FS SONNE

Expedition SO307: MADAGASCAR, MADAGASCAR-BIO & INDICOM

12.09. – 28.10.2024, Durban – Durban

6. Weekly Report (14.10. – 20.10.2024)

In the middle of this week, a passing storm front threw our work plan into disarray. Despite all efforts, we were unable to carry out any work in the area of Walter's Shoal, the highest peak of the Madagascar Ridge, which rises to a water depth of around 18 meters. After two days (during which we were only able to map to a limited extent due to the weather), we were able to resume station work on the morning of October 17. However, in the meantime we arrived in the northern part of the working area, where a larger number of seamounts and the prospect of sampling the steep western flank of the Madagascar Ridge made up for the lack of opportunity at Walter's Shoal.

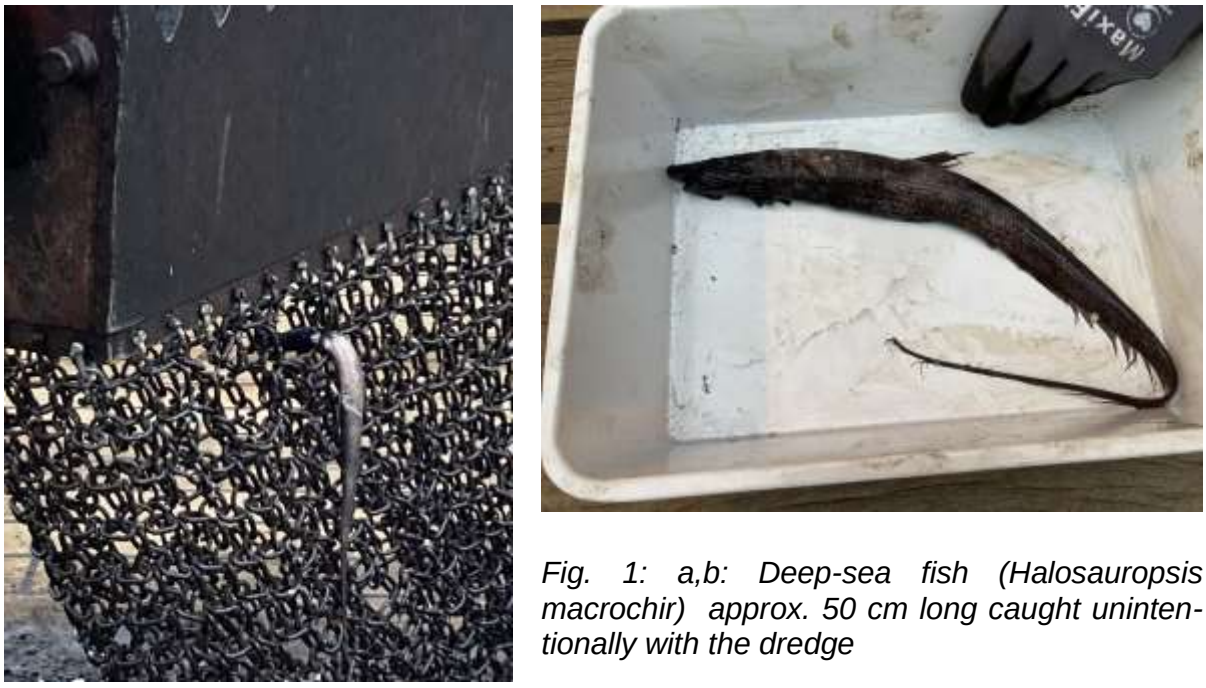

Fig. 1: a,b: Deep-sea fish (Halosauropsis macrochir) approx. 50 cm long caught unintentionally with the dredge

Shortly before the arrival of the bad weather, there was a surprise for our biologists, who had not been spoiled by a large yield of macrofauna on this expedition so far. Although dredge haul DR123 did not yield any rock samples, a dead deep-sea fish was stuck in the mesh of the chain bag when the device was brought on deck (Fig. 1a, b). This so-called lizard eel (*Halosauropsis macrochir*) is a deep-sea fish that mainly lives between 1,100 and 3,000 m (exactly in the depth range of this dredge track at 2,050 m). It was first described by the German zoologist Albert Günther in 1878. As curator at the Natural History Museum in London, he discovered this species in the material brought back by the British Challenger Expedition (1872-1876).

This week, the biological oceanographers began their last experiment of this cruise. Parts of the ocean water collected with the rosette sampler from a depth of 2000 m (see

3rd Weekly Report) were further examined on board in elaborate experiments to better understand the microbial turnover of organic carbon in the deep sea. Microorganisms that live in the deep sea are dependent on organic substances that are produced in the upper 100 m of the water column and then transported to the depths. Marine gels, consisting of carbohydrate-rich, transparent exopolymer particles and proteinaceous particles, can contribute significantly to this downward particle flux. In order to investigate how the microbes degrade these particles, the experiments are conducted under the same conditions as in the deep sea (2.5°C and absolute darkness). In one setup, only the naturally occurring gel particles are available and in a comparison group artificially produced gel particles are added. For this purpose, the SONNE has specially cooled laboratories in which the scientists have to work in insulating clothing (like a ski suit) at 2.5°C and 6.5° (Fig. 2a). The latter temperature simulates a possible future rise in deep water temperature as a result of climate change.

In these experiments, low-level radioactive substances are also used as “food” for the bacteria, whose activity can then be quantified by measuring the radiation emitted. All work with radioactive substances may only be carried out by specially trained personnel in a separate isotope container located outside on deck (Fig. 2b).

2a) (top): One of the climate laboratories (cooled to 2.5°C). The red light of the fairy light chain is not perceived by the microbes. Fig. 2b (left): Entrance to the isotope container for working with radioactive substances.

Towards the end of this week, we arrived back at the steep western edge of the Madagascar Ridge, about 50 nautical miles (almost 100 km) south of where we started our sampling of the ridge five and a half weeks ago.

Everyone on board is well and sends their regards to those back home,

Jörg Geldmacher
(GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel

Blogbeiträge zu dieser Expedition finden sich unter: https://www.oceanblogs.org/so307/