The monitoring of Verkhniy Kaban lake by rbcL gene of freshwater organisms using next-generation sequencing

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Abstract

© 2018 BRNSS Publication Hub. All rights reserved. Aim: The lake Verkhniy Kaban, along with the lakes Sredny Kaban and Nizhny Kaban, makes the part of the Kaban lake system. The lakes are located in the center of the large industrial city and experience anthropogenic load. According to the estimates of the Lake Kaban ecologists, they are related to polluted lakes. Materials and Methods: The sequencing of rbcL gene fragment sequences of the freshwater lake Verkhniy Kaban hydrobionts during autumn (2016) and summer (2017) sampling periods in FASTQ format is included in the international database on NCBI site with the following unique numbers: SRR7470846, SRR7459785, and SRR7463965. Results: The results of the analysis are given, and the water quality evaluation of the Verkhniy Kaban Lake (Kazan, Russia) is presented in the work on the basis of the rbcL gene of freshwater organisms by the method of new generation sequencing. The comparative analysis of metagenomic data shows that the majority of organisms of the Verkhniy Kaban Lake are grouped according to rbcL gene near b-mesosaprobic zone. The Verkhniy Kaban Lake can be characterized as contaminated with the water quality transitional to b-mesosaprobic one. Conclusions: The use of modern methods of molecular biology for the purpose of bioindication gives positive results and increases the effectiveness and reliability of water body ecological state evaluation. The obtained results are of great practical interest in the field of water body monitoring, in particular, and the environment as a whole.

Keywords

Bioindication, RbcL gene, Saprobity, The sequencing of new generation

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