ID: 6008

Effects of oil water-soluble fractions (WSFs) on marine and freshwater nematode assemblages: a microcosm approach

Luana C. Monteiro[1,*], Walter Traunspurger[2] and Tom Moens[1]

[1] Ghent University, Department of Biology, Marine Biology Research Unit, Krijgslaan 281/S8, 9000 Ghent, Belgium

[2] University Bielefeld, Department of Animal Ecology, Konsequenz 45, 33615 Bielefeld, Germany

[*]luana.dacostamonteiro@ugent.be

The water-soluble fractions (WSFs) of oils contain highly toxic compounds, despite their low persistence in aquatic environments. Their effects may be instantaneous or delayed, provoking immediate mortality or sublethal effects, for instance on growth and reproduction. We investigated the effects of crude oil WSFs on both marine and freshwater (FW) meiobenthos, with focus on nematode assemblages, in microcosm experiments lasting up to 15 weeks. Both experiments were performed simultaneously. Nematoda was the most abundant group, comprising ca. 90% of the meiofauna in both marine and freshwater sediments. Oligochaeta (both marine and freshwater), Copepoda (marine), Amphipoda (marine), and Tardigrada (freshwater) almost disappeared from oil WSF treatments. Significant impacts on total nematode abundance, diversity and species composition only became apparent after 15 weeks, indicating that delayed effects are far more pronounced than instantaneous effects. In the short-term, significant oil WSF effects occurred in marine but not in freshwater microcosms: After one week, oil WSFs reduced the number of deposit- and epistrate feeders. In freshwater microcosms, significant effects on nematode feeding types were only detected by differences in the index of trophic diversity, but not by the multivariate comparison of feeding-type composition. Overall, sensitivity was species-specific in both marine and freshwater microcosms, with sometimes opposing responses between even congeneric species. Our results showed that oil WSFs can yield strong effects on both marine and freshwater meiobenthos, and demonstrate the need to assess WSF effects on communities at the species level and over time periods well exceeding the residence time of WSF compounds in the environment.

Keywords: Oil pollution, Nematoda, benthic communities, direct toxicity, experiments, microcosms

ID: 6017

Meiofauna research to understand the future impact of deep-sea mining in the Clarion-Clipperton Zone

Ann Vanreusel[1,*], Freija Hauquier[1], Lara Macheriotou[1], Tania N Bezerra[1], Ellen Pape[1] and Lisa Mevenkamp[1]

[1]Marine Biology Research Group, Ghent University (UGent), Gent, Belgium

[*]ann.vanreusel@ugent.be

Polymetallic nodule mining in the abyss is a nascent industry hoping to meet the growing worldwide demand for metallic minerals. Given that prospective mining is likely to have a profound impact on deep seafloor communities, knowledge on their ecology is pivotal in order to provide sound guidelines for environmentally

sustainable mining practices. We therefore studied different aspects of benthic meiofaunal communities as one of the most abundant taxa in abyssal environments such as the Clarion-Clipperton Zone (CCZ) of the east Pacific Ocean. Through a combination of field sampling and in situ experimental approaches both the natural variability in biodiversity and community composition as well as the response to mining related disturbance and its recovery afterwards was investigated. It was shown that despite their success in the abyss in terms of abundances and species richness meiobenthic taxa will be impacted by mining with potentially slow recovery. Through this multimethod approach on meiofauna we aim to illustrate the potential of free-living nematodes as a model taxon to understand drivers and processes of disturbance and recovery in such an extreme oligotrophic environment.

Keywords: Abyssal, nematodes, impact, biodiversity, distribution

ID: 6019

Biomonitoring of freshwater sediments – A comparative assessment using meiobenthic communities and species-based indices

Arne Haegerbaeumer[1,*], Régis Vivien[2], Benoît J.D. Ferrari[2] and Walter Traunspurger[1]

[1] Bielefeld University, Bielefeld, Germany
[2] Centre Ecotox Eawag-EPFL, Lausanne, Switzerland
[*]a.haegerbaeumer@uni-bielefeld.de

Nowadays, environmental pollution of surface waters is regarded as one of the most prominent issues, resulting in an emergence of holistic environmental management measures. Soft sediments are known as hotspots of contamination, being of major environmental concern and considerably contributing to the chemical and ecological status of aquatic ecosystems. For this purpose, a thorough eco(toxico)logical assessment of soft sediments can aid in identifying the causes of environmental stress and the implementation of measures to improve the health of this ecosystems. Among the various assessment elements, biological indicators are considered as fundamental due to their overall ecological thoroughness and by providing a holistic measure over time. Regarding suitable bioindicators to assess soft sediment quality, meiobenthic organisms are of particular concern since they are representing very abundant and species-rich components of these habitats. However, they remain under-explored and are not extensively used in routine biomonitoring programs. To contribute to further processes in sediment assessments, surface sediments of Lake Geneva were collected along a contamination gradient and comparatively analysed in this study in terms of chemical and biological parameters. Specifically, structural and functional endpoints of meiobenthic communities were assessed. Additionally, the nematode-based NemaSPEAR[%]-index, and the IOBL, based on oligochaete community analysis, were calculated. Preliminary results revealed distinct responses of meiobenthic organisms to chemical stress, with marked variations in the susceptibility among the various endpoints. Furthermore, the relative distribution of sensitive/tolerant nematode and oligochaete species could also be related to the contamination conditions. Overall, this study provides results allowing for a better sediment assessment of sediment quality and confirmed the importance of looking at the level of meiobenthic communities.

Keywords: Bioindication, meiofauna, nematodes, oligochaetes, contamination, benthos