

Bioaerosol observations at S17 and Syowa station, Antarctica, with the 60th Japanese Antarctic Research Expedition (JARE)

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The ice cores from the Antarctica could preserve microorganisms from the ancient atmosphere, atmospheric bioaerosols, trapped in the snow and ice of the ice sheet (Segawa et al., 2010). Microorganisms in the Antarctic ice cores could be useful to reconstruct past environments. Atmospheric bioaerosols, may consist of viruses, bacteria, fungi, pollen, plant fibers and are airborne particles that are biological in origin. The bioaerosol over the Antarctica is getting a lot of attention as meteorology, cloud physics, phylogeography, phylogeny, extremophile, environmental medicine, and so on. Bioaerosol observations were carried out at Syowa Station, Antarctica, during the 54th Japanese Antarctic Research Expedition (2012-2013). We sampled bioaerosols using our bioaerosol sampler at C- heliport and at container yard in Syowa Station. Bioaerosols near to the ground were directly sampled beside the colony of Adélie penguins at the the Hukuro Cove (Kobayashi et al., 2016). The 16S rDNA clone library from air on the Antarctica was dominated the class Bacilli, Chloroplast, Alpha-proteobacteria, Beta-proteobacteria, and Gamma-proteobacteria etc. However, these observations were only one time and it did not fine that these bioaerosols live or dead because bioaerosol analysis was only the 16S rDNA clone library.

In this study, we carried out the bioaerosol observations at an observation site called S17 on Antarctic continent ice sheet (69.0°S, 40.1°E, from December 26, 2018, to January 23, 2019) and Syowa station (69.0°S, 39.6°E, from February 1 to 7, 2019) with the 60th Japanese Antarctic Research Expedition (JARE). The bacteria concentrations by a microorganism sensor (BM-300C) were altered at S17 and Syowa station, especially, increased on the blizzard remarkably. The class-level distributions of sequences was determined every day. At both observation site, sequences grouping to the Flavobactrlia and Betaproteobacteria were predominant. The values of ratio in the class-level distributions were changed every day. The future plan is to examine bacteria living by a separation culture experiment.

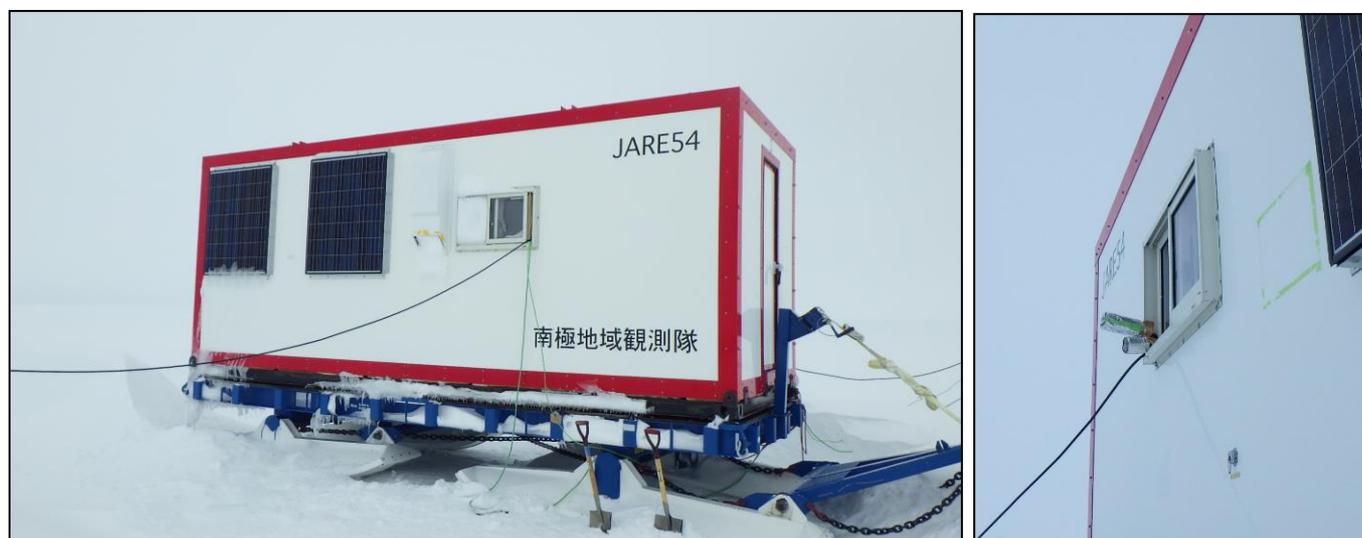


Figure 1. Atmospheric bioaerosol observation at S17.

References

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