

Evaluation of the ecological state of water reservoirs using the COI protein of zooplankton

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Abstract

Water reservoirs located in industrial areas are commonly under strong anthropogenic pressure and an efficient monitoring of their ecological state is desired. Bioindication using the zooplanktonic organisms is one of the most relevant approaches widely used for evaluation of the ecological state of waters. World widely, the water-living species are identified visually and results depend on expert's opinion and subjectivity. In this study an alternative method for organism identification using the marker protein cytochrome oxidase subunit 1 (COI) is proposed. Multiple alignments by Clustal Omega algorithm of 95 amino acid sequences of available COI proteins from zooplanktonic organisms included in the V.Sladechek's list (1973) was performed. A short unique (4-33) amino acid sequences were identified in 23 proteins of organisms normally used as bioindicators of water saprobity, a common indicator of ecological state of water body. This fact allows further developing the antibodies for direct qualification and quantification of the indicator species in the probe. We suggest that this approach represents a new technique for the ecological evaluation of ecological state of waters by using the metaproteom of water living organisms.

Keywords

COI protein, Indicator species, Saprobity, Water reservoir, Zooplankton