

Abundance and distribution of microorganisms involved in sulfur cycling in the Horonobe sedimentary rock

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The redox reactions of the sulfur compounds are one of the important reactions at the physical cycle in the subsurface environment. The microorganisms takes part in most these oxidation reduction reactions, and it is thought that an important working is done to the physical cycle in the subsurface biosphere. In this research, the distribution in which the number of microbial cells, the s sulfur-oxidizing bacteria, and the sulfate-reducing bacteria was clarified about the core and the underground water that had been obtained by the large depth bore that Japan Nuclear Cycle Development Institute had done in the Horonobe area.

Core samples were collected in the Horonobe area from 18 different depths with 5 bore holes. Ground water samples were collected in the same area from 6 different depths with 3 bore holes. The center of each core sample (i.e. the section without contamination by surface microorganisms or oxidation) is further cored for an uncontaminated research sample with Drilling machine is specially equipped with an anaerobic chamber.

Total counts stained by acridine orange were from $3.76E+05$ to $6.43E+06$ cells/g in the core samples, from $2.70E+03$ to $1.65E+06$ cells/ml in the groundwater samples. As a result of the MPN measurement of the anaerobic sulfur-oxidizing bacteria in core samples, a large amount of those bacteria group were distributed in some points. It was suggested that those bacteria group be one of the dominant species in these points. An interesting result in which being detected from all the underground water samples was obtained though the sulfate-reducing bacteria was not detected from the core at all. The phylogenetic analysis of 16S rRNA gene suggested sulfur-oxidizer in core and Ground water samples were *Pseudomonas* sp.