

COENOLOGY, DISTRIBUTION AND ECOLOGY OF THE SPECIES *ADONIS VERNALIS* L. IN THE SOUTH-WEST OF OLTENIA, ROMANIA

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Abstract

Adonis vernalis L., known as pheasant's eye, spring pheasant's eye, yellow pheasant's eye, is a perennial plant with yellow flowers from the Ranunculaceae family that grows in xerophytic meadows but sometimes also in the glades of the thermophilic and sub-thermophilic forests of Europe and Asia. Following the studies carried out, in the south-west of Oltenia, the species was identified in xerophytic and xero-mesophytic meadows, but also in the glades and clearings of the Turkey oak and Hungarian oak trees in the localities: Radovan, Perișor, Plenița, Mărăcine, Tencănu, Vârvoru de Jos, Târnavă.

The populations were found on level ground at altitudes between 60-125 m. From a phytocoenotic point of view, the species was identified in the following plant communities: *Stipetum capillatae* Schneider-Binder 1967, *Bothriochloetum ischaemi* (Krist. 1937) Pop 1977, *Festucetum valesiacorupicolae* Csuros et Kovacs, *Quercetum cerris* Georgescu 1941; *Quercetum frainetto-cerris* (Georgescu 1945) Rudski 1949.

The populations of the species are very few, the number of individuals in a population being quite small. It was found that the climatic changes of recent years, combined with the expansion of the sandy lands in Oltenia, had a negative impact on this species both from the population and phytocoenotic point of view.

Pheasant's Eye (*Adonis vernalis*) has most recently been assessed for The IUCN Red List of Threatened Species in 2011. *Adonis vernalis* is listed as Least Concern. The species is also protected by 2 international agreements important at European level.

Key words: *Adonis vernalis*, coenology, populations, distribution, ecology, Oltenia

INTRODUCTION

Adonis vernalis L., known as pheasant's eye, spring pheasant's eye, yellow pheasant's eye, is a perennial plant with yellow flowers from the Ranunculaceae family.

Adonis vernalis is a rare plant distributed in the eastern part of the middle Europe through Eastern and South-Eastern Europe to Western Siberia to Eastern Siberia Yenisei region (Akeroyd, 1993).

Because it is considered to be a threatened species, it is included in most red data books of its range countries. In the synoptical red list for Central Europe the species is assessed as vulnerable by Schnittler & Gunther (1999).

This species is characteristic for various xerotherms pant communities of continental-sub-mediterranean type, belonging to *Festucetalia valesiaceae* (Denisow et al., 2008).

This species is considered a relict, in Oltenia it is a vernal or pre-vernal species that most often prefers sunny places, settling on chernozems with moderate humidity. Even if it grows in xerotherms meadows It is a mesophytic species with an optimal development in close correlation with the seasonal variation a ecological conditions in Silvestepa of Oltenia.

In many countries, especially in Europe, the populations of this species are getting smaller and smaller, so that the species was included in the IUCN Red List having the threat status in Europe - Least Concern although in some areas of Europe the threat status can be assessed – the risk of extinction. The species is also protected by 2 international agreements: Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) - Annex II and Commission regulation (EU) No 1320/2014, of 1 December 2014, amending Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein (EU regulation of trade of fauna and flora) - Annex B.

In Oltenia, the species was cited from the following localities: Radovan Forest (Buia, Popescu and Trică, 1950), Perișor Forest (Buia, 1950), Poiana Plenița (Buia, 1951), Valea Rea, Radovan (Buia, Popescu and Păun, 1954 , 1955), Perișor (Păun and Trica, 1957).

MATERIALS AND METHODS

The territory under study is in the south-west of Oltenia, the species was identified in xerophytic and xero-mesophytic meadows, but also in the glades and clearings of the Turkey oak and Hungarian oak trees in the localities: Radovan, Perișor, Plenița, Mărăcine, Tencănaș, Vârvoru de Jos, Târnava.

This territory is part of the ROSAC (ROSCI)0202 Silvestepa of Oltenia protected area (fig. 1, 2).

Syntaxonomic and geobotanical studies of the plant were carried out in all the indicated localities and phytosociological

relevés were carried out using the Braun-Blanquet Method.

RESULTS AND DISCUSSIONS

Following the studies carried out, in the south-west of Oltenia, the species was identified in xerophytic and xero-mesophytic meadows, but also in the glades and clearings of the Turkey oak and Hungarian oak trees in the localities: Radovan, Perișor, Plenița, Mărăcine, Tencănaș, Vârvoru de Jos, Târnava.

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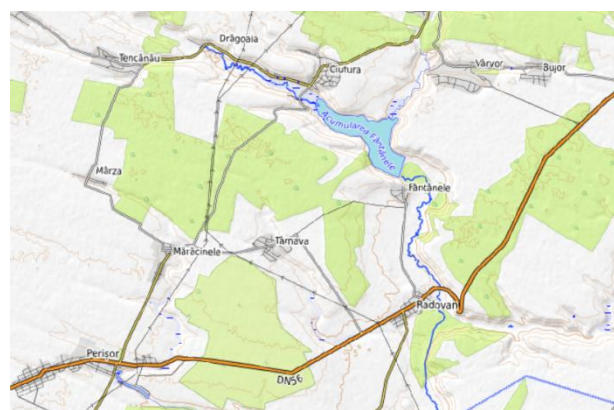


Fig. 1. Map with the studied area

Most often in the researched territory the species is found in dry grasslands that form the natural habitat 6210 Semi-natural dry grasslands (*Festuco-Brometalia*). Within this habitat, the phytocoenoses that have a greater number of individuals of *Adonis vernalis* form the plant communities *Bothriochloetum ischaemi* (Krist. 1937)

Pop 1977 and *Festucetum valesiacorupicolae* Csuros et Kovacs. The populations within these phytocoenoses have a larger number of individuals, they are more vigorous and have increased vitality.

In the plant communities edified by the species *Quercus cerris* and *Q. frainetto* the species is found in forest clearings, in cleared areas of the forest or in the area of enclaves.

Populations within these forest habitats have an even smaller number of individuals, and they have a weaker development of plant organs (fig. 2).

Within the forest phytocoenoses of *Quercus cerris* and *Q. frainetto*, in which populations of the species *Adonis vernalis* were identified, a number of invasive species were encountered.

They exert an important anthropic pressure on *Adonis vernalis* populations.

Adonis vernalis is a component of the *Quercetum frainetto-cerris* (Georgescu 1945) Rudski 1949 and *Quercetum cerris* Georgescu 1941 plant communities, its population being estimated at approx. 550 individuals in the forests of Tencanau, Mărăcine, Perișor and Radovan.

Early spring is a frequently encountered species in the phytocoenoses of these forest habitats. In the meadows in the immediate vicinity of these forests, the populations are rarer but more numerous in terms of number of individuals. In general, the flowering season of *Adonis vernalis* in the surveyed territory appears in the last days of March and the first days of April to mid-May.



Fig. 2. *Adonis vernalis* in the *Quercus cerris* and *Q. frainetto* plant community in the Tencănu and Mărăcine Forests

Table 1. The floristic composition of *Quercetum frainetto-cerris* (Georgescu 1945) Rudski 1949 plant community

No. of relevée	1	2	3	4	5	6	
Coverage tree layer (%)	0.7	0.7	0.7	0.8	0.7	0.8	
Coverage of herbaceous layer (%)	70	70	70	70	80	70	
Altitude (x 10 m.s.m)	120	115	115	120	120	120	
Area (m ²)	400	400	400	400	400	400	K
Char. ass.							
<i>Quercus cerris</i>	4	4	4	2	3-4	4	V
<i>Quercus frainetto</i>	1	2	2	4	3	1-2	V
Quercetalia et Quercetea 4ubescens-petraeae							
<i>Quercus pubescens</i>	-	-	+	-	-	+	II
<i>Crataegus monogyna</i>	+	+	+	-	+	+	V
<i>Potentilla micrantha</i>	+	+	+	+	+	+	V
<i>Lychnis coronaria</i>	+	-	-	+	-	+	III
<i>Crocus flavus</i>	+	+	-	-	+	-	III
<i>Poa nemoralis</i>	-	-	+	1	-	+	III
<i>Acer campestre</i>	+	-	+	+	+	+	V
<i>Ligustrum vulgare</i>	+	+	+	+	+	+	V
<i>Cornus sanguinea</i>	+	-	-	+	+	-	III
<i>Genista tinctoria</i>	-	+	-	+	-	-	II
<i>Cornus mas</i>	+	-	+	-	-	+	III
<i>Pyrus pyraeaster</i>	-	-	-	+	+	+	III
<i>Euonymus verrucosus</i>	-	-	+	-	+	-	II
<i>Tanacetum corymbosum</i>	+	-	-	+	+	-	III
<i>Vincetoxicum hirsutinaria</i>	-	-	+	+	+	-	III
<i>Melittis melissophyllum</i>	-	-	+	+	-	-	II
<i>Peucedanum cervaria</i>	-	+	+	-	+	+	IV
<i>Crataegus pentagyna</i>	+	-	-	-	-	-	I
<i>Melampyrum cristatum</i>	-	-	-	-	+	+	II
<i>Digitalis ferruginea</i>	-	-	+	-	-	+	II
<i>Campanula persicifolia</i>	-	-	-	+	+	-	II
<i>Lathyrus niger</i>	-	+	-	+	-	+	III
<i>Trifolium medium</i>	-	-	-	-	+	+	II
<i>Asparagus tenuifolius</i>	-	-	-	+	-	+	II
<i>Glechoma hirsuta</i>	+	-	+	+	-	+	IV
<i>Viola odorata</i>	-	-	-	+	+	+	III
Carpino-Fagetea							
<i>Carpinus betulus</i>	+	-	-	-	+	+	III
<i>Cerasus avium</i>	+	-	-	-	-	+	II
<i>Malus sylvestris</i>	+	-	+	-	-	-	II
<i>Tilia platyphyllos</i>	+	-	-	-	-	-	I
<i>Ulmus glabra</i>	+	-	-	-	-	-	I
<i>Polygonatum latifolium</i>	-	-	+	-	-	-	I
<i>Geum urbanum</i>	+	-	-	-	+	-	II
<i>Brachypodium sylvaticum</i>	+	+	-	+	+	+	V
<i>Lamium maculatum</i>	-	-	-	+	-	-	I
<i>Festuca heterophylla</i>	-	+	+	-	+	+	IV
<i>Carex pilosa</i>	-	+	+	-	+	+	IV
<i>Galium schultesii</i>	-	+	+	-	+	+	IV
<i>Veronica chamaedrys</i>	-	+	+	-	+	+	IV
<i>Prunella vulgaris</i>	-	-	-	+	+	+	III
<i>Rubus caesius</i>	-	-	-	+	+	-	II
<i>Euphorbia amygdaloides</i>	+	-	-	-	-	-	I
<i>Dactylis polygama</i>	1	-	-	-	+	+	III
<i>Lathyrus venetus</i>	-	-	-	+	-	+	II
<i>Mycelis muralis</i>	+	-	-	+	-	+	III
<i>Aremonia agrimonoides</i>	-	-	-	+	-	-	I
<i>Hieracium sabaudum</i>	+	+	+	+	-	+	V

<i>Fragaria vesca</i>	+	-	-	-	-	+	II
<i>Acer tataricum</i>	+	-	+	+	+	+	V
<i>Clinopodium vulgare</i>	-	-	-	+	+	+	III
Variae Syntaxa							
<i>Adonis vernalis</i>	2	1-2	+1	+	+	+1	V
<i>Robinia pseudoacacia</i>	1	-	-	-	+	-	I
<i>Achillea millefolium</i>	-	+	-	-	-	+	II
<i>Agrimonia eupatoria</i>	+	-	-	-	-	-	I
<i>Veronica officinalis</i>	-	-	-	-	+	+	II
<i>Serratula tinctoria</i>	-	+	-	-	-	+	II
<i>Lysimachia nummularia</i>	-	+	-	+	-	+	III
<i>Euphorbia cyparissias</i>	+	-	-	+	+	+	III
<i>Galium verum</i>	+	-	-	-	-	+	II
<i>Verbascum phoeniceum</i>	-	+	-	+	-	+	III
<i>Valeriana officinalis</i>	-	-	-	-	-	+	I
<i>Galium mollugo</i>	-	-	+	-	-	-	I
<i>Phytolacca americana</i>	+	-	-	+	+	-	III
<i>Ambrosia artemisiifolia</i>	-	+	+	-	+	+	IV
<i>Erigeron canadensis</i>	+	+	+	+	+	+	V
<i>Erigeron annuus</i>	-	+	+	+	+	+	IV
<i>Ailanthus altissima</i>	-	+	+	+	+	+	IV

Place and data of the relevées: Mărăcine, Tencănu, Radovan, 5.IV.2022; 30.III.2022; 7.IV.2023

Source: performed by the authors based on their own research.

CONCLUSIONS.

In the studied areas, *Adonis vernalis* grows in different biotope habitats, the density and frequency of individuals being influenced by several parameters: altitude, slope, climatic conditions specific to the vegetation period and the composition and floristic physiognomy of the phytocoenoses. The species has proven it self particularly well sensitive to early spring temperature drops, favorable temperature conditions being above 10°C. Populations of *Adonis vernalis* change dynamically due to the secondary succession of meadows in which the contributing species is found. The protection and ensuring the conservation of the species in all plant communities where *Adonis vernalis* occurs should be actively carried out in situ, which requires the development of a plan and special protection measures that include the avoidance of grazing in these meadows, the prohibition of collecting the species, having in view of its collection for medicinal purposes and the avoidance of

crossing the habitat of the species with motorized vehicles.

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