GENUS *ALLIUM* L. 1753 (AMARAYLLIDALES, ALLIACEAE) ON FLOODED HABITATS IN SOUTHERN PART OF THE PANNONIAN PLANE (VOJVODINA, SERBIA)

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Abstract

In humid habitats in Vojvodina, only two species of Allium genus has been recorded – A. angulosum and A. vineale. Their distribution is consequence of their ecological adaptability and their origin. A. angulosum belongs to the primitive Rhizirideum section, and by that could be defined as an inhabitant of humid grasslands and ecosystems connected to the dictation of the higric factor. A. vineale is more developed representative of the Allium genus, and it is not limited to the humid habitats, but in Vojvodina it could be found on similar places, because of its wide ecological valence. Both species grow in vegetation of humid grasslands of classis Molinio-Arrhenatheretea Tx. 1937, as well as in classis of weed vegetation Artemisietea vulgaris Lohm., Prsg. et Tx. 1950. A. angulosum is frequent inhabitant of lowland flooded forest vegetation of order Populetalia albae Br.-Bl. 1931, classis Querco-Fagetea Br.-Bl. et Vlieg. 1937.

Keywords

Distribution, floristic diversity, ecological characteristics

1. INTRODUCTION

Vojvodina province is situated on southern brim of Pannonian basin, characterized with fragmented climate-zonal forest and steppe vegetation. Aside of developed steppe plant associations, especially along Danube and flows of other large rivers, vegetation of habitats with variable water regime have been developed. Permanent negative anthropogenic influence is threat to extinction for ecosystems such as marshes, wetlands, flooded meadows in Vojvodina. Ecological adaptations of species in genus *Allium* L. 1753, aimed to modification subterraneous organs, have improved accumulation of organic matter and survival of arid period. However, some of them are successfully adapted and they are taking part in building of plant communities in humid habitats.

2. MATERIAL AND METHODS

During the years of field investigations, completed with literature data and information from Institute of Biology and Ecology in Novi Sad Herbarium (BUNS), presence of species of genus *Allium* on analyzed habitats is defined, with accent on flooded areas along Danube River. Sin taxonomic status of plant communities are grouped in alliances and orders according to Parabućski et al. [13], Kojić et al. [12] and to the Vegetation of Serbia [15]. On UTM map (10x10 km) habitats of recorded species are located (UTM yone T34). Basic ecological demands are shown through ecological indices [5]; while life forms of these species define their basic adaptive characteristics [19].

3. RESULTS AND DISCUSSION

For now, two species of genus *Allium* that successfully inhabit humid habitats have been recorded in Vojvodina: *A. angulosum* and *A. vineale.*

Allium angulosum L.1753

Distribution of this species in Vojvodina is connected with habitats which are permanently flooded. *A. angulosum* mostly inhabit flooded plains and humid meadows, and can be considered as an edificatory of wet meadows inside climate-zonal vegetation of forests and steppe.

This species is mostly distributed in middle part of river Danube flow in Vojvodina (UTM Code: DR/00;10;11;20;30) [23, 14, 16, 17, 18, 2, 3, 7, 9, 6, 1]. Also *A. angulosum* has been found near Danube in western Backa region (UTM Code: CR46) [10]. Considering that eastern part of Vojvodina, Banat, is relatively pore with water flows, this species has been recorded only on few localities near Begej river (UTM Code: DR/51; 52) [16, 1] and vicinty of Banatska Palanka (UTM Code: EQ26) [1]. Near river Sava, in southern Vojvodina (Srem), it is recorded only in flooded forests of southeastern Srem (UTM Code: CQ67) [9], as well as near Obedska Bara, on locality near Kupinovo village (UTM Code: DQ35), however this plant species has not been recorded on that place since 1916 (Fig. 1).
Ecological indices: SBT_s TB_6 WB_8 RB_8 NB_3 LB_8 SB_0 [5]
Life form: a Mac-Meg G bulb/rhiz scap

Cenological distribution on flooded habitats in Vojvodina:
Classis *Querco-Fagetea* Br.-Bl. et Vlieg. 1937
Order: *Populetalia albae* Br.-Bl. 1931
Alliance: *Salicion albae* Soó 1940
Alliance: *Populion albae* Br.-Bl. 1931
Alliance: *Alno-Quercion roboris* Ht. (1937) 1938
Classis: *Molinio-Arrhenatheretea* Tx. 1937
Order: *Molinietalia coeruleae* Koch 1926
Alliance: *Molinion coeruleae* Horv. 1949
Order: *Arrhenatheretalia* Pawl. 1928
Alliance:*Agropyro-Rumicion crispi* Nordh. 1940
Classis: *Artemisietea vulgaris* Lohm., Prsg. et Tx. 1950
Order: *Galio- Alliarietalia* (Txd. 1950) Oberd. et al. 1967
Alliance: *Convolvulion sepii* Tx. 1947

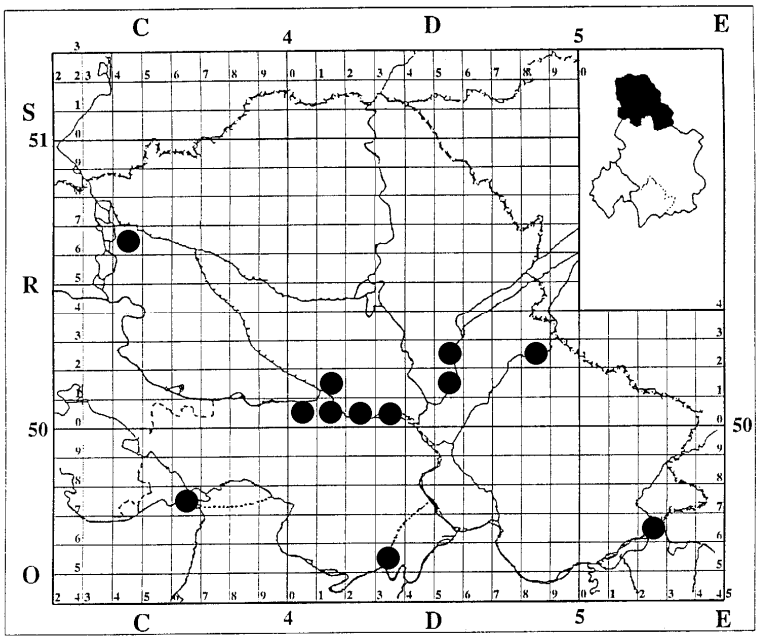

Fig. 1. *Distribution of Allium angulosum on humid habitats in Vojvodina*

Considering the status of species that inhabit only specific types of habitats, its definition as a Specialists species (SBTs) fulfill general view on a plant that is not tolerant to changes in habitat conditions. Its presence in alliances of classis *Artemisitea vulgaris* is surprising, we have to point out that this data origin from localities near water flows. *A. angulosum* is species of submontane wide leaved forests (TB8), but in Vojvodina it grows in forest-steppe zone in habitats which are occasionally flooded (WB8), so it can be indicator of flooded meadows in steppe area. It demands alkaline (RB8), oligotrofic (NB3) grounds with enough daylight (LB8). It is halofobic plant (S0) but it has been recorded on saline soils near Novi Sad [4].

A. angulosum belongs to the Rhizirideum section, it also could be seen from the description of its life form: G bulb/rhiz. This quite primitive section of genus *Allium* is characteristic for moderate continental areas, and its rhizome is main accumulation of organic matter. It is flowering during summer (a) and it can be 60 to 100 cm high (Mac-Meg).

In Vojvodina it grows in three vegetation classes. Classis Querco-Fagetea is presented with alliances of lowland flooded forests *Salicion albae, Populion albae* and *Alno-Quercion roboris*, while in classis of humid meadows *Molinio-Arrhenatheretea* it is present in alliances of hygro-mesophylous meadows *Molinion coeruleae* and mezophylous meadows and pasturages *Agropyro-Rumicion crispi*.

Allium vineale L. 1753

Species of wide distribution and wide ecological valence according to all factors. Although it is representative of the *Allium* section, which mostly inhabit dry places, *A vineale* is successfully accommodated to humid areas in Vojvodina, and it could be found along river banks and frequently flooded areas.

In Vojvodina, it has been recorded on few humid localities along Danube river (UTM Code: CR/37; 45; DR/10; 20) [14, 20,]. It has been also recorded near Plazovic river (UTM Code: CR57) [21], in lower Tisa region, near river (UTM Code: DR32) [8], as well as near Begej (UTM Code: DR51) [11] and in eastern Potamisje (near Tamis river) (UTM Code: DR82) [22] (Fig. 2).

Ecological indices: SBT_W TB_7 WB_4 RB_5 NB_7 LB_3 SB_0 [5]
Life form: v-a Mes-Mac G bulb scap

Cenological distribution on flooded habitats in Vojvodina:
Classis: *Molinio-Arrhenatheretea* Tx. 1937
Order: *Molinietalia coeruleae* Koch 1926
Alliance: *Molinion coeruleae* Horv. 1949
Classis: *Artemisietea vulgaris* Lohm., Prsg. et Tx. 1950
Order: *Galio- Alliarietalia* (Txd. 1950) Oberd. et al. 1967
Alliance: *Convolvulion sepii* Tx. 1947

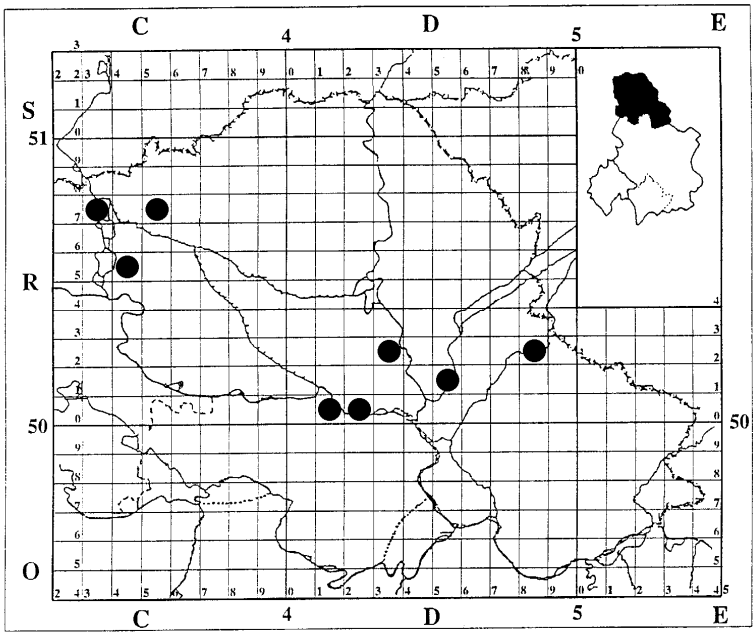

Fig. 2. *Distribution of Allium vineale on humid habitats in Vojvodina*

Species *A. vineale* is wide spreaded, stress tolerant plant. According to its social status, it could be treated as inhabitant of places with intensive anthropogenic influence (SBTw). It is characteristic for the termophylous forest-steppe belt (TB7), it grows on moderate humid (WB4), weakly acid (RB5) soils, rich in nitrogen (NB7), with low day light (LB5). It is halofobic (S0), but it has been found on saline soils in Vojvodina [1].

Belonging to the Allium section, it has developed ability for accumulation of organic matter in bulb (G bulb). It is flowering during the spring and summer (v-a), and its high reaches 30 to 60 cm (Mes-Mac).

A. vineale is mostly companion species in alliances, with low degree of presence that is consequence of high adaptive plastic and wide ecological valence. In Vojvodina it has been recorded on humid habitats, only in alliance *Molinion coeruleae*, as well as in few associations of alliance *Convolvulion sepii*.

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