ANALYSIS OF CONSORTIUM AS BIONDICATION TRANSFORMED FOREST STATE ON THE BORDER OF THE KYIVS'KE POLISSYA AND THE KYIVS'KA VYSOCHYNNA OBLAST

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Consorts connection of woody plants and xylotrophic fungi in the transformed oak-horn-pine forest on the border of the Kyivs'ke Polissya and the Kyivs'ka vysochynna oblast' were analyzed as bioindication of state forests. Vitality, age, sanitary structures of Pinus sylvestris L. and Quercus robur L. and species, systematic, trophic structures of xylotrophic fungi were investigated.

Koadaptive system, xylomycobionts, Pinus sylvestris L., Quercus robur L.

The study of consorts connection as specific ecological objects is important for deeper noesis of not only biological variety, but of issues of phylogeny, regularities of historical transformation of communities, the solving of which is at the initial stage. It is now generally accepted the core role of forests in stability of biosphere due to preservation of biodiversity and its global influence upon the planet's climate (Rio, 1992). Taking into account the ecosystematic, biospheric role of tree vegetation as an active participant of substances, energy and information cycling on the Earth, as well as the environment of existence of multiple living organisms' species, the issue of studying and preservation of forests remains one of the most significant aspects of natural management in the world. In this context the consorts connection of tree vegetation and wood-destroying fungi are essential elements the study. Xylotrophic macromycetes (aphyllophoroid and agaricoid fungi) are polyphyletic group of organisms which distributed over several families and orders among the division Asco-, Basidiomycota. They execute decay of cellulose, hemicellulose and lignin of wood. These fungi are the major wooddecaying organisms. They play an important role in the nutrient cycle of forest ecosystems.

The purpose of research were to evaluation of consorts connection of tree vegetation and wood-destroying fungi of model plot on the border of Kyivs'ke Polissya and Kyivs'ka vysochynna oblast'.

Materials and methods. For the study was selected area of Boyars'ka station of forest research (BSFR) as model transformed territory in the city Boyarka of Kyyevo-Svyatoshyns'ky region. It is located on the border of Kyivs'ke Polissya and Kyivs'ka vysochynna oblast' according to the physical and geographic zoning of Ukraine. Forest of BSFR covers an area of 21,1 thousand hectares. The climate is characterized by high rainfall and relatively high average temperatures [4].

In model plot a number of ecological research was performed at different levels of diagnostics of xylotrophic fungal infestation: organ, tree bion, population (species), biogroup (stratum) of phytocoenosis, phytocoenosis. The state of trees was evaluated according to common methods of forestry and landscape ecology [1, 2]. The names of plants were given according to S.K. Cherepanov [7]. We characterized the state of surface of soil layer and determined the stage of degression by A.F. Polyakov [5]. The phytosanitary state of trees was appraised by biomorphological parameters (density of top, color, distribution of leaves, damage of insects and pathogens, state of cortex, the presence of wilting branches, etc.) in accordance with the sanitary rules [6]. The stand state index was calculated as sum of gains in the index of trees' state for the number of trees in a certain category, divided by total quantity of examined trees. The healthy ones (I) are considered the stand with index 1-1,5, the weakened ones (II) – 1,51-2,50, heavily weakened (III) – 2,51-3,50, the wilting ones (IV) – 3,51 – 4,50, "recent dead tree stand" (V) – 4,51 – 5,50, "old dead tree stand" (VI) – 5,51 – 6,50.

The measuring unit is understood as substrates of *Pinus sylvestris* L. and *Quercus robur* L. on which carpophores of fungi were detected. Collection of factual evidence was carried out during the period of visible growth and formation of carpophores of xylotrophic fungi during second ten days of September 2013. Every detected species was photographed in vivo. The species that are easily identified "in oculo nudo" and do not require additional micromorphological studies, were not included in the exsiccatae. If required, the colour, smell, structure of carpophores were noted, the reaction of punks to mechanical damage (change of colour, sap ooze); ordination on substrate. The dead substrate of the host tree of xylotrophic fungi was divided into two categories – pruning and stump, taking into account the morpho-

metric parameters. Nomenclature identified species of xylotrophic fungi concepted by the nomenclature base MycoBank (mycobank.org) and current literature [9–11].

We have used the factor Menhinika (species richness of xylomycobiota):

$$D_{Mn} = \frac{S}{\sqrt{N}},$$

S – number of species; N – number of finds;

and Shannon index (generalized assessment of diversity):

$$H = \sum p_i \log_{10} p_i,$$

p_i – relative abundance of each species [8].

Conclusions

We have analyzed consorts connection of tree vegetation and wood-destroying fungi of model plot of BSFR (c. Boyarka, Kyiv region) on the border of Kyivs'ke Polissya and Kyivs'ka vysochynna oblast' as bioidicators of state of transformed forests. It was established that the most significant criterion of "transformation" of investigated area were suboptimal composition of phytocoenoses relatively to ecotope, the age structure of the stand, absence of large-sized fallen woody debris; degradation of phytosanitary state of trees and the depletion of stands. They leads to changes of ecological regimes of forest environment. Which in turn lead to structural changes of co-adaptive system of tree vegetation and wood-destroying fungi. In general on model plot was detected 23 species of macromycetes, which refer to 19 genus, 14 families, 6 orders of divisions Ascomycota (classes Leotiomycetes) and Basidiomycota (class Agaricomycetes). Ecological structure of mycobiota evidenced of its adaptive nature in this type of forest which attributed to both climatic zones. The spreading of parasitic fungi is 9,0 %. Generalized assessment of diversity of xylomycobiota – 1,24±0,06, species richness – 3,13±0,16, fraction of stenotrophic fungi – 17,4 %. The largest number of finds of wood-destroying fungi were detected on large-sized stumps of *Quercus robur* L. (34,2 %). The little number of finds (15,8 %; 5,3 %) of xylotrophic fungi on different categories of substrates of *Pinus sylvestris* L. explained to the biological characteristics of the species. At the same time the age, vitalitative, phytosanitary structure of stands of *Q. robur*, *P. sylvestris* and specific, systematic and trophic structure of xylotrophic fungi evidences on significant pathological processes in this type of forest.

In general, the study's hypothesis was proved, that specific, trophic, systematic structure of xylotrophic fungi depicts the phytosanitary state, vitalitative and age structure of stands. This testifies the unity, inter-connection of these components at all hierarchic levels of forest ecosystem's structural organization.

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