

Biodiversity of fruit-bearing forest species in the protected landscape "Konjuh"

Biodiverzitet voćnih šumskih vrsta u zaštićenom pejzažu "Konjuh"

Sead Noćajević¹, Jasmina Ovčina², Admir Musić², Emir Imširović¹,
Besim Salkić¹, Said Karić³

¹ University of Tuzla, Univerzitetska 8, Tuzla 75000, Bosnia and Herzegovina

² CISP (Comitato Internazionale per lo Sviluppo dei Popoli), Filipa Kljajića 22, Tuzla 75000 Bosnia and Herzegovina

³ Plantations Spreča (Spreca Farm)

ABSTRACT

The area of the protected landscape "Konjuh" is distinguished by quality forest ecosystems, featuring diverse fruit-bearing forest species, which contributes to the conservation of biodiversity of the protected landscape "Konjuh". The aim of the paper is to assess the state of biodiversity of fruit-bearing species in the forest ecosystems of the study area, with the emphasis on determining the genus richness as a basis for conservation (in/ex situ), breeding and economic use. During the vegetation season in 2015 and 2016, several relevés (phytosociological plot) were made in the Protected Landscape "Konjuh". The results of the research indicate the high level of variability for most of the species according to characteristics of biology, pomology, and ecology. The fruit trees, like the noble hardwood, are wild cherry, (*Prunus avium* L.), wild pear (*Pyrus communis* L.), wild apples (*Malus sylvestris* Mill.), Breccia (*Torminalis clusii* M. Roem.), *Sorbus aria* L. et al, Wild cherry, Vrapcarka (*Prunus avium* L.) is the most famous forest fruit grower, occurs as a single tree or in smaller groups (Noćajević, 2009). The benefits of fruit-bearing forest species are emphasized in the bloom and the fruiting time, when "decorated" forest provide a rich bee pasture and feeding nutriment for forest fauna (Orešković et al. 2006). Fruit-bearing Forest species are significant as the genera of the varieties and as a basis for the grafting for high-grade varieties. Also, they are important for humans from the aspect of ecology, nutrition, dietotherapy, pharmacology and bioenergy balance.

Key words: Biodiversity, Fruit-bearing Forest species, Protected landscape "Konjuh", relevé (phytosociological plot), distribution".

* Corresponding author: Sead Noćajević, University of Tuzla, Univerzitetska 8, Tuzla 75000, Bosnia and Herzegovina;
e-mail address: sead.n_63@hotmail.com

INTRODUCTION - Uvod

According to ecologic - vegetative reionization (Stefanović et al., 1983), the area of the Konjuh mountain belongs to the area of the inner Dinarides. In the area of the Konjuh Mountain, there is the area of the protected landscape "Konjuh" belonging to the parts of the municipalities Banovići, Kladanj, and Živinice. The protected landscape "Konjuh" is the matrix of orchards, pastures, arable land, deciduous and coniferous forests, mixed forests, stony and scarce surfaces, scrubs. Fruit-bearing forest species are an important source of flora in these habitats. Protected landscape "Konjuh" has the potential and the opportunity to develop as the eco and the mountain tourism site, as well as strengthening the production of healthy/organic food. Forest is a fundamental natural resource in which the natural laws prevail. Often, it is under negative pressure of the anthropogenic influence that disturbs the balance of biocenosis, time and biodiversity. Protected areas are not excluded from this process. Forest, because of its polyvalence, is the most complex and most universal integral ecological system that includes other ecosystems (Bojadžić, 2001). Although subject to various harmful effects, forests still represent the healthiest natural framework on earth, and nonwood products can be used in nutrition like extremely healthy foods. The primary ecological services of the forest are the oxygen production, food, and raw materials source, habitats for various plants and animals species, and various more benefit outside the mentioned spheres. In "Forest as a Factor of Development of Bosnia and Herzegovina", Šaković (1996) said: "The poliversity of the forest as a natural resource is reflected in ecological, aesthetic, socioeconomic and other values". According to the statistics, the area of Bosnia and Herzegovina has about 1% of the protected areas. Protected Landscape "Konjuh" occupies about 2.9% of the territory of the Tuzla Canton. This paper observes significant biological diversity of the fruit-bearing forest species in this relatively small area (8.139,77 ha). Fruit-bearing forest species have enormous importance for the living world and their conservation in natural habitats is the general conservation interest in the Protected Landscape "Konjuh". *The benefit of fruit-bearing forest species are emphasized in the bloom and the fruiting time, when "decorated" forest provide a rich bee pasture and feeding nutriment for forest fauna* (Orešković et al. 2006). In order to maintain the biodiversity of fruit-bearing forest species, the primary task is to determine the richness of their genus as a basis for implementing further measures for its conservation (*in/ex situ*), breeding and economic use.

MATERIAL AND METHODS –

Materijal i metode

The monitoring of the fruit-bearing forest species biodiversity in the area of the protected landscape "Konjuh" is an input for further conservation activities. For this purpose, we made relevé (phytosociological plot), according to the principles of the **Zurich–Montpellier school of phytosociology** (Braun-Blanquet, 1964; Westhoff & Van der Maarel, 1973), in the period of 2015 and 2016. Plot area was 20x20 m (400m²). As a sample of a wider area, we analyzed five (5) sites within the protected landscape "Konjuh" (northeast Bosnia): Mačkovac, Zlaći, Zobik, Bebrava, and Tisca. Each relevé contain set of general data: the identifying number, the date, the site's location, biogenic and physiognomic characteristics, the record of a responsible person, the plot size, and index of coverage and sociality for founded fruit-bearing forest species. Taxonomic keys were used to determine plant species Rotmahler (2000), Hegi (1906-1974), Oberdorfer (1994), Domac (1994), Javorka and Csapody (1991) Monitoring of ecological conditions was carried out at the plot sites. Location data were taken by Garmin GPSMAP 60CSx. The study area geological background is characterised by a eutric cambisol with serpentinites and peridotites. Particular emphasis is placed on orographic conditions (relief, altitude, exposition, slope). The orographic conditions modify the variation of climatic conditions in the investigated areas.

THE AIM OF THE RESEARCH –

Cilj istraživanja

- To assess the state of biodiversity of fruit-bearing forest species in the Protected Landscape "Konjuh".
- To make an inventory of fruit-bearing forest species in the study area with data on quantitative participation of each plant species in the forest stand with the recommendation of conservation of founded biodiversity

SPECIFIC AIMS OF THE RESEARCH –

Specifični ciljevi istraživanja

- To make relevé (phytosociological plot) on fruit-bearing forest species in the part of the Protected Landscape "Konjuh", based on the principles of the **Zurich–Montpellier school of phytosociology** (Braun-Blanquet, 1964).
- To valorise the biodiversity of fruit-bearing forest species in the Protected Landscape of Konjuh (northeast Bosnia).

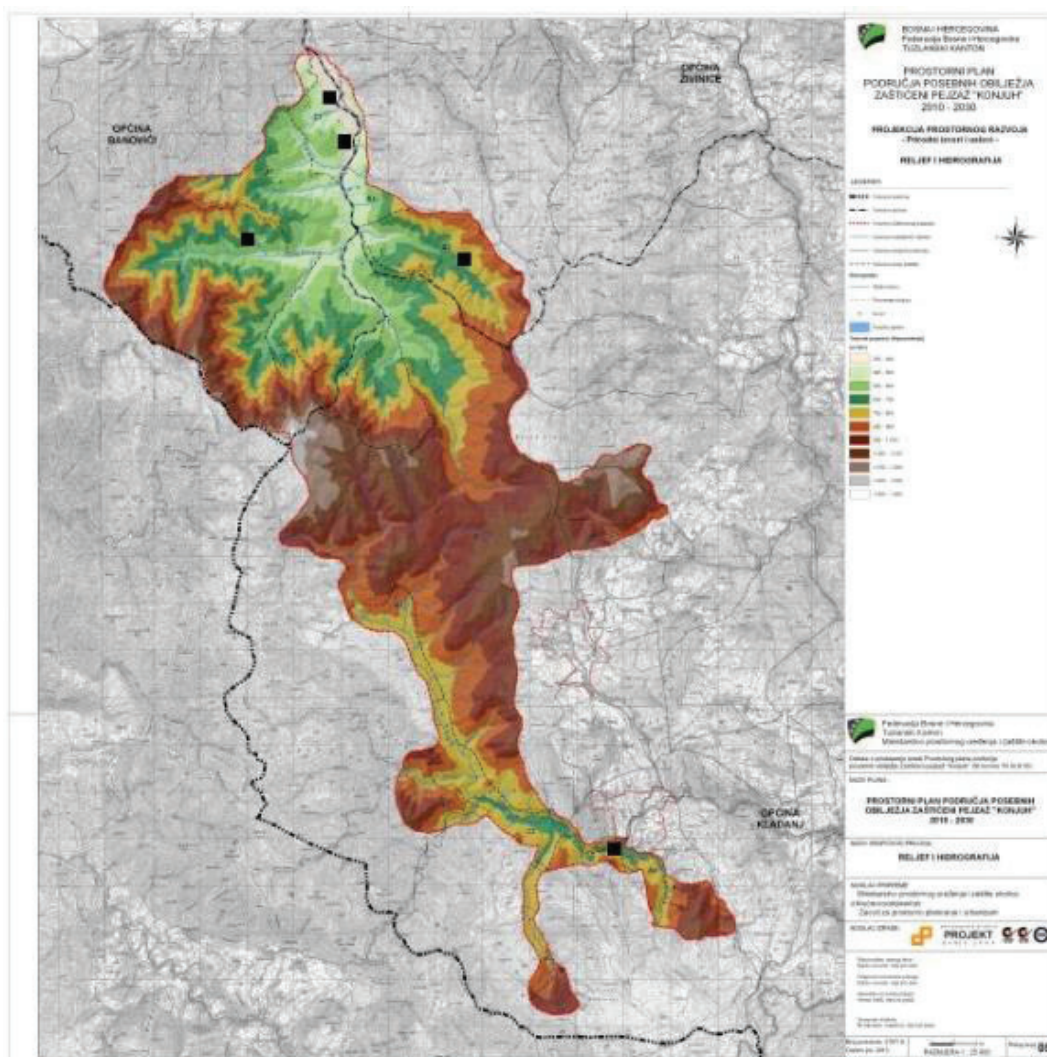


Figure 1: Map of the site on which research was conducted in Protected Landscape (ZP) Konjuh (source: [http:// www.vladatk.kim.ba](http://www.vladatk.kim.ba))

Slika 1. Mapa područja u kom je provedeno istraživanje u Zaštićenom Pejzažu (ZP) Konjuh (izvor: [http:// www.vladatk.kim.ba](http://www.vladatk.kim.ba))

The possibility of separating ecotypes or autochthonous varieties from the aspect of conservation of fruit and biodiversity ex-situ, breeding and economic use of fruits is monitored. Priority was given to small-scale farmers, vulnerable and economically important.

RESULTS AND DISCUSSION – Rezultati i diskusija

In the past, The Konjuh Mountain has been slightly floristically explored, and previous researchers have found only one floral association, *Fagetum sylvaticae montanum*. According to the syntaxonomic examination of Bosnia and Herzegovina, most of the founded plant species from The Konjuh Mountain belong to the Central European floral elements, i.e. class *Quercio-fagetea*, the association *Fagetum sylvaticae montanum*, *Quercio-Carpinetum illyricum* (Horvat et al., 1974). Heteroge-

neous floral composition, especially within noble hardwood, shows significant ecological differences at the level of individual sites and indicates that The Konjuh Mountain should not be covered only by one floral association. According to ecologic-vegetative reionization (Stefanović et al., 1983), the area of The Konjuh Mountain belongs to the area of the inner Dinarides. The protected landscape "Konjuh" belongs to the northern temperate geographical zone, with favourable ecological conditions and rich plant diversity (Noćajević et al., 2011). At the surface of 8.139,77 ha and at the altitude of 300-1.328 meters, the Protected Landscape "Konjuh" occupy the 2,9% of the Tuzla Canton territory, and consist mainly of forests within the municipalities of Banovići, Kladanj and Živinice (source: <http://www.zpkonjuh.ba/>). The area is abundant with fruit-bearing forest species. In 2015 and 2016, we found, in the form of individual trees, groups of trees,

several plantations of fruit trees, scattered over the protected landscape “Konjuh”. About 20 different fruit-bearing forest species have been identified by this research: *Malus sylvestris* (Mill), *Pyrus pyrastrer* (L.) Burgsd. *Prunus avium* (L.), *Aesculus hippocastanum*, *Juglans regia*, *Sorbus torminalis* (L.), *Sorbus aria* (L.), *Sorbus aucuparia*, *Sorbus domestica*, *Prunus cerasifera* (Ehrh.), *Corylus avellana* (L.), *Cornus mas*, *Prunus spinosa*, *Crataegus oxyacantha* (L.), *Vaccinium myrtillus* (L.), *Rubus caesius* (L.), *Rubus idaeus* (L.), *Fragaria vesca* (L.), *Rosa canina* (L.), *Sambucus nigra*.



Figure 2: Fruit bearing species in the fruiting phase

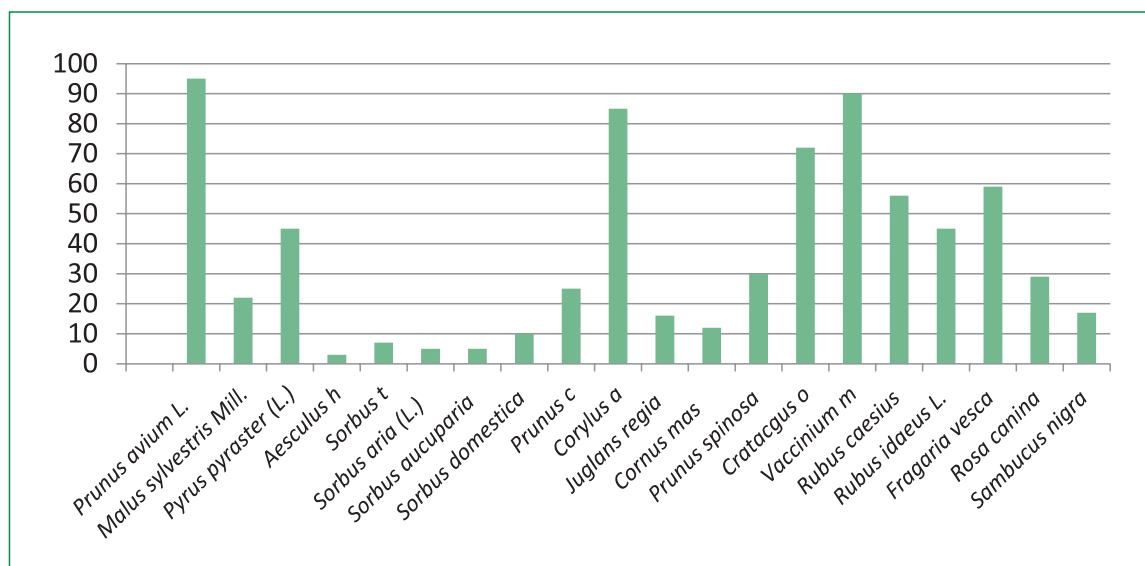
Slika 2. Voćne šumske vrste u plodonošenju

Table I. Phytocenological record in five (5) explored sites in PL Konjuh
 Tabela I. Fitocenološki snimak na pet (5) istraživanih lokaliteta u ZP Konjuh

Number of recording	I	II	III	IV	V
Region	Mačkovac	Zlaća	Zobik	Bebrava	Tisovac
Surface of recording (m)	20 x20	20 x20	20 x20	20 x20	20 x20
Elevation	450m	330m	550m	610m	500m
Exposition	SW/S-E	SE/N-E	SW/S-E	S/S-W	SE/N-E
Tilt (°)	13°	9°	15°	16°	17°
Geological background	peridot	serpenit	eutrični kambisol	Serpent	peridot
Coverage (%)	65	70	71	80	60
<i>Prunus avium L.</i>	3.3	4.3	3.2	1.2	2.3
<i>Malus sylvestris Mill.</i>	1.2	1.2	1.3	3.3	2.1
<i>Pyrus pyrastrer (L.) Burgsd.</i>	1.1	2.1	3.1	2.2	+
<i>Aesculus hippocastanum</i>	+	+	+	+	+
<i>Sorbus torminalis (L.)</i>	+	+	+	+	+
<i>Sorbus aria (L.)</i>	+	+	+	1.1	+1
<i>Sorbus aucuparia</i>	1.1	1.1	1.2	1.2	1.2
<i>Sorbus domestica</i>	+	+	+	+	+
<i>Prunus cerasifera Ehrh.</i>	3.3	2.2	2.1	3.1	3.2
<i>Corylus avellana L.</i>	3.4	3.3	3.3	3.2	2.1
<i>Juglans regia</i>	2.2	3.2	1.2	+	1.1
<i>Cornus mas</i>	1.1	+	+	2.1	2.2
<i>Prunus spinosa</i>	2.3	2.3	+	2.1	1.1
<i>Crataegus oxyacantha L.</i>	4.3	3.2	4.2	4.3	2.1
<i>Vaccinium myrtillus L.</i>	1.2	2.1	4.3	4.3	3.3
<i>Rubus caesius L.</i>	3.3	3.4	4.2	4.2	3.1
<i>Rubus idaeus L.</i>	3.2	3.3	3.4	3.1	3.4
<i>Fragaria vesca L.</i>	3.4	4.3	3.3	4.3	4.3
<i>Rosa canina L.</i>	1.2	2.1	2.1	+2	2.2
<i>Sambucus nigra</i>	2.2	3.1	3.2	3.2	2.1

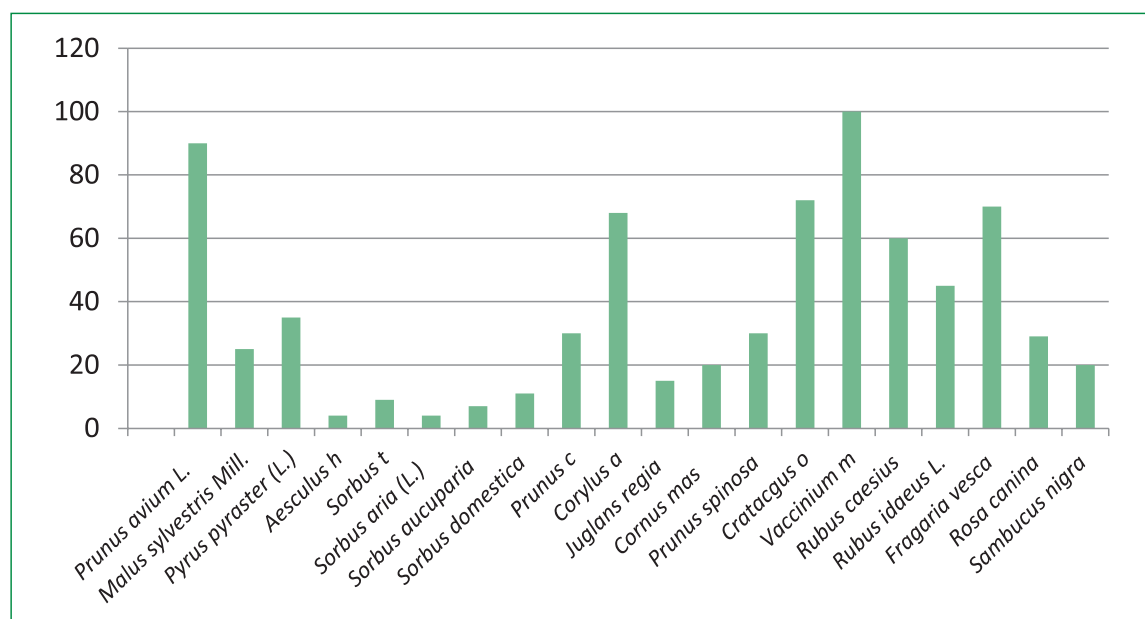
2015/2016

Class QUERCO-FAGETEA,
 Ass. Fagetum sylvaticae montanum, Querco-Carpinetum illyricum (Horvat et al. 1974)



Graph 1. Numerical presentation of forest fruit bearing species in PL Konjuh, 2015

Grafikon 1. Brojčana zastupljenost voćnih šumskih vrsta u ZP Konjuh 2015



Graph 2. Numerical presentation of forest fruit bearing species in PL Konjuh, 2016

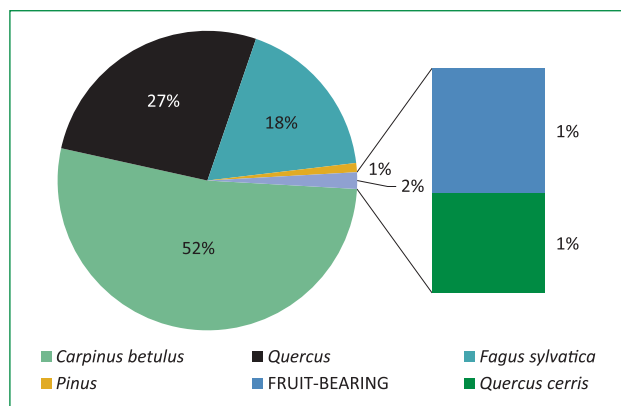
Grafikon 2. Brojčana zastupljenost voćnih šumskih vrsta u ZP Konjuh 2016

These fruit trees grow in a moderate continental climate, just as they are in the study sites localities. It belongs to the Cfb climate group. The main characteristic is annual air temperature fluctuations with a sharp rise from January to July, and a gradual fall to December. Vegetation period lasts from 180 to 190 days, as it is in Kladanj region. The forest layers are clearly expressed at study sites with a clear difference between the layers: the trees - the shrub - the herbaceous plants. The fruit-bearing trees as forest species contribute to the of the

biodiversity of forest ecosystems. The tree and shrub species are represented by 19 plant species, and dominant is the wild cherry (*Prunus avium* L.), which is widespread in The Konjuh mountain, occurs as a single tree along the roads or in smaller groups Noćajević (2009) (see Graph 1. for details).

It can be easily see in Graph 2. that the most frequent found fruit plant is the blueberry (*Vaccinium myrtillus* L.) as it is suitable for sour and moderately wet soil.

Also in two years of research, wild cherry is among the most common fruit trees in the protected landscape "Konjuh". It is an important autochthonous species of Bosnian forests and as such, it can be considered as the most favorable material for the creation of many varieties of cherries in fruit growing. Wild cherry is very important for the conservation of biodiversity. It is why the wild cherry is called "tree of the future" Ballian (2002). This is confirmed by the high price of technical wood in the world market. We have found seedling nearby several full growth mother trees, which are in the full fruiting phase (wild cherries, wild pears, wild apples, dwarfs, hawthorn, scabies, and walnut trees). It can be considered as natural rejuvenation mechanism what is particularly important for conservation issues. The fruit trees are mostly found in the forest edges, along the forest roads, and at the opening. Not so frequent, but also found deep in the forest (see Graph 3. for details).



Graph 3. Representation of wood mass in Bosnia and Herzegovina

Grafikon 3. Prikaz drvne mase u Bosni i Hercegovini

All mention above shows us the significant biodiversity level of primordial ecosystems and taxa in the area of the Protected Landscape "Konjuh". It is necessary to use this area on the principles of maximum protection and sustainability of existing natural values.

Cherry Wild, *Prunus (Prunus avium)* – is important in preserving biodiversity and is also the earliest seasonal forest fruit at the same time as stone fruit. Wild cherry is red to blackish, it is very healthy fruit. The fruit is smaller and slightly more acidized than the homemade cherry, but very sophisticated. It eats fresh, suitable for the preparation of jams, compotes, etc. It contains 80% water, leucose, pectin, organic acid (apple, citrus, wine), vitamins C, B and carotene, rich in potassium. Especially abounds with phenols and polyphenols, and can be used as natural antioxidants.

Blueberries (*Vaccinium myrtillus*) are a significant part of biodiversity in PL "Konjuh", they are classified into a group of berry fruits characterized by its intense red and purple color. Carriers of this color are pigments from the group of bioflavonoids, more precisely anthocyanins, and the color of the fruit is more intense means that the fruits are richer in these healing substances. The nutritionists put it at the level of the healthiest fruit.

Wild apple (*Malus sylvestris*) – a significant contribution to the biodiversity of PL "Konjuh", contains sugar, pectin, tannin, gallotannin, vitamins A, B and C, essential oil, phosphorus, geraniol, acetaldehyde, apple, ant, carnese and citric acid. The fruit tastes very sour.

Wild pear (*Pyrus pyraeaster*) – a part of the floristic richness in PL "Konjuh" contains proteins, sugar, starch, pectin, tannin, silicic and phosphoric acid (ideal brain food), mucus and ballast.

Dwarf (*Prunus cerasifera*) – the fruits are smaller, red, orange or other colors, of the egg shape. Contains minerals: potassium, phosphorus, magnesium, vitamins: A (beta-carotene), B group and vitamin C. Medicinal properties: acting laxative.

Scrub (*Sorbus domestica*) – Representatives of this genus are characteristic of forest biodiversity, they are found as soliter trees in the investigated areas and the fruit contains sugar, pectin, tannin, carotenoid, vitamin C, organic acids (apple, wine and citrus) and rubber. Ethnobotanical research in the Bosnian-Herzegovinian region shows that the products of wild cherry, wild apples and pears were used in the treatment and prevention of metabolic diseases (diabetes) Redžić et al. (2007). As far as the *Pyrus pyraeaster* fruits are produced, well-known dried hoshaph (used for compote) with very high stability, and today, from the ripe fruits of *Malus sylvestris*, found in clean ecological environments such as forests, they produce delicious compotes, juices (apple vinegar), sour jam that represents top quality healthy food in the prevention of all diseases (including metabolic diseases). This fruit juice is a natural high-value multivitamin drink. Excellent fruit tea Jašić (2007) is prepared from mixed fruits of dry wild fruit.

Wild scrub (*Sorbus torminalis*) is a slow-growing deciduous tree, at the same time the strongest tree in Europe, grows up to 25 meters in height, and sometimes more. It has a rounded, much branched, dense crocheted and erecting branches. After the first cold, the fruits become edible and tasty. The plant propagates with seed and vegetative. The rocks have a strong firing force from the roots, so that the trees of the same genotype can be found around the tree.

Wild strawberries (*Fragaria vesca*) abound in phytochemical compounds from the group of antioxidants, such as procyanidine, elaginic acid and elagitinin, and pelargonidine, the main compound from the group of anthocyanins, which is responsible for the characteristic red strawberry color.

Forestry fruit trees as an integral part of forest ecosystems also contribute significantly to the polyvalent functions of the forest. Distribution of fruit trees in forest habitats significantly contributes to feeding animals. From the original name of the cherry tree, bird cherries (sparrows) can be concluded that most of the birds contributed to its distribution. In the studied areas of the Konjuh mountain, it was noticed that there are mostly wild cherries, and very few breeders (*Sorbus torminalis*) and *Torminalis clusii* and if their habitats are suitable. Genofond breeds, muskels and scabies should be preserved as noble herbivores and provide seedling production in order to create highly valuable crops with stems of favourable biomorphological properties (Idžojtić, 2004).

CONCLUSIONS - Zaključci

- About 20 different fruit-bearing forest species have been identified by this research: *Malus sylvestris* (Mill), *Pyrus pyraeaster* (L.) Burgsd. *Prunus avium* (L.), *Aesculus hippocastanum*, *Juglans regia*, *Sorbus torminalis* (L.), *Sorbus aria* (L.), *Sorbus aucuparia*, *Sorbus domestica*, *Prunus cerasifera* (Ehrh.), *Corylus avellana* (L.), *Cornus mas*, *Prunus spinosa*, *Crataegus oxyacantha* (L.), *Vaccinium myrtillus* (L.), *Rubus caesius* (L.), *Rubus idaeus* (L.), *Fragaria vesca* (L.), *Rosa canina* (L.), *Sambucus nigra*.
- In the studied areas of the Konjuh Mountains, there are mostly individuals with wild cherries (*Prunus avium*), blueberries (*Vaccinium myrtillus*) and a very small number of breeders (*Sorbus torminalis*) and *Torminalis clusii* and their habitats.
- Forest fruit trees as rare and endangered species should be left in the group in which they are in natural habitats, and in particular mother trees, ie, in this way natural reproduction and distribution would be preserved, and certainly better-quality biodiversity in forest ecosystems would be ensured.
- The biodiversity of forest fruit trees in PL Konjuh is important and can contribute to the implementation, management tools and define guidelines for further monitoring and specific conservation measures, focusing on sustainable management and improvement of this area and its overall biodiversity.

REFERENCES - Literatura

- Ballian, D. (2002): Drvo budućnosti, Biološki List br.1., Biološko društvo u Federaciji Bosne i Hercegovine, Sarajevo, 29-30
- Bojadžić, N; (2001): Gazdovanje šumama, Udruženje šumarskih inženjera i tehničara FBIH, Sarajevo
- Braun-Blanquet, J., (1964): Pflanzensozologie. Grundzüge der Vegetationskunde. Springer Wien-New York.
- Dizdarević, A. (1997): Šume i životna sredina, Stručni skup iz oblasti šumarstva "Eko:Tuzla 97"
- Domac, R., (1994): Flora Hrvatske. Priručnik za određivanje bilja. Školska knjiga, Zagreb
- Hegi, G., (1906-1974): Illustrierte Flora von Mitteleuropa, I-VII, München
- Horvat, I., Glavač, V., Ellenberg, H., (1974): Vegetation Südostruropas. Geobotanica selecta, Bd.4 Fisher Verlag, Jena
- Idžojtić, M. (2004): Brekinja, *Sorbus torminalis* (L.) Crantz – plemenita listača naših šuma, Šumarski list 3–4: 181–185, Zagreb.
- Jašić, M. (2007): Tehnologija voća i povrća, Tehnološki fakultet, Tuzla, 370. Str
- JAVORKA, S. & CSAPODY, V., (1991): Iconographia florae partis Austro-orientalis Europae centralis. Akademiai Kiado, Budapest.
- Matović, M., Rakonjac, Lj., Ratknić, M. (2005): Lekovite biljke i šumske voćkarice. Beograd: Institut za šumarstvo, str. 1-268.
- Nišić, A., Abadžić, O., Butković, I., Jašić, M., Noćajević, S. (2005): LEAP Općine Živinice, Živinice, 15-18.
- Noćajević, S., (2009): Morfološko-fenološka diferencijacija prirodnih populacija divlje trešnje *Prunus avium* u okolini Tuzle., Magistarski rad.
- Noćajević, S., Ferhatović, Dž., Smajlhodžić H., Karić, S., (2011): Stanje i mogućnosti zastupljenosti divlje trešnje (*Prunus avium* L.) kao pratilac šumskih ekosistema. Međunarodni naučni Skup "Šume indikator kvaliteta okoliša "Akademija nauka i umjetnosti BiH, Sarajevo, Bosna i Hercegovina.

Noćajević, S., Ferhatović, Dž., Smajlhodžić H., (2011): Uticaj ekoloških faktora na distribuciju divlje trešnje (*Prunus avium* L.) u okolini Tuzle, Međunarodni naučni Skup „Struktura i Dinamika Ekosistema Dinarida (Stanje, mogućnosti perspektive)“ (posvećen životu i naučnom djelu Profesora emeritusa dr. Muse Dizdarevića) 15-16.juna/lipnja 2011., Prirodno-matematički fakultet/ Akademija nauka i umjetnosti BiH, Sarajevo, Bosna i Hercegovina.

Noćajević, S., Ferhatović, Dž., Smajlhodžić, H., Muhić, B., (2011): Habitus of superior genotypes of wild cherry (*Prunus avium* L.) from natural populations of areas of environment Tuzla, Agricultural University of Tirana International Conference of Ecosystems Tirana, Albania, June 4-6, 2011

Oberdorfer, E., (1994): Pflanzensociologische Exkursionsflora 7.Auflage. Stuttgart, Verlag Eugen Ulmer, 1050 str.

Orešković, Ž., Dokuš, A., Harapin, M., Jakovljević, T., Maradin, R., (2006): Istraživanja tehnologije proizvodnje voćkarica, Radovi, Izvanredno izdanje 9, Šumarski institut Jastrebarsko: 65–73, Jastrebarsko.

Redžić, S., Velić, S., (2007): Etnobotanika ljekovitih biljaka u liječenju metaboličkih bolesti kod čovjeka.

Međunarodni naučni skup „Prirode i društvene vrijednosti ekosistema Dinarida“ Berane, Andrejevica, Plav, 25-27. maj 2007. Crna Gora

Rothmaler, W., (2000): Exkursionsflora von Deutschland. Bd. 3. Spektrum, Berlin.

Šaković, Š (1996): Šuma kao faktor razvoja Bosne i Hercegovine

Stefanović, V., Beus, V., Burlica, Č., Dizdarević, H., Vukorep, I., (1983): Ekološko-vegetacijska reonizacija Bosne i Hercegovine, Šumarski fakultet, Univerzitet u Sarajevu, Posebno izdanje: br. 17, 1-51, Sarajevo

Westhoff, V. & E. Van Der Maarel, (1973): The Braun-Blanquet approach. In Handbook of Vegetation Science (Ed. R. Tüxen) Part V. Ordination and Classification of Communities (ed. R. H. Whittaker), p. 617–726. Junk, The Hague.

Web sources:

<http://earth.google.com/>

http://www.vladatk.kim.ba/Vlada/Dokumenti/Prostorni_plan-Konjuh.PDF ●

SAŽETAK

Područje zaštićenog pejzaža "Konjuh" odlikuju se kvalitetnim šumskim ekosistemima, koji sadrže raznolike voćne šumske vrste, što doprinosi očuvanju biodiverziteta zaštićenog pejzaža "Konjuh". Cilj rada je procijeniti stanje biološke raznolikosti voćnih vrsta u šumskim ekosistemima istraživanog područja, s naglaskom na utvrđivanju rodno bogatstva kao osnove za očuvanje (in / ex situ), uzgoj i ekonomsku upotrebu. Tokom vegetacijske sezone 2015. i 2016. godine, u zaštićenom pejzažu "Konjuh" napravljeno je nekoliko izdanja (fitosociološka parcela). Rezultati istraživanja ukazuju na visok nivo varijabilnosti većine vrsta u skladu sa karakteristikama biologije, pomologije i ekologije. Voćke su poput plemenitog tvrdog drveta divlje trešnje (*Prunus avium* L.), divlje kruške (*Pyrus communis* L.), divlje jabuke (*Malus sylvestris* Mill.), Breče (*Torminalis clusii* M. Roem.), *Sorbus aria* L. et all, Divlja trešnja, Vrapcarka (*Prunus avium* L.) najpoznatiji je uzgajivač šumskog voća, javlja se kao pojedinačno stablo ili u manjim skupinama (Noćajević, 2009). Blagodati plodonosnih šumskih vrsta naglašavaju se u vremenu cvjetanja i plodonošenja, kada "okićena" šuma pruža bogatu pčelinju pašu i hranidbu za šumsku faunu (Orešković i sur. 2006). Voćne šumske vrste značajne su kao rodovi sorti i kao osnova za kalemljenje visokokvalitetnih sorti. Također, za ljude su važni s aspekta ekologije, prehrane, dijetetske terapije, farmakologije i bioenergetske ravnoteže.