

Zachodniopomorski Uniwersytet Technologiczny
w Szczecinie

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Zróżnicowanie zbiorowisk
grzybów mikroskopijnych
w odniesieniu do zróżnicowania
zbiorowisk roślinnych
w Słowińskim Parku Narodowym

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Summary

Differentiation of microscopic fungi communities related to the differentiation of plant communities in the Słowiński National Park

The occurrence of microscopic fungi in phytocoenoses of the Słowiński National Park was investigated in the years 2001–2005. The permanent plot method was used to examine seven localities: *Carici arenariae-Empetretum nigri* (CaEn), *Elymo-Ammophiletum* (EA), *Empetro nigri-Pinetum* (EnP), *Fraxino-Alnetum* (FA), *Helichryso-Jasionetum litoralis* (HJL), *Myrico-Salicetum auritae* (MSa) and *Vaccinio uliginosi-Betuletum pubescentis* (VuBp). Five plots were established at each locality. The study material (fragments of living plants presenting disease symptoms, dead fragments still attached to the plant or recently fallen on the ground) was collected every month from May until October.

A total of 677 species of fungi belonging to 25 orders were identified in the study. They colonized 282 species of plants and 10 species of fungi. Altogether 132 species were not included on A preliminary checklist of micromycetes... (2008) and 258 species of fungi were recorded on hosts not reported for these species on the checklist. The greatest number of fungi colonized living shoots and leaves of vascular plants (445) and the smallest number occupied living trunks and branches (only two).

The majority of species represented anamorphic fungi (60,1% of all recorded fungi). Of them, the greatest number belonged to the order *Sphaeropsidales* (217). The greatest spread was observed for fungi of this order (30,4% of all records). A large spread was also recorded for fungi of the order *Moniliales* (22,2% of records). Hosts mostly belonged to the first frequency class (72,5% of plant species colonized by fungi) and the smallest number was categorized in the fifth class (occurring in mass; 2,3%). Fungi occurring sporadically on hosts were the most frequently recorded species (first frequency class; 52,4% of all records). The greatest species richness of fungi was observed in FA (336) and the smallest in EA (82). The majority of species in EA belonged to the phylum Ascomycota while anamorphic fungi prevailed at other localities. The greatest similarity of fungal communities was identified between HJL and CaEn.

Exclusive fungi were found at each locality and their number was higher at sites richer in fungal species. The smallest number of such species was recorded in EA and the highest in FA. Plants recorded at other research sites in the SNP were hosts of the majority of core fungal species. A site's abiotic and biotic factors had a considerable influence on the species richness, spread, frequency and seasonal dynamics of the occurrence of fungi. Differences were observed not only for various localities but also for plots within one locality. The microclimate affected the species structure of fungal communities and their phenology at dune localities: fungi formed resting stages (meiomorphic or telial) there earlier.

The species richness of plants at the research sites considerably influenced the species richness of fungi colonizing them. The greatest number of fungi and their hosts was recorded at forest localities and the smallest number at dune localities. Plant density had a considerable impact on the frequency of fungi. Fungi mostly colonized low-frequency plants at forest localities and at the scrub locality. Fungi were observed more frequently on higher-frequency plants at dune localities.

The abundance of fungal communities and their species composition also depended on morphological features of the host and an ability to tolerate unfavourable thermal conditions. The number of species of plants having pubescent leaves and the spread of fungi colonizing them were lower than those of glabrous-leaf plants related to them. Taller plants were colonized by fungi more often at dune localities. A defence mechanism preventing excessive evaporation from leaves by their curling caused a decreased species richness and a spread of pathogens occupying them.

High tolerance of fungi to environmental conditions was reflected in their wide spread, especially at the least favourable localities (dune sites). Fungi of the orders *Pleosporales*, *Moniliales*, *Sphaeropsidales* and *Uredinales* were the most tolerant species while representatives of the order *Peronosporales* were the least tolerant fungi. Organisms belonging to the order *Peronosporales* were mostly found at forest localities and at the scrub locality where the plant density and air humidity were high.

A biocoenotic balance may probably be observed at the forest and scrub localities due to a high species richness, a small spread of fungi and a high contribution of core species. The species richness was small at the sites in the coastal belt and the spread of fungi was low. The traits observed in *EA* suggest that the biocoenotic balance may be disturbed at the site: the species structure of fungi observed at the locality (the number of fungi occurring in meiomorphic stages prevailed over those in anamorphic stages) differed from that at other localities.