



## **Changes of key biological and chemical properties of soils during the Podzol Formation Process on different aged coastal bars of Ladoga Lake, Russia**

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Soil development, morphology, chemical features and taxonomy structure of microbiological communities were studied on sands of recently formed Holocene terraces of the Ladoga Lake. 4 Podzol soils from the chronosequences that formed on the different-aged Lake Ladoga coastal bars in the Nizhnesvirsky Nature Reserve (Leningrad region, north-west Russian Federation), which have ages ranging from 70 to 1,590 years were studied. The study of chronosequences allows analysis of the temporal and spatial dynamics of concurrent ecogenesis, soil microbial complex succession as well as soil development. A correlation of the taxonomic structure of the prokaryotic community with typical and key soil-forming processes of the northern taiga zone was revealed. Each diagnostic (genetic) horizon determined was characterised by a specific structure in the microbial complex, which was also related to the ages of the coastal bars. The microbiome of the upper (organic) horizons was characterized mostly by copiotrophic microorganisms, dominated by Proteobacteria, Actinobacteria and Bacteroidetes. Podzolic (E) horizons were characterised by the dominance of *Mycobacterium* sp. (Actinobacteria). In deeper horizons, the percentage of copiotrophic bacterial groups decreased, and the abundance of oligotrophs, as well as archaeal lineages, increased. The lowest (gleyic, G) horizons were characterised by the presence of anaerobic, methane-producing, bacteria. The older the coastal bar, the clearer the signs of podzol formation, the greater the thickness of the E horizon, and the more obvious the dissimilarity between the microbiomes in distinct genetic horizons. This work was supported by Russian Scientific Foundation, project № 17-16-01030 “Soil biota dynamics in chronoserries of posttechnogenic landscapes: analyses of soil-ecological effectiveness of ecosystems restoration” and Scientific Park of Saint-Petersburg State University, “Biobank” research center.