

### 3rd weekly report (06.02.17 – 12.02.17

SO-254 „PoriBacNewZ“ 26.01.2017 (Auckland, Neuseeland) – 27.02.2017 (Auckland, Neuseeland)

Meanwhile more than half of our cruise passed by and we are approaching a station at 50°S, 179° E at increasing wind intensity of around Beaufort scale 6-7. After a focus of the investigations on the benthic sponge communities by ROV also in the second week and in total ten successful dives the focus shifted to work in the water column. This is mainly due to the markedly rougher weather conditions since we passed 40°S latitude into the roaring fourties. Two ROV stations had to be cancelled because of waves higher than 2.5 m and one needed to be stopped after a few hours. This wave height is the limit for ROV operations. Weather conditions are such that it is highly improbable that we can operate the ROV further south. Presumably we can use it again only after return from the southern study area with a continuous fairly high swell and currently wind at Beaufort 6-8 to calmer regions further north and better weather conditions.

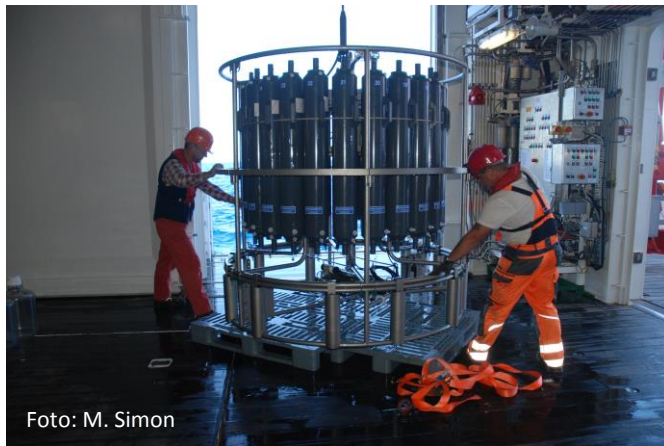


Foto: M. Simon

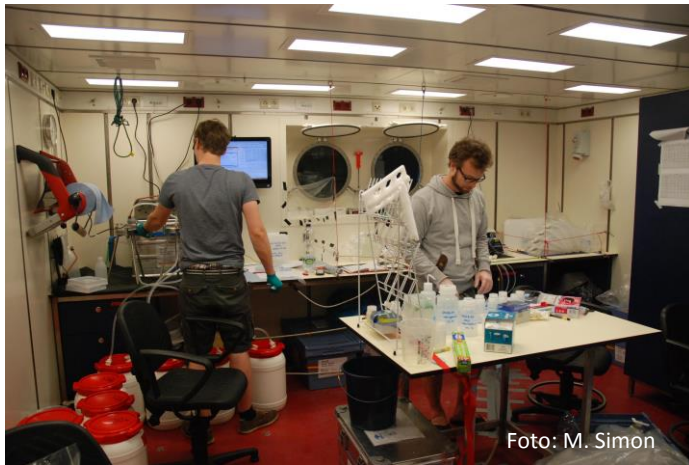


Foto: M. Simon

Work in the water column and surface sediment on the bacterial communities, the geomicrobiome and rare earth elements progressed well. The first mesocosm experiment was terminated. So far all five planned stations could be sampled. For collecting samples once again the new CTD acquired by ICBM with in total 24 20 L-Niskin bottles proved as an excellent instrument. With two CTD casts, one from 5 to 300 m and the other one from 300 m to 10 m above sea floor at 3100 to 5800 m depth, the entire water requirements can be met. Most interesting is always to monitor the development of the profile on the screen of the computer which controls the CTD and stores the data. At fixed depths the bottles are closed and with the withdrawn and filtered samples sound biogeochemical parameters such as chlorophyll, phytoplankton community composition, particulate organic carbon and nitrogen and dissolved inorganic macronutrients such as nitrate and phosphate are assessed. As important microbial parameters bacterial cell

numbers, biomass production, turnover rates of amino acids, glucose and acetate and bacterial community growth rates are determined on board. Thus, we have a rather good overview of the growth dynamics of the bacterial communities in the water column. In addition samples are filtered and fixed for the analysis of the composition of bacterial communities by fluorescence in situ hybridization (CARD-FISH, MAR-FISH) and metagenomic, metaproteomic and metatranscriptomic approaches later in the home labs. At a few stations samples were collected to isolate bacteria. Further, at each station a McLane in situ pump was deployed to later analyze in the filters by metagenomics approaches population genomics of an important member of the *Roseobacter* group. Samples collected by means of a plankton net do not only serve for isolating bacteria from zooplankton but also for a visual inspection of the composition of the zooplankton and show its great diversity in the southwestern Pacific.

By means of this broad spectrum of methods we are most confident to successfully assess comprehensively the composition and biogeographic patterns of the bacterial communities in the various biogeographic provinces of the southwestern Pacific.



Water samples for studying the diversity of the dissolved organic matter and trace elements are passed through cartridges and extracted right at the Niskin bottles for further analyses. As this work takes quite a while the responsible scientists need to wait until the others are finished to withdraw their samples from the Niskin bottles. We are very excited about these data as they give us a very detailed insight into the distribution of water masses in the study area. This is most interesting in particular in the

southern Pacific with rather complex current patterns.

Also the investigations of the sediment by the MUC, after the first failing station, were successful at the two next stations. The mineral and yellow-greyish color of the sediment structure points to little productive regions in the southwest Pacific. By means of an epifluorescence microscope the bacterial numbers are already assessed on board. All further investigations of the bacterial communities by molecular and genomic methods will be done in the home lab.

The end of the first half of the cruise was celebrated on board with a little decent party and enriched with live music of excellent quality. Food was also excellent, as well as the meals during the entire cruise. I would like to thank the team in the kitchen guided by Andre Garnitz for the delicious food.



Best regards on behalf of the scientific party and crew,

Meinhard Simon