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During the 5th week of our cruise, the ANDEEP project was in the focus of our efforts. Last Sunday, we arrived at the southernmost point of our cruise near Kapp Norvegia. Here, the ANDEEP transect began on which samples were taken across the continental slope from 1000 to 4000 m depths. In between we reached the central Weddell Sea with a water depth of 4900 m. The shelf organisms of the Kapp Norvegia region are fairly well known if compared to the deeper sites, therefore the biologists want to analyse, whether and how the composition of the bottom dwelling fauna, the benthos, changes downslope towards the deep sea and to which depth the shelf fauna occurs.

The evaluation of the samples from 1000-m station clearly demonstrated that at this depth a typical shelf fauna was sampled. In order to understand the life at the ocean floor as well as possible, the deep-sea biologists employ a set of different gears in a standardised way. The CTD supplies data on water temperature, salinity, density and nutrient content, the camera system provides pictures of the surface and upper layers of the ocean floor, on which both the animals and the traces they leave can be studied, as well as grain size, quality of the sediment, and the sediment oxygen content, which indicates down to which depth in the sediment one can expect larger organisms.

A set of different gears consisting of multiple corer, giant box corer, epibenthic sledge and Agassiz trawl is used to sample organisms of all different size classes from the smallest interstitial forms to large animals, like sponges, anemones, sea urchins, starfishes, sea cucumbers and fishes. One of the working groups investigates peracarid crustaceans (for example marine isopods and amphipods), who are brooders, as the females carry a brood pouch on their ventral side, in which the juveniles are kept until they are mature enough to take care of themselves. This group of animals (which are 0.25 mm to several cm in length) is called macrofauna.

An epibenthic sledge is used in order to sample a high number of individuals of these organisms for systematics, evolutionary biology, zoogeography, biodiversity research and genomics. This sledge possesses a ground plate and two box openings to which plankton nets with cod ends of 0.3 mm mesh size are attached 27 cm and 1 m above the seafloor. Because the sledge opens mechanically upon bottom contact, one can be sure that only benthic organisms are sampled. While the corers are employed vertically over the side and provide a quarter of a square meter of ocean bottom, the trawled gear like the epibenthic sledge and the Agassiz trawl are towed at the back of the vessel via the A-frame. For these deployments 1.5 times the cable length to the water depth has to be lowered, meaning for a sample in more than 4900 m depth one has to lower and hoist 7500 m of cable.

Isopods, relatives of pill bugs, in the deep sea, can have very bizarre shapes. The Mesosignidae, star-shaped isopods, are particularly impressing, but comparatively rare. However, we were lucky and found already some specimens of this family. Deep-sea biology is still fascinating because so very little is known about the life at great depths.

Molecular biologists intend to answer questions as: How big are genetic differences between individuals from different depths or regions? Are these differences comparable with those from coastal waters? Do morphologically similar animals differ genetically, meaning are there cryptic species in the deep sea which can not be identified using morphological methods? For this purpose molecular biologists study the genetic diversity of the deep-sea organisms by taking tissue samples from the animals on board from which DNA samples are extracted which will be analysed after the return in the home labs. The results might help to better understand the deep-sea habitat and its inhabitants.

With the best wishes from all on board
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