

# The application of environmental DNA for the monitoring of Antarctic marine ecosystem

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A monitoring of biological community structure and diversity is essential to understand the global climate impact on the Antarctic marine ecosystem. Traditional biomonitoring methods typically rely on sampling methods, combined with morphology-based identification, which is time-consuming and requires sophisticated expertise. To elucidate the full impact of rapidly shifting climate on the Antarctic ecosystem, efficient and effective tools are required to understand spatial and temporal variations in biological communities. Environmental DNA (eDNA) –genomic material extracted from cells and tissue shed by organisms into environmental samples, such as soil, sediments and water –is a possible tool for rapid assessing marine biodiversity and community composition. We conducted an eDNA observation in January 2019 along the 110°E transect off Wilkes Land, East Antarctica, by the training vessel *Umitaka-maru*, Tokyo University of Marine Science and Technology. In total, 189 samples were collected from surface to deep layers covering various water mass which was located from 40°S to 65°S along the 110°E transect. We will generate DNA-based biodiversity data from these samples to produce the first comprehensive analysis of metazoan genetic diversity in the Southern Ocean. The eDNA observation and preliminary experiments are outlined here, and a future plan of analyses are discussed.

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