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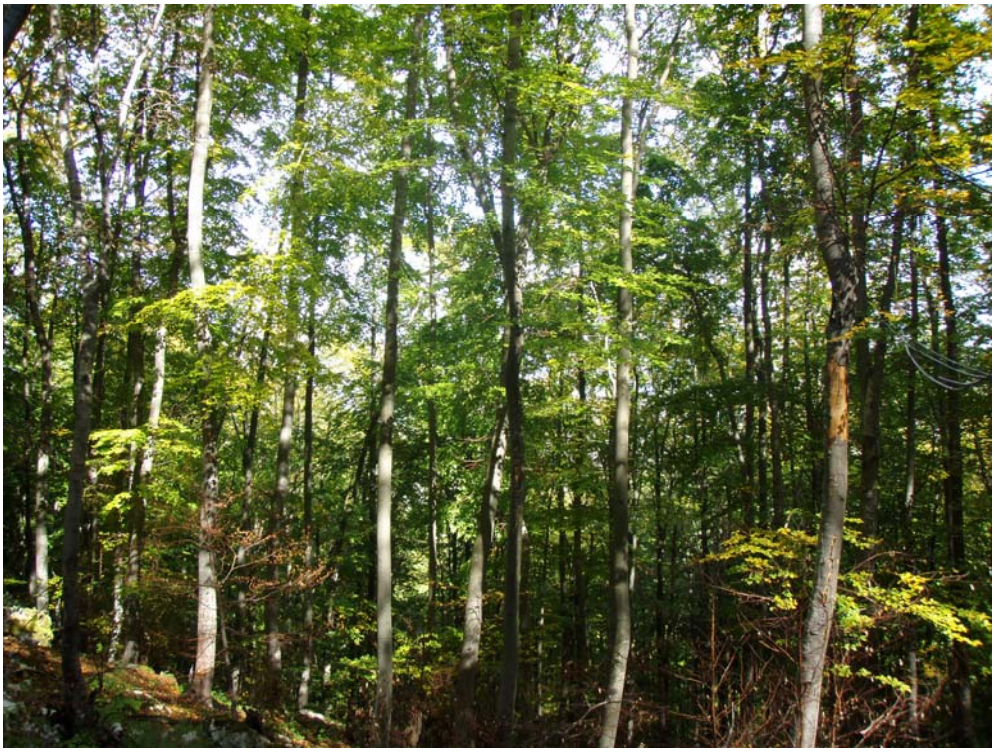
TOM 59-60



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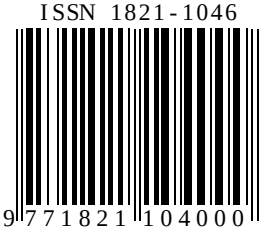

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Original scientific paper

COMMON ASPEN AND BIRCH FORESTS IN PESTER PLATEAU

Mihailo RATKNIĆ[1], Ljubinko RAKONJAC[1], Milorad VESELINOVIĆ[1], Sonja BRAUNOVIĆ[1], Svetlana BILIBAJKIĆ[1], Vladan POPOVIĆ[2]

Abstract: *The disappearance of the forests at the global level points to the seriousness of the problem and requires the urgent application of the measures aimed at ending of the degradation and devastation of the current forest ecosystems. The concept of the ecocentric (or biocentric) use of the resources implies that the ecosystem is the complexity of the living organisms and is valuable in itself because it treats in other way the needs of humans and their attitude towards nature. This paper is based on the Concept of the sustainable development and focused on the smaller territorial units (areas). The common aspen and birch forests in Pester plateau (Southwestern Serbia) were researched. These researches are aimed at the definition of the condition of the natural resources of forests and forest ecosystems and their use based on the principles of the sustainable development.*

Key words: common aspen and birch forests, G1.95, sustainable use, natural resources

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ŠUME JASIKE I BREZE NA PEŠTERSKOJ VISORAVNI

Abstract: *Nestajanje šuma u svetskim razmerama ukazuje na ozbiljnost problema i zahteva hitno preduzimanje mera na zaustavljanju degradacije i devastacije postojećih šumskih ekosistema. U konceptu ekocentičnog (ili biocentričnog) korišćenja resursa ekosistem predstavlja kompleksnost živih organizama i ima svoju vrednost sam po sebi zato što razmatra na drugi način potrebe ljudi i njihov odnos prema prirodi. Rad bazira na Konceptu održivog razvoja i usredsređen je na manje teritorijalne celine (područja). Istraživanje je obavljeno u šumi jasike i breze na Pešterskoj visoravni (jugozapadna Srbija). Cilj ovih istraživanja je da se definiše stanje prirodnih resursa šuma i šumskih ekosistema i njihovo korišćenje na principima održivog razvoja.*

Ključne reči: šume jasike i breze, G1.95, održivo korišćenje, prirodni resursi

1. INTRODUCTION

The disappearance of the forests at the global level points to the seriousness of the problem and requires the urgent application of the measures aimed at the stopping of the degradation and devastation of the current forest ecosystems. The concept of the ecocentric (or biocentric) use of the resources implies that the ecosystem is the complexity of the living organisms and is valuable in itself because it treats in other way the needs of humans and their attitude towards nature. The way in which nature creates and maintains the ecosystems is respected. The ecosystems protects, maintains and regenerates the functions of the natural ecosystems which also implies the use of all goods and services for the satisfaction of the human needs on the stable permanent bases. The ecological processes in the ecosystems are favoured, since they satisfy the economic needs of the society, which does not include the industrial use. The integral part is the care for the soil, water, biodiversity and biomass. The achievement of these goals is based on the ecological, socio-demographic and economic criteria. This paper is based on the Concept of the sustainable development and focused on the smaller territorial units (areas).

2. MATERIAL AND METHOD

The common aspen and birch forests in Pester plateau (Southwestern Serbia) were researched. The pedological characteristics were researched based on the pedological profiles, and the soil types were determined based on the soil classification (Skoric, Filipovski, Ciric, 1985), as well based on the EUNIS classification. For the determination of the species the following sources

were used: “Flora of Federal Republic of Serbia“ (1970-1986), “Ikonographie der flora des südöstlichen Mitteleuropa” (Jávorka, S., Csapody, V., 1979), “Ikonographie der flora des südöstlichen Mitteleuropa” (Jávorka, S., Csapody, V., 1979), “Flora and vegetation of Mt. Golija and Mt. Javor“ (Gajic, M., 1990) and “Flora of the National Park Tara“.

The spectra of the floral elements were processed in accord with the systematization of the floral-geographical elements by Gajic (Gajic, 1980, 1984). The biological spectra of the plants were processed by Kojic et al. method (Kojic, M. et al., 1997). The basic types of the life forms were classified by Raunkiaer’s method (Raunkiaer, 1934). The area covered by forests and forest stands, the classification of the areas per types of the stands, the wood volume and volume increment were analyzed. The percentage of the trees with a diameter up to 30 cm in the total volume was particularly analyzed.

3. THE RESEARCH RESULTS

By EUNIS classification birch forests belong to:

G1 – BROADLEAF DECIDUOUS FORESTS

G1.9 – Forests with birches <*Betula*>, common aspen <*Populus tremula*>, Europen rowen <*Sorbus aucuparia*> or common hazel <*Corylus avellana*> which do not occur on marshy terrains

G1.95 – Common aspen forests <*Populus tremula*> and birch forests <*Betula*> with elders <*Sambucus*>

The equivalent association: ***Populeto-****Betuletum* Glisic (1950), 1975

The association of common aspen and birch is widely spread on the silicate acid parent rocks, on the poor skeletal soils. It occurs in the altitudinal range of beech, logging units, forest gaps and burnt areas. It is scattered throughout Pester Plateau and occurs without the greater joint complexes. In Lisa and Planina it appears as the form of the development of the forest vegetation on the sites of the previously cleared beech forests. The zone of the smaller stands was reported in Sugubine and Fijuljame, in Divlja Rijeka, where it is spread on the sites of the former pastures. From Lopiz to Uvac and Gonj Village, it appears in the smaller groups, alternating with the areas covered by pure birch, on the sites in the vicinity to brooks and small rivers, with sufficient humidity in summer months as well. From Grac to Zabren, on the barren limestone terrains, this association was not reported. It appears in the direction

to Bare, in the stands which are more subject to felling, where it creates high stands with the closed canopy. The stands of this association are best expressed in the beech-fir forest in the vicinity of Jasikovac to Bare with the greater canopy gaps. In addition, it appears in the forest preserves in Tomov Gaj and the parts of Stavalj in the direction to Stavljanske Breze. It appears on the deeper soils in Budjevo, but also on the shallower soils of Zminjaca.

These forests often forms the mosaic pattern with the common hazel, but they avoid the steep slopes on the shallower soils. On the deeper soils they also occur on the highly-inclined slopes. In Uvac valley it condescends to the river bank where it was reported on the deeper pseudogley. On the higher positions with the greater inclinations above Vapa (in Tomov Gaj) it occurs in the form of the high stands with closed canopy in the groups of common hazelnut trees in the underwood layer. It mainly occupies the colder positions, such as in Sugubine, on the acid soils of the sands. It appears more frequently in the sheltered places and river valleys, with the sufficient humidity, which are not subject to strong winds and which are characterized by more favourable air circulations, in comparison to the open and warmer exposures with the lack of humidity. The common aspen and birch forests most frequently occur on the neogene sediments, gravels, sand, and clay sandstones. This association mainly appears on the distric cambisols, but it also occurs on pseudogleys on the terrains in the vicinity of brooks and little rivers, up to the colluvium at the higher altitudes in Mt. Javor. It is located at the altitudes from 1,000 to 1,400 metres on the colder exposures (northen, northeastern), but sometimes it also occurs on the warmer, southern exposures, in the vicinity of brooks on the deeper soils, from terrains with the small inclination angle (in Tomov Gaj) to the highly-inclined terrains (40^0) on the warmer slopes of Ogorijevac. The district cambisols are up to 70 cm deep, whereas the pseudogleys are up to 90 cm deep. In regard to the mechanical characteristics, these soils are sandy loam, loam, and the pseudogleys in the lower horizons of the clays.

The total of 139 plant species were reported: 13 tree species, 10 shrub species, and 116 species which appear in the layer of the ground flora.

Floristical composition of common aspen and birch forests

Acer pseudoplatanus L., *Aegopodium podagraria* L., *Ajuga reptans* L., *Alchemila vulgaris* L., *Anthemis arvensis* L., *Aremonia agrimonoides* (L.) DC, *Asarum europaeum* L., *Astrantia major* L., *Betula pendula* Roth., *Brachypodium silvaticum* (Huds.) P.B., *Bromusarvensis* L., *Calamagrostis arundinacea* (L.) Roth., *Campanula patula* L., *Campanula persicifolia* L., *Carex silvatica* Huds., *Centaruea jacea* L., *Centaurea montana* L., *Cephalanthera alba* (Cr.) Simk., *Cephalanthera rubra* (L.) Schr., *Chaerophyllum aureum* L.

Clematis alpina (L.) Mill., *Corylus avelanna* L., *Crataegus monogyna* Jacq., *Crepis biennis* L., *Crepis mollis* (Jacq.) Asch., *Dactylis glomerata* L., *Dactylorhiza incarnata* (.) Soo, *Dactylorhiza sambucina* (L.) Soo, *Danaa cornubiensis* (Torn.) Burn., *Danthonia provincialis* Lam.et DC, *Daphne blagayana* Fray., *Daphne laureola* L., *Daphne mezereum* L., *Deschampsia flexuosa* (L.) Tr., *Digitalis ambigua* Murr., *Digitalis viridiflora*, *Doronicum columnae* Ten., *Dryopteris filix-mas* (L.) Schot., *Epipactis latifolia* (L.) All., *Eryngium palmatum* Vis.et. Panč., *Euphorbia amygdaloides* L., *Evonymus verrucosus* Scop., *Fagus silvatica* L., *Festuca amethystina* L., *Festuca heterophylla* Lam., *Festuca valesiaca* Schl., *Filipendula ulmaria* (L.) Max., *Fragaria vesca* L., *Frangula alnus* Mill., *Galium cruciata* (L.) Scop., *Galium purpureum*, *Galium silvaticum* L., *Galium vernum* Scop., *Galium verum* L., *Gentiana asclepiadea* L., *Geranium phaeum* L., *Geranium robertianum* L., *Geum rivale* L., *Geum urbanum* L., *Glechoma hirsuta* W.etK., *Helminthia echioides* (L.) Gartn., *Hieracium bauhini* Schult., *Hypericum maculatum* Cr., *Hypericum perforatum* L., *Juniperus communis* L., *Knautia arvensis* (L.) Coult., *Laser trilobium* (L.) Borkh., *Leontodon crispus* Vill., *Leontodon hispidus* L., *Lilium martagon* L., *Lonicera caprifolium* L., *Lotus corniculatus* L., *Lunaria rediviva* L., *Luzula campestris* (L.) Lam.et DC, *Luzula luzulina* (Vill.) Tore et Sar., *Luzula luzuloides* (Lam.) Dan., *Lysimachia nummularia* L., *Maianthemum bifolium* (L.) Schm., *Medicago orbicularis* (L.) All., *Melampyrum pratense* L., *Melissa officinalis* L., *Melittis melissophyllum* L., *Mercurialis perennis* L., *Paris quadrifolia* L., *Peucedanum alsaticum* L., *Peucedanum carvifolia* Vill., *Phyteuma spicatum* L., *Pirus piraster* Burg., *Plantago media* L., *Poa trivialis* L., *Polygala major* Jacq., *Polygonatum verticillatum* (L.) All., *Polypodium vulgare* L., *Populus tremula* L., *Potentila erecta* (L.) Raucsh., *Potentilla heptaphylla* Jusl., *Potentilla inclinata* Vill., *Potentilla recta* L., *Primula veris* Huds., *Prunela vulgaris* L., *Prunus avium*, *Pteridium aquilinum* (L.) Kuhn., *Quercus petraea* (Matt.) Lieb.,*Rhamnus falax* Boiss., *Ribes alpinum* L., *Rosa micrantha* Borr., *Rosa pendulina* L., *Rumex acetosa* L., *Salix capreae* L., *Sanicula europaea* L., *Selinum carvifolia* L., *Serratula tinctoria* L., *Seseli annum* L., *Silene nutans* L., *Silene roemeri* Friv., *Silene viridiflora* L., *Solidago virga-aurea* L., *Sorbus aucuparia* L., *Stachys alpina* L., *Stachys officinalis* (L.) Trev., *Stachys silvatica* L., *Stellaria holostea* L., *Thalictrum aquilegifolium* L., *Thymus jankae* Čel., *Tilia cordata* Mill., *Trifolium hybridum* L., *Trifolium montanum* L., *Trifolium pratense* L., *Vaccinium myrtillis* L., *Veratrum album* L., *Veronica chamaedrys* L., *Veronica officinalis* L., *Veronica urticifolia* Jacq., *Vicia cassubica* L., *Vicia grandiflora* Scop., *Viola alba* Bess., *Viola odorata* L., *Viola silvestris* Lam., *Waldstenia geoides* Willd.

The high percentage of hemicryptophytes is reported (56.12%), which is the result of the aggravated life conditions for the plants of the altitudinal

zone in which this association appears. The relatively sufficient percentage of geophytes (15.83%) points to the favourable edaphic conditions (humidity, structure, and soil depth). There is a significant percentage of the phanerophytes and nanophanerophytes (16.54%). Chamaephytes account for 5.04%, terophytes for 2.88%, and terophytes/chamaephytes for 3.60%. In regard to the biological spectrum this association can be defined as the hemicryptophyte-phanero-phyte.

The Mid-European floral elements, which in combination with the Eur-Asian account for the great part of the spectrum (60.71%), are most common. The real Sub-Mediterranean floral elemens account for 5.71%.The floral elements of the northern regions (5.00%) circumpolar and cosmopolites (7.86%), account for 12.86%, which is significant and points to the colder conditions in which this association occurs. The Pontic-Central-Asian floral elements account for 9.29%, and Sub-Atlantic for 4.29% (Table 1).

Table 1. *Spectrum of the floral elements in common aspen and birch forests*

The name of the group of the floral element	Floral element	Percentage %	
1 FLORAL ELEMENTS OF THE NORTHEN REGIONS			
Arctic floral elements			
Boreal floral elements	Sub-boreal	0.71	
	Sub-boreal-European –West Siberians	0.71	
	Sub-boreal-circumpolar	2.86	
	Boreal-Eur-Asian	0.71	4.99
2 MID-EUROPEAN FLORAL ELEMENTS			
Mid-European	Mid-European	12.86	
and European	Sub-Mid-European	21.43	
	Alpine- Carpathian	0.71	
	Sub-Mid-European-Sub-Mediterranean	0.71	35.71
3 SUB-ATLANTIC FLORAL ELEMENTS			
Sub-Atlantic and Atlantic	Sub-Atlantic-Sub-Mediterranean	3.57	
4 SUB-MEDITERRANEAN FLORAL ELEMENTS			
Sub-Mediterranean	Sub-Mediterranean	5.71	
East-Sub-Mediterranean	East-Sub-Mediterranean	1.43	
	Sub-Euxian	0.71	
Balkan and	Sub-Illyrian	0.71	
Balkan-Apenninian	Moeasian-Dacian	0.71	
	Moeasian-Sub-Dacian	0.71	
	Illyrian – Scardo-Pindic	0.71	
	Mid-Balkan-Central-South Apenninian	0.71	
	Balkan	0.71	
	Sub-Balkan-Apenninian	0.71	12.82
5 PONTIC-CENTRAL ASIAN FLORAL ELEMENTS			
	Pontic-Central Asian	0.71	
	Sub-Pontic-Central Asian	2.86	
Pontic	Sub-Pontic	2.86	
	Pontic-Sub-Mediterranean	0.71	
	Pontic-East-Sub-Mediterranean	2.14	9.28
6 EUR-ASIAN FLORAL ELEMENTS			
	Sub-South Siberian	2.86	
	Eur-Asian	12.86	

The name of the group of the floral element	Floral element	Percentage %	
	Eur-Asian-African	0.71	
	Sub-Eur-Asian	9.29	25.72
7 CIRCUMPOLAR AND COSMOPOLITAN FLORAL ELEMENTS			
	Circumpolar	3.57	
	Sub-circumpolar	2.14	
	Cospomolites	2.14	7.85

This is a bi-dominant association; in all layers of trees and shrubs the common aspen and birch are dominant. The degree of the crown covered area ranges from 0.4 to 0.8. The tree height depends on the degree of the stand preservation and ranges from 7.5 to 25.0 m. The average diameter of the trees of the first layer ranges from 15 cm on the slopes of Uvac and Sugubine to 30 cm in the stands in T. Gaj and Sugubine. The stands which are least preserved appear in the vicinity of the rural meadows and pastures, since they were damaged by the neighbouring rural population. Along with the common aspen and birch, the following species occur in the tree layer: *Pyrus pyraster, Fagus moesiaca, Acer pseudoplatanus, Quercus petraea, Tilia cordata*. In the shrub layer the common hazel is dominant. Along with it, the following species appear: *Crataegus monogyna, Prunus avium, Rosa pendulina, Evonymus verrucosus, Juniperus communis, Lonicera caprifolium*. There are also the invidual trees of the following species: *Acer pseudoplatanus, Frangula alnus, Ribes alpinum, Rosa micrantha, Salix capraea, Rhamnus falax*. The layer of the ground flora is not abundant. The ground flora coverage ranges from 0.30 to 0.35.

Ecological indexes of the common aspen and birch forests

There are the following values of the ecological indexes of the common aspen and birch forests:

- For the humidity the average value is 2.77 (from 2.74 to 2.86);
- For the chemical reaction of soil the average value is 3.08 (from 2.67 to 3.34)
- For the nutrients the average value is 2.58 (from 2.35 to 2.76)
- For the light the average value is 3.14 (from 3.00 to 3.29)
- For the temperature the average value is 3.14 (from 2.97 to 3.31)

Medicinal plants in common aspen and birch forests

The total of 54 species of medicinal plants was reported in the common aspen and birch forests, i.e. 41.0% of the total number of species (Table 2).

In the first category 12 plant species were reported, i.e. 8.6%. *Quercus petraea* is put in circulation, and there are no limits to the collection of it. There are legal limits for the quantity of the other species which can be collected over a year. The species *Veratrum album* is incorporated in the Red Book and the collection of it is prohibited.

In the second category 3 plant species, or 2.1% were reported. All reported species are in circulation, whereas the control and circulation of *Solidago virga-aurea* is controlled.

Fourteen species, or 10.1% belong to the third category. The species *Ajuga reptans, Glechoma hirsuta, Melittis melissophyllum i Populus tremula* have not been put in circulation. The species *Daphne mezereum, Fagus silvatica, Polypodium vulgare* are in circulation. The collection and circulation of the following species from this category of healing rate are controlled: *Gentiana asclepiadea, Geranium robertianum, Potentila erecta i Asarum europaeum*, which is characterized by the ocassional and uneven collection. *Daphne blagayana* is on the Red List and the collection of it is strictly limited.

In the fourth category of the healing rate 11 plant species, or 7.9%. were reported. There are no legal limits in regard to the quantity of the species *Acer pseudoplatanus, Plantago media and Sorbus aucuparia* which can be collected on the natural sites. The collection and circulation of the species *Corylus avelanna, Digitalis ambigua, Fragaria vesca, Galium verum and Veronica chamaedrys* are controlled. The species *Euphorbia amygdaloides, Prunus avium i Stachys officinalis* have the important role in the traditional folk medicine.

In the fifth category 17 species or 12.2% were determined. There are no limits in regard to the circulation of the species *Filipendula ulmaria and Potentilla recta,* the collection and circulation of *Alhemila vulgaris* are controlled, whereas the other species did not have an important role in the economy, except for the use in the folk medicine.

Table 2. *Medicinal plants in common aspen and birch forests*

Species	Category of healing rate	Status	
Betula pendula Roth.	I	Order	In circulation
Crataegus monogyna Jacq.	I	Order	In circulation
Dryopteris filix-mas (L.) Schot.	I	Order	In circulation
Hypericum perforatum L.	I	Order	In circulation
Juniperus communis L.	I	Order	In circulation
Melissa officinalis L.	I	Order	In circulation
Primula veris Huds.	I	Order	In circulation
Quercus petraea (Matt.) Lieb.	I		In circulation
Sanicula europaea L.	I	Order	In circulation
Tilia cordata Mill.	I	Order	In circulation

Species	Category of healing rate	Status	
Vaccinium myrtillis L.	I	Order	In circulation
Veratrum album L.	I	Red Book, decree, order, IUCN extremely endangered and vulnerable	Prohibited
Rumex acetosa L.	II		In circulation
Solidago virga-aurea L.	II	Order	In circulation
Veronica officinalis L.	II		In circulation
Ajuga reptans L.	III		
Asarum europaeum L.	III	Order, occasional and uneven collection	In circulation
Daphne blagayana Fray.	III	CL, the collection is strictly limited	In circulation
Daphne mezereum L.	III		In circulation
Fagus silvatica L.	III		In circulation
Gentiana asclepiadea L.	III	Order	In circulation
Geranium robertianum L.	III	Order	In circulation
Geum urbanum L.	III	Order	In circulation
Glechoma hirsuta W.etK.	III		
Melittis melissophyllum L.	III		
Polypodium vulgare L.	III		In circulation
Populus tremula L.	III		
Potentila erecta (L.) Raucsh.	III	Order	In circulation
Viola odorata L.	III		
Acer pseudoplatanus L.	IV		In circulation
Corylus avelanna L.	IV	Order	In circulation
Digitalis ambigua Murr.	IV	Order	In circulation
Euphorbia amygdaloides L.	IV		
Fragaria vesca L.	IV	Order	In circulation
Galium verum L.	IV	Order	In circulation
Plantago media L.	IV		In circulation
Prunus avium	IV		
Sorbus aucuparia L.	IV		In circulation
Stachys officinalis (L.) Trev.	IV		
Veronica chamaedrys L.	IV	Order	In circulation
Aegopodium podagraria L	V		
Alchemila vulgaris L.	V	Order, rare collection	In circulation
Centaruea jacea L.	V		
Daphne laureola L.	V		
Doronicum columnae Ten.	V		
Filipendula ulmaria (L.) Max.	V		In circulation
Frangula alnus Mill.	V		
Galium vernum Scop.	V		
Lilium martagon L.	V		

Species	Category of healing rate	Status	
Lonicera caprifolium L.	V		
Lotus corniculatus L.	V		
Lysimachia nummularia L.	V		
Paris quadrifolia L.	V		
Peucedanum carvifolia Vill.	V		
Potentilla recta L.	V		U prometu
Prunela vulgaris L.	V		
Pteridium aquilinum (L.) Kuhn.	V		
Salix capreae L.	V		
Thalictrum aquilegifolium L.	V		
Trifolium pratense L.	V		

Fruit trees in common aspen and birch forests

Common aspen and birch forests are relatively rich in fruit trees. The presence of the following species were reported: *Pirus piraster, Corylus avellana, Crataegus monogyna, Juniperus communis, Vaccinium myrtillis, Sorbus aucuparia, Frangula alnus, Lonicera caprifolium, Rhamnus falax, Ribes alpinum and Fragaria vesca.*

Honey plants in common aspen and birch forests

In common aspen and birch forests 53 honey plants were reported, out of which 8 woody, 12 shrub, and 33 herbaceous species. The average honey yield of the association is 2.96 (Table3).

Table 3. *Honey plants in common aspen and birch forests*

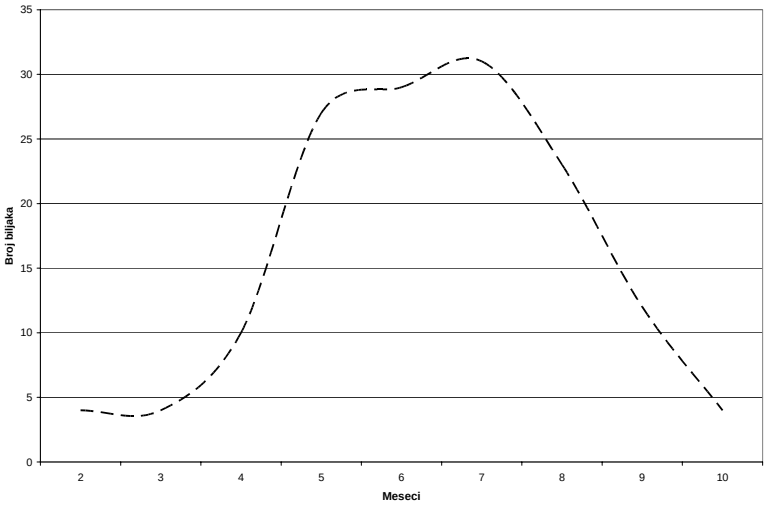
	Species	Months								
		2	3	4	5	6	7	8	9	10
Trees										
Tilia cordata Mill.	D4					1	1			
Prunus avium	D4					1	1	1	1	
Quercus petraea (Matt.) Lieb.	D3				1					
Populus tremula L.	D3	1	1							
Sorbus aucuparia L.	D2				1					
Betula pendula Roth.	D2			1	1					
Fagus silvatica L.	D2				1					
Acer pseudoplatanus L.	D2			1	1					
Shrubs										
Corylus avelanna L.	Ž4	1								

	Species	Months								
		2	3	4	5	6	7	8	9	10
Salix capreae L.	Ž4		1	1						
Rosa pendulina L.	Ž4				1	1				
Crataegus monogyna Jacq.	Ž3				1	1				
Frangula alnus Mill.	Ž3				1	1	1	1		
Ribes alpinum L.	Ž3			1	1	1				
Evonymus verrucosus Scop.	Ž3			1	1					
Vaccinium myrtillis L.	Ž2				1	1				
Daphne blagayana Fray.	Ž2					1	1			
Daphne mezereum L.	Ž2	1	1	1						
Daphne laureola L.	Ž2	1	1	1						
Clematis alpina (L.) Mill.	Ž2						1	1		
Herbaceous plants										
Stachys officinalis (L.) Trev.	Z4						1	1		
Veronica chamaedrys L.	Z4			1	1	1				
Centaruea jacea L.	Z4					1	1	1	1	1
Filipendula ulmaria (L.) Max.	Z4					1	1	1		
Thalictrum aquilegifolium L.	Z4				1	1	1			
Campanula persicifolia L.	Z4					1	1			
Centaurea montana L.	Z4							1	1	1
Stachys alpina L.	Z4						1	1	1	
Stachys silvatica L.	Z4					1	1	1	1	
Trifolium hybridum L.	Z4				1	1				
Trifolium montanum L.	Z4				1	1	1	1		
Veratrum album L.	Z3						1	1		
Solidago virga-aurea L.	Z3						1	1	1	
Ajuga reptans L.	Z3				1	1	1			
Gentiana asclepiadea L.	Z3						1	1	1	1
Digitalis ambigua Murr.	Z3					1	1	1	1	
Lysimachia nummularia L.	Z3				1	1	1			
Potentilla recta L.	Z3				1	1	1			
Prunela vulgaris L.	Z3						1	1		
Astrantia major L.	Z3				1	1	1	1		
Geum rivale L.	Z3			1	1					
Phyteuma spicatum L.	Z3					1	1			
Polygala major Jacq.	Z3						1	1		
Vicia grandiflora Scop.	Z3				1	1				
Fragaria vesca L.	Z2				1	1				
Hypericum perforatum L.	Z2						1	1	1	
Melissa officinalis L.	Z2					1	1	1		

	Species	Months								
		2	3	4	5	6	7	8	9	10
Primula veris Huds.	Z2			1	1					
Plantago media L.	Z2				1	1	1	1	1	
Aegopodium podagraria L	Z2				1	1	1			
Lilium martagon L.	Z2						1	1		
Lotus corniculatus L.	Z2				1	1	1	1	1	1
Knautia arvensis (L.) Coult.	Z2				1	1	1	1	1	

The highest percentage of the honey plants in blossom was reported in July, but the percentage of it in May, June, July, and August, is the precondition for the long-lasting bee pasture (Graph 1).

Graph 1. *The number of honey plants in common aspen and birch forests which blossom over a year*



Wood resources of common aspen and birch forests

Common aspen and birch forests occupy an area of 251,22 hectares. Tall forests account for 11.8%, whereas the coppice stands occupy the remaining area. The devastated coppice stands of common aspen and birch account for 6.6%. The total volume is 3,704 m^3, and the volume of tall forests is 1060 m^3, i.e. it accounts for 3.1% of the total volume. The trees with the diameter up to 30 cm account for 77.5% (Table 4.).

Table 4. *Wood resources of common aspen and birch forests*

Area (ha)	Total volume (m^3)	Volume by diameter degrees										Volume increment (m^3)
		< 10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	>90	
Tall devasted common aspen and birch forests												
29.56	1060	1060										24.2
Coppice forest of common aspen and birch												
205.05	32225	1840	13006	9827	5202	1971	381					877.3
Devasted coppice forest of common aspen and birch												
16.61	419	419										4.0

4. DISCUSSION

Given the fact that by the multi-century destruction of the plant resources in Pester Plateau their condition has been endangered, it directly refers to the socio-demographic status of the population. These researches are aimed at the definition of the condition of the natural resources, determination of the priorities of the activities for the elimination of the unfavourable conditions, which should be followed by the determination of the measures for the improvement of their condition. By the achievement of the aims of the research of the sustainable use of the plant resources of Pester Plateau the bases for the following projects are set: Implementation of the European standards and models and for the creation of the methods of the registration of the plant resources; Creation of the strategical frame for the sustainable management by the renewable resources based on the principles of the sustainable development and previous degree of the study of the current natural resources; Preservation and increase of the ecological, biological, climate, socio-cultural and economical contributions to the use of the plant resources; Environmental protection, social and spiritual function and value of natural ecosystems, which are achieved by: establishment, extension, and suitable management by the protected areas and associations, preservation of forests in the representative ecological systems and regions, preservation and management of the game, gene pool preservation, methods of support and maintance of the sustainable use of the biological resources and preservation of biodiversity; Support and improvement of the national programs of reforestation and reclamation of the degraded sites, establishment of the new and improvement of the current forests of different purposes, in order to reduce the pressure on the current forest ecosystems; To base the concept of the planning of the permanent management by the renewable resources on the criterium – the presevation of the environmental quality, which means that the economic use of the renewable plant resources must not mitigate the numerous ecological functions, and the preservation and enrichment of the site biodiversity; To create the conditions for

the establishment of the elements of the sustainable agricultural production; To preserve and improve the biodiversity.

5. CONCLUSIONS

- Common aspen and birch forests occur as the stage of the progression sucession, on the former pastures and meadow when the zoo-anthoropogenic influences are no longer present.
- By EUNIS classification, these associations belong to broadleaf decidious forests (G1.95 – Common aspen forest <*Populus tremula*> and birch <*Betula*> with elders <*Sambucus*>).
- The most frequent soils are district cambisols, whereas colluviums and pseudogley are less frequent.
- The total of 139 plant species were reported: 13 tree species, 10 shrub species and 116 species which occur in the ground flora layer.
- The average value of the ecological indexes for humidity is 2.77, for chemical reaction of soil 3.08, for nutrients 2.58, for light 3.14, and for the temperature 3.14.
- Fifty-four species of the registered plant species are medicinal plants, i.e. 41.0%, out of which 12 species belong to the first class, 3 species to the second class, 14 species to the third class, 11 to the fourth class, and 17 species to the fifth class of the healing rate.
- Common aspen and birch forests are relatively rich in fruit trees. The presence of the following species were reported: *Pirus piraster, Corylus avellana, Crataegus monogyna, Juniperus communis, Vaccinium myrtillis, Sorbus aucuparia, Frangula alnus, Lonicera caprifolium, Rhamnus falax, Ribes alpinum and Fragaria vesca.*
- In common aspen and birch forests 53 honey plants were reported, out of which 8 woody, 12 shrub, and 33 herbaceous species. The average honey yield of the association is 2.96. The highest percentage of the honey plants in blossom was reported in July, but the percentage of it in May, June, July, and August, is the precondition for the long-lasting bee pasture.
- Common aspen and birch forests occupy an area of 251,22 hectares. Tall forests account for 11.8%, whereas the coppice stands occupy the remaining area. The devastated coppice stands of common aspen and birch account for 6.6%. The total volume is 3,704 m^3, and the volume of tall forests is 1,060 m^3, i.e. it accounts for 3.1% of the total volume. The trees with the diameter up to 30 cm account for 77.5%

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COMMON ASPEN AND BIRCH FORESTS IN PESTER PLATEAU

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Summary

Common aspen and birch forests occur as the stage of the progression sucession, on the former pastures and meadow when the zoo-anthoropogenic influences are no longer present. By EUNIS classification, these associations belong to broadleaf decidious forests (G1.95 – Common aspen forest <Populus tremula> and birch <Betula> with elders <Sambucus>). The most frequent soils are district cambisols, whereas colluviums and pseudogley are less frequent.The total of 139 plant species were reported: 13 tree species, 10 shrub species and 116 species which occur in the ground flora layer.The average value of the ecological indexes for humidity is 2.77, for chemical reaction of soil 3.08, for nutrients 2.58, for light 3.14, and for the temperature 3.14. Fifty-four species of the registered plant species are medicinal plants, i.e. 41.0%, out of which 12 species belong to the first class, 3 species to the second class, 14 species to the third class, 11 to the fourth class, and 17 species to the fifth class of the healing rate. Common aspen and birch forests are relatively rich in fruit trees. The presence of the following species were reported: *Pirus piraster, Corylus avellana, Crataegus monogyna, Juniperus communis, Vaccinium myrtillis, Sorbus aucuparia, Frangula alnus, Lonicera caprifolium, Rhamnus falax, Ribes alpinum and Fragaria vesca.* In common aspen and birch forests 53 honey plants were reported, out of which 8 woody, 12 shrub, and 33 herbaceous species. The average honey yield of the association is 2.96. The highest percentage of the honey plants in blossom was reported in July, but the percentage of it in May, June, July, and August, is the precondition for the long-lasting bee pasture. Common aspen and birch forests occupy an area of 251,22 hectares. Tall forests account for 11.8%, whereas the coppice stands occupy the remaining area. The devastated coppice stands of common aspen and birch account for 6.6%. The total volume is 3,3704 m^3, and the volume of tall forests is 1060 m^3, i.e. it accounts for 3.1% of the total volume. The trees with the diameter up to 30 cm account for 77.5%

ŠUME JASIKE I BREZE NA PEŠTERSKOJ VISORAVNI

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Rezime

Šume jasike i breze javlja se kao stadijum progresivne sukcesije, na nekadašnjim pašnjacima i livadama posle prestanka zooantropogenih uticaja. Po EUNIS klasifikaciji pripadaju širokolisnim listopadnim šumama (G1.95 - Šuma trepetljike <Populus tremula> i breze <Betula> sa zovama <Sambucus>). Zemljišta su distrični

kambisoli, ređe pseudoglejevi i koluvijumi. Konstatovano je 139 biljaka, od čega 13 vrsta drveća, 10 vrsta žbunova i 116 vrsta prizemne flore. Ekološki indesi za vlažnost imaju prosečnu vrednost 2.77, za hemijsku reakciju zemljišta 3.08, za hranljive materije 2.58, za svetlost 3.14 i za temperaturu 3.14. Od ukupno registrovanih biljaka 54 je lekovito, odnosno 41.0% i to: 12 pripadaju prvoj, 3 drugoj, 14 trećoj, 11 četvrtoj i 17 vrsta petoj kategoriji lekovitosti. Šume jasike i breze relativno su bogate voćkaricama. Konstatovano je prisustvo sledećih vrsta: *Pirus piraster, Corylus avellana, Crataegus monogyna, Juniperus communis, Vaccinium myrtillis, Sorbus aucuparia, Frangula alnus, Lonicera caprifolium, Rhamnus falax, Ribes alpinum i Fragaria vesca.* U šumama jasike i breze konstatovano je 53 medonosnih vrsta, od čega 8 drvenastih, 12 žbunastih i 33 zeljastih. Srednja mednost zajednice iznosi 2.96. Broj medonosnih biljaka u cvetu je najbrojniji tokom jula, ali njihova zastupljenost tokom maja, juna, jula i avgusta obezbeđuje dugotrajnu pčelinju pašu. Šuma jasike i breze konstatovana je na 251.22 hektara. Na ovoj površini visokih šuma ima 11.8%, dok su ostale izdanačke sastojine. Devastirane izdanačke sastojine jasike i breze učestvuju sa 6.6%. Ukupna zapremina je 33704 m^3 od čega je, u visokim šumama 1060 m^3, odnosno 3.1%. Stabla sa prečnicima tanjim od 30 cm učestvuju sa 77.5%

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