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Allium amethystinum Tausch, a new species of the vascular flora of the Republic of Macedonia

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Abstract
In this paper, *Allium amethystinum* is reported, for the first time, for the flora of the Republic of Macedonia. It is a Mediterranean species, distributed in central and eastern Mediterranean region. The presence of *A. amethystinum* confirms the sub-Mediterranean character of a part of the flora of the Republic of Macedonia. From the valley of r. Crn Drim, its distribution area extends mostly along the r. Treska. Photographs of its habitats, parts and different stages of the plants as well as drawings of the floral parts that characterize the species, are also given.

Key words: *Allium amethystinum*, sub-Mediterranean flora, Republic of Macedonia.

Introduction

This report of *Allium amethystinum* Tausch, as well as the recent reports of few other species (Teofilovski, 2017, Matevski, 2017, Niketić & al., 2017 and others) are the best evidence that the research of the flora of the Republic of Macedonia, with about 150 years of more or less intensive floristically research, is far from being finished.

A. amethystinum (Fig. 1) is a Mediterranean element, distributed in central and eastern Mediterranean region: Southern Italy, former Yugoslavia, Albania, Bulgaria, Greece, Crete, East Aegean islands, NW, W, SW Turkey (Stearn, 1978,1980; Kollman, 1984; Mathew, 1996). The existing distribution map in the World Checklist of Selected Plant Families (2010), corresponds to the data of the above-mentioned authors. In both cases, the whole territory of the former Yugoslavia is marked as a part of the distribution area of this species. That, in many cases, is confusing and doesn't give the real picture about the presence of the species in different parts on the territory of the former state. Years earlier Bothmer (1972) gave more precise data about the distribution of this species on the territory of former Yugoslavia. According to his data, the territory of the Republic of Macedonia is not included in the distribution area of *A. amethystinum*. Therefore, it has been concluded, basing on this and the other data from the available literature, that there are no information about the presence of *A. amethystinum* on the territory of the Republic of Macedonia.

Material and methods

The material, collected from the listed localities in the period from 1998 to 2017, is deposited in the Herbarium of the Macedonian Museum of Natural History (HMMNH) (localities 1-3), along with the material collected by Aco Teofilovski (localities 4-8), kept in his private collection. Standard botanical literature was used for the material's determination (Garbari, 1982; Stearn, 1978, 1980, 1981; Kollman, 1984; Mathew, 1996; Wraber, 1999). Photographs were taken from the typical habitats (Fig. 5) as well as from the different stage of the plant's development and parts. Drawing's from different floral parts, which characterized the species, are presented, as well.

Results and discussion

Allium amethystinum Tausch, Syll. Pl. Nov. Ratisb. 2: 256 (1828)

[Syn.: *A. segetum* Jan. ex J. A. & J. H. Schultes fil. in Roemer & Schultes, Syst. Veg. 7:1020 (1830); *A. descendens* auct. non L., e.g. Boiss. Fl. Or. 5:236 (1882); Halacsy, Consp. Fl. Graecae 3:243 (1904); *A. stojanovii* Kovatchev in Nov. Syst. Pl. Vasc. (Leningrad) 1968:42]

Details on the findings:

1. Mk. – v. Nova Breznica (Skopje): Kozjak, 1076 m asl.., 02.07.2011 (N 41 53 32.0: E 021 13 26.7) (Leg./Det.: Z. Nikolov)

2. Mk. - Jablanica Mt. (v. Modrič): along the road to the village Modrič, 730 m asl., 21.06.2012 (N 41 22 05.5; E 020 34 43.2) (Leg./Det.: Z. Nikolov)

3. Mk. - Debar: along the r. Crn Drim, between the v. Modrič and v. Lukovo, 500-600 m asl., 22.06.2012 (Leg./Det.: Z. Nikolov)

4. Mk. - Tetovo: 1.5 km NE-E from the railway station "Dolno Orešje", carbonate, 510 m asl., 01.07.2013 (Leg./Det.: A. Teofilovski)

5. Mk. - Osoj: 4.3. km NE from v. Lukovica, locality "Turčin", rocky and bushy places, carbonate, 950 m asl., 28.06.2013 (Leg./Det.: A. Teofilovski)

6. Mk. – Poreče: in the village of Blizansko, grassy place, carbonate, m asl., 09.06.2016 (N41°45'40.98"; E21°9'31.13") (Leg./Det.: A. Teofilovski)

7. Mk. – Struga: near the road between Elen Kamen and Autocamp Livadišta, 700 m asl., 12.06.2017. (N41°7'47.28"; E20°38'23.67") (Leg./Det.: A. Teofilovski)

8. Mk. – Jablanica Mt.: near the road to Debar, in the vicinity of v. Globočica, stony place, carbonate, 700 m.a.s.l., 22.06.2016 (N41°19' 31.37"; E20°38'1.98") (Leg./Det.: A. Teofilovski)

Well-developed populations of this species were encountered at the localities Kozjak (v. Nova Breznica, Skopje), Jablanica Mt (v. Modrič), and the valley of the r. Crn Drim, Debar (Fig. 4). Voucher specimens from the vicinity of Tetovo, Osoj, Poreche, Struga and v. Globochica (Crn Drim valley) were collected and determined by Aco Teofilovski (Fig. 4).

Although morphologically distinct, *A. amethystinum* has been often confused with *Allium sphaerocephalon* L. and *Allium guttatum* Steven subsp. *guttatum* (Moris) Stearn (Bothmer, 1972; Anačkov, 2009). The main characteristic of this species is so called "second inflorescence" as a result of different time of flowering and forming the fruits between the lateral and the central flowers, in the same inflorescence (Fig. 1, c, d). There are also other characteristics that make clear distinction between this species, the previous-mentioned two as well as from other, close-related one (Bothmer, 1972).

Morphologically, our plants match those described by Bothmer (1972), Kollman (1984), Stearn (1980), Mathew (1996) (Fig.1, 2).

The variations of the filament of the outer stamen, mentioned by Bothmer (1972), also appear in some plants from the population in Kozjak, v. N. Breznica (Fig. 3).

The presence of *A. amethystinum* on the territory of the Republic of Macedonia, is one more confirmation to the sub-Mediterranean character of the part of our flora as well as the route of their penetration to this territory. Through the valley of the r. Crn Drim, this species expended its distribution area mostly along the r. Treska.

Acknowledgements

I am grateful to Vlado Matevski and Goran Anačkov for their valuable suggestions and comments that improved the earlear draft of the manuscript. Also, I appreciate the contribution by Aco Teofilovski in getting clearer picture of the chorology of this species in our country as well as the donation of the voucher specimens to the Museum.

Figure 1. *Allium amethystinum* Tausch

a) fistulose leaf b) flowering plant c) flowering plant with "secondary inflorescence" d) fruiting stage of the plant.

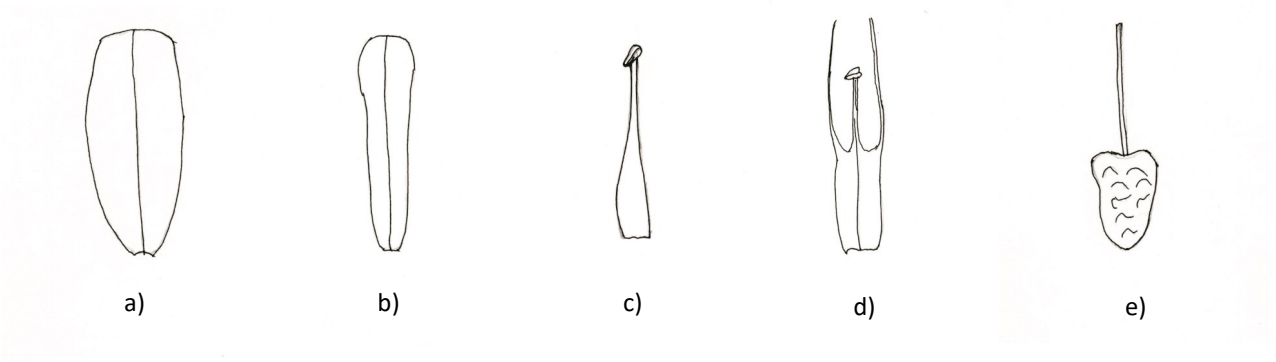

Figure 2. *Allium amethystinum* Tausch.
Forms of: a) outer tepal; b) inner tepal; c) outer stamen; d) inner stamen; e) ovary.

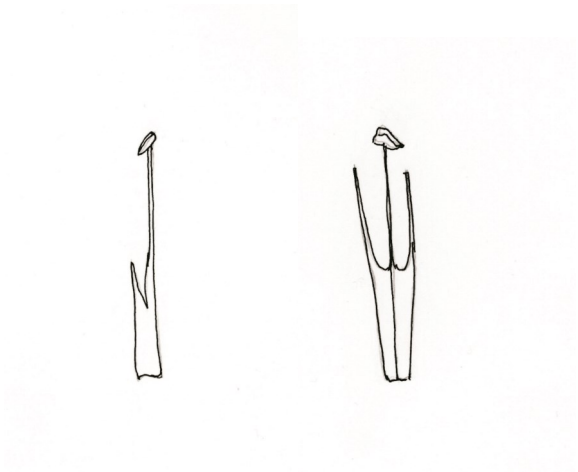

Figure 3. *Allium amethystinum* Tausch. Variability of the filament of the outer stamen.

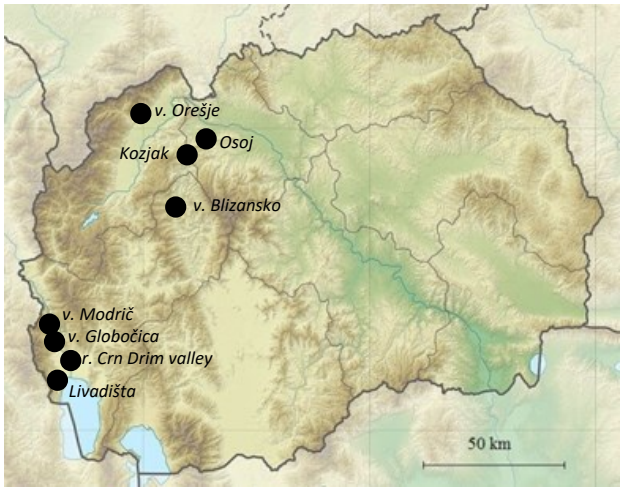

Figure 4. Distribution of *Allium amethystinum* Tausch in the Republic of Macedonia.

Figure 5. Habitats of *Allium amethystinum* Tausch, with visible flowers
a) Kozjak (v. Nova Breznica) b) Jablanica Mt (v. Modrich).

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Allium amethystinum Tausch, нов вид од васкуларната флора на Република Македонија

Зоран Николов

Пронаоѓањето на *Allium amethystinum* како и на неколку други видови (Matevski, 2017; Teofilovski, 2017; Niketić et al., 2017 и др.) се најдобар доказ дека проучувањето на флората на територијата на Република Македонија, и покрај долгогодишните повеќе или помалку интензивни истражувања, не е завршено.

A. amethystinum е медитерански елемент распространет во централниот и источниот дел на Медитеранот (Stearn 1978,1980; Kollman, 1984; Mathew 1996). Податоци за неговото присуството, на територијата на Република Македонија досега не се регистрирани. Во текот на различните флористички истражувања (1998-2017), а посебно во текот на истражувањата во рамките на проектот „Таксономија и хорологија на родот *Allium* во Република Македонија“ (2012-2014), добро развиени популации од овој вид сретнавме на неколку локалитети: Козјак (с. Нова Брезница), Јабланица (с. Модрич) и по долината на р. Црн Дрим (помеѓу селата Модрич и Луково). Хоролошката слика за распространувањето на овој вид на територијата на Република Македонија ја надополнуваат податоците на Ацо Теофиловски, за следните локалитети: Осој, с. Орешје (Тетово), с. Близанско (Пореч̌е), Ливадиште (Струга) и долината на р. Црн Дрим (с. Глобочица).

И покрај јасните морфолошки разлики, *A. amethystinum* често е заменуван со *Allium sphaerocephalon* L. или *Allium guttatum* Steven subsp. *guttatum* (Moris) Stearn. Основната морфолошка карактеристика по која овој вид се разликува од другите блиски видови, е формирањето на т.н. секундарно соцветие, што се јавува како резултат на различното време на цветање, на централните и страничните цветови, во едно исто соцветие.

Во морфолошки поглед, нашите примероци сосема се вклопуваат во дијагнозите на Bothmer (1972), Stearn (1980), Kollman (1984), Mathew (1996). Варијабилноста на филаментот кај надворешните прашници, наведена од Bothmer (1972), се јавува и кај некои наши примероци од локалитетот Козјак (с. Нова Брезница).

Присуството на *A. amethystinum* на територијата на Република Македонија е потврда како на субмедитеранскиот карактер за еден дел од нашата флора, така и за едниот од двата коридора по кој што растенијата продирале на оваа територија. Според регистрираните наоѓалишта би можело да се претпостави дека овој вид својот ареал од долината на р. Црн Дрим (Јадрански слив), го проширил главно по течението на р. Треска.

Клучни зборови: *Allium amethystinum*, субмедитеранска флора, Република Македонија