

The classification of synusial epigeic and epiphytic bryophyte communities of forest coenoses of forest-steppe zone of Ukraine

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Abstract: The syntaxonomical classification and characteristics of synusial epigeic and epiphytic bryophyte communities of forest coenoses of forest-steppe zone of Ukraine is presented in this paper.

Key words: mosses, associations, ecological-floristic classification, bryophyte communities

1. Introduction, material and methods

The main structural components of subcontinental forest vegetation are more or less formed, synusial bryophyte communities. Their structure and classification is insufficiently studied. The role of moss-likes in different types of vegetation and growth degree of their moss cover is indefinite. That is why the research of bryophyte communities of forest, steppe and other phytocoenoses is an important aspect of bryocoenotic research. The purpose of our work was detection of synusial epigeic and epiphytic bryophyte communities in forest phytocoenoses of forest-steppe zone of Ukraine and their classification.

The material for this work is both floral collecting and geobotanical descriptions of moss ground cover (120 descriptions) made by the author on the territory of the forest-steppe zone of Ukraine. The descriptions were made by conventional methods (Baischeva *et al.* 1994; Marstaller 2001).

The classification of bryophyte communities was made by ecological-floristic classification (based on the method of Braun-Blanquet 1964). The names of syntaxa follow the Code of phytosociological nomenclature (Weber *et al.* 2000) and names of mosses are given according to "Bryophytic checklist of Ukraine" (Boiko 2008). The syntaxonomical scheme of epiphytic moss

vegetation is made on the basis of Marstaller's recent summaries (Marstaller 1993, 2006).

2. Results and discussion

As a result of original research, the bryophyte communities of forest coenoses of the forest-steppe zone of Ukraine encompass: 3 classes, 3 orders, 4 alliances, 8 associations, 3 subassociations and 5 communities without ranks. The syntaxonomical scheme of these communities and their distribution features within the region are given below.

The syntaxonomical scheme of investigated communities

Class: *Ceratodonto purpurei-Polytrichetea piliferi*
Mohan 1978

D.s. *Cladonia arbuscula*, *C. foliacea*, *C. furcata*, *C. rangiferina*, *Cetraria islandica*, *Peltigera malacea*, *Polytrichum piliferum*

Order: *Polytrichetalia piliferi* v. Hübschm. 1975

D.s. *Ceratodon purpureus*, *Racomitrium canescens*, *Polytrichum juniperinum*

Alliance: *Ceratodonto purpurei-Polytrichion piliferi*
Waldh. ex v. Hübschm. 1967

D.s. *Cephaloziella divaricata*, *Ceratodon purpureus*, *Polytrichum juniperinum*

Association: *Racomitrio-Polytrichetum piliferi* v. Hübschm. 1967

- *typicum* Nörr 1969

D.s. *Polytrichum piliferum*

- *ceratodontetosum purpurei* v. d. Dunk 1972

Association: *Brachythecietum albicantis* Gams ex Neum. 1971

D.s. *Brachythecium albicans*

Association: *Polytrichetum juniperini* v. Krus. 1945

D.s. *Polytrichum juniperinum*

Class: *Cladonio digitatae-Lepidozieta reptantis* Jez. & Vondr. 1962

D.s. *Cladonia coniocraea*, *Cl. digitata*, *Cephalozia bicuspidata*, *C. hampeana*, *Dicranum viride*, *Lophocolea heterophylla*, *Bryum moravicum*, *Plagiothecium denticulatum*, *P. laetum*, *P. piliferum*

Order: *Diplophylletalia albicantis* Phil. 1963

D.s. *Pohlia cruda*, *Diplophyllum albicans*

Alliance: *Dicranellion heteromallae* Phil. 1983

D.s. *Atrichum undulatum*, *Dicranella heteromalla*, *Ditrichum pusillum*, *Scapania curta*

Suballiance: *Brachythecienion velutini* Marst. 1984

D.s. *Brachythecium velutinum*, *Bryoerythrophyllum recurvirostrum*, *Bryum subelegans*, *Eurhynchium hians*, *Fissidens taxifolius*, *Plagiochila porelloides*

Association: *Fissidenthetum bryoidis* Phil. ex Marst. 1983

D.s. *Fissidens bryoides*

Association: *Plagiothecietum cavifolii* Marst. 1984

D.s. *Plagiothecium cavifolium*

Community with *Dicranella heteromalla*

D.s. *Dicranella heteromalla*

Suballiance: *Pogonatenion urnigeri* (v. Krus. 1945) Phil. 1956

D.s. *Dicranella crispa*, *Polytrichum formosum*, *P. commune*, *P. juniperinum*, *P. piliferum*

Community with *Atrichum undulatum*

D.s. *Atrichum undulatum*.

Alliance: *Bryo capillaris-Brachythecion rutabuli* Lee. 1975

D.s. *Brachythecium oedipodium*, *B. salebrosum*, *B. velutinum*, *Bryum subelegans*, *Amblystegium serpens*

Association: *Plagiothecietum neglecti* Ricek 1968

D.s. *Plagiothecium nemorale*, *P. succulentum*

Class: *Hylocomieta splendens* Marst. 1992

Order: *Hylocomietalia splendens* Gillet ex Vadam 1990

D.s. *Rhytidiadelphus squarrosus*, *R. triquetrus*, *Thuidium tamariscinum*, *Plagiomnium affine*

Alliance: *Pleurozium schreberi* v. Krus. 1945 (Syn. *Hylocomion splendens* Vadam 1990)

D.s. *Scleropodium purum*, *Hylocomium splendens*, *Pleurozium schreberi*, *Dicranum scoparium*,

Hypnum jutlandicum, *Polytrichum alpinum*, *P. formosum*.

Association: *Pleurozietum schreberi* Wisn. 1930 (Syn. *Ptilio crista-castrensis-Hylocomietum splendidis* v. Krus. 1945)

D.s. *Hylocomium splendens*, *Ptilium crista-castrensis*, *Pleurozium schreberi*

- *typicum*

- *dicranetosum polyseti* Gapon 2010 (Gapon 2010).

- *clavulinietosum rugosi* – Gapon 2010 (Gapon 2010).

Alliance: *Eurhynchion striati* Waldh. 1944

Association: *Eurhynchietum striati* Wisn. 1930

D.s. *Eurhynchium angustirete*

Association: *Plagiomnietum undulati* Gapon 2010 (Gapon 2010).

D.s. *Plagiomnium undulatum*

Community with *Tortula subulata*

D.s. *Tortula subulata*

Alliance: *Fissidention taxifolii* Marst. 2006

Association: *Eurhynchietum swartzii* Waldh. ex Wilm. 1966

D.s. *Oxyrhynchium hians*, *Fissidens taxifolius*

Community with *Oxyrhynchium hians*

D.s. *Oxyrhynchium hians*

Community with *Plagiomnium cuspidatum*

D.s. *Plagiomnium cuspidatum*

The communities of the *Ceratodonto purpurei-Polytrichetea piliferi* Mohan 1978 class within the region are found in pine and oak-pine forests. The first association *Racomitrio-Polytrichetum piliferi* v. Hübschm. 1967 is widespread only within phytocoenoses of pine forests and low-age pine plantations, two others (*Brachythecietum albicantis* Gams ex Neum. 1971 and *Polytrichetum juniperini* v. Krus. 1945) are noted in the complexes of typical pine and oak-pine forests. The identified communities are widespread on the entire territory of the forest-steppe zone, but often occur on the left bank of the Dniepr.

The communities of the *Cladonio digitatae-Lepidozieta reptantis* Jez. & Vondr. 1962 class are found in all types of forest vegetation: broadleaf, coniferous and mixed forests, mainly on the trunk of trees or on dead wood. Throughout the research territory, the associations: *Plagiothecietum cavifolii* Marst. 1984, *Plagiothecietum neglecti* Ricek 1968 and persistent communities without rank *Dicranella heteromalla* – comm., *Atrichum undulatum* – comm., that are found in zonal types of oak, oak-hornbeam, maple-linden-oak vegetation are observed there more frequently than others. The communities of *Atrichum undulatum* – comm., *Dicranella heteromalla* – comm. are observed in broadleaf forests and in pine, oak-pine forest coenoses, where they are found also on disturbed soil.

It should be stressed that, in broadleaf forests, the proportion of characterized bryophyte communities in the ground cover is small. They are developed only in free of the forest cover areas and increase under tree trunks or in disturbed soil. Only in western forest-steppe zone, the association of *Fissidenthetum bryoidis* Phill. ex Marst. 1983 is observed seldom and is found in oak-hornbeam and beech-oak forests.

The communities of the *Hylocomietea splendidis* Marst. 1992 class within the region are found on soil in pine, oak-pine and broadleaf forests. The *Pleurozietum schreberi* Wisn. 1930 association, with subassociations of *P. s. dicranetosum polyseti* Gapon 2010 prov. and *P. s. clavulinetosum rugosi* Gapon 2010 prov. is typical in pine and oak-pine forests.

Other syntaxa are found mainly in zonal types of vegetation – broadleaf forests. The *Plagiomnietum*

undulati Gapon 2010 prov., *Eurhynchietum swartzii* Waldh. ex Wilm. 1966 associations and communities without rank *Tortula subulata* - comm. and *Plagiomnium cuspidatum* – comm. are observed more often than others. The *Eurhynchietum striati* Wisn. 1930 association is seldom found in beech-oak and hornbeam-oak forests and only in the western region.

So the basis of synusial bryophyte communities of the forest-steppe zone of Ukraine comprises more or less stable bryophyte communities of different syntaxonomic accessories. The identified communities of forests, which are zonal types of vegetation, belong to 2 classes, 2 orders, 4 alliances, 6 associations and 5 communities without rank. The communities of pine and oak-pine forests belong to 3 classes, 3 orders, 3 alliances, 1 suballiance, 4 associations, 2 subassociations and 2 communities without rank.

References

- BOIKO Ě. F. A. 2008. Checklist of Bryobionta of Ukraine. 232 pp. Ailant, Kherson.
- BRAUN-BLANQUET J. 1964. Pflanzensoziologie. Grundzüge der Vegetationskunde. 3. Aufl. 865 pp. Springer, Wien-New York.
- GAPON S. V. 2010. New associations and subassociations of moss vegetations of the Ukrainian Forest-Steppe. Ukr. Botan. Journ. 67(6): 865-879.
- BAISCHEVA E. Z., SOLOMETCH A. I. & IGNATOVA E. A. 1994. Bryophyte Vegetation of Bashkiria, South Urals. Arctoa 3: 139-152.
- MARSTALLER R. 1993. Synsystematische Übersicht über die Moosgesellschaften Zentraleuropas. Herzogia 9: 513-541.
- MARSTALLER R. 2001. Die Moosgesellschaften des Naturschutzgebietes Wartburg-Hohe Sonne bei Eisenach (Deutschland). Feddes Repertorium 112(7-8): 525-563.
- MARSTALLER R. 2006. Syntaxonomischer Konspekt der Moosgesellschaften Europas und angrenzender Gebiete. 13, 192 pp. Haussknechtia Beigef., Jena.
- WEBER H. E., MORAVEC J. & THEORILLAT D. P. 2000. International Code of Phytosociological nomenclature. 3 additional. Journal of Vegetation Science 11 (5): 739-768.