

Distribution of chlorophyll *f* within hot spring microbial mat

Satoshi Ohkubo^{1*}, Hideaki Miyashita¹

¹Grad. Sch. of Human Environ. Stud., Kyoto Univ.

Chlorophyll (Chl) *f* is a recently discovered photosynthetic pigment, which absorbs far-red (FR) light (700-750 nm) in vivo. The distribution and role of Chl *f* in natural environments were still unclear. We have isolated Chl *f*-containing cyanobacteria from various habitats by cultivation using FR-LED as their sole light sources. These cyanobacteria produced Chl *f* only when the cells were grown under FR-LED. Therefore, we hypothesized that Chl *f* was distributed only in certain environments where FR light mainly existed, and it contributed to the oxygenic photosynthesis at those habitats. We thought that the inner layer of microbial mat was one of such environments, because photosynthetically active radiation (PAR 400-700 nm) was absorbed by phototrophs in surface layer. In this study, we aimed to reveal the vertical distribution of Chl *f* and the light environment within hot spring microbial mats.

We collected 20 microbial mat samples at 6 hot springs in Nagano and Gifu prefectures in Japan. Chl *f* was detected from 5 samples of them. Vertical profiles of Chl *f* and downward spectral irradiance within microbial mats were measured by using HPLC and fiber optic spectrophotometer, respectively. Community structure analysis in mats was also performed by PCR-DGGE to reveal the vertical distribution of Chl *f*-producing cyanobacteria. In this poster, we discuss the adaptive significance of Chl *f* in microbial mats.

Keywords: chlorophyll *f*, cyanobacteria, microbial mat