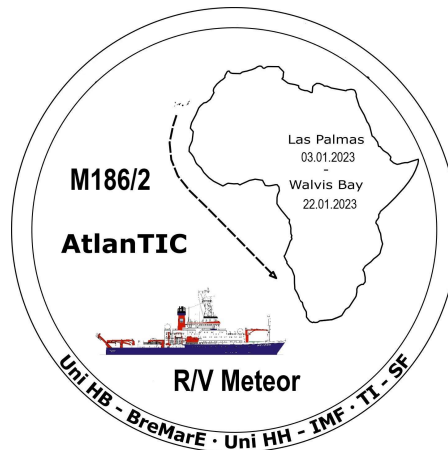


Second Weekly Report of the Research Cruise M186/2 with R/V METEOR for the period of 9th to 15th January 2023



The second week at sea started on Monday, 9th of January 2023, for the first time with a higher swell of more than three metres; nothing dramatic that would limit our research activities. However, the swell reminded everybody that we are indeed in the open Atlantic Ocean.

In the meantime, we left the region of the Cabe Verde Islands with large amounts of drifting seaweed and many flying fishes behind us. Our work programme with one sampling station per day in the morning from 06:00 a.m. to 09:00 a.m. continues regularly. In order to fulfil contradictory requirements for nighttime darkness during the deployment of the Isaacs-Kidd Midwater Trawl (IKMT) and daylight for the CTD casts at all stations, we already had to shift the ship's clocks one hour ahead. Thus, we currently have German time here on board. On Thursday, 12th of January 2023, in the evening, we crossed the equator. Now here on the southern hemisphere, days are longer in the summer. In addition, on our south-easterly course, sunrise is slightly earlier each day. Therefore, we will have to advance the ship's clock once again in the coming night. Then we are in the same time zone as our port of arrival Walvis Bay in Namibia. The whale and seabird observation team occasionally sights groups of dolphins, usually far away from the ship. Yesterday evening, however, a group of spotted dolphins accompanied us for a while and enthralled everybody on board with their high and wide jumps.



Fig.: Jumping spotted dolphins shortly before sunset on 14th of January 2023. (Foto: Jan Zimmermann).

We would like to use this weekly report to present the research of the colleagues from the Institute of Marine Ecosystem and Fisheries Sciences of the University of Hamburg in more detail. They are interested in the distribution, biodiversity and productivity of phyto- and microplankton.

Phytoplankton mostly consists of small unicellular algae that are primary producers and form the base of the marine food web. Microzooplankton includes unicellular and tiny multicellular organisms that act as the first consumers in the food chain. A variety of equipment is used to collect the samples. A Multinet is deployed to collect larger phytoplankton and microzooplankton. The Multinet consists of five nets with 55 μm mesh size that can be opened or closed at different water depths. For our investigation, it is used down to 100 m water depth and allows a high vertical resolution of the water column for later biodiversity analyses in the home laboratory.

Furthermore, two smaller Apstein nets with 20 μm mesh size are used at each station. This gear is deployed by hand down to 10 m water depth. The samples from the first net are frozen at -80°C and will later be used to determine ratios of stable carbon and nitrogen isotopes. The second net is used for analyses of species composition.

A CTD / rosette water sampler is used to measure abiotic parameters and to collect water samples from several discrete depths in the upper 100 m for taxonomic analyses, determination of chlorophyll content, primary production measurements, and the determination of photosynthetic fitness of phytoplankton. Primary production measurements are conducted in a rotating incubator with water from the chlorophyll maximum in bottles with defined light transmittance over six hours (see Fig. 2). Parallel, respiration is measured in two dark bottles. Applying the experimental results and the light measurements from the CTD, a primary production profile can be calculated for the water column. Photosynthetic fitness is measured with a Fast Repetition Rate Fluorometer (see Fig. 2) by exciting the photosystems of the algae with different light pulses.

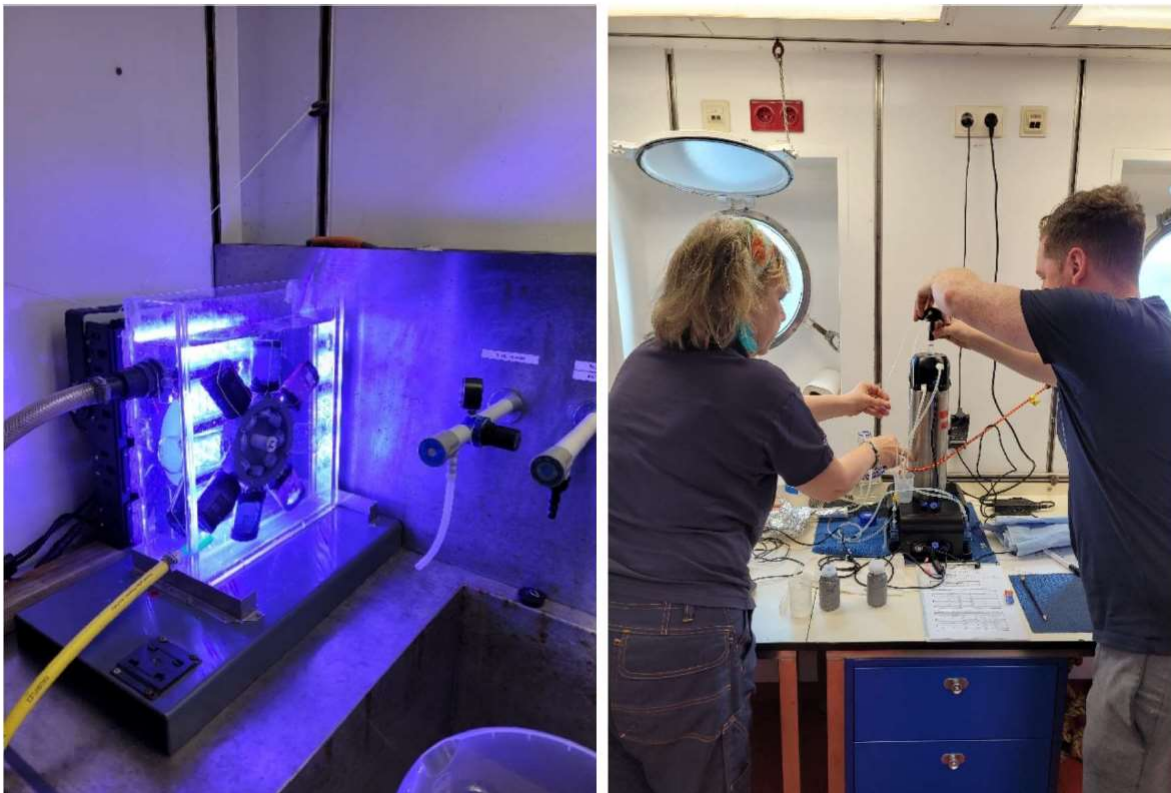


Fig. 2: An incubation to determine primary production (left). Phytoplankton samples rotate in bottles with different light transmittance in front of a light source in a water bath with controlled temperature. Scientists from the University of Hamburg working with the Fast Repetition Rate Fluorometer (right; Photos: Rolf Koppelman).

Today on Sunday, for the first time, we will shift station work into the afternoon and forgo the IKMT deployment. We will use the saved time for deeper casts with the CTD/rosette water sampler and zooplankton MultiNet down to 1500 m maximum sampling depth instead of our standard sampling depth of 600 m at the previous stations. We are all curious what organisms we will catch from greater depths.

On behalf of all cruise participants, we send best regards from R/V Meteor.

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