

Assessing the influence of different types of anthropogenic impact on beech forest ecosystems structure in Latorica river basin

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The six habitat types in beech forest zone in Latorica river basin have been studied: 1. Primary beech forests; 2. Modified beech forests; 3. Semi-natural beech forests; 4. Secondary hay meadows; 5. Secondary pasture meadows; 6. Ruderal habitat. Indicator species analysis, biodiversity indices calculations (species richness, evenness, Shannon-Wiener index and Simpson index), ecosystem structure and species composition assessment have been performed.

The Carpathian Mountains represent Europe's largest continuous forest ecosystem supporting the natural biodiversity for Europe (CEI, 2001). This region is considered as a hotspot of biodiversity, with a large proportion of endemic species (CEI 2001; Kuemmerle et al., 2006). European beech (*Fagus sylvatica* L.) is a major and widespread tree species of forest in Europe and in Carpathians (Standovar and Kenderes, 2003).

In this investigation, we analyzed the forest naturalness and degradation steps of beech forest area of the Ukrainian Carpathian Mountain region and determined the influence of different types of anthropogenic impact on plant diversity in the forest ecosystems. The study area is Latorica river basin located in Eastern Carpathian Mountains, Transcarpathian region of Western Ukraine. The following forest habitat types have been determined for analyses: 1) Primary beech forest (PBF) with native tree species and none human impacts; 2) Modified beech forest (MBF) with lower disturbed ecological processes is distinguished from primary forest, but can be restored naturally; 3) Semi-natural beech forest (SBF) is seriously degraded by cutting, but can be regenerated naturally; and degraded non-forest land without forest stands are represented by three types: 4) Secondary hay meadows (SHM); 5) Secondary pasture meadows (SPM); 6) Ruderal habitats (RH) with road side and tree species remnants on degraded habitats. Twenty plots in each forest types have been analyzed. The total number of study sites contains 120 plots.

Our results have shown changes in species composition under different anthropogenic impact. In particular, the rare species are present in PBF, MBF, SBF and SHM. In contrast, alien species are present in SBF, SPM and SHM, while their numbers per plots have been increased in RH. Apart from, there are changes in life forms distribution between studied sites: such life forms as ferns, trees and shrubs have shown ecosystem naturalness while grasses can indicate degradation processes. The highest values of species richness ($21,7 \pm 3,5$) as well as diversity indices (Simpson and Shannon-Wiener indices) have been observed in SHM. But in PBF species richness have been decreased in two times ($10,4 \pm 4,1$). Our investigations revealed changes in ecosystem structure depending on degradation: the average cover of bryophytes and lichens in degraded sited have been decreased while bare ground cover have been increased. The indicator species analysis demonstrates that in natural ecosystems indicators are presented by species of different life forms and families while

in ecosystems under degradation processes are presented mainly by hemicryptophytes and by species of Poaceae and Asteraceae families.

REFERENCES

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***Sorbus torminalis* (L.) Crantz. (Rosaceae) in the Uzhansky National Nature Park (Ukrainian Carpathians) Kvakovska I.M.**

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The rare species included into the Red Data Books of Ukraine is reported, – *Sorbus torminalis*, in Uzhansky National Nature Park. Its habitats contain 20 generative individuals. A geobotanical description of the above habitat is presented. The conservation suggestions are also presented.

Берека *Sorbus torminalis* – зникаючий вид, занесений у Червону книгу України (2009). В Україні проходить крайня північно-східна межа поширення виду (Червона книга України, 2009).

Ужанський національний природний парк (Ужанський НПП) розташований у північній частині Великоберезнянського району Закарпатської області. Він є частиною трилатерального Міжнародного (польсько-словацько-українського) біосферного резервату “Східні Карпати”. Згідно з районуванням України територія парку розташована в Ставненсько-Жденіївському геоботанічному районі Карпатського геоботанічного округу (Голубець, 1977).

Локалітет *Sorbus torminalis* є єдиним локалітетом цього виду на території Міжнародного біосферного резервату «Східні Карпати». Вид зростає у Костринському ПНДВ, квартал 12 на горі Княгиниця. Координати ділянки: UTMX – 609265, UTMU – 5422590. Висота – 440 м н.р.м., південно-східний кам’янистий схил крутизною 35°.

Нами розпочато моніторинг за даним локалітетом, у 2011 році закладено постійну пробну площу, проведено дослідження ценотичної структури, проведено фітоценотичний опис популяції з участю даного виду.