南極リュッツホルム湾袋浦におけるバイオエアロゾルの直接採集と生物分析

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Direct sampling and bioanalyses of bioaerosols on Hukuro Cove, Lützow-Holm Bay, Antarctica

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Bioaerosols are airborne particles that are biological in origin. They may consist of viruses, bacteria, fungi, pollen, plant fibers. The bioaerosol over the Antarctica is getting a lot of attention as phylogeography, phylogeny, extremophile, meteorology, environmental medicine, *etc*. The study of atmospheric bioaerosol over the Antarctic will be focused on because it is attracting attention to find the microorganism in the Antarctic ice cores, investigate the long-range transport of atmospheric bioaerosol, and be starting the worldwide bioaerosol observations. However, there are few researches about bioaerosols suppling there ecosystems in Antarctica.

In this study, bioaerosols near to the ground were directly sampled beside the colony of Adélie penguins at the the Hukuro Cove during the 54th Japanese Antarctic Research Expedition (2012-2013). We carried out the sampling using the bioaerosl sampler[1)] from 11:06 to 12:06 (LT) and from 16:18 to 17:18 (LT) on January 22, 2013 (Fig.1). DNAs extracted from membrane filter samples were analyzed using the MiSeq sequencer as next-generation sequenving technologies. From the result of the MiSeq sequencer (Fig.1), the main bacterial sequence diversity observed in this methods was *Burkholderiaceae* (28 %), *Bacillaceae* (11 %), and *Rhodospirillaceae* (11 %). Rahman *et al*., reported that intestinal contents (faeces) of Antarctic Adélie penguins contained *Bacillus* spp [2)]. The *Bacillaceae* suggested to originate in Antarctic Adélie penguins and there is some possibility of diffusing with the wind.

Figure 1. The sampling of bioaerosol at the Hukuro Cove.

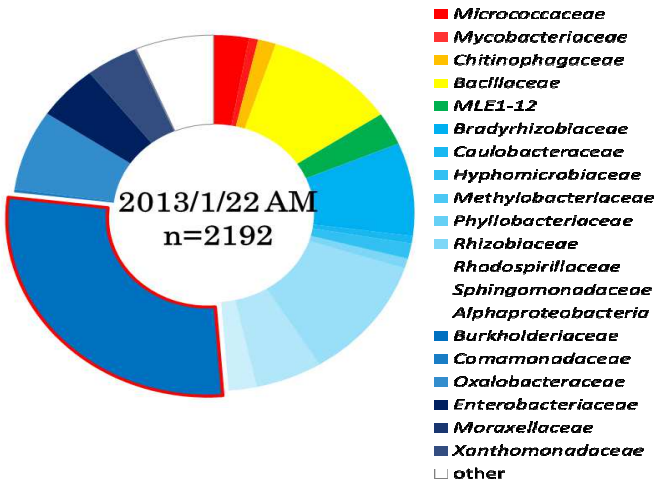

Figure 2. Fumly level distribution of bioaerosol on the Hukuro Cove..

References

1) Kobayashi, F., *et al*., Study on atmospheric diffusion of bioaerosols in a KOSA source region, Earozoru Kenkyu, 22, 218-227, 2007.
2) Rahman, M.H., et al., Occurrence and deiversity of the tetracycline resistance gene *tet*(m) in enteric bacteria of Antarctic Adélie penguins, Journal of Antimicrobial Chemotherapy, doi:10.1093/jac/dkn209 , 2008.