

# Mercury concentration in soil observed around Syowa station, Antarctica

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## Introduction

Because of the cold climate and small precipitation, Antarctic ecosystems are probably the simple. However, the effect of human activities around each station in Antarctica has been reported. (Brooks et al., 2019, Claridge et al., 1995). In order to continue the sustainable research observation in Antarctica, it is important to understand the effect of human activities around the station. In this study, we analyzed the mercury (Hg) concentration in surface soils around Syowa station, Skarvsnes hut and Langhovde hut. Our objective of this study is to clarify the impact of human activity to the environment in Antarctica. Usually, fossil fuel contains Hg and when it is emitted, some of them may be deposited near the source.

## Sample collection

Surface soil samples were collected by systematic and grid sampling method (every 100 to 200 m) around each site in 2007 and 2008. These samples were obtained which passed through 500  $\mu\text{m}$  sieve and Hg concentration was determined by CVAAS method (Nippon Instruments Co. Ltd., MA-2000). Quality assurance/quality control (QA/QC), were validated by analyzing the standard reference material of Trace elements in pine needles (pinus taeda) 1575a, and Reference material (BCR no.482) trace elements in lichen were analyzed. The recovered value for Hg were 93.3% and 91.5% respectively, indicating the accuracy of the analysis.

## Result and discussion

The Hg concentration in surface soil samples fluctuates from 0.14 to 13.7  $\mu\text{g}/\text{kg}$ , and these values were lower than the average Hg content in the Earth crust (approximately 50  $\mu\text{g}/\text{kg}$ ). The reason of these low Hg concentration in soil was assumed that the most of surface soil around Syowa station and Langhovde were decomposed granite known as the low in Hg concentration than the others. The high concentration of Hg in surface soil samples were observed near the station buildings (Fig.1(a)). The Hg concentration around Syowa station in surface soil is at most 97 times higher than the background area. Same tendency was observed around Langhovde hut (Fig.1(b)). Our result indicates that the human activity in the Syowa station area and Langhovde hut may cause the environmental contamination in Antarctica.

## References

Brooks et al., Antarctic Science 31 (6) 304-314, 2019.

Claridge G.G.C et al., Antarctic Science 7 (1) 9-14, 1995.

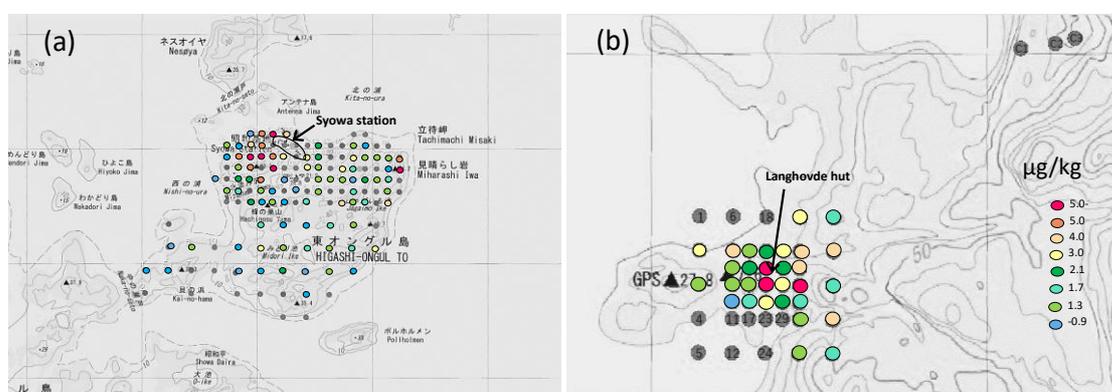


Figure 1 Map of sampling site and mercury concentration in soil (a) Syowa station, (b) Langhovde hut