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# Survey of submediterranean leguminous species in Serbian flora

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**Summary** - This paper presents submediterranean leguminous species which appear in natural meadow and pasture, phytocenoses of Serbia. There have been included genera *Trifolium*, *Medicago*, *Onobrychis* and *Lotus*. A great number of species (33,3%) has an excellent, very good and good quality, which makes their collection and the process of selection possible. It was found that, out of the total number of species of genus *Trifolium*, 40% belong to the submediterranean group of floral elements, 45,5% from genus *Medicago*, and 83,3% from genus *Onobrychis*, also belong to it, while there are no species from genus *Lotus*.

**Key-words:** floral elements, *Trifolium*, *Medicago*, *Onobrychis*, *Lotus*

**Résumé** - Dans ce travail, on présente des espèces subméditerranéennes de légumineuses se trouvant aux phytocenoses naturelles de prairies et de zones de parcours de la Serbie. Cette étude concerne les genres *Trifolium*, *Medicago*, *Onobrychis* et *Lotus*. Un grand nombre d'espèces (33%) est soit d'une qualité excellente, soit très bonne, soit bonne; c'est pourquoi on peut les collectionner et les utiliser dans le processus de la sélection. On a constaté que sur le total des espèces du genre *Trifolium*, 40% des éléments floraux appartiennent au groupe subméditerranéen; 45.5% du genre *Medicago* et 83.3% du genre *Onobrychis* appartiennent aussi ce groupe, tandis que le genre *Lotus* ne présente aucune espèce subméditerranéenne.

**Mots-clés:** éléments floraux, *Trifolium*, *Medicago*, *Onobrychis*, *Lotus*

## Introduction

Concerning plants and the geographical position, the largest part of Serbia belongs to the submediterranean region. The group of submediterranean elements is the commonest one with 27,7% which agree with the map of Kleopow-a (Walter, 1954 and Walter and Straka, 1970). It includes the west mesial area (central Serbia) and the far eastern part of Illyrian area (central-western to south-western Serbia).

In Serbian flora 316 species have been determined which represent submediterranean floral region. They mostly belong to the groups which connect the submediterranean region with the neighbouring regions (Jankovi *et. al.*, 1984). Among the legumes of Serbian flora there are many which belong to this floral element. Because of their great significance as forage crops, this paper contains the species out of genera *Trifolium*, *Medicago*, *Onobrychis* and *Lotus*. Those with the best quality can be taken into the selecting process and as xerotherm species they can be used on arid habitats of town and mountain areas.

## Materials and methods

We have examined the species of genera (*Trifolium*, *Medicago*, *Onobrychis* and *Lotus*) of the family *Fabaceae* which appears in the flora of meadow and pasture phytocenoses of Serbia. The submediterranean legume species have been analysed according to Serbian flora (SANU, 1972). The geographical and plant belonging of the elements from the submediterranean floral elements was taken according to Gaji (1980).

## Results and discussion

We have analysed 71 leguminous species of 4 genera (*Trifolium*, *Medicago*, *Onobrychis* and *Lotus*) and separated 30 species which belong to the floral elements from submediterranean group (Table 1,2,3).

Concerning the number of species in Serbian flora, the most numerous one is genus *Trifolium* (50 species), *Medicago* (11 species), *Onobrychis* (6 species) and *Lotus* (4 species).

Within genus *Trifolium*, the species which cover the whole submediterranean region are the following ones: *Trifolium angustifolium*, *T. glomeratum*, *T. hirtum*, *T. lagopus*, *T. lappaceum*, *T. leucanthum*, *T. michelianum*, *T. patens*, *T. purpureum*, *T. resupinatum* and *T. nigrescens*. The elements from the submediterranean region can be put in two sub-groups. The sub-group of eastern-submediterranean floral elements contains the following species: *T. dalmaticum*, *T. echinatum*, *T. pallidum*, *T. physoides* and *T. tenuifolium*. The sub-group of the Balkan and Balkan-Apennine floral elements contains: *T. meneghinianum*, *T. trichopterum* and *T. velenovskyi* (Table 1.).

Within the genus *Medicago*, three species (*M. orbicularis*, *M. rigidula* and *M. tuberculata*) cover the whole submediterranean region. Some parts of it are covered by only two species (*M. carstiensis* and *M. prostrata*) and they both belong to the sub-group of the Balkan-Apennine floral elements (Table 2).

Out of the genus *Onobrychis* all the species appearing in Serbian flora, cover only certain parts of the submediterranean region. *Onobrychis viciaefolia* is the only species which belongs to the sub-group of the eastern-submediterranean floral elements. The following species: *O. alba*, *O. ocelata*, *O. oxyodonta* and *O. pindicola* belong to the sub-group of the Balkan and Balkan-Apennine floral elements (Table 3.).

Table 1. Survey of submediterranean floral elements of the species from genus *Trifolium* in Serbian flora.

Species	Floral elements
<i>T. angustifolium</i> L.	Submediterranean
<i>T. glomeratum</i> L.	Submediterranean
<i>T. hirtum</i> All.	Submediterranean
<i>T. lagopus</i> Pour.	Submediterranean
<i>T. lappaceum</i> L.	Submediterranean
<i>T. leucanthum</i> M. Bieb.	Submediterranean
<i>T. michelianum</i> Savi.	Submediterranean
<i>T. patens</i> Schreb.	Submediterranean
<i>T. purpureum</i> Lois.	Submediterranean
<i>T. resupinatum</i> L.	Submediterranean
<i>T. nigrescens</i> Vis.	Submediterranean
<i>T. dalmaticum</i> Vis.	Eastern – submediterranean
<i>T. echinatum</i> M. Bieb.	Eastern – submediterranean
<i>T. pallidum</i> W. et K.	Eastern – submediterranean
<i>T. physoides</i> Stev.	Eastern – submediterranean
<i>T. tenuifolium</i> Ten.	Eastern – submediterranean
<i>T. meneghinianum</i> Clem.	Mesial
<i>T. trichopterum</i> Pancic	Mesial
<i>T. velenovskyi</i> Vand.	Mesial

Tab. 2. Survey of submediterranean floral elements of the species from genus *Medicago* in Serbian flora.

Species	Floral elements
<i>M. orbicularis</i> (L.) All.	Submediterranean
<i>M. rigidula</i> (L.) Desr.	Illyrian
<i>M. tuberculata</i> Willd.	Sub-illyrian – Sub-panonian
<i>M. carstiensis</i> Wulf.	
<i>M. prostrata</i> Jacq.	

 Tab. 3. Survey of submediterranean floral elements of the species from genus *Onobrychis* in Serbian flora.

Species	Floral elements
<i>O. viciaefolia</i> Scop.	Eastern Submediterranean
<i>O. alba</i> (W. et K.) Desv.	Balkan-Apeninne
<i>O. ocellata</i> Beck.	Illyrian-Apeninne
<i>O. oxyodonta</i> Boiss et Huet	Subscardian-Pindic
<i>O. pindicola</i>	Scardian-Pindic

The participation of the submediterranean floral elements within genera *Trifolium*, *Medicago*, *Onobrychis* and *Lotus* is presented in table 4.

 Table 4. Participation (%) of submediterranean floral elements in genera *Trifolium*, *Medicago*, *Onobrychis* and *Lotus*.

Genus	Total number of Species	Submediterranean floral elements		
		Number	%	
<i>Trifolium</i>	50		20	40,0
		Submediterranean	11	55,0
		Eastern Submediterranean	5	25,0
		Mesial	3	15,5
		Subscardian-Pindic	1	5,0
<i>Medicago</i>	11		5	45,5
		Submediterranean	3	60,0
		Illyrian	1	20,0
		Subillyrian-Subpontic	1	20,0
<i>Onobrychis</i>	6		5	83,3
		Eastern Submediterranean	1	20,0
		Balkan-Apeninne	1	20,0
		Illyrian-Apeninne	1	20,0
		Subscardian-Pindic	1	20,0
		Scardian-Pindic	1	20,0
<i>Lotus</i>	4	-	-	-

The greatest participation of submediterranean species is within genus *Onobrychis* (83,3%) then within genus *Medicago* (45,5%), somewhat less it is genus *Trifolium* (40,0%) and without any submediterranean species is genus *Lotus*.

The largest number of different floral elements have the species from genus *Onobrychis* (5 species), followed by genus *Trifolium* (4 species) and finally genus *Medicago* (3 species).

## Conclusions

The submediterranean species from genera *Trifolium*, *Medicago*, *Onobrychis* and *Lotus* make up 42,25% from the total number of species of these genera, appearing in Serbian flora. Out of 50 species of genus *Trifolium*, 20 are submediterranean, which makes 40,0%. Genus *Medicago* has 11 species of Serbian flora, five of which (45,5%) are the submediterranean ones. Out of six species of genus *Onobrychis*, five (83,3%) are submediterranean ones. Genus *Lotus* (four species), none submediterranean species.

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