

# デジタルビデオカメラのRGBデータ解析による南極陸上生態系の成長速度測定の試み

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## Attempt to measure of growth rate for terrestrial ecosystem on Antarctica by analysis of RGB data for photographs of digital video camera

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Growth rate for terrestrial plants such as mosses and lichen on Antarctica is very low and then it is very difficult to directly measure of the growth rate. For example, Bokhorst et al. (2015) showed no significant change in the Lichen or Moss community without treatment from 2003 to 2013 in their fields experiments using open top chamber. Unusual case of successful measurement of growth rate is for fruticose lichen (*Usnea aurantiacoatr* and others) and crustose lichen (*Acarospora macrocyclos* and others) by using carbon stable isotope ratio analysis on Fildes Peninsula which is one of the relatively mild weather in Antarctica (Li et al. 2014). They showed the minimum growth rates of these lichens is 0.1 [mm/year].

In this study, we dealt with the difficulty of measurement for growth rate of terrestrial communities on Antarctica by using more easily way which is analysis of RGB data of photographs. Permanent quadrat for vegetation survey has been set and kept since 1984 in the Antarctic Specially Protected Area No. 141 and taken photographs using compact digital camera each quadrats by Japanese Antarctic Research Expedition since 1988. The permanent quadrat for vegetation survey set up around Yukidori-valley near Showa station on the north-east Antarctica and was chosen places growing mosses, cyanobacteria and lichens in the area.

First we attempt to develop an analytical method of RGB data of photographs by digital video camera for vegetation survey. The RGB data were derived from these photographs and analyze using discriminant analysis to detect the cover degree of whole plant community and each taxonomic group. And raw RGB value, brightness, relative RGB value to brightness and 2G\_RG index (Richardson 2007) were chosen as variables and examined availability of the variables to discriminate the cover degree of vegetation and separate a vegetation to each taxonomic group. It was obtained as a result that raw RGB values had a least error rate when the teacher data and target data are from same pictures. The error rate differed depending on the pictures. And next we compared photographs of Lichens and moss community on same quadrat and then we discussed about the comparison.

### References

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