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Soil Micromycetes under Pine and Birch Forests in the Pasvik Reserve

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Soils of the studied area are represented by Al–Fe- humus podzols with the —-BHF–C profile. Soils of the Pasvik Reserve were sampled from the organic horizon under different plant microgroups in pine and birch forests in June 2013 and 2015 by conventional approaches of soil mycology.
The number of microscopic fungi in the pine forest varied from 46000 to 216000 CFU/g in the years of the investigation. In the birch forest, the number of micromycetes varied from 44000 to 70000 CFU/g and was 2.0–2.5 times smaller than that in the soil of the pine forest.
The variance analysis has shown a statistically significant effect of forest type and pH on the number of fungi number, while the correlation of the number of micromycetes with the soil water content and temperature was not revealed.
In two years, 12 species of microscopic fungi belonging to six families, five orders, three classes, and two divisions were identified in the soils under the pine forest; a group of fungi with infertile mycelium was also found. In the soils of the birch forest, 18 fungal species belonging to nine families, seven orders, five classes, and two divisions and fungi with infertile mycelium were identified. In the investigation period, the community of soil micromycetes under the birch forest included the genera Acremonium, Aspergillus, Cosmospora, Clonostachys, Mortierella, Mucor, Penicillium, Phialophora, Torula, Trichoderma, and Umbelopsis, and its diversity was greater in comparison with the soil under the pine forest, where micromycetes were represented by the genera Clonostachys, Cosmospora, Mortierella, Mucor, Penicillium, Trichoderma, and Umbelopsis.
In soils of both forest types, representatives of the genus Penicillium predominated: they comprised 42% of the total number of identified species in the pine forest and 22% in the birch forest. The abundance and occurrence of the species Penicillium spinulosum, as well as of P. glabrum and Trichoderma viride, were the greatest in soils of the pine forest under all plants. In soils of the birch forest, representatives of the order Mucorales – o Umbelopsis isabellina, Mucor sp., and Mortierella alpin – predominated; P. glabrum, Aspergillus ustus, T. viride, and T. koningii species were also abundant in the years of the study.
The similarity dendrograms of the species composition of the complexes of microscopic fungi under different plant microgroups make it possible to specify two types of communities of micromycetes: of the birch forest with the similarity coefficient higher than 50% and of the pine forest. This division was clearly pronounced in 2013; in 2015, an exception was represented by the community of micromycetes under grasses.