



# Nematode communities from a natural oil seep off Svalbard

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Cold seeps are considered hotspots of energy on the seafloor, establishing unique conditions for life to thrive. In chemosynthetic-based habitats such as these, sediments from active sites are typically inhabited by endemic nematode communities which tolerate the local reduced environmental conditions, but no studies have been carried out on seep sites so far north in the Arctic. Under the scope of the AKMA project, an oil seep site located offshore Svalbard was sampled for the first time to investigate the associated meiofauna assemblages with methane and crude oil seepage. Replicated samples were collected by means of the blade and push cores handled by the ROV Ægir6000, both on bacterial mats with evident gas and oil seepage, as well as in sediments nearby without evident seepage activity, as reference. Sediments collected were used to characterize the community structure and diversity of the meiofauna taxa, particularly the nematode assemblages, as well as key environmental parameters (i.e, sediment and pore-water geochemistry, organic content, grain size). Preliminary observations showed no major differences in total meiofauna density between microhabitats, with a predominance of nematodes (>90%), followed by harpacticoid copepods and nauplii larvae, typically seen in other deep-sea environments. However, an in-depth investigation into the nematode assemblages revealed that bacterial mats hosted an extremely low diversity of nematode species, by comparison, to the reference locations. Bacterial mat-associated assemblages were predominantly composed of a single species, *Dichromadora* sp.1, followed by *Halomonhystera* cf. *disjuncta* and Linhomoidae sp. 1. Evidence of morphological and reproductive adaptations in the species present seems to allow them to survive in this toxic environment, namely due to high concentrations of hydrogen sulfide and oil presence. The findings resulting from this study contribute to a large gap in the understanding of how infauna thrive in extreme environments with the presence of hydrocarbons in the Arctic.

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