

The Weed Flora of Mirijevo – the Analysis of Living Forms

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Abstract: A total of 228 species of the vascular plants from the 159 genera and 44 families were found in various types of weed flora of Mirijevo (NE – Belgrade). The acquired results were analysis from the floristic and ecological aspects, i.e. analysis of living forms.

Key words: weed, weed flora, living form, Mirijevo.

Introduction

Although the weed flora of the Belgrade area was investigated (Jovanović, 1994) the flora of Mirijevo region has not been systematically studied. But, there is great need for such studyings because they have both scientific and practical significance, since they should serve as the basis to make the choice of the rational measures of the protection against the weeds. The purpose of this work was to research the weed flora of the Mirijevo region from the floral and ecological aspect, i.e. analysis of life form in that way, expand «the network» of studied urban entities of Serbia up to the level where different comparative analyses are possible.

The collecting of the plants was performed with the research on the terrain in the period from April 2000 until October 2001 in the crops (wheat, corn, sugar beet, sunflower, soybean, lucern, the vegetables: potatoes, peas, onion and garlic, cabbage, cauliflower, tomatoes, peppers, carrots, parsley, celery), long term implantations (fruit-gardens and vineyards), meadows and pastures in the region of Belgrade peripheral settlement Mirijevo.

General characteristics of the investigated area

The municipality of Mirijevo is the region of around 2963 ha situated in the northeast part of Belgrade lies in hilly around at 70-265 m. The pedological map of Mirijevo is eutric cambisol. The mean annual air temperature in Mirijevo is 12.1⁰C, the average in July the warmest month of the year is 23.4⁰C, and January is the coldest month with the mean temperature of 0.8⁰C. Average precipitation in the period 1990-2000 was 707.8 mm (Nestorović, 2002).

Material and Methods

The collected plant material used for the investigation encompasses the total of the 228 specimens.

The identification of the plants was made according to: Josifović (1970-1977), Saric and Diklic (1989), Canak et al. (1978), Javorka & Csapody (1975), Pignatti (1982), Jordanov (1963-1989).

Life forms classification of species was made according to standard Raunkier scheme carried by Ellenberg and Mueller-Dambois (1967), updated and adapted for the Serbian territory by Stevanovic (1992).

Abbreviations for parameters defining life forms are given for each species as proposed by Jovanović (1994).

Results and Discussion

A total of 228 taxons of vascular plants, classified into 159 genera and 44 families (Table 1) were found at different types of the weed flora in the region of Mirijevo. The class of *Monocotyledones* is represented with 39 species (16.12%) of 26 genera and 4 families, and the class of *Dicotyledones* with 188 species (82.46%) of 132 genera and 39 families. From the *Horsetails* only one species (*Equisetum arvense*) was found in the investigated area.

The largest families in the weed flora of Mirijevo coincide with the most numerous families in the flora of entire Serbia: *Asteraceae* (41), *Poaceae* (29), *Fabaceae* (19), *Lamiaceae* (19), *Brassicaceae* (9), *Chenopodiaceae* (9), *Boraginaceae* (7), *Cyperaceae* (7), *Caryophyllaceae* (6), *Polygonaceae* (6), *Ranunculaceae* (5), and others had been expected with regard to the synanthropic character of many species of these families. Some genera in the weed flora of Mirijevo are represented with typical weeds species: *Trifolium* (5), *Carex* (4), *Centaurea* (4), *Mentha* (4), *Chenopodium* (4), *Bromus* (4), *Rumex* (4), etc., that points at the anthropogenic character of various habitats, indicating either nitrification or the presence of other anthropogenic effect that make those weed habitats highly dynamic and unstable biotopes.

The analysis of the participation of different life forms in the weed flora of Mirijevo shows considerable domination of the hemicryptophytes (47.81%), which agrees with the level of occurrence of this life form in the flora of entire Serbia (Tab. 2) (Diklic 1984).

Table 1- Survey of the weed flora of Mirijevo with its life forms, floristic elements and ecological indices

FAMILY AND SPECIES	LIFE FORM	FAMILY AND SPECIES	LIFE FORM
AMARANTHACEAE		<i>Crepis setosa</i> Hall. Fil.	a Mes-Meg T scap
<i>Amaranthus retroflexus</i> L.	a Mes – Alt T scap	<i>Erigeron canadensis</i> L.	a Meg-Alt
APIACEAE		<i>Filago germanica</i> L.	a-aut Mi-Meg T scap
<i>Caucalis daucoides</i> L.	a Mi T scap	<i>Galinsoga parviflora</i> Cav.	a Mes-Meg T scap
<i>Daucus carota</i> L.	a Meg H scap/a T scap	<i>Gnaphalium luteoalbum</i> L.	a-aut Mi-Meg T scap
<i>Eryngium campestre</i> L.	a Mes – Meg H scap	<i>Hieracium pillosella</i> L.	v-a Mi-Mes H ros
<i>Pastinaca sativa</i> L.	a Meg-Alt H scap bienn	<i>Inula britannica</i> L.	a Mes-Meg H scap
<i>Torilis arvensis</i> (Huds) Link.	a Meg T scap	<i>Lactuca saligna</i> L.	a Meg-Alt T scap/a H scap
ARISTOLOCHIACEAE		<i>Lactuca serriola</i> L.	a Meg-Alt H scap bienn/a T scap
<i>Aristolochia clematitis</i> L.	a Mes – Meg G rad scap	<i>Matricaria chamomilla</i> L.	a T scap
ASTERACEAE		<i>Matricaria inodora</i> L.	a Mes-Meg T scap/a H scap bienn
<i>Achillea millefolium</i> L.	a Meg H scap	<i>Picris echioides</i> (L.) Gaertn.	a Meg T scap
<i>Arctium lappa</i> L.	aut Meg-Alt H scap bienn	<i>Picris hieracioides</i> L.	a Meg-Alt T scap bienn/a H scap
<i>Ambrosia artemisiifolia</i> L.	aut Meg T scap	<i>Pulicaria dysenterica</i> (L.) Bernh.	a Mes-Meg H scap
<i>Artemisia vulgaris</i> L.	aut Meg-Alt H scap	<i>Senecio vernalis</i> W. et K.	v Mes-Meg T scap
<i>Bellis perennis</i> L.	a Mes H ros	<i>Senecio vulgaris</i> L.	v-aut Mi-Meg T scap
<i>Carduus acanthoides</i> L.	a Meg-Alt H scap bienn	<i>Sonchus arvensis</i> L.	a Meg-Alt H scap
<i>Carduus nutans</i> L.	a Meg-Alt H scap bienn	<i>Sonchus asper</i> (L.) Mill.	a Meg-Alt T scap/a H scap bienn
<i>Centaurea arenaria</i> M. B.	a-aut Meg H scap/a H scap bienn	<i>Taraxacum officinale</i> Web.	v-aut Mes H ros
<i>Centaurea cyanus</i> L.	a Mes-Meg T scap	<i>Tragopogon dubius</i> Scop.	a Mes-Meg H scap bienn
<i>Centaurea rhenana</i> Boreau	a Meg H scap bienn/a H scap	<i>Tragopogon pratensis</i> ssp. <i>orientalis</i> L.	v-aut Mes-Meg H scap
<i>Centaurea scabiosa</i> L.	a Meg-Alt H scap	<i>Tussilago farfara</i> L.	v Mi-Mes G rhiz
<i>Cichorium intybus</i> L.	a-aut Meg-Alt H scap	<i>Xanthium spinosum</i> L.	a Mes-Meg T scap
<i>Cirsium arvense</i> (L.) Scop.	a Meg-Alt G rad scap	<i>Xanthium italicum</i> M. D. Love	a Meg-Alt T scap
<i>Crepis rhoeadifolia</i> M. B.	a Meg-Alt H scap bienn	BRASSICACEAE	
		<i>Berteroa incana</i> (L.) DC.	a Mes H scap
		<i>Brassica juncea</i> L.	a Mes-Meg T scap

FAMILY AND SPECIES	LIFE FORM	FAMILY AND SPECIES	LIFE FORM
<i>Brassica napus</i> L.	v-aut T scap/H scap bienn	<i>Chenopodium murale</i> L	a Meg-Alt T scap
<i>Capsella bursa-pastoris</i> (L.) Med	v-aut Mi-Meg T ros/H ros bienn	<i>Chenopodium strictum</i> Murr.	a Meg T scap
<i>Sinapis alba</i> L.	a Mes-Meg T scap	<i>Kochia laniflora</i> (Gmel.) Borb.	a-aut Mes T scap
<i>Lepidium draba</i> L.	v-a Mes-Meg H scap	<i>Kochia scoparia</i> (L.) Scharad.	a Meg-Alt T scap
<i>Lepidium perfoliatum</i> L.	v Mes-Meg T scap/H scap bien	<i>Salsola kali ssp. ruthenica</i> So	a Mes-Alt T scap
<i>Rorippa silvestris</i> (L.) Bess.	a Mi-Mes H scap		
<i>Descurainia sophia</i> (L.) Webb.	a Meg T scap/a H scap bienn	CONVOLVULACEAE	
BORAGINACEAE		<i>Calystegia sepium</i> (L.) R. B.	a SH herb
<i>Anchusa officinalis</i> L.	a Meg H scap bienn/a H scap	<i>Convolvulus arvensis</i> L.	a SG herb rhiz
<i>Cerinthe minor</i> L.	T	CRASSULACEAE	
<i>Cynoglossum officinale</i> L.	a Mes-Meg H scap bienn	<i>Sedum album</i> L.	Mi-Mes Ch herb rept succ
<i>Echium vulgare</i> L.	a Mes-Alt H scap bienn/a H scap	CUCURBITACEAE	
<i>Heliotropium europaeum</i> L.	a Mes-Meg T scap	<i>Bryonia alba</i> L.	a SG tub herb
<i>Lappula echinata</i> Gilib.	a Mes-Meg T scap	<i>Bryonia dioica</i> Jacq.	a SG tub herb
<i>Myosotis arvensis</i> (L.) Hill.	a Mes H scap bienn/a T scap	<i>Echinocystis lobata</i> M.	a ST herb
CANNABACEAE		CUSCUTACEAE	
<i>Cannabis sativa</i> L.	a Meg-Alt T scap	<i>Cuscuta epithymum</i> L.	ST par
CARYOPHYLLACEAE		CYPERACEAE	
<i>Gypsophylla muralis</i> L.	v-aut Mi-Mes T scap	<i>Bolboschenus maritimus</i> Palla	a Meg emer Hyd G rhiz
<i>Saponaria officinalis</i> L.	a Meg H scap	<i>Carex distans</i> L.	v-a Meg H caesp
<i>Silene alba</i> (Mill.) Krause	a Meg H scap bienn/a H scap	<i>Carex divisa</i> Huds.	v-a Mes-Meg G rhiz
<i>Silene conica</i> L.	v-a Mi-Mes T scap	<i>Carex gracilis</i> Curt.	v-a Meg G rhiz
<i>Stellaria media</i> (L.) Vill.	v-aut Mi T rept	<i>Carex vulpina</i> L.	a Meg H caesp
CHENOPODIACEAE		DIPSACACEAE	
<i>Atriplex patula</i> L.	aut Meg-Alt T scap	<i>Dipsacus laciniatus</i> L.	a Meg-Alt H scap bienn
<i>Atriplex tatarica</i> L.	a Meg-Alt T scap	<i>Knantia arvensis</i> (L.) Goult	a Mes-Meg H scap/a H scap bienn
<i>Chenopodium album</i> L.	a Meg-Alt T scap	<i>Scabiosa ochroleuca</i> L.	a Meg H scap
<i>Chenopodium hybridum</i> L.	a Mes-Meg T scap		

FAMILY AND SPECIES	LIFE FORM	FAMILY AND SPECIES	LIFE FORM
EQUSETACEAE		HYPERICACEAE	
<i>Equisetum arvense</i> L.	a Meg G rhiz	<i>Hypericum perforatum</i> L.	a Mes-Meg H scap
EUPHORBIACEAE		JUNCACEAE	
<i>Euphorbia cyparissias</i> L.	a Mes-Meg H scap	<i>Juncus articulatus</i> L.	a Mes-Meg G rhiz caesp
<i>Euphorbia platyphyllos</i> L.	a Mes-Meg T scap	<i>Juncus atratus</i> Krock	a Meg G rhiz caesp
<i>Euphorbia salicifolia</i> Host.	a Meg H scap	<i>Juncus compressus</i> Jacq	a Mes G rhiz caesp
FABACEAE		LAMIACEAE	
<i>Amorpha fruticosa</i> L.	fo dec Mi P caesp	<i>Ballota nigra</i> L.	a Mes H scap
<i>Astragalus cicer</i> L.	a Mes-Meg H scap	<i>Glechoma hirsuta</i> W. et K.	a Mes H rept
<i>Coronilla varia</i> L.	a Meg H scap	<i>Lamium amplexicaule</i> L.	v Mi-Mes T scap
<i>Glycyrrhiza echinata</i> L.	a Meg-Alt G rad scap	<i>Lamium maculatum</i> L.	v-a Mes-Meg H scap
<i>Lathyrus tuberosus</i> L.	a Meg G tub rept	<i>Lamium purpureum</i> L.	v Mi-Mes T scap
<i>Lotus corniculatus</i> L.	a Mes H scap	<i>Leonorus cardiaca</i> L.	a Meg-Alt H scap
<i>Medicago sativa</i> L.	a Mes-Meg H scap	<i>Lycopus europaeus</i> L.	a Mes-Meg H scap/emer Hyd G rhiz
<i>Medicago lupulina</i> L.	a Mes T scap/a H scap	<i>Lycopus exaltatus</i> L.	a Mes-Meg H scap/emer Hyd G rhiz
<i>Mellilotus albus</i> Medic.	a Meg T scap/a H scap bienn	<i>Marrubium peregrinum</i> L.	a Meg-Alt H scap
<i>Mellilotus officinalis</i> (L.) Pallas	a Meg-Alt H scap bienn	<i>Mentha arvensis</i> L.	a Mes-Meg H scap
<i>Ononis spinosa</i> L.	fo dec Mes-Meg Ch suff caesp	<i>Mentha longifolia</i> (L.) Huds.	a Mes-Meg H scap
<i>Robinia pseudoacacia</i> L.	fo dec Mes P scap	<i>Mentha piperita</i> L.	a Mes-Meg H scap
<i>Trifolium arvense</i> L.	a Mes T scap/a H scap bienn	<i>Mentha pulegium</i> L.	a Mi-Mes H scap
<i>Trifolium campestre</i> Schreb.	a Mes T scap	<i>Prunella vulgaris</i> L.	a Mi-Mes H scap-semi
<i>Trifolium fragiferum</i> L.	a Mes H rept	<i>Salvia pratensis</i> L.	a Mes-Meg H scap
<i>Trifolium pratense</i> L.	a Mes H scap	<i>Salvia verticillata</i> L.	a Mes-Meg H scap
<i>Trifolium repens</i> L.	a Mi H rept	<i>Scutellaria hastifolia</i> L.	a Mi-Meg G rhiz scap
<i>Vicia pannonica</i> Crantz	a Mes-Meg T scap/ST herb	<i>Thymus serpyllum</i> L.	v-a Mi-Mes Ch suff rept
<i>Vicia villosa</i> Roth	a Meg-Alt T scap/ST herb		
GERANIACEAE		LYTHRACEAE	
<i>Geranium pusillum</i> L.	a Mi-Mes T scap/a H scap bienn	<i>Lythrum virgatum</i> L.	a Meg-Alt H scap
<i>Erodium cicutarium</i> L.	v-a Mi-Mes T semiros-scap		

FAMILY AND SPECIES	LIFE FORM	FAMILY AND SPECIES	LIFE FORM
MALVACEAE		<i>Bromus tectorum</i> L.	a Mes-Meg T scap
<i>Althaea officinalis</i> L.	a Meg-Alt H scap	<i>Calamagrostis epigeios</i> (L.) Roth.	a Meg-Alt H caesp
<i>Hibiscus trionum</i> L.	a-aut Mes-Meg T scap	<i>Cynodon dactylon</i> (L.) Pers.	a Mes G rhiz rept-caesp
<i>Malva pusilla</i> Sm.	a-aut Mes-Meg T scap	<i>Dactylis glomerata</i> L.	a Meg H caesp
<i>Malva silvestris</i> L.	a Meg-Alt H scap bienn/a H scap	<i>Digitaria ciliaris</i> (R.) Koeler	a Mes T caesp-rept
OENOTHERACEAE		<i>Echinochloa crus-galli</i> (L.) Beauv.	a Meg-Alt T caesp
<i>Epilobium adnatum</i> Gris	a Mes-Meg H scap	<i>Festuca arundinacea</i> Schreb.	a Meg-Alt H caesp
<i>Epilobium parviflorum</i> Scherb	a-aut Meg H scap	<i>Festuca pratensis</i> Huds.	a Meg H caesp
OLEACEAE		<i>Eragrostis minor</i> Host.	a Mi-Mes T caesp
<i>Fraxinus ornus</i> L.	fo dec Mes P scap	<i>Hordeum murinum</i> L.	a Mes-Meg H caesp
OXALIDACEAE		<i>Koeleria gracilis</i> Pers.	a Meg H caesp
<i>Oxalis stricta</i> L.	a Mi-Mes H scap	<i>Lolium perenne</i> L.	a Mes H caesp
PAPAVERACEAE		<i>Panicum milliaceum</i> L.	a Meg-Alt T scap
<i>Chelidonium majus</i> L.	v-a Mes-Meg semiros	<i>Phalaris arundinacea</i> L.	Alt emer Hyd G rhiz
<i>Papaver rhoeas</i> L.	a Meg T scap	<i>Phalaris canariensis</i> L.	v-a Mes-Alt T scap
PLANTAGINACEAE		<i>Phleum pratense</i> L.	a Mes-Meg H caesp
<i>Plantago altissima</i> L.	a Meg H ros	<i>Phragmites communis</i> Trin.	a Alt emer Hyd G rhiz
<i>Plantago major</i> L.	a Mes-Meg H ros	<i>Poa pratensis</i> L.	a Mes-Meg H caesp
<i>Plantago media</i> L.	a Mes-Meg H ros	<i>Setaria verticillata</i> (L.) Beauv.	a-aut Mes-Meg T caesp
POACEAE		<i>Setaria viridis</i> (L.) Beauv.	a-aut Mes-Meg T caesp
<i>Agropyron repens</i> (L.) Beauv.	a Mes – Meg G rhiz caesp	<i>Sorghum halepense</i> (L.) Pers.	a-aut Meg-Alt G rhiz caesp
<i>Alopecurus aequalis</i> Sobol.	v-aut Mes-Meg T scap/H caesp bienn	<i>Typha angustifolia</i> L.	a Alt emer Hyd G rhiz
<i>Alopecurus pratensis</i> L.	a Meg-Alt H caesp	POLYGONACEAE	
<i>Arrhenatherum elatius</i> (L.) M. et K.	a Meg-Alt H caesp	<i>Polygonum aviculare</i> L.	a-aut Mi-Meg T rept
<i>Bromus commutatus</i> Schard.	a Meg T scap	<i>Polygonum lapathifolium</i> L.	a-aut Meg T scap
<i>Bromus mollis</i> L.	a Mi- Meg T scap	<i>Rumex acetosa</i> L.	a Meg H scap
<i>Bromus sterilis</i> L.	a Mes-Meg T scap	<i>Rumex acetosella</i> L.	a Mes-Meg H scap
PRIMULACEAE		<i>Rumex obtusifolius</i> L.	a Meg H scap
		<i>Rumex patientia</i> L.	a Alt H scap

FAMILY AND SPECIES	LIFE FORM	FAMILY AND SPECIES	LIFE FORM
<i>Lysimachia nummularia</i> L.	Ni-Mi Ch herb rept	SAMBUCACEAE	
RANUNCULACEAE		<i>Sambucus ebulus</i> L.	a Alt G rad scap/a H scap
<i>Consolida regalis</i> S. F. Gray	a Mes-Meg T scap	<i>Sambucus nigra</i> L.	fo dec Mi P scap
<i>Ranunculus acris</i> L.	a Meg H scap-semiros	SCROPHULARIACEAE	
<i>Ranunculus repens</i> L.	a Mes-Meg H rept	<i>Linaria vulgaris</i> Mill.	a-aut Mes-Meg H scap
<i>Ranunculus sardous</i> Cr.	a Mes-Meg T scap-semiros	<i>Verbascum phlomoides</i> L.	a Meg-Alt H ros bienn
<i>Thalictrum simplex</i> L.	a-aut Mes-Alt H scap	<i>Veronica arvensis</i> L.	v-a N-Mes T scap
RESEDACEAE		<i>Veronica hederifolia</i> L.	v Mi-Mes T scap
<i>Reseda lutea</i> L.	a Mes-Meg H scap/a T scap	SIMARUBIACEAE	
ROSACEAE		<i>Ailanthus altissima</i> (M.) Sw.	fo-dec Mes P scap
<i>Agrinomia eupatoria</i> L.	a Meg H scap	SOLANACEAE	
<i>Geum urbanum</i> L.	a Meg H scap	<i>Datura stramonium</i> L.	a-aut Meg-Alt T scap
<i>Potentilla anserina</i> L.	a Mes H rept	<i>Solanum dulcamara</i> L.	a Meg-Alt S lig
<i>Potentilla argentea</i> L.	a Mes-Meg H scap	<i>Solanum nigrum</i> L.	v-aut Mes-Meg T scap
<i>Potentilla reptans</i> L.	a Mi-Mes H rept	URTICACEAE	
<i>Potentilla supina</i> L.	a Mes T scap/a H scap	<i>Parietaria officinalis</i> L.	a Mes-Meg H scap
<i>Rosa canina</i> L.	fo-dec NP caesp	<i>Urtica dioica</i> L.	a Meg-Alt H scap
<i>Rubus caesius</i> L.	fo-dec NP rept	VALERIANACEAE	
RUBIACEAE		<i>Valerianella locusta</i> (L.) Laterr.	a Mes T scap
<i>Galium mollugo</i> L.	a Meg-Alt H scap	VERBENACEAE	
<i>Galium verum</i> L.	a Mes-Meg H scap	<i>Verbena officinalis</i> L.	a Mes-Meg H scap
SALICACEAE		VIOLACEAE	
<i>Populus alba</i> L.	fo dec Mes P scap	<i>Viola arvensis</i> Fr.	v-a Mes-Meg H scap
<i>Populus nigra</i> L.	fo dec Mes P scap		

Table 2 – Survey of life forms and their presence (%) in weed flora of Mirijevo

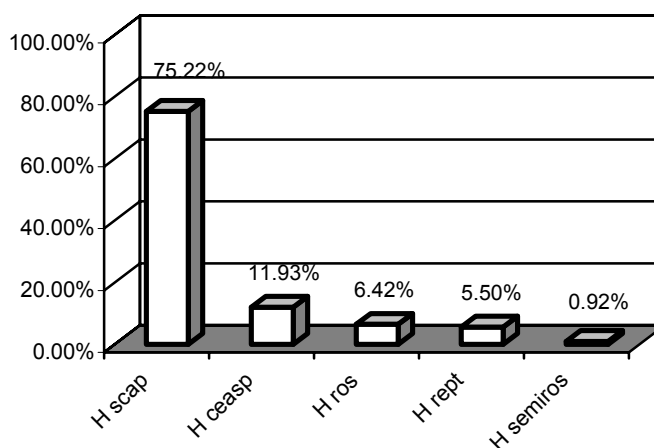
Hemicryptophytes	N	%	Geophytes	N	%
H scap	63	27,63	G rhiz	4	1,75
H scap bienn	17	7,46	G rhiz –caesp	4	1,75
H scap semiros	2	0,88	G rhiz –scap	1	0,44
H caesp	13	5,70	G rhiz –rept-caesp	1	0,44
H rept	6	2,63	G tub-rept	1	0,44
H ros	6	2,63	G rad –scap	4	1,75
H ros bienn	1	0,44	Total	15	6,58
H semiros	1	0,44			
Total	109	47,81			
Therophytes	N	%	Chamaephytes	N	%
T scap	66	28,95	Ch suff-caesp	1	0,44
T scap semiros	2	0,88	Ch suff-rept	1	0,44
T caesp	6	2,63	Ch herb-rept	1	0,44
T caesp rept	1	0,44	Ch herb-rept-succ	1	0,44
T rept	2	0,88	Total	4	1,75
T ros	1	0,44			
Total	78	34,21			
			Phanerophytes	N	%
Hydrophytes	N	%	NP caesp	1	0,44
Hyd G rhiz	5	2,19	NP rept	1	0,44
Hyd T scap	1	0,44	Mi P scap	1	0,44
Total	6	2,63	Mi P caesp	1	0,44
			Mes P scap	5	2,19
Scandentophytes	N	%	Total	9	3,95
S herb	3	1,32			
S lig	1	0,44			
S par	1	0,44			
S tub	2	0,88			
Total	7	3,07			

Hemicryptophytes

This life form includes 109 species in Mirijevo. Perennial scapose hemicryptophytes (H scap) forms are represented most they include 55 species (*Lotus corniculatus*, *Urtica dioica*, *Galium mollugo*, etc.). Except 17 biennial species (H scap bienn): *Tragopogon dubius*, *Cynoglossum officinale*, *Dipsacus laciniatus*, etc., and 2 species of transitional character (H scap semiros: *Ranunculus acris*, *Prunella vulgaris*), there are scapose hemicryptophytes as well that can facultatively be therophytes (H/T scap: *Reseda lutea*, *Daucus carota*, etc.). The species *Lycopus europaeus* and *Lycopus exaltatus* are primary hemicryptophytes, but in certain conditions could be hemicryptophytes.

Perennial scapose hemicryptophytes together with biennial, transitional and facultative species include 75.22% species of total hemicryptophytes (Fig. 1).

Figure 1 - The structure of hemicryptophytes in weed flora



The caespitose hemicryptophytes (H caesp: *Carex distans*, *Carex vulpina*, *Calamagrostis epigeios*, etc.) include 13 species (11.93%).

The reptant hemicryptophytes include 6 species (5.50%): *Trifolium repens*, *Glechoma hirsuta*, *Trifolium fragiferum*, *Ranunculus repens*, *Potentilla anserina*, *Potentilla reptans*.

Rosette hemicryptophytes (H ros: *Hieracium pilosella*, *Taraxacum officinale*, *Plantago major*, etc.) include 7 species (6.42%), but species *Verbascum phlomoides* is biennial rosette hemicryptophytes (H ros bienn). Semi rosette hemicryptophytes are represented by one species – *Chelidonium majus*.

Domination of the hemicryptophytes in the weed flora of Mirijevo (47.81%), agrees with the level of the occurrence of this life form in the flora of entire Serbia (Tab. 2).

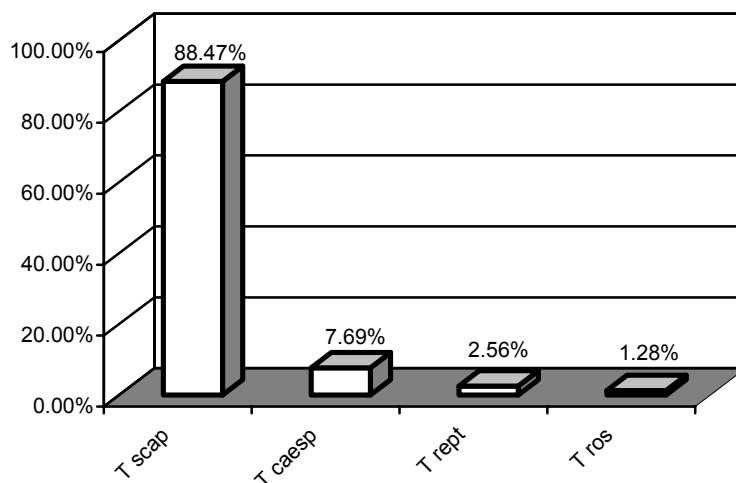
The analysis of the phoenological dynamics of this living form shows the domination of summer – blooming species (95): *Geum urbanum*, *Dactylis glomerata*, *Coronilla varia*, etc. The transitional summer–autumn group (a-aut) includes 5 species (*Epibolium parviflorum*, *Linaria vulgaris*, *Cichorium intybus*, etc.). The spring/summer–blooming group (v-a) includes 7 species (*Hieracium pilosella*, *Lepidium draba*, etc.) The autumn group includes only two species: *Artemisia vulgaris*, *Arctium lappa*.

The analysis of the size categories of this life form with 37 species shows the domination of the transitional group Mes-Meg. The transitional group Meg-Alt includes 24 species, and group of the tall hemicryptophytes includes 26 species.

Therophytes

The therophytes are represented with 78 species (34.21%), which ranks them second in the biological spectrum of the Mirijevo weed flora. Scapose therophytes are represented most, includes 57 species (T scap: *Amaranthus retroflexus*, *Silene conica*, *Datura stramonium*, etc.). Scapose therophytes with 2 transitional species (T scap-semiros: *Erodium cicutarium*, *Ranunculus sardous*) and 12 primary scapose species (T scap: *Brassica napus*, *Medicago lupulina*, etc.) that in certain terms can demonstrate facultatively as hemicryptophytes make the 88.47% of the total hemicryptophytes present in the weed flora of Mirijevo (Fig. 2).

Figure 2 -The structure of therophytes in weed flora



The caespitose therophytes (T caesp: *Bromus sterilis*, *Eragrostis minor*, *Setaria viridis*, etc.) include 6 species and together with one transitional species (T caesp-rept: *Digitaria ciliaris*) represent 7.69% of total therophytes. The annual reptant (T rept) includes 2 species: *Stellaria media*, *Polygonum aviculare*. The species

Capsella bursa-pastoris belongs to rosette therophytes (T ros). But, primary therophytes include 4 species that in certain terms can facultatively demonstrate like therophytes (Fig. 2).

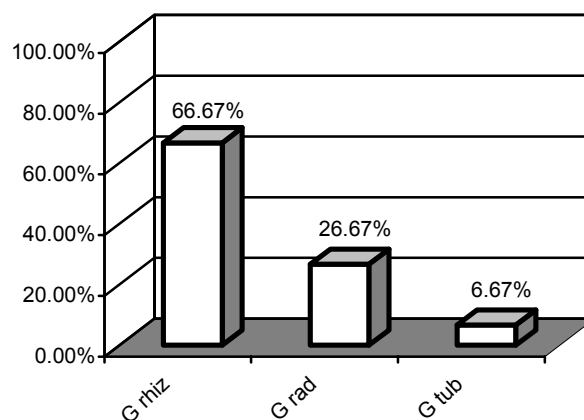
The analysis of the phenological dynamics of the therophytes with 51 species shows the domination of the summer-blooming species (a) (*Erigeron canadensis*, *Consolida regalis*, *Amaranthus retroflexus*, etc.). The transitional summer-autumn group (a-aut) includes 10 species (*Kochia laniflora*, *Hibiscus trionum*, *Setaria viridis*, etc.), spring/autumn-blooming group (v-aut) includes 7 species (*Brassica napus*, *Senecio vulgaris*, etc.), spring/summer-blooming group (v-a) includes 4 species (*Silene conica*, *Erodium cicutarium*, etc.). The spring-blooming group includes 5 species (*Veronica hederifolia*, *Lamium amplexicaule*, etc.). The autumn-blooming group includes 2 species: *Ambrosia artemisiifolia* and *Atriplex patula*.

The analysis of the size therophytes categories shows as the domination the group of tall plants from transitional group Meg-Meg with 24 species and Meg-Alt with 12 species.

Geophytes

Geophytes are represented in the weed flora of Mirijevo with 15 species (6.58%). Most of them belong to the rhizomic type (G rhiz) with 10 species, of which the scapose rhizomic geophytes (G rhiz scap) is represented by one species, *Scutellaria hastifolia*, reptant rhizomic geophytes (G rhiz rept) include one species, *Cynodon dactylon*, and the caespitose rhizomic geophytes (G rhiz caesp) include 4 species (*Juncus atratus*, *Juncus articulatus*, *Juncus campestris*, *Sorghum halepense*). The group of root-budding geophytes (**G rad scap**) includes 4 species (*Cirsium arvense*, *Aristolochia clematitis*, *Glycyrrhiza echinata*, *Sambucus ebulus*), and tuberous geophytes (G tub: *Lathyrus tuberosus*) (Fig. 3).

Figure 3 - The structure of geophytes in weed flora



The analysis of the geophytes phenological dynamics with 11 species shows the domination of the summer-blooming species. The analysis in size categories of the geophytes shows that the domination group is the tall plants.

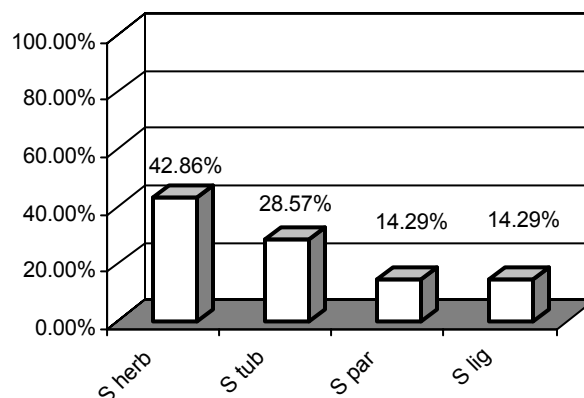
Phanerophytes

Phanerophytes are represented in the weed flora of Mirijevo with 9 species (3.95%) (Tab. 1). The group mesophanerophytes (Mes P scap) includes 5 species: *Robinia pseudo-acacia*, *Fraxinus ornus*, *Populus alba*, *Populus nigra*, *Ailanthus altissima*. The group nanophanerophytes (NP) includes 2 species *Rubus caesius* (NP rept) and *Rosa canina* (NP caesp). The group microphanerophytes includes 2 species *Amorpha fruticosa* (MiP caesp) and *Sambucus nigra* (MiP scap).

Scandentophytes

The scandentophytes are represented in the weed flora of Mirijevo with 7 species. The herbaceous forms include 5 species, of that 2 are geophytes tuberous nature (SG tub herb: *Bryonia alba*, *Bryonia dioica*), one species is geophytes rhizomic nature (SG herb rhiz: *Convolvulus arvensis*), hemicryptophytes species (SH herb) is *Calystegia sepium*, therophytes species (ST herb) is *Echinocystis lobata*. To this living form belongs also one parasite species *Cuscuta epitimum*, as well as the lignified species (S lig) *Solanum dulcamara* (Fig. 4).

Figure 4 - The structure of scandentophytes in weed flora



Chamaephytes and Hydrophytes

Chamaephytes are represented in the weed flora of Mirijevo with 4 species (1.75%), and hydrophytes with 6 species (2.63%).

Conclusion

The total of 228 taxons of the vascular plants belonging to the 159 genera and 44 families were found in various types of habitats in the region of Mirijevo (NE Belgrade).

Asteraceae, *Poaceae*, *Fabaceae* and *Lamiaceae* are the families with most species in the weed flora of Mirijevo. Considerable participation of the species of the families *Apiaceae*, *Boraginaceae*, *Cyperaceae*, *Caryophyllaceae*, *Polygonaceae*, *Rosaceae*, *Ranunculaceae*, *Scrophulariaceae*, and typical weed species of genera *Carex*, *Trifolium*, *Centaurea*, *Mentha*, *Chenopodium*, *Bromus*, *Rumex* and *Potentilla* indicate a pronounced antropogenic character, i.e. a dynamic and unstable nature of weed flora.

The analysis of the participation of different life forms in the weed flora of Mirijevo shows considerable domination of the hemicryptophytes (47.81%). Perennial scapose hemicryptophytes, and their biennial and caespitose forms are represented most. The analysis of the hemicryptophytes phenological dynamics shows a domination of the summer-blooming species (87.16%), while basic and transitional groups of tall plants predominated in view of size categories.

The therophytes are represented with 78 species (34.21%), which ranks them second in the biological spectrum of the weed flora. Apart from the fact that the structure of the therophytes are dominated by the scapose therophytes. The analysis of the therophytes phenological dynamics shows a domination of the

summer-blooming species (65.38%). The basic and transitional groups of tall plants predominated regarding the size categories.

The geophytes are represented in the weed flora of Mirijevo with 15 species (6.58%). Most of them belong to the rhizomic type (66.67%). The analysis of phenological dynamics of the geophytes shows the domination of the summer-blooming species (73.33%). The analysis of the geophytes size categories shows the domination of the group of tall plants.

The phanerophytes are represented in the weed flora of Mirijevo with 9 species (3.95%), scandentophytes with 7 species (3.07%), chamephytes with 4 species, and hydrophytes are represented with 6 species (2.63%).

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KOROVSKA FLORA MIRIJEVA – ANALIZA ŽIVOTNIH FORMI

- originalni naučni rad -

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Rezime

Taksonomskom analizom korovske flore Mirijeva utvrđeno je da se na različitim tipovima korovskih staništa nalazi 228 vrsta vaskularnih biljaka iz 159 rodova i 44 familije. Od ukupnog broja klasi *Dicotyledones* pripada 188 vrsta (82,46%) iz 132 roda i iz 39 familija, a klasi *Monocotyledones* 39 vrsta (16,12%) iz 26 rodova i 4 familije. Razdeo rastavića zastupljen je samo jednom vrstom iz familije *Equisetaceae*. Familije koje su najbrojnije vrstama su *Asteraceae*, *Poaceae*,

Fabaceae, Lamiaceae. Među nazastupljenijim rodovima ističu se *Carex, Trifolium, Centaurea, Mentha, Chenopodium, Bromus, Rumex, Potentilla*.

Analizom zastupljenosti životnih formi u korovskoj flori Mirijeva ustanovljen je hemikriptofitsko–terofitski karakter. U okviru životne forme hemikriptofita (47,81%) najbrojnije su stablove hemikriptofite koje od ukupnog broja čine 75,22%.

Fenološku dinamiku karakteriše dominacija vrsta koje cvetaju tokom leta (95), dok je analiza uzrasnih kategorija pokazala dominaciju visokih biljaka.

U spektru životnih formi biljaka istraživanog područja po brojnosti su na drugom mestu terofite (34,21%) među kojima dominiraju stablovi oblici, dok je na trećem mestu životna forma geofita (6,58%). Među geofitama dominiraju rizomatozne forme, koje su najbolje prilagođene korovskim staništima. Skandentofite i hidrofite zastupljene su sa 3,07%, odnosno 1,75% u ukupnom spektru životnih formi. Brojnost hamefita i fanerofita je mala, pošto su ove životne forme vezane za stabilna staništa sa primarnom vegetacijom.