



Microbiome of postpyrogenic soils: insights from metagenomic study

Grigory Gladkov (1), Ekaterina Maksimova (2), Elizaveta Pershina (1,2), Ekaterina Ivanova (1), Anastasiia Kimeklis (1,2), Evgeny Andronov (1,2), and Evgeny Abakumov (2)

(1) ARRIAM, Saint-Petersburg, Pushkin, Russia, (2) Saint Petersburg State University, Saint Petersburg, Russia

Fires have a strong effect on soil microbiome, and the mechanisms of soil restoration after fires are currently not well understood. This study describes the characteristics of microbial communities in the gray-humus soils of pine forests in the city of Togliatti after forest crown and surface fires. Geochemistry, soil respiration and microbial community structure via 16S rRNA gene sequencing were studied in different soil horizons. Both crown and surface fires resulted in the decrease in microbial diversity and shifts in taxonomic composition. For samples recovering from fires, there is a tendency to an increase in the proportion of representatives from phylum Actinobacteria and Firmicutes and a decrease in Verrucomicrobia. An increase in the proportion of bacteria (Micrococaceae) associated with the degradation of substances formed after combustion also has been shown. From our work it follows that the crown fire has a smaller effect on the soil microbiome than the surface fire, the largest changes in the microbiome structure were found in the intermediate horizon. At the same time, differences in the structure of the soil microbiome between horizons are intensified after exposure to the soil of a surface fire. Work is supported by RSF grant 17-16-01030 «Dynamics of soil biota in chronoserries of post-technogenic landscapes: analysis of soil-ecological efficiency of ecosystem restoration processes»