

Biominalization in Sr-rich biomats at Zhemchug hot springs, Russia

Koushirou Miyata[1], Kazue Tazaki[1]

[1] Dept. Earth Sci., kanazawa Univ.

At Zhemchug hot springs, southwest Lake Baikal, Russia, the biomats contain high concentration of Ca and Sr, which microbiological, chemical and mineralogical analyses were carried. Optical and scanning electron microscopic observation revealed that carbonate minerals were associated with cyanobacteria. The biomats have colorful layered structure, such as green, white, brown and black. Chemical analysis of the biomats revealed high concentration of CaO (85-96 wt%) and SrO (1.1-2.2 wt%) in the four layers. The mineralogical composition of the layered structure is mainly aragonite associated with calcite. Elemental layered patterns of the biomats are shown in EPMA elemental content maps indicating the coincidence of Ca and Sr. EPMA and XRD analyses revealed that the biomats contain high concentration of Sr in the crystal structure of aragonite. By increasing pH and the oxygen concentration on the surface of biomats, the cyanobacteria could potentially increase the rate of metal accumulation. The cyanobacteria in hot spring biomats may carry important role to form aragonite associated with Sr.