Geophysical Research Abstracts
Vol. 17, EGU2015-6767, 2015
EGU General Assembly 2015

Methanogenic archaea diversity in hyporheic sediments of a small lowland stream

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Abundance and diversity of methanogenic archaea were studied at five localities along a longitudinal profile of a Sitka stream (Czech Republic). Samples of hyporheic sediments were collected from two sediment depths (0-25 cm and 25-50 cm) by freeze-core method. Methanogen community was analyzed by fluorescence in situ hybridization (FISH), denaturing gradient gel electrophoresis (DGGE) and sequencing method. The proportion of methanogens to the DAPI-stained cells varied among all localities and depths with an average value 2.08 $\times$ 105 per g of dry sediment. A total of 73 bands were detected at 19 different positions on the DGGE gel and the highest methanogen diversity was found at the downstream located sites. Cluster analysis of DGGE image showed three main clusters consisting of localities that differed in the number and similarity of the DGGE bands. Sequencing analysis of representative DGGE bands revealed phylotypes affiliated with members belonging to the orders Methanosarcinales, Methanomicrobiales and Methanocellales.

The authors are thankful to the European Social Fund and state budget of the Czech Republic for providing the financial support during this study. This work is a part of the POSTUP II project CZ.1.07/2.3.00/30.0041, which is mutually financed by the previously stated funding agencies.