

Deep-sea macrobenthos biodiversity survey at the Southern Ocean in KH-19-6 Leg 4

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The Southern Ocean's marine biodiversity has been a subject of numerous research expeditions, but many exciting questions still remain in understanding the unique ecosystems and genetic interactions between various sites in the Antarctic region, both heavily influenced by the Antarctic Circumpolar Current. Despite most of the Southern Ocean being deep sea, the fauna of the continental slope and the Antarctic abyssal plain remain poorly investigated (Clarke & Johnston 2003). Notably, areas with steep cliffs and seamounts are difficult to survey for benthic organisms, and thus not well understood.

During Japanese surveys of the deep Southern Ocean, benthic sampling has mainly relied on core samplers or grab sampler. These methods have some disadvantages for biological sampling, such as a coring failure when steep topography is present and their limited sample volume and sizes. Japanese Antarctic Research Expedition (JARE) is a major Japanese research project in the Southern Ocean, led by the R/V *Shirase* and T/V *Umitaka Maru*, but few macrobenthos surveys have been conducted. R/V *Shirase* has conducted a bottom trawl survey in the past, but ongoing or planned regular benthos observations are lacking. The marine biological observation by the T/V *Umitaka Maru* in JARE is largely focused on plankton surveys. Previously the R/V *Hakuho Maru* has also carried out expeditions to the Southern Ocean, but these have mostly focused on geology and collaboration with macrobenthos researchers has been largely absent. As such, there was a need to strengthen the sampling for understanding the benthos diversity in the Antarctic region on-board Japanese research vessels.

To address this issue, we carried out a research cruise in the Southern Ocean on-board R/V *Hakuho Maru* (KH-19-6 cruise Leg 4) to conduct macrobenthos samplings using rock dredges and a multiple corer. We discovered 158 species belonging to four phyla, including many undescribed species (Ogawa et al. in prep.). One of the polychaetes has already been described as a new species of the genus *Flabelligena* (Jimi et al. 2020). We would like to discuss the future development of macrobenthos research using rock dredges and multiple corers, in addition to introducing the results from this voyage.



Figure 1. Deep-sea macrobenthos collected during the KH-19-6 cruise Leg 4.

References

Clarke, A. and N.M. Johnston, Antarctic marine benthic diversity, *Oceanography and Marine Biology: an Annual Review*, 41, 47–114, 2003.

Jimi, N., Ogawa, A., Hiruta, F. S., Ikehara, M., and S. Imura, A new deep-sea species of *Flabelligena* from off the South Orkney Islands, the Southern Ocean. *Biodiversity Data Journal*, 8, e53312.