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Distribution and activity of benthic bacteria in four lakes in the Bory Tucholskie National Park (Poland)

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ABSTRACT: Benthic bacteria play a major role in the decomposition and transformation of organic matter in water bodies. The imbalance between organic matter input and decomposition leads to its accumulation in the benthos and thus to the conversion of aquatic into terrestrial systems. This is a global problem, exacerbated by anthropic activities. The factors that determine the metabolic activity of bacteriobenthos have been extensively discussed. The complexity and importance of this information inspired us to study the occurrence and activity of benthic bacterial populations in different environmental conditions. We investigated 4 lakes of different trophic status (eutrophic, mesotrophic, oligotrophic and dystrophic) in the Bory Tucholskie National Park, Poland. The results indicated that the abundance of benthic bacteria was not determined by the trophic status of these water bodies; the lowest number was recorded in the eutrophic lake, and was considerably higher in meso- and oligotrophic lakes. Organic carbon oxidation was most intense in the eutrophic lake, despite containing the lowest number of benthic bacteria. Our results show no significant correlation between the total number of benthic bacteria and their respiratory activity, expressed as the rate of organic carbon oxidation. Taxonomic analysis demonstrated that species of the *Firmicutes* and *Proteobacteria* phyla were predominant among benthic strains. In conclusion, our research shows that the abundance and activity of benthic bacterial communities are lake-specific and can be determined by many environmental factors.

KEY WORDS: Benthic bacteria · Taxonomic diversity · Respiratory activity · Lakes

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