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METHANE AS CARBON SOURCE FOR FRESHWATER FOOD WEBS – A POSSIBLE LINK BETWEEN THE METHANE CYCLE AND THE 13C SIGNATURE OF CHIRONOMID LARVAE

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Stable carbon isotope analysis of chironomid larvae revealed a depletion in 13C compared to signatures of sediment and particulate organic matter. Following the hypothesis that this depletion is due to an incorporation of carbon derived from biogenic methane, we investigated the methane cycle and chironomid larvae in two lakes with different morphology. First results indicate a coupling of the larval signature to the rates of methane turnover, with more 13C depleted larvae occuring in the lake with higher methane turnover rates and higher cell numbers of methanotrophs. Molecular analysis of the microbial community in the sediment revealed minor differences for the methanogenic populations, and no difference for methanotrophs. In both lakes, a clear dominance of Methylococcaceae was found. The analysis of larval tissue showed a concentration of microorganisms only in the gut lumen of the larvae, where intact bacterial cells with bright fluorescence signals were detected by FISH. Furthermore, archaeal and eubacterial 16S rDNA clone libraries were set up from larval tissue and gut content to get a more detailed picture of the microbial flora.