# Growth and respiration of aquatic bacteria on organic carbon from different terrestrial sources

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ABSTRACT

Streams and lakes are recipients for terrestrial drainage of organic carbon. This allochthonous organic carbon is metabolized, mainly by bacteria, with significant consequences for the biostructure and energy pathways of freshwater ecosystems. The degree to which these substrates support heterotrophic bacteria and their role as energy mobilizers is largely determined by bacterial growth efficiency (BGE), i.e., bacterial production per unit of assimilated carbon. We tested the hypothesis that catchment characteristics influence BGE by regulating the organic carbon quality and the availability of inorganic nutrients. Ten boreal headwater streams were examined (68°N 18°E), representing a gradient ranging from organic carbon supplied mainly from mires to carbon supplied mainly from forests. The forest coverage (%) of the catchment showed a positive correlation with BGE and BGE was positively correlated with the absorbance ratio A254/365 and negatively with C:P and C:N ratios. The data suggest that there was a pool of rapidly utilized carbon which was drained mainly from forest soils and which was incorporated into bacterial biomass with great efficiency. Its exploitation was probably nutrient limited as indicated by nutrient enrichment experiments.