and number of registered individuals.

3. RESULTS AND DISCUSSION / REZULTATI I DISKUSIJA

The taxon *Astragalus muelleri* subsp. *muelleri* was found at two separate localities on the slopes of Žaba Mt (Figure 1):

1. The slopes of the Četović hill near the village of Gradac; 17.702510 °E, 42.947741 °N; 160 m; YH25; near the road on rocky submediterranean abandoned pastures *Stipo-Salvietum officinalis* Horvatić (1956) 1958; 08 May 2010; collected by Đ. Milanović, V. Stupar, J. Brujić and Davor Nikić; BALU DJM 82/10-11/001; only few registered individuals close to each other.
2. The slopes above the ruins of Hadžibegov grad near the village of Hutovo; 17.801185 °E, 42.950566 °N; 440 m; YH25; rocky submediterranean pastures *Stipo-Salvietum*

officinalis Horvatić (1956) 1958; 10 May 2010; collected by Đ. Milanović, V. Stupar, J. Brujić and Davor Nikić; BALU 000682, BALU 000683; ca 30 registered scattered individuals throughout the pasture.

The registered specimens from the slope of Mount Žaba fully correspond to the diagnoses of the taxon *Astragalus muelleri* subsp. *muelleri* (Höchstetter, 1827; Peruzzi et al., 2014; Podlech, 2008), with the note that our populations have somewhat more flowers and longer racemes than recorded in the literature. Collected specimens are up to 40 cm tall, branched and woody at the base, ascending, and, when young, appear almost whitish due to dense, medifixed, appressed hairs. Lower leaves have narrowly elliptic leaflets with ob-

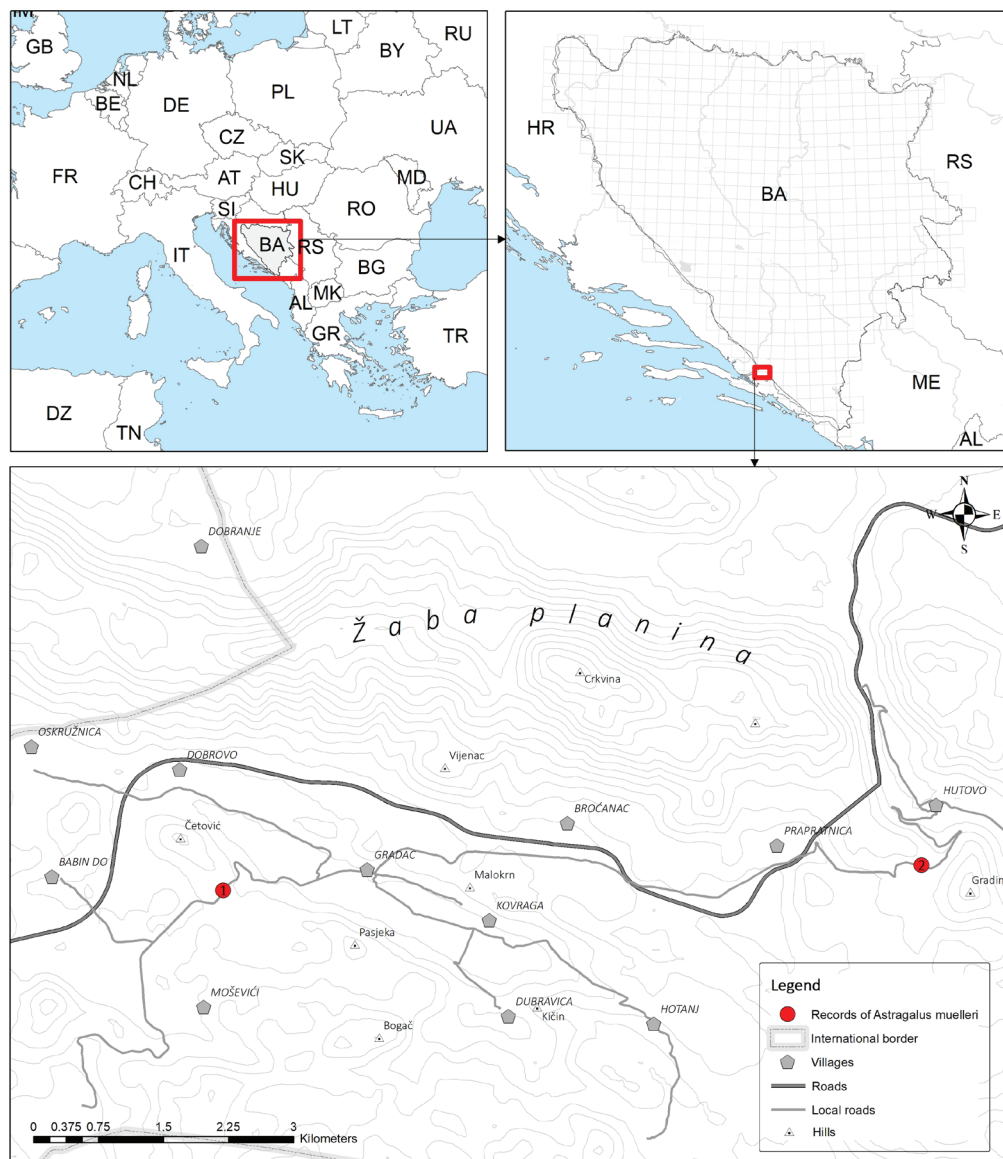


Figure 1. New localities of *Astragalus muelleri* subsp. *muelleri* in Bosnia and Herzegovina / **Slika 1.** Nova nalazišta *Astragalus muelleri* subsp. *muelleri* u Bosni i Hercegovini

tuse apices, while upper leaves are always linear and acute, more or less densely hairy on both sides, especially when young. Racemes are 3–11 cm long, dense only at the beginning of flowering, but later become extended with remote 10–30 flowers. Bracts are approximately 1 mm long, narrowly triangular, and

covered with black hairs. The calyx is 5–9 mm long, more or less densely covered with black hairs. Petals are purple-lilac (see **Figures 2–4**).

In the study area, the species grows solitarily, mostly on warmer, rocky, sub-Mediterranean *Stipo-Salvietum officinalis* pastures, in various stages of succession, as well as on road cut-

tings at the edge of these pastures. Given that such pastures are present in the wider area of Neum and deeper inland along the Ner-

etva river, we presume that the species is also somewhat more widely distributed in Bosnia and Herzegovina.



Figures 2-4. *Astragalus muelleri* subsp. *muelleri* at the beginning of flowering / **Slike 2-4.** *Astragalus muelleri* subsp. *muelleri* na početku cvjetanja (© Đ. Milanović)

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Sažetak

U radu su predstavljena nalazišta *Astragalus muelleri* Steud. & Hochst., nove vrste za floru Bosne i Hercegovine, koja je pronađena na dva lokaliteta na kamenjarskim submediteranskim pašnjacima padina planine Žabe u opštini Neum. Sakupljeni primjerci pripadaju podvrsti subsp. *muelleri*, koja je do sada smatrana endemičnom za Hrvatsku i Crnu Goru. Sa ovim nalazištem flora Bosne i Hercegovine bogatija je za još jedan endemičan zapadnobalkanski takson.

Ključne riječi: *Astragalus muelleri*, Bosna i Hercegovina, endemična vrsta, flora, novo nalazište