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**SOZOLOGICAL EVALUATION OF GRASSLANDS IN THE UPPER PART OF
DNISTER-RIVER CATCHMENT (WESTERN UKRAINE)**

Тасенкевич Л., Розенталь Г., Мисенко О. Созологічна оцінка трав'яних фітоценозів верхів'я р. Дністер (Західна Україна) // Наук. зап. Держ. природознавч. музею. – Львів, 2008. – Вип. 24. – С. 83-88.

Наведено оцінку стану й тенденцій змін трав'яних угруповань у верхів'ї басейну р. Дністер. Здійснено природоохоронну категоризацію лучних угруповань та запропоновано найбільш сприятливий режим використання рідкісних фітоценозів з метою збереження їх видового різноманіття.

Тасенкевич Л., Розенталь Г., Мисенко О. Созологическая оценка травяных фитоценозов верховья р. Днестр (Западная Украина) // Науч. зап. Гос. природоведч. музея. – Львов, 2008. – Вып. 24. – С. 83-88.

Приведена оценка состояния и тенденций изменения травяных сообществ в верховье бассейна р. Днестр. Проведена природоохранная категоризация луговых сообществ и предложен наиболее благоприятный режим использования редких фитоценозов для сохранения их видового разнообразия.

The grassland areas are one of the important elements of the landscape of the Western Ukraine. Although there are several monographs published on the meadows of entire Ukraine [1, 2, 4], the Ukrainian Carpathians [3] and the upper-Dnister Beskydy Mts. [5] but rather general approach to the subject was applied in all of them.

The detail mapping and study on the grasslands in the upper part of the Dnister basin, conducted within the frames of the German-Ukrainian Scientific UNESCO-BMBF project “Transformational processes in the Dnister-river region (Western Ukraine)”, are the first of such type in the entire west-Ukrainian region.

Material and methods

The investigation were conducted in 6 model communes:

- at the plane area of the upper part of basin – in Horyhlyady and Olesha,
- at the supra-montane belt – Verkhni Luzhok-Busovys'ko,
- at the lower part of the montane belt – Volosyanka-Yalynkuvaty.

The procedure of vegetation investigation in the field and methods of arranging the data collected on the grassland vegetation of Dublany, Kolodrubby, Olesha, Horyhlyady, Volosyanka and Yalynkuvaty communes were based on the principles of dominance classification. Associations and phytocoenoses (communities) have been named according to their most prominent species (dominants). Nomenclature in most cases was applied after Shelag-Sosonko et al. [6].

The grassland phytocoenoses of Verkhni Luzhok-Busovys'ko area were investigated with Braun-Blanquet method [12]. For association determination and syntaxa designation

the Matuszkiewicz's „Key for determination of plant communities of Poland” [10] was used.

Results and discussion

Due to the detail mapping and study of the grasslands in the upper part of the Dnister river-catchment the myth about uniformity of vegetation cover and poor floristic composition in the region have been shattered. Some findings were unexpected and surprising, both among grassland communities and among vascular plants, such as *Gentiana acaulis*, a subalpine species unknown till now in this part of the Ukrainian Carpathians and coenoses *Nardetum (strictae) alliosum (victoralis)*.

Although the grasslands had undergone extensive anthropogenic changes in different communes, their state, from the viewpoint of nature conservation, is unequal. As a conservational "desert" might be described grasslands in Olesha commune. They are represented by pastures, mostly on their last stage of degradation (*Lolietum (perennis) polygoniosum (avicularae)*, community *Trifolium repens + Potentilla anserina*).

In somewhat better situation are the grasslands of Horyhlyady commune. Here opposite processes can be observed in vegetation cover: spontaneous transmuting of abandoned arable lands into multi-species hay-meadows, overgrowing of grassland with bushes, and further degradation of pastures with depletion of species diversity.

Even in such a landscape changed by human activities as Horyhlyady's, there are several rare plant species and two stands of associations worth of protection.

Rare plant species:

- *Alyssum hirsutum* Bieb. – Pontic species on the north-western edge of the area;
- *Dianthus carthusianorum* L. subsp. *commutatus* Zapal. – endemic of the Podolian region;
- *Festuca trachyphylla* (Hackel) Krajina – Central-European species and its coenoses on the southern edge of the area;
- *Filipendula vulgaris* L. – endangered medicinal plant;
- *Petrorhagia prolifera* (L.) P.W.Ball et Heywood – sub-mediterranean species on the northern edge of the area;
- *Veronica spicata* L. subsp. *barrelieri* (Schott ex Roemer et Schultes) Murb. – steppe species on the north-western edge of its area.

As natural habitats are continuing to deteriorate and increasing number of wild species are seriously threatened and the ecological problems are often of a transboundary nature, it is necessary to elaborate proposals to the authorities on the establishment of botanical mini-reserve in order to conserve them in the nearest to the eastern frontier of EU area of western Ukraine.

In accordance with Habitat Directive [7] pseudo-steppes (meadow steppes) are the natural habitat types which conservation is the priority task in order to create efficient pan-European ecological network. In Horyhlyady commune to such types belong *Brachypodietum (pinnati) organidosum (vulgaris)* and *Agrostidetum (tenuis) cynosuroidesum (crustati)* with characteristic for such a habitat species as *Anchusa officinalis* L., *Asparagus officinalis* L., *Asperula cynanchica* L., *Brachypodium pinnatum* (L.) Beauv., *Bupleurum falcatum* L., *Campanula rotundifolia* L., *Centaurea calcitrapa* L., *C. rhenana* Boreau,

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Dichanthium ischaemum (L.) Roberty, *Filipendula vulgaris* L., *Poterium sanguisorba* L., *Scabiosa ochroleuca* L., *Seseli annuum* L., *S. libanotis* L.

In the mountainous communes – Busovys'ko-Verkhniy Luzhok and Volosyanka-Yalynkuvate, the impact of men is strong around the human settlements and is seen not just as orchards and vegetable gardens, but also in the form of plant communities which have emerged owing to men activity as the various types of meadows, pastures, and tall herb communities.

The grasslands in Busovys'ko-Verkhniy Luzhok are composed of 32 associations and five communities, in Volosyanka-Yalynkuvate – of 41 associations and five communities [14].

The criteria proposed for estimation of the scale of threat to vegetation of Germany [9], were applied for evaluation of non-forest vegetation of Busovys'ko-Verkhniy Luzhok and Volosyanka-Yalynkuvate as well. There are five of them: category 1 – not or only potentially threatened, 2 – locally important, threatened, 3 – regionally important, strongly threatened, 4 – trans-regionally important (e.g. for one province), threatened by total loss, 5 – internationally or nationally important.

The **category 1** is represented in the grasslands of Busovys'ko-Verkhniy Luzhok by *Convolvulo arvensis-Agropyretum repentis* – a stage of spontaneous demutation of arable land, *Alopecuretum pratensis* – one of the commonest semi-natural association of hay-meadows in the flood lands of the Dnister-river region, and *Festuco pratensis-Plantaginetum* – heavy grazed and often suffering overgrowing with bushes. In Volosyanka-Yalynkuvate substantial area is occupied by coenoses of this category. They are *Caricetum rostratae*, *Equiseteto (palustris) muscosum*, *Menthetum longifoliae*, *Phragmitetum australis*, *Deschampsietum caespitosae* (with co-dominance of *Deschampsia caespitosa*, *Cynosurus cristatus*, *Trifolium repens*), *Festucetum rubrae* (with co-dominance of *Festuca rubra*, *Cynosurus cristatus*, *Lolium perennis*), poor mat-grass pastures *Nardetum strictae*, which are still used as pastures in the lower altitudes and are abandoned in the polonyiny-belt, *Trifolietum (repentis) plantaginosum (majoris)* – a trampled down pastures along stream sides and paths, complexes *Festucetum rubrae + Vaccinietum myrtilli* and *Nardetum strictae + bushes + trees* – neglected hay-meadows and pastures, communities *Pteridium aquilinum*, *Rubosum hirtae*, *Rubosum caesiae*, *Epilobietum angustifoliae* and complex *Epilobietum angustifoliae + Picea abies* – patches of glades on a forest edge, overgrowing with *Coryllus avellana*, tall *Epilobium angustifolium* together with rasp-berries, black-berries etc.

The vegetation units belonging to the category 2 are widely spread throughout Busovys'ko-Verkhniy Luzhok and Volosyanka-Yalynkuvate area. They are as follows:

Poo-Tussilaginetum farfarae occurs on the pebbly bank of the Dnister;

At places where water levels are high or upon water courses small patches of *Phragmitetum australis*, *Mentho-longifoliae-Juncetum inflexi*, *Juncetum (inflexii) trifoliosum* (with *T.repens* and *T.fragiferum*), *Juncetum (effusii) muscosum*, *Filipenduletum (ulmariae) scirpetosum (sylvatici)*, *Equiseteto (fluviatilis) valerianosum (simplicifolii)*, *Eriophoretum latifoliae*, *Petasitetum kablikianii* are found.

Mesophilous meadows and pastures take the largest areas. They are hay-meadows, mostly cut once a year: *Arrhenatheretum elatioris + Festuca pratensis* community, *Trisetum flavescens* community, and extensively pastured *Lolio-Polygonetum arenastris*, *Lolio-Cynosuretum*, *Agrostis capillaris* community, *Festuca rubra* community,

Deschampsia caespitosa community, *Lolio-Polygonetum arenastri*, *Sieglingio-Agrostietum*, *Calluno-Nardetum strictae*.

At the higher elevations in Volosyanka-Yalynkuvate area *Calamagrostidetum villosae*, *Nardetum strictae* and *Vaccinietum myrtilli* prevail. Succession phenomena occur in the pastures i.e. trees and bushes appear chiefly pines, spruces, blackthorns, junipers, willows, alder and blackberries. Despite extensive use and high level of their transformation, in some patches of these communities several protected (mainly members of *Orchidaceae* family) and rare species (*Menyanthes trifoliata*, *Blysmus compressus* etc.) occur.

To the **category 3** belong regionally important, strongly threatened vegetation units.

In Busovys'ko-Verkhniy Luzhok the frequent components of the vegetation cover are *Arrhenatheretum elatioris*, *Festuco-Cynosuretum*, *Scirpetum silvatici*, *Epilobio-Juncetum effusi*. Rather rare are coenoses of the forest edges – *Trifolio-Agrimonetum*. In grasslands of Volosyanka-Yalynkuvate *Eriophoretum angustifoliae*, *Deschampsietum (caespitosae) juncosum (effusii)*, *Deschampsietum (caespitosae) cirsiosum (rivularis)*, *Filipenduletum ulmariae* are of this category.

The most vulnerable and valuable grassland phytocoenoses are these of the categories 4 and 5. They are not numerous and, as a rule, cover small surface.

Upon the water course of small stream in Verkhniy Luzhok one stand of **4th category** association *Caricetum paniculatae* was found, and other few locations of this coenoses – in a mosaic complex *Epilobio-Juncetum effusi* + *Angelico-Cirsietum oleracei* + *Scirpetum silvatici* + *Lysimachio vulgaris-Filipenduletosum* + *Caricetum paniculatae*. Also belong to the category 4 pastures *Hieracio vulgati-Nardetum*, *Polygalo-Nardetum* and *Calluno-Nardetum strictae*, which suffer from heavy grazing and in spite of this, are overgrown with *Juniperus communis* L., *Rubus* spp., *Prunus spinosa*, in lower elevations – with *Pinus sylvestris* L. On the shingly alluvia along the banks of the Dnister thickets of *Salici-Myricarietum* occur, which also can be attributed to the category 4.

Fairly often phytocoenoses of **category 5** occur in small isolated patches, as *Valeriano-Caricetum flavae*, which occupy water-logged sites. The valerian-sedge marshes are not common, as calcium-rich waters are rare in this part of the Ukrainian Carpathians. The prominent feature of these communities is presence of several vulnerable and endangered species in its floristic composition. They are quite numerous populations of rare and Red book of Ukraine species: *Carex davalliana* Smith, *Blysmus compressus* (L.) Panzer ex Link, *Epipactis palustris* (L.) Crantz, *Dactylorhiza maculata* (L.) Soó, *D. majalis* (Rchb.) Hunt et Summerhayes, *Gymnadenia conopsea* R.Br. subsp. *densiflora* (Wahlenb.) K.Rich.

Other internationally important associations are *Campanulo serratae - Agrostietum capillaris*, *Anthyllidi-Trifolietum montani*, *Gladiolo-Agrostidetum capillaris*, *Molinietum caeruleae*.

Campanulo serratae-Agrostietum capillaris, described from Bieszczady National Park in Polish part of the East Carpathians [8], was discovered in Verkhniy Luzhok. Due to its remoteness from the village, stands of association are not used as a pasture after being mown; hence, their floristic diversity and colorfulness do not suffer depletion even without fertilizing. Carpathian endemic *Campanula serrata* is a differentiate species of this association.

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Anthyllidi-Trifolietum montani is endemic Carpathian association known till now from the Pieniny Mts. in the West Carpathians [13], was discovered in Verkhniy Luzhok (although in floristically a little impoverished state).

The floristic composition of coenoses, temporarily attributed to *Gladiolo-Agrostidetum capillaris*, is depleted in comparison to the typical association of the Western Carpathians, as some characteristic species are absent. It also differs from have not been described formally *Agrostetum vulgare pocuticum* [11] from the higher part in the east of the Ukrainian Carpathians. The outstanding feature of this association is abundant occurrence of *Alchemilla* spp., different members of *Leguminosae* and *Orchidaceae* families.

The only stand of *Molinietum caeruleae* – a multi-species hay-meadow is under threat of overgrowing with different shrub and tree species.

Rare and threatened phytocoenoses occur mainly at low elevations in commune Busovys'ko-Verkhniy Luzhok and there are only few of them in the grasslands of forest belt in Volosyanka-Yalynkuvate commune. For example, a stand of *Mentha (longifoliae) equisetosum (palustris)* with numerous populations of *Epipactis palustris*, other members of *Orchidaceae* family, and *Blysmus compressus*.

Above the upper forest limit the pastoral management was behind a significant increase in the area occupied by mat-grass pastures. Apart from dominating pure *Nardetum strictae*, the unique phytocoenosis not described from the whole Carpathians previously occurs here – *Nardetum (strictae) alliosum (victoralis)*. It is strictly confined to the south-west and west oriented 5-10° inclined slopes of the upper part of ridge. The species composition is floristically closely related to the *Nardetum strictae*, but its striking feature is high abundance of *Allium victoralis*, covering in average 30% of ground, but in some places the percentage is even higher.

The Red book species *Arnica montana*, *Gymnadenia conopsea*, *Pseudorchis albida*, *Epipactis palustris* etc., although not abundant but are constant in the phytocoenosis composition. For its preservation keeping of traditional land-use, i.e., one-time mowing at the end of July or beginning of August is needed.

Conclusion

Due to detailed phytosociological researches it was discovered that phytocoenotic and floristic diversity in the Upper-Dnister region is much higher than it was considered earlier. Although the grasslands had undergone extensive anthropogenic changes in different communes, the range of rare phytocoenoses, such as *Nardetum (strictae) alliosum (victoralis)*, *Gladiolo-Agrostidetum capillaris*, *Campanulo serratae-Agrostietum capillaris*, *Anthyllidi-Trifolietum montani* and new localities of rare plant species were discovered.

It was established occurrence of 86 associations and 11 communities in 6 model communes – Horyhlyady and Olesha, Verkhni Luzhok-Busovys'ko, Volosyanka-Yalynkuvaty.

Based on estimation of their current state, threats and tendencies of development, the sozologic categorization of grassland phytocoenoses allowed attributing them to five categories.

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