MANUELA - Patterns in meiobenthic community structure on a European scale

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During the previous year, focus within MANUELA was put on (1) continuing the development of the NeMys database and identification key; (2) the collection of datasets and the integration of these datasets in a central MANUELA database; the analysis of the data collected in the database.
During the period February 2006-February 2007, 620 taxa were added to the nematode dataset within NeMys. 353 literature sources were added, 290 were linked to a PDF. The total number of literature sources for nematodes is now 3396. About 90 new users were registered, which brings the number of users of the nematode dataset to 232. The nematode identification key was refined and new keys to species were added.
The final version of MANUELA central database was released in March 2007 and consists of 94 component datasets. In total 140431 distribution record on 1864 unique meiobenthic taxa are captured in the database. Based on this database, the ERMS for marine nematodes was updated with 333 valid nematode species (increase of 16%) and 35 datasets (38132 distribution records) were transferred to EurOBIS.
Analyses of the MANUELA database initially focuses on 6 topics: (1) Large Scale Patterns in European Meiobenthos; (2) Species Assembly Rules; (3) Universal response to disturbance; (4) Patterns in deep-sea meiobenthos; (5) Size and shape of nematodes (6) Patterns in harpacticoid copepod communities. Results are still preliminary but promising. Meiobenthic communities at the large scale are mainly structured by sedimentological and depth-related variables. There is a clear distinction between estuarine and marine nematode populations. In the deep sea, differences in communities were not related to latitude but to bathymetric depth. Communities living deeper then 2000 m were clearly different from shallower communities, each depth zone was characterised by typical genera. In addition, eutrophic and oligotrophic areas showed different nematode communities. The relationship bathymetric depth and nematode individual biomass was further explored by investigating patterns in Length, Width and Length/Width ratios of nematodes. Biomass, Length and Width were indeed higher at the shelf seas compared with deeper communities, however these patterns cannot be explained by depth/food alone. Local varying environmental characteristics such as mineralization rates, hydrodynamic stress and physical human disturbance are very important to explain the morphometric characteristics of nematode communities.
Although nematode communities are structured by environmental variables rather then by location, we observed a convergence of geographically distinct nematode assemblages subjected to disturbance, suggesting that a universal meiobenthic response to disturbance exists.
A preliminary analyses on the copepod data revealed that copepod communities were different between different areas as well.
The community composition of nematodes was modelled using artificial neural networks. The model is based on a subset of the database, containing all datasets from the Belgian Continental Shelf. At the moment, diversity can be predicted at a raster grid of 1 km² (depending on the maps of environmental variables), further modelling will focus on the composition of the nematode communities.
Final results will be presented at the MarBEF MANUELA session that will be organised on the forthcoming 13th International Meiofauna Conference in Recife (Brazil).