Acta Horti Bot. Bucurest. 2023, **49**: 25-32

POLYPOGON MONSPELIENSIS FROM OLTENIA, ROMANIA

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Abstract: Characterised by numerous microclimates that are present from the plain area and up to the alpine region, the territory of Oltenia previously offered and still manages to offer surprises from a floristic point of view, as well as from other perspectives.
The recent climate changes have altered the typical habitats of some plants, resulting in their discovery in areas where, according to the data in the specialized literature, were not previously known to exist. Among the many species of Poaceae that are present in the spontaneous flora of Oltenia, there are certain species of sozological and phytogeographical interest. This is also the case with the species presented in the current paper, i.e. *Polypogon monspeliensis* (L.) Desf.
Polypogon monspeliensis (L.) Desf. is an Atlantic-Mediterranean coastal species, found especially on the western and southern European coastal sands. It is native to northern Africa, southern and western Europe, western and northern Asia, Japan and the Indian subcontinent (India, Nepal, Pakistan, and Sri Lanka). The species has been widely naturalized in southern and eastern Australia, in South Africa, New Zealand, Canada, the USA, Central and South America, as well as in Hawaii. In Romania, it is known from the south-eastern part of the country: Tulcea and Constanța counties. In Poiana Brașov and Vaideeni (Vâlcea County), the species is mentioned as an adventive plant.
The present paper contributes with information regarding the chorology and ecology of this species.
Keywords: chorology, vulnerable, spontaneous flora, Oltenia, Romania

Received: 16 October 2023 / Accepted: 18 November 2023

Introduction

The genus *Polypogon* belongs to the Poaceae family; in Europe, it is represented by three species: *Polypogon viridis* (Gouan) Breistr., *P. monspeliensis* (L.) Desf. and *P. maritimus* Willd (Tutin 1980). The first of these species is perennial, while the last two are annual plants.

In the spontaneous flora of Romania, *Polypogon monspeliensis* is the only species that belongs to the *Polypogon* genus (Ciocârlan 2000, 2009; Sârbu *et al.* 2013).

The Romanian botanical literature presents it as a rare plant (Beldie 1979; Ciocârlan 2000, 2009; Oprea 2005; Sârbu *et al*. 2013). Certain authors consider that it is a taxon with uncertain status (Sârbu & Oprea 2011).

In Romania, the species is known from the south-eastern part of the country, i.e. from Tulcea and Constanța counties (Panțu *et al*. 1935; Morariu 1957, 1965; Șerbănescu 1972; Dihoru & Negrean 1975; Făgăraș & Gomoiu 2002; Oprea 2005). From Poiana Brașov, it is mentioned as an adventive species (Dihoru & Negrean 2009; Sârbu *et al*. 2013).

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For the territory of Oltenia, the species was firstly mentioned by the co-author of the present paper, within the Upper Catchment of the Luncavăț river (Niculescu 2009).

Polypogon monspeliensis (L.) Desf. FI. Atl. 1: 67 (1798). (Poaceae) (Șerbănescu 1972, Tutin 1980). [HMR 769 - Săvulescu 1939; FEGL 43 -Todor 1959]. It represents a vulnerable, coastal, Atlantic-Mediterranean species (Ciocârlan 2009), which is found especially on the western and southern European coastal sands. According to some authors, it is considered indigenous on the shores of the Black Sea (Brândză 1898; Morariu 1965; Șerbănescu, in Săvulescu 1972; Oprea 2005) and in the Danube Delta (Panțu *et al*. 1935; Morariu 1965; Șerbănescu, in Săvulescu 1972; Ciocârlan 1994; Sanda *et al*. 2008). It is native to northern Africa, southern and western Europe, western and northern Asia, Japan and the Indian subcontinent (India, Nepal, Pakistan, and Sri Lanka). The species has been widely naturalized in southern and eastern Australia, in South Africa, New Zealand, Canada, the USA, Central and South America, as well as in Hawaii. It is a taxon situated at the north-eastern limit of the typical area (Dihoru & Negrean 2009).

In the south-eastern part of Romania, where this species has a good representation, it creates a well-assembled vegetal layer, which is classified by certain botanists in the association *Polypogonetum monspeliensis* Morariu 1957 (Morariu 1965; Sanda *et al*. 2008). It is also mentioned as an accompanying species, in the phytocoenoses of the associations *Hyppophaë-Salicetum elaeagni* Br.-Bl. et Volk 1940 from the Danube Delta (Hanganu *et al*. 2002), *Potentillo supinae – Petunietum parviflorae* Dihoru & Negrean 1975 (Dihoru & Negrean 1976), on Grindul Lupilor [Sandbank of the Wolves] in *Bolboschoenetum maritimi* Eggler 1933 (Sârbu *et al*. 2000) and on Saele – Istria Sandbank in *Bassietum hirsutae* Șerbănescu 1965 (Ștefan *et al*. 2001).

Through this work, we contribute to the knowledge of the chorology of the *Polypogon monspeliensis* species, based on data collected from the field, in conjunction with those existing in herbaria in the country and phytosociological literature.

Material and methods

Characterised by numerous microclimates that are present from the plain area and up to the alpine region (Fig. 1), the territory of Oltenia offered and still manages to offer surprises from a floristic point of view, as well as from other perspectives.

The climate changes occurred in recent years have modified the typical space of some plants, which were also identified in other areas than those mentioned in the specialized literature. Among the numerous species of Poaceae that are present in the spontaneous flora of Oltenia, there are certain species of sozological and phytogeographical interest.

From a methodological viewpoint, in order to carry out the present work, the authors conducted numerous field trips from April to October, with the aim of identifying a material that would allow for a correct determination.

Then the main herbaria in the country were consulted: Iași (”Alexandru Ioan Cuza” University Herbarium - I), Cluj-Napoca (“Babeș-Bolyai” University Herbarium in Cluj-Napoca - CL), Bucharest (Herbarium of the Institute of Biology of the Romanian Academy - BUCA; Herbarium of the “D. Brândză” Botanical Garden in Bucharest - BUC), Craiova (Herbarium of the University of Craiova - CRA), Galați

(Herbarium of the Galați Museum of Natural Sciences – GLHM). The acronyms of consulted herbaria are in accordance with Index Herbariorum (Thiers 2022+).

The plant material found in different settlements within Oltenia was photographed in situ and then collected (in few specimens), herborized and included in the herbarium of the University of Craiova (CRA). Field and laboratory research was carried out during the 2019 – 2022 interval. The plant material was determined by using the specialized Romanian and foreign literature (Tutin *et al*. 1980; Beldie 1979; Ciocârlan 2000, 2009; Sârbu *et al*. 2013).

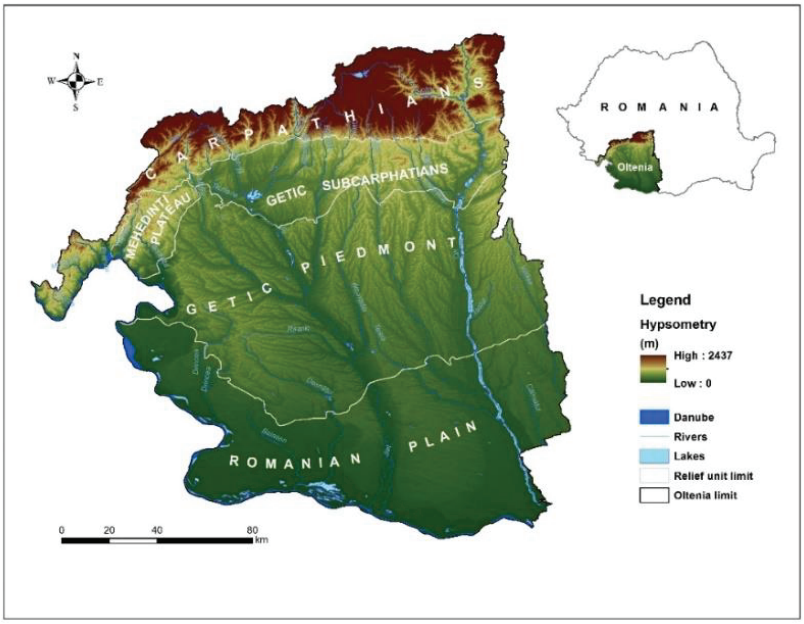

Fig. 1. Location and main physical-geographical characteristics of Oltenia (GIS processing after Topographical Map, 1:25,000. Elevation: SRTM, 30 m)

Results and discussion

Polypogon monspeliensis (L.) Desf. is a tetraploid species (2n=24), which can be easily distinguished from the other genera of the Poaceae family by several morphological characters that are visible both on fresh and on herborized plant material: obtuse glumes that are rounded or shortly emarginate, but awned in both cases and with the awn being two to three times longer (Tutin *et al*. 1980).

The specialized literature mentions it from:

Brașov: "Poiana Brașovului, on the side of the road (M. Danciu)".

Constanța: Saele-Istria Sandbank; "Constanța at Mamaia, Eforie, Techirghiol, between Lake Agigea and the Zoological Research Station"; Istria, VIII 1963, G. Negrean [HGN], Mamaia, 5.VII.1969, G. Negrean [HGN]; Constanța, 26.X.1936, T. Săvulescu [BUCM 11.818] and *Trei Papuci* Beach, 44°10'08"N, 28°39'2"E, alt. -0.5 m, 18.VIII.1984, G. Negrean [BUCM 84.799]; "Ad marginem lacus salsis Techirghiol et stationem viae ferreae Eforie, alt. ca. 1 m, 3.VIII.1955, I. Todor" [FEGL 43]; Comorova Forest, 30.VI.1963, G. Negrean [HGN]; north of Mangalia, 6.VII.1969, G. Negrean [HGN].

Tulcea: Sulina, 28.IX.1963, O. Constantinescu [BUCM 11.819], (Dihoru & Negrean 1975); Cardon, Letea, Caraorman, Littoral, Sf. Gheorghe, Ciotic, Perișor, Portița, 27.VI.1978, G. Negrean, [BUCM 52.723]. TL/CT: Grindul Lupilor [Sandbank of the Wolves].

Buzău: the Buzău river meadow (Oprea 2005). It was also identified from the localities Ciuta, Pârscov, Rătești and Săpoca (Buzău County) by PhD. Biol. Oprea A. (oral communication).

Olt: Gura Padinii - herbarium material collected by Popescu G. and Uță I. (1988).

During the four years of field research, the species was identified in sandy places on a small island of the Jiu River, near Teasc settlement (Fig. 2, 3), as well as in the Jieț river meadow, on the outskirts of Ostroveni settlement (Fig. 4).

It grows on sandy soils (Prodan 1914, 1935, 1939), as a pioneer species or where the coverage is very light, as was the case on the islet on the outskirts of Teasc settlement, or it coexists with *Agrostis stolonifera*, *Medicago sativa*, *Cynodon dactylon*, *Xanthium orientale* subsp. *italicum*, *Aster tripolium* subsp. *pannonicus*, *Apera spica-venti, Hordeum geniculatum, Trifolium fragiferum*, and *T. repens* in the meadow of the Jieț river, at Ostroveni. In the sites where it was identified, there are no phytocoenoses that can be classified as *Polypogonetum monspeliensis* Morariu 1957, as it is mentioned from the south-east of Romania (Morariu 1965; Sanda *et al*. 2008).

Fig. 2. Polypogon monspeliensis in a sandy habitat located on an islet of the Jiu river, near Teasc settlement (orig.)

Fig. 3. Polypogon monspeliensis – habitus (orig.)

Fig. 4. Polypogon monspeliensis from the grassland of the Jieț river, on the outskirts of Ostroveni settlement (orig.)

Due to the climatic conditions in which it grows, this plant can be successfully used for ornamental purposes, especially in the settlements located in the southern areas of Romania.

The distribution maps were achieved by using the Corolog 2010 program, which is a product of the Institute of Biology - Bucharest (RoBioAtlas 2003).

The program uses an Access database, with information originating in the specialized literature, in herbaria and in the field, as well as two types of maps, i.e. the map of average annual temperatures in Romania (Fig. 5) and the map of average annual precipitation in Romania (Fig. 6).

Conclusions

The present research contributes with significant information regarding the chorology of the species *Polypogon monspeliensis* (L.) Desf. in Romania.

If we consider the extensive areas of sandy lands to the left of the Jiu River, it's possible that the habitat of this species may expand in the near future. However, when we analyse the significant impact of zoo-anthropogenic factor in the areas where the species was found, especially on the sandy lands, along with the recent decrease in precipitation in this region, it's evident that the species' state is not favourable. This is why we consider it's essential to protect this species in Romania.

If we consider the fact that the sites where the plant was found belong to the natural protected area *ROSCI0045 Coridorul Jiului*, we consider that the presence of the *Polypogon monspeliensis* species in this part of the country could be a longstanding one.

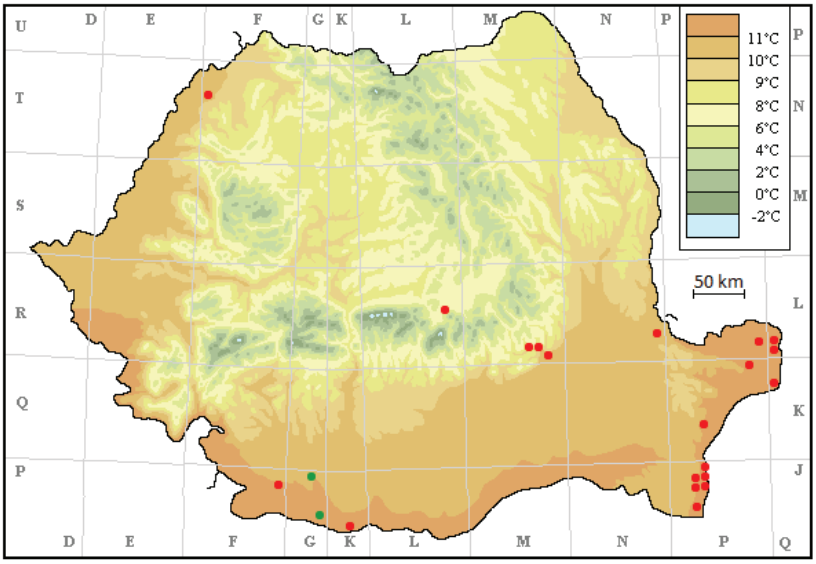

Fig. 5. Distribution of the species *Polypogon monspeliensis* in Romania, correlated with the average annual temperature.

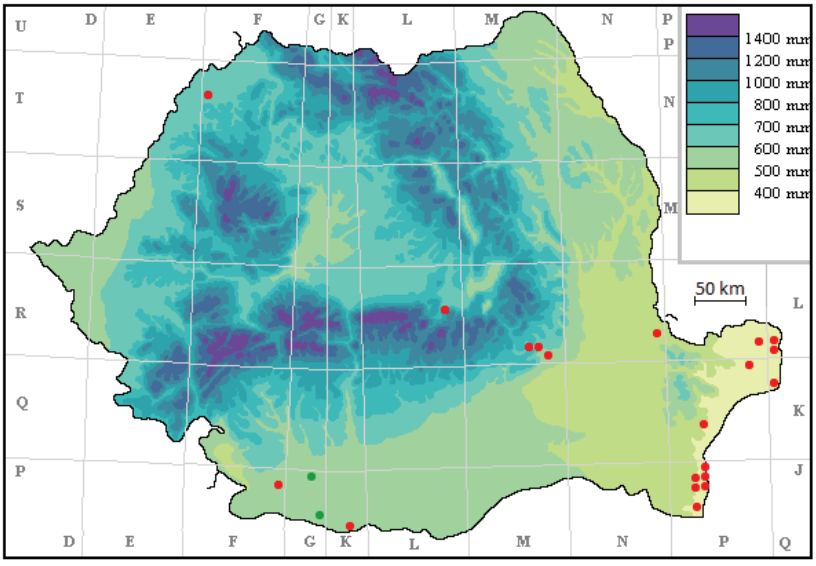

Fig. 6. Distribution of the species *Polypogon monspeliensis* in Romania, correlated with the average annual precipitation.

Acknowledgements: This work was supported by the following projects of the University of Craiova: "Revision of the Management Plan of the Protected Natural Areas ROSCI0045 Corridorul Jiului, ROSPA0023 the Jiu – the Danube Confluence,

ROSPA0010 Bistreț and the nature reserves *Locul Fosilifer Drănic* - 2391 and Pădurea Zăval [Zăval Forest] - IV.33".

At the same time we want to thank our colleagues Mihai Pușcaș (Babeș Bolyai University, Cluj Napoca), Irina Irimia ("Alexandru Ioan Cuza" University, Iași) and Sorin Ștefănuț (Institute of Biology of the Romanian Academy, Bucharest), for their support in providing the herbarium information.

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