

**PHYTOCOENOLOGICAL INVESTIGATIONS OF
ass. Fagetum submontanum (Rudski 1949) Jov. 1967 AT THE
MICROLOCALITIES IN THE AREA OF LOWER CORSE
OF THE RIVER TIMOK (EAST SERBIA)**

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ABSTRACT. At microlocalities in the area of lower course of the river Timok (East Serbia), in the districts of Tamnič, Smedovac, Rajac, Bračevac, Crnomasnica and Brusnik villages, relic communities of ass. Fagetum submontanum were investigated. All localities are situated at the altitude lower than 200 meters, and are placed in microdepression and stream canyons, in which specific conditions of temperature, humidity and light exist. Phytocoenological investigations at these localities were made for the first time, and show very specific floristic composition.

INTRODUCTION

Beech forests in East Serbia were investigated by a number of investigators (Gigov, 1955, Mišić, 1981, Mišić and Dinić, 1967; 1970; 1972; 1977, Jovanović, 1973). The subjects of their investigations were either the complexes of beech forests on high mountain massifs (Jovanović, 1980) or beech forests in sheer rocks and canyons in this region of Serbia (Mišić, 1981). But, the small communities of beeches were mostly unknown for researchers. Only people who live in the area of the lower course of the Timok river know for them, and since the forests are dominant in this area, they call them „bučine,„. They mostly cover surfaces smaller than a hectare, and seldom the larger ones (Marković et al 1997). They occur on a few locations near the Tamnič, Brusnik, Bračevac, Crnomasnica, Rajac, Smedovac, Rogljevo, Rečka villages, and at the three-border point of the Tamnič, Rečka and Mokranje (Čapljanac) villages. They occur on the north slopes, near the streams, in the cuttings and the recesses, i. e. on the places with increased humidity, decreased air circulation and light. The forests are interesting because of a few things. First, they are interesting because of their specific location, because of the small surface they cover and of their floristic composition, and then, because there is an open question of their origin and further survival. During last decades, the anthropogenic influence can be recognized in merciless cuttings of the forests.

The aim of this work is not only to study their floristic composition and to make them closer to the public, but also to raise the question of their complete protection.

MATERIALS AND METHODS

Phytocoenological investigations of the beech communities at the microlocalities in the area of lower course of the Timok river were carried out during the summer of 1996, and the spring of 1997. The communities of beech forests occur in the area of the Tamnič village: localities Bučina Rupje, (Rup), Gornja bučina, (Gor) and Kand`ik (Kan); of the Smedovac (Sme) village: localities Alija (Ali), Smedovačka bučina (SmB); of the Crnomasnica (Crn) village: Fntina badina (Fnt); of the Bračevac village (Bra) - locality Manastirište (Man), and of the Brusnik village: locality Milovanska bučina (Mil). 13 phytocoenological records were taken using the T•xen method. We estimated that this method is the most appropriate method for showing the specific nature of the communities, which, among other things, rarely cover the surfaces larger than a hectare, and very often the surfaces are much smaller. Very precise phytocoenological records, collected on the localities, are given in the table 1, and they present all the necessary data about the localities.

RESULTS AND DISCUSSION

Beech communities, located at the microlocalities in the area of the lower course of the Timok river, are distributed mosaic-like and are deeply hidden in the oak forests complexes. They cover small areas, and are located on very inaccessible localities, mostly in the upper courses of streams and small rivers. That is the reason why they remained totally unknown to many investigators of the area. The terrains that the forests cover, are of very interesting relief and resemble canyons. Steep slopes of the cuttings are turned to west, northeast and north. Besides that, on these places, snow starts melting later in spring. All this makes this area a specific ecoclimate optimum for *Fagus moesiaca* species. It should be pointed out that in this climate area beech forests rarely occur at so low altitude. Beech forest communities analyzed in the work are altitude lower than 200, or even 100 meters. On these localities, the level of humidity is high during the whole vegetation period. The beech forests and some enormous trunks, whose diameters are sometimes larger than a meter, look very impressive and one may think they are titans from the old times.

Results of the phytocoenological research are shown in the table 1. From the obtained results, it is clearly seen that the species *Fagus moesiaca* is absolutely dominant and edificatory species, which, together with species *Dentaria bulbifera*, *Melica uniflora*, *Asperula odorata* and *Festuca silvatica*, show that the species belong to the Fagetum submontanum (Rudski 1949) Jov. 1967 (Tomić, 1992) community. This cannot be debated in any case, but, spontaneous grouping of the species according to the floristic composition, in some communities in the area of the Tamnič, Smedovac, Brusnik and Crnomasnica villages, can be detected. These are *Tilia platyphyllos* and *Acer campestre* species from the Carpini betuli community. This indicates the succession of hornbeam forests over beech forests. The fact that thermophile species from oak forest communities, can be found here, and they are Quercion frainetto-cerris et Quercetalia pubescentis: *Quercus cerris*, *Quercus conferta*, *Staphylea pinnata*, *Polygonatum odoratum*, *Convallaria majalis*, *Melittis melissophyllum*, *Viola hirta*, and especially the species *Cephalanthera rubra*, which grows here as a consequence of the negative anthropogenic influence, is also indicative and important. Many

species from the Querco-Fagion communities grow here, and this happens mostly on the places where their communities meet.

Origin of the species was not meant to be the topic of the investigations, so we did not analyze it, but it is very interesting. It may seem that the communities belong to the relict vegetation of this part of East Serbia (Jovanović, 1955). It is obvious that the further phytocenological research of beech forests on other localities is necessary.

Phytocenological table 1.

<i>Fagetum submontanum</i> (Rudski 1949) Jovanović 1967														C O N S T A N C Y	C O V E R E F.
Successive no. of record	1	2	3	4	5	6	7	8	9	10	11	12	13		
No. of record	2	6	4	3	1	5	8	13	9	10	7	11	12		
Date	6	6	6	6	6	6	6	6	6	6	6	6	6		
Locality	Sme	Tam	Tam	Tam	Sme	Tam	Bru	Brac	Crn	Crn	Brus	Smed	Smed		
Place	Alij	Rup	Gor	Kan	Alij	Rup	Mil	Man	Fnt	Fnt	Mil	SmB	SmB		
Density of trees layer a in %	90	90	90	90	90	90	90	90	85	95	95	90	85		
Density of trees layer b in %	40	40	20	40	10	30	30	25	10	<5	20	10	10		
Cover of herb layer c in %	30	80	15	40	35	20	20	30	30	35	20	20	40		
Inclination [°]	65	30	20	50	70	45	65	60	60	15	40	15	25		
Exposition	NNE	N	NW	NNW	NW	W	NE	N	N	N	NW	N	NE		
Height of trees in m							35		35				25		
Average diameter in cm	100	30	10	100		40		40	40	60	40	40	25		
Area of record in m ²	200	180	150	200	200	200	300	200	150	150	200	200	160		
Number of species in the record	17	22	14	26	31	25	19	30	15	23	14	32	11		
Ch. *Fagion moesiaca et Fagion silvatica															
* <i>Fagus moesiaca</i>	a	5.5	4.4	5.5	4.4	4.4	4.4	5.5	4.5	4.4	5.5	5.4	5.4	V	7596
* <i>Fagus moesiaca</i>	b	1.1	1.1	1.1	2.2	2.2	2.2	1.1	2.2	+	+	1.1	2.2	V	1008
* <i>Fagus moesiaca</i>	c	.	.	+	.	+	.	.	+	.	.	+	1	III	58
<i>Acer pseudoplatanus</i>	a	+	.	.	+	.	.	.	.	.	.	.	.	I	8
<i>Acer pseudoplatanus</i>	b	+	.	.	.	.	.	.	+	.	.	.	.	I	8
<i>Acer pseudoplatanus</i>	c	+	.	.	.	.	.	.	.	+	.	+	.	II	12
<i>Dentaria bulbifera</i>	c	+	+	.	+	+	+	1.1	.	.	1.1	.	.	IV	100
<i>Melica uniflora</i>	c	.	+	.	+	+	+	+	.	1.1	.	.	.	III	62
<i>Asperula odorata</i>	c	.	.	+	+	.	.	2.2	.	.	.	2.2	.	II	277
<i>Festuca silvatica</i>	c	.	.	.	.	.	.	.	.	.	.	.	3.4	I	288
Ch. et ^D. Carpinion betuli															
<i>Tilia platyphyllos</i>	a	+	+	+	+	+	.	+	.	.	.	.	.	III	27
<i>Tilia platyphyllos</i>	b	.	+	+	+	+	.	+	.	.	.	.	.	III	23
^ <i>Acer campestre</i>	a	.	+	.	+	+	+	+	+	.	.	.	.	III	27
^ <i>Acer campestre</i>	b	.	+	+	+	+	+	+	.	.	.	.	.	III	27
<i>Carpinus betulus</i>	a	.	.	+	+	.	.	+	.	.	.	+	.	II	15
<i>Carpinus betulus</i>	b	.	.	+	+	.	+	+	.	+	.	.	.	II	19
<i>Cerasus avium</i>	b	.	.	.	.	.	.	+	.	.	.	+	+	II	12
<i>Dactylis aschersoniana</i>	c	.	.	.	.	.	.	.	.	.	.	+2	+	I	8
<i>Carex pilosa</i>	c	.	.	.	.	.	.	.	.	.	.	.	2.2	I	135
<i>Ranunculus cassubicus</i>	c	.	.	.	.	.	.	.	.	.	.	.	.	I	1
Ch. Quercion frainetto-cerris et *Quercetalia pubescentis															
<i>Quercus cerris</i>	a	.	.	.	+	.	+	.	.	+	.	.	.	II	12
<i>Quercus cerris</i>	b	.	.	.	+	+	.	.	.	.	.	.	.	I	8
<i>Quercus cerris</i>	c	.	.	+	+	.	+	.	.	+	+	+	.	III	23
<i>Quercus conferta</i>	b/c	.	.	.	.	+/-	.	.	.	.	.	+/	.	I	8
* <i>Staphylea pinnata</i>	b	.	.	.	+	.	.	.	.	.	.	.	.	I	4
<i>Sorbus torminalis</i>	b	.	.	.	.	+	.	.	.	.	.	.	.	I	4
<i>Sorbus torminalis</i>	c	.	.	.	.	+	.	.	.	.	.	.	.	I	4
* <i>Polygonatum odoratum</i>	c	.	.	.	+	2.2	.	.	+	.	.	.	.	II	142
* <i>Convallaria maialis</i>	c	.	.	1.1	2.1	.	.	.	.	.	.	.	.	I	173
* <i>Melittis melissophyllum</i>	c	.	.	.	.	.	.	.	+	.	.	.	+	I	8
* <i>Viola hirta</i>	c	.	.	.	.	.	.	.	.	.	+	.	+	I	8
* <i>Cephalanthera rubra</i>	c	.	.	.	.	.	.	.	.	.	.	.	+	I	4
Ch. Querco-Fagetea															
<i>Corylus avellana</i>	b	+	+	.	.	.	+	.	.	.	.	.	.	II	12
<i>Fraxinus excelsior</i>	a	.	+	.	.	.	+	.	.	.	.	.	.	I	8
<i>Fraxinus excelsior</i>	b	.	.	.	+	+	+	+	.	.	.	.	+	II	19
<i>Cornus sanguinea</i>	b/c	.	+/-	.	.	+/-	+/-	.	+/-	.	.	.	+/	II	19

<i>Acer platanoides</i>	a/b	.	.	.	.	/+	.	.	.	+/+	+/	.	.	.	I/I	16
<i>Ulmus scabra</i>	a/b	.	/+	.	.	.	.	+/	.	/+	.	.	.	.	II	12
<i>Hedera helix</i>	b/c	.	.	.	+/	.	.	.	.	.	.	.	/+	.	II	142
<i>Prunus spinosa</i>	b	.	.	.	.	+	.	.	.	.	.	.	.	.	I	4
<i>Prunus spinosa</i>	c	.	.	.	.	.	.	.	.	.	.	.	+	.	I	4
<i>Lathyrus vernus</i>	c	.	.	+	+	+	+	+	+	2.2	+	.	+	+	IV	169
<i>Stachys silvatica</i>	c	+	+	.	+	1.1	.	+	+	+	.	+	.	.	IV	65
<i>Euphorbia amygdaloides</i>	c	.	+	.	+	+	.	+	+	+	.	+	.	.	IV	31
<i>Pulmonaria officinalis</i>	c	+	.	.	2.1	.	+	+	+	.	+	+	.	.	III	158
<i>Mycelis muralis</i>	c	+	.	+	.	.	+	+	+	.	.	+	+	.	III	27
<i>Helleborus odorus</i>	c	.	+	.	+	+	+	+	+	.	+	+	.	.	III	27
<i>Primula vulgaris</i>	c	+	.	.	+	.	+	+	+	+	.	.	.	.	III	27
<i>Viola silvestris</i>	c	.	.	+	+	+	.	.	+	.	+2	.	+	.	III	23
<i>Aegopodium podagraria</i>	c	1.1	4.4	.	.	+	.	.	+	+2	.	.	.	.	II	531
<i>Galeobdolon luteum</i>	c	.	.	+	.	.	+	.	.	.	3.3	.	.	.	II	296
<i>Symphytum tuberosum</i>	c	.	.	.	.	+	+	+	+	.	.	.	.	.	II	15
<i>Arum maculatum</i>	c	+	+	.	.	.	.	.	+	.	.	.	.	.	II	12
<i>Parietaria officinalis</i>	c	+	+	.	.	+	.	.	.	.	.	.	.	.	II	12
<i>Tamus communis</i>	c	+	.	+	.	.	.	.	.	.	+	.	.	.	II	12
<i>Mercurialis perennis</i>	c	.	.	.	.	.	+	.	.	+	+2	.	.	.	II	12
<i>Sanicula europaea</i>	c	.	.	.	.	.	.	.	+	+	.	.	.	.	II	12
<i>Brachypodium silvaticum</i>	c	.	.	.	.	.	.	.	+	.	+	.	+	.	II	12
<i>Neottia nidus-avis</i>	c	.	.	.	.	.	.	.	.	.	.	.	+	.	I	4
Other:																
<i>Robinia pseudacacia</i>	a	.	+	.	.	.	+	+	.	+	.	+	.	.	II	19
<i>Robinia pseudacacia</i>	b	.	.	.	.	+	.	.	.	.	.	+	.	.	I	8
<i>Juglans regia</i>	a	.	+	.	.	.	.	.	.	.	.	.	.	.	I	4
<i>Juglans regia</i>	b	.	.	.	.	.	+	+	.	.	.	+	r	.	II	12
<i>Juglans regia</i>	c	+	+	+	+	.	.	.	+	.	r	+	.	.	III	24
<i>Populus tremula</i>	a	.	+	.	.	.	+	.	.	.	.	.	.	.	I	8
<i>Quercus sessilis</i>	a	.	.	.	.	.	.	.	.	.	.	+	.	.	I	4
<i>Quercus sessilis</i>	b	.	+	.	.	+	.	.	.	.	.	+	.	.	II	12
<i>Quercus sessilis</i>	c	.	.	.	.	.	.	+	+	.	.	+	r	.	II	12
<i>Sambucus nigra</i>	b	+	.	.	+	+	+	+	+	+	.	+	.	.	IV	31
<i>Sambucus nigra</i>	c	.	.	.	.	+	.	.	.	.	.	.	.	.	I	4
<i>Crataegus monogyna</i>	b	.	.	+	+	+	+	.	+	.	.	.	.	.	II	19
<i>Morus nigra</i>	b	+	.	.	.	.	.	.	.	.	.	.	.	.	I	4
<i>Geum urbanum</i>	c	+	.	.	+	+	+	+	.	.	.	.	.	.	II	15
<i>Hieracium murorum</i>	c	.	.	.	.	.	.	.	.	.	.	.	2.1	+	I	138
<i>Veronica chamaedrys</i>	c	.	.	.	.	.	.	.	.	.	.	.	+	+	I	8
<i>Ajuga reptans</i>	c	.	.	.	.	1.1	.	.	.	.	.	.	.	.	I	38

Sporadic species:

Ch. *Quercion frainetto-cerris* et **Quercetalia pubescentis*: **Agrimonia eupatoria* (c): 12(+); **Glechoma hirsuta* (c): 5(+);

**Lathyrus niger* [c]: 13[+], **Viburnum lantana*

c]:10[+];

Ch. *Quercio-Fagetea*: *Acer platanoides* (c): 1(+); *Asperula taurina* (c): 2(+), 4(+); *Carex digitata* (c): 12(+), 13(+); *Carex silvatica* (c): 8(+), 12(+); *Dryopteris filix-mas* (c): 7(+), 11(+); *Fraxinus excelsior* (c): 10(+), 13(+); *Phyteuma spicatum* (c): 12(+); *Poa nemoralis* (c): 12(+); *Smyrnium perfoliatum* (c): 5(+);

Ch. *Carpinion betuli*: *Acer campestre* (c): 3(+), 8(+), 10(+); *Carpinus betulus* (c): 4(+); *Cerasus avium* (c): 12(+); *Tilia platyphyllos* (c): 3(+),5(+);

Other: *Asplenium trichomanes* [c]: 10[+], *Calystegia sepium* [c]: 2[+], *Campanula glomerata* [c]: 10[+.2], *Clematis vitalba* [c]: 12[+], *Equisetum maximum* [c]: 2[+], *Fragaria sp.* [c]: 12[+], *Geranium phaeum* [c]: 8[+], *Hieracium sp.* [c]: 12[r], *Pimpinella minor* [c]: 5[+], *Pteridium aquilinum* [c]: 5[+], *Rosa sp.* [c]: 12[+].

Explanations:Alij- Alija, Bru- Brusnik, Crn- Crnomasnica, Fnt- Fntina Badina, Gor- Gornja Bučina, Kan- Kand'ik, Man- Manastirište, Mil- Milovanska Bučina, Rup- Bučina Rupije, SmB- Smedovačka Bucna, Sme- Smedovac

Besides that, it is necessary to provide appropriate protection for these beech forests, so that their total disappearance would be avoided.

CONCLUSIONS

On the basis of the results of the investigations, analysis of the data, which were collected both on the terrain and in the literature on this topic, we may conclude that:

- Phytocoenological structure of beech forests, which occur on the localities in the lower course of the Timok river, in the areas of Tamnič, Smedovac, Crnomasnica, Braćevac and Brusnik villages is interesting because of a few things.
- The forests have been unknown to the public so far, and the results of the investigations of the forests are published for the first time.
- They are located at the altitude lower than 200 meters, what can rarely be found in our climate zone. Specific conditions of increased humidity, decreased airing and light regime are present in the localities. The forests cover small surfaces, and are distributed mozaic-like in the complexes of oak forests, but they maintained all the characteristics species of the Fagetum montanum (Rudski 1949) Jov. 1967.
- In a smaller number of communities we recorded the changes of the floristic composition due to the appearance of the species which are characteristic for *Carpini betuli*, and it is a slight indication of the succession of hornbeam forests over beech forests, and of species such as: *Quercus cerris*, *Quercus conferta*, *Staphylea pinnata*, *Polygonatum odoratum*, *Convallaria majalis*, *Melittis melissophyllum*, *Viola hirta* and *Cephalanthera rubra*, what clearly indicates the negative anthropogenic influence which makes the further survival of these communities completely unforeseeable. This is a clear indication that the forests should be protected.

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