O18 An observation on the relationship between meiofauna biodiversity and ecosystem functioning at different spatial scales

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Earth is experiencing a pervasive and uncontrolled loss of species, which has raised concerns about the deterioration of ecosystem functions and services. Studying the diversity−ecosystem function relationship (BEF) in the deep sea is of primary importance in the face of biodiversity loss and for our understanding of how the deep sea functions. Up to now, contrasting results (i.e. exponential, negative or null) concerning the relationships between nematodes biodiversity and ecosystem functioning and efficiency have been reported from different deep-sea environments, and considering large spatial scales (e.g. Oceans; Basins) of investigations. It has been hypothesized that the spatial scales at which ecosystem function and diversity are measured are likely to influence the BEF relationship observed, and that their nature is related to the system analysed and the organisms involved. Here, we investigate the relationship between nematodes structural (i.e., H′; $\log_e$; $ES_{(51)}$; J′) and functional (i.e., MI; TD; body shape) diversity and independent measures of ecosystem functioning (bacterial biomass; nematode predators biomass) and efficiency (meiofaunal biomass to biopolymeric carbon ratio; meiofaunal biomass to bacterial biomass ratio) on two open slope systems in the western Mediterranean sea. BEF relationships were investigated considering a local- (100s meters; i.e., each slope system kept separate during the statistical analysis) and a meso- (100s kilometres; i.e., both slope systems taken together) spatial scale of investigation. At a local spatial scale there was no relationship between species/functional diversity and ecosystem function and efficiency after accounting for the effects of environmental variables. At a meso- spatial scale species and functional diversity were significantly and negatively correlated with ecosystem functioning and covariates explained almost half of the variation. These results would suggest a relation of competition between the organisms or even a functional redundancy rather than functional complementary, that usually governs positive BEF relations. Future studies from other regions/systems need to be taken into account, and based on different taxa to provide further insights into the diversity−ecosystem function.

O19 Meiofaunal colonization processes on organic and inorganic substrata at the Lucky Strike vent field on the Mid-Atlantic Ridge

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Despite the fragmented nature of hydrothermal vent fields, nascent vent sites are rapidly colonized by a pool of regional species. While succession of large hydrothermal fauna is relatively well established, we lack information on the associated meiofauna, in particular, on nematodes and copepods. The aim of the present study is to investigate the colonization process of organic and inorganic substrata by meiofaunal assemblages deployed at the Eiffel Tower hydrothermal edifice on the Lucky Strike vent field (MAR), at varying distances from visible hydrothermal activity. Abundance, biomass and diversity of colonizing meiofaunal organisms were compared with the results from a previous two-year pilot experiment (Cuvelier et al. 2014). In total, 46 copepod species were found in our substratum experiment, representing a four-fold increase in copepod diversity in the LS vent field. Overall, the substrata harboured a very heterogeneous community including not only vent-specific species but also uncommon copepod taxa that have not been described from vent sites. The community composition on the substrata changed gradually from active to inactive microhabitats along the gradient of temperature and fluid input, with an increasing heterogeneity and the appearance of rare and exclusive species with decreasing fluid input. While showing the lowest densities, slates exhibited the highest copepod diversity across the activity gradient. High densities of juveniles and larval forms confirmed that copepod communities can be well established in a variety of microhabitats and are capable of spending their whole life cycle under extreme conditions. For the nematodes, inorganic substrata were preferred near the vents, while organic substrata were rapidly colonized in areas not influenced by vent activity. Nematode females were dominant at almost all sites while numerous females at the ovigerous stage and juveniles were reported near the vent emissions, suggesting that nematode populations were reproducing well after nine months. Our data further suggest that inorganic substrata were preferred in the early succession stages, while organic ones required a longer term in order to be densely colonized. The type of substratum significantly influenced the composition of colonizing nematodes after nine months, while after two years the structure of nematode communities was influenced rather by hydrothermal activity.

Benthic foraminifera encrusting dropstones in the Porcupine Abyssal Plain, NE Atlantic: notes on their diversity and faunal cover

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Benthic foraminifera are a major component of modern deep-sea soft-bottom communities. However, many foraminiferal species live attached, either permanently or temporarily, to hard substrates such as ice-rafted dropstones, which are a common feature of the seafloor at higher latitudes globally. Here, we examined encrusting organisms on 127 dropstones taken from the top of a small abyssal hill (∼550 m high) located within the Porcupine Abyssal Plain–Sustained Observatory area (PAP-SO,