

Methane production by zooplankton

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For the oceanic methane budget semi-enclosed basins like the Baltic Sea play an important role due to high methane production rates in the sediments and fast ventilation of the relatively shallow water column. In the central Baltic Sea, the methane distribution is characterized by strong seasonal and spatial gradients [1].

We measured the methane concentrations throughout the water column along a transect in 2016. We also measured methane production rates by zooplankton in August 2016.

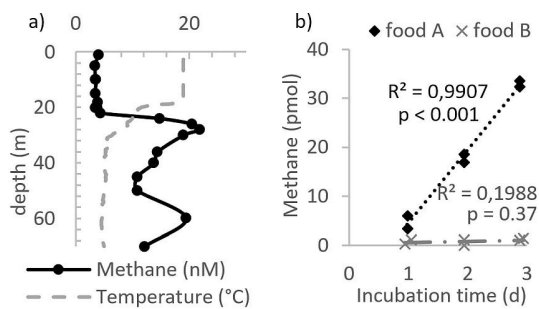


Figure 1: a) Depth profile of methane and temperature, b) Methane concentration in zooplankton incubations.

We found a subthermocline methane enrichment at different stations (Fig.1a). We also found that zooplankton contribute to the production of methane in these oxygenated waters [2]. This production may depend on the available food type (Fig. 1b). Our methane production rates are lower than those measured for larger zooplankton in the North Atlantic [3]. However, we show that the available food type, as a substrate for methanogenic Archaea associated with zooplankton, has a significant impact on the methane production rates. We suggest, that methane production by zooplankton may be a global phenomenon, which is likely to be affected by climate change through changes in physiological rates, and shifts in food web structure [4].

[1] Jakobs et al. (2014) *Cont. Shelf Res.*, **91**, 12–25. [2] Schmale et al. (under review) *Limnol. Ocean.* [3] De Angelis & Lee (1994), *Limnol. Ocean.*, **39**, 6, 1298–1308. [4] O'Connor et al. (2009), *PLoS Biol.*, **7**, 8, 3–8.