

係留気球を用いた南極域上空の大気バイオエアロゾル直接採集

小林 史尚¹、牧 輝弥¹、柿川 真紀子²、山田 丸³、松木 篤²、長沼 毅⁴、岩坂 泰信⁵

¹ 金沢大学 理工研究域

² 金沢大学 環日本海域環境研究センター、³ 労働安全衛生総合研究所、⁴ 広島大学 生物圏科学研究科、

⁵ 滋賀県立大学

Direct sampling of atmospheric bioaerosol over the Antarctic using a tethered balloon

Fumihisa Kobayashi¹, Teruya Maki¹, Makiko Kakikawa², Maromu Yamada³, Atsushi Matsuki²,
Takeshi Naganuma⁴, Yasunobu Iwasaka⁵

¹College of Science and Engineering, Kanazawa University

²Institute of Nature and Environmental Technology, Kanazawa University, ³National Institute of Occupational Safety and Health, ⁴Graduate School of Biosphere Science, Hiroshima University, ⁵University of Shiga Prefecture

During the 54th Japanese Antarctic Research Expedition (2012-2013), the atmospheric bioaerosol at an altitude of about 1,000 m was directly sampled at Syowa Station using a tethered balloon (Fig.1). The bioaerosols near to the ground and sea surface were sampled by the bioaerosol sampling apparatus on the naval ice-breaker, Shirase, in the Antarctic Ocean and by the bioaerosol sampler at the Yukidori Valley, the Langhovde Glacier, and the Hukuro Cove. We experienced the direct sampling and bio-analysis of atmospheric bioaerosols in yellow dust (KOSA) using the bioaerosol sampler which was developed on our own terms, a tethered balloon, and an airplane over Japan and China (Kobayashi *et al.*, 2008). More than sixty strains were isolated as atmospheric bioaerosol over Dunhuang City in China and Suzu City in Japan using separated culture method and metagenomic method. 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. To apply our previous methods in the study on KOSA bioaerosol, the direct sampling and bio-analysis of atmospheric bioaerosol over the Antarctic will be tried. The results and finding of atmospheric bioaerosol over the Antarctic will be establish the strong and important impacts to not only biogeography, ecology, history of the Earth, theory of evolution, influence of health, ice-forming nucleus, and global long-range transports of atmospheric bioaerosols, but also investigation on ecosystem in the sky.



Figure 1. The sampling of atmospheric bioaerosol using a tethered balloon (Photo by Inai).

References

Kobayashi, F., M. Kakikawa, *et al.*, Study on atmospheric diffusion of bioaerosols in a KOSA source region, *Eurozoru Kenkyu*, 22, 218-227, 2007.