

PHENOLS AND PHENOL-OXIDIZING BACTERIA IN NATURAL WATERS

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Structure of the microbial community in natural waters depends upon a number of factors among which nutrient status, productivity of phytoplankton, sources and levels of dissolved organic carbon as well as levels of pollutants load are important. The eco-physiology of phenol-oxidizing bacteria (POB) has been discussed. POB and phenols content in water of three different lakes of North-West Russia were studied in 1999-2002. Lake Ladoga is one of the biggest lakes of Europe. It is the only source of drinking water for the population of more than six million people. Lake Krasnoe is a small typical lake of Karelia. Lake Razliv is a flood of the Sister River and a component of loading on the Gulf of Finland. POB were constantly presented in lake water and formed the definite background with biodegradation potential. Lake Ladoga surface water samples from 6 stations in 2001, 2002 showed phenols content did not exceed $2 \mu\text{g l}^{-1}$ and abundance of POB up to 16 cells ml^{-1} . Phenols concentrations as well as abundance of POB were susceptible to seasonal changes. Abundance of POB in the period of phytoplankton destruction (August, 1999, 2001, 2002) in Lake Krasnoe was up to 35 cells ml^{-1} and phenols content was up to $3 \mu\text{g l}^{-1}$. The highest numbers of POB (64 cells ml^{-1}) and the greatest phenols concentrations (more $5 \mu\text{g l}^{-1}$) were observed in Lake Razliv. This lake is anthropogenic stressed by city St. Petersburg. In order to interpret the field results experiment was carried out. Its results demonstrated that number of POB as well as their activity limited by phenols content in water environment. Those parameters could be used as an indicator of the areas with increased phenols content.