Нацыянальная акадэмія навук Беларусі

Міністэрства прыродных рэсурсаў і аховы навакольнага асяроддзя Рэспублікі Беларусь

Міністэрства лясной гаспадаркі Рэспублікі Беларусь

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МОНИТОРИНГ И ОЦЕНКА СОСТОЯНИЯ РАСТИТЕЛЬНОГО МИРА

МАНІТОРЫНГ І АЦЭНКА СТАНУ РАСЛІННАГА СВЕТУ

VEGETATION MONITORING AND ASSESSMENT

Матэрыялы Міжнароднай навуковай канферэнцыі, прысвечанай 80-годдзю Нацыянальнай акадэміі навук Беларусі

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М77 **Мониторинг** и оценка состояния растительного мира. Материалы Международной научной конференции. Минск, 22-26 сентября 2008 г. / Институт экспериментальной ботаники им. В.Ф. Купревича НАН Беларуси. – Минск: Право и экономика, 2008. – 459 с. – ISBN 978-985-442-588-7.

В сборник включены материалы Международной научной конференции «Мониторинг и оценка состояния растительного мира», посвященной 80-летию Национальной академии наук Беларуси. Всего представлено 190 докладов от 99 ведомств, учреждений науки, охраны природы и образования, предприятий лесного хозяйства из Беларуси, России, Украины, Литвы, Казахстана, Узбекистана, Абхазии, Германии, Польши.

В материалах подводятся итоги работ по мониторингу и изучению состояния растительного мира, обсуждаются актуальные проблемы мониторинга лесной, луговой, водной, болотной растительности, насаждений в условиях техногенной и рекреационной нагрузки и пути их решения. Значительная часть представленных работ посвящена проблемам мониторинга, охраны окружающей среды и использования ресурсов растительного мира.

Materials of International scientific conference "Vegetation Monitoring and Assessment" dedicated to 80th anniversary of National academy of sciences of Belarus are presented. The book consists of 190 reports from 99 scientific and educational organizations of Belarus, Russia, Ukraine, Lithuania, Uzbekistan, Germany, Abkhazia, Poland, working in field of vegetation monitoring, nature conservation, forestry.

Results of vegetation monitoring and assessment and actual problems of monitoring of forest, meadow, water, mire vegetation and plantations under technogenic and recreational pressure are discussed in the book. Significant part of reports is concerned with problems of monitoring, environmental protection and rational use of plants resources.

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SOME ASPECTS OF WOOD-INHABITING FUNGI MONITORING IN FOREST COMMUNITIES

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Абмяркоўваецца метад працяглага вывучэння цэнатычных груповак грыбоў-ксілатрофаў на стацыянарных пробных пляцоўках 400 м^2; разгледжаны практычныя аспекты дакументавання назіранняў, у тым ліку геаграфічная прывязка пляцоўкі. На прыкладзе супольнасці шыракаліста-яловага леса **(Querco-Piceetum)** ***наказана магчымасць***

выяўлення да 52 відаў картыцыоідных грыбоў* (Corticiaceae s. l., Basidiomycetes) *на адной пляцоўцы у вышіку 7 год назіранняў. Маніторынг цэнатычнай групоўкі дазволіў прасачыць сязонную дынаміку пладанашэння грыбоў, вылучыці віды, якія назіраюцца пастаянна і спарадычна.

Dead wood is a large reservoir of biologically combined carbon in forest ecosystems, and its decay is a key process of matters circulation in forest, along with fallen leaves decomposition. In "healthy" ecosystem of reserved boreal or nemoral forest dead wood contitutes *ca* 1/3 of the total wood biomass. The products of its decomposition makes litter and soil physically structured and ultimately forms soil humus. The process of lignocellulose masses decay, including wood *sensu stricto* and bark, carried out mostly by the true fungi (*Eumycota*, the phyla *Basidiomycota, Ascomycota*, and anamorphic fungi with unstated teleomorph), forming succession series on such substrata. *Zygomycota* and *Glomeromycota* are also known on dead wood, but their role in decomposition is little studied. The decay process is supplemented by invertebrates activity, and in minor scale by bacteria vital functions and physical weathering. The big number of species, inhabiting dead wood, can seem to be superfluous, but as Hawksworth (1991) noted, it enables easily to replace the species coming out from the community when the environment changes, by other species with similar functions. Ultimately, the saprobic fungi on wood has big economic importance for forests, decomposing dead standing and fallen trees, branches, and cutting leavings. The detailed research into species diversity and its dynamics are necessary for the knowledge of natural regularities for development and functioning of "healthy", productive and stable forest ecosystems.

Laying and geographical binding of permanent sample plots (PSP). The subject of our research were the coenotical assemblages of corticioid fungi (*Corticiaceae s. l., Basidiomycetes*), i.e. the sets of species occurred in the contour of a biocoenosis. It was stated that in forest communities the sufficient and representative for sampling and simultaneously commensurable for the study during 0.5 working day is 400 m^2 plot. For the repeated samplings it is essential to document the geographical position of each PSP in the form which is intelligible and assessible for other workers. Geographical binding is carried out by describing administrative locality, position in forest ecomony division, and the distances from the main surrounding geographical objects, includig forest roads and vistas. Additional method is the measuring of geographical coordinates by geographical positioning device (GPS).

The example considered here is PSP "Pic1/Mi" (Spruce forest No. 1 on Minsk Eminence – Yurchenko, 2007), which is situated *ca* 1 km NE of the center of Litvinkovo (Litsvinkava) village in Logoisk (Lahoisk) district (Figure). The corners of the plot are conventionally symbolized A, B, C, D. The most convenient shape is the plot 20 × 20 m, the sides of which are oriented according to south-north direction. For the fungi sampling in the field it is enough to mark by a rope the two perpendicular sides of the plot. Commonly the two situation sketches or schemes are drawn in the field: detailed scheme of the plot, showing main objects inside it and near it (Figure, c), and the sketch of their position relative to the closest forest roads, glades, edges. Further the plot is marked on fragmets of the map 1:100000 and the Earth surface satellite image (e.g. NASA Landsat 2000). The key corner D is associated here with a middle-aged growing oak. The coordinates of this corner, determined by GPS device, are: 54°7.764±003' N, 27°44.207±003' E (measuring conditions: signals from 3 and more satellites, the accuracy ±7 m). The coordinates of this PSP determined earlier on the map 1:200000 were: 54°8' N, 27°44'20" E.

The using of 1 m conventional grid inside the plot (Fugure, d) permits to designate the approximate position for the each fungal sample in Cartesian coordinates starting from the corner A, by measuring it by 1 m-marked rope.

The results of corticioid fungi monitoring on sample plot "Pic1/Mi". For this community of aspen-spruce forest of *Oxalis* type with admixture of *Betula pendula, Quercus robur*, and *Acer platanoides* (*Querco-Piceetum Wł. Matuszkiewicz*), were processed the data of three samplings done over 7 years period (Table). The sufficient changes in the composition of plant community were not observed. The resulting list includes 52 species, and evidently this number is not terminal.

For assessing the fungi abundance we worked out 3-marks scale, which takes into account both the fruitbodies occurrence character and thier biomass. The mark 1 is ascribed to the fungi with thin fruitbodies (0.03–0.3 mm), found in 1–2 places, or with thicker fruitbodies (0.31–5 mm), found solely or in a small group. The mark 3 is ascribed to the fungi with thin, but frequent (5 and more finds) fruitbodies, or thicker fruitbodies, found in 3 and more places. Seasonal dynamics of fruitbody occurrence was traced: *Athelia epiphylla* complex, *Peniophora cinerea*, *Steccherinum fimbriatum*, *Vuilleminia comedens* were abundant in autumn; *Hyphodontia sambuci* and *Phanerochaete sordida* were common in spring. Eight species were recorded in autumn only, and 23 in spring only – the last fact appears in contrast to the hypothesis of autumn fructifying of most corticioid species. The 2nd and te 3rd samplings added 14 and 11 species, respectively, to the total list. The records of 20 species (38%) were not repeated between samplings. Only 9 species (17%) were constant and recorded in all three samplings; 4 of them are ubiquists in Belarusian mycobiota. Remarkably that 4 species were found here in single locality for Belarus, and 3 species – in the second locality for the country.

It was stated that *ca* 30 species of corticioid fungi can be recorded on 400 m^2 sample plot at least after 2 hours (in autumn) and 2.5 hours (in spring) of careful examination of fallen material and litter.

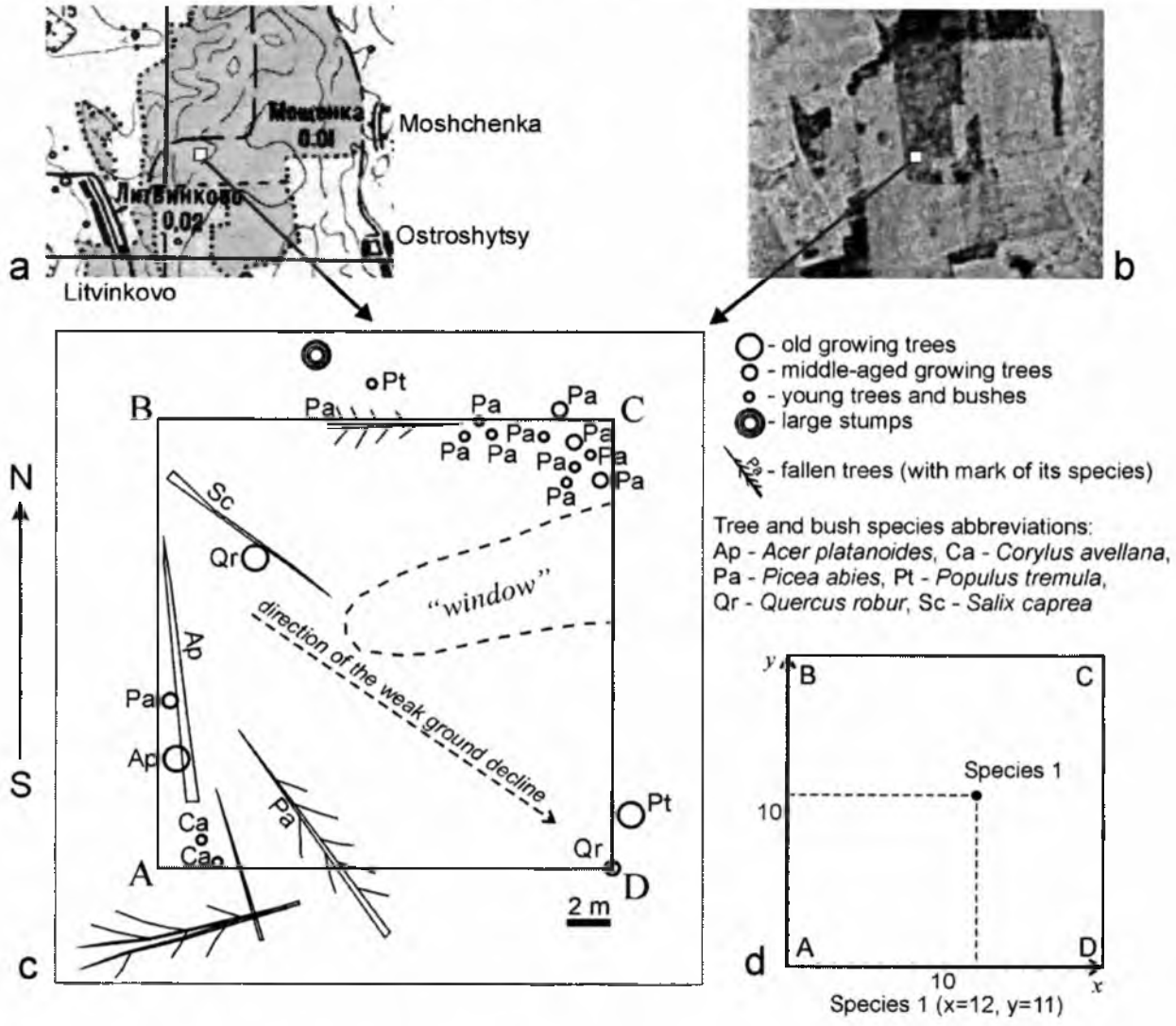

Fig. – Geographical binding and sketch of the sample plot "Pic1/Mi": a – position of the plot on a fragment of 1:100000 topographic map, b – position of the plot on a fragment of the Earth surface satellite image (NASA Landsat 2000), c – sketch of the plot with the main binding objects, d – using of Cartesian coordinates for describing the fungi position inside a plot.

The species found on PSP "Pic1/Mi" constitute 23% of the total number of corticioid fungi species recorded in Belarus today. It tells about rather uniform geographical distribution of these fungi (but if to consider them in scale of broadleaf-spruce forests only). Broadleaf-aspen-spruce forests are characterized by the highest species capacity in respect of corticioid fungi [e.g., 46 species were recorded over 3 years and 4 samplings on the plot of *Querco-Piceetum* in Byarezinski Biosphere Reserve (Yurchenko, 2003)], following *Alnus glutinosa* and *Betula pubescens* forest formations, inhabited by more than 30 species per 400 m^2.

The monitoring data can be used for assessing the fungi geography and the need for conservation measures for selected species.

Table – The results of corticioid fungi monitoring on sample plot "Pic1/Mi"

Species	Sampling date and the number of finds (with abundance mark in brackets)		
	30 IV 2001	9 XI 2003	26 IV 2008
Amphinema byssoides	1(1)	4(2)	4(2)
Athelia arachnoidea	1(1)	2(1)	–
Athelia epiphylla complex	1(1)	11(3)	–
Athelia fibulata	–	3(2)	–
Botryohypochnus isabellinus	–	2(1)	1(1)
Brevicellicium olivascens	2(1)	1(1)	–
Ceraceomyces microsporus	–	1(1)	–
Ceraceomyces sp.	–	1(1)	–
Cylindrobasidium evolvens	–	1(1)	1(1)
Gloeocystidiellum porosum	–	1(1)	–
***Hyphoderma definitum*	1(1)	–	–
Hyphoderma praetermissum	2(1)	2(1)	1(1)
Hyphoderma setigerum	3(2)	–	1(1)
Hyphodontia crustosa	–	1(1)	–
Hyphodontia nesporii	–	1(1)	–
Hyphodontia radula	1(1)	2(1)	–
Hyphodontia rimosissima	3(2)	–	1(1)
Hyphodontia sambuci	1(1)	1(1)	7(3)
Irpex lacteus	1(1)	–	–
Leptosporomyces sp.	–	–	1(1)
Peniophora cinerea	1(1)	5(3)	2(2)
Peniophora incarnata	2(2)	1(1)	1(1)
Peniophora nuda	1(1)	–	1(1)
Peniophora polygonia	–	–	1(1)
Peniophora quercina	1(1)	1(1)	–
Phanerochaete sordida	–	1(1)	3(3)
Phlebia aurea	1(1)	–	–
**~~*Phlebia tristis*~~ Dacryobolus sudans	–	–	1(2)
Phlebiella cf. *pseudotsugae*	1(1)	–	–
Phlebiella sulphurea	1(1)	1(1)	1(1)
***Phlebiella tulasnelloidea*	1(1)	–	–
Pseudochaete tabacina	–	–	1(1)
Resinicium bicolor	–	–	2(1)
Scopuloides hydnoides	–	–	1(1)
Sistotrema brinkmannii	–	4(2)	2(1)
**Sistotrema efibulatum*	1(1)	–	–
Sistotrema oblongisporum	–	3(2)	1(1)
Sistotrema octosporum	–	1(1)	2(1)
Sistotremastrum niveocremeum	2(1)	1(1)	1(1)

Species	Sampling date and the number of finds (with abundance mark in brackets)		
	30 IV 2001	9 XI 2003	26 IV 2008
Steccherinum fimbriatum	3(2)	5(3)	1(1)
Stereum hirsutum	1(1)	–	1(2)
Stereum rugosum	2(2)	–	1(1)
Tomentella atramentaria	1(1)	2(1)	2(1)
**Tomentella fibrosa*	–	1(1)	–
Tomentella stuposa	–	–	4(2)
Tomentella cf. *sublilacina*	–	–	1(1)
Trechispora farinacea	1(1)	–	–
Trechispora microspora	1(1)	2(1)	–
**Tubulicrinis* sp.	–	–	1(1)
Vuilleminia comedens	–	6(3)	–
*Indet. sp. 1	–	–	2(1)
Indet. sp. 2	–	–	1(1)
Species number per sampling	27	29	31
Total species number	52		

* – species found in single locality for Belarus,
** – species found in two localities for Belarus.