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The influence of heavy metal accumulated in aquatic life in the Hyogo,Ikuno mine outskirts and the Yabu City.

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In this study, water chemistry was studied under the condition of serpentine area with high Mg ion concentration and the metal mine area with high sulfate concentration from mine drain. In particular heavy metal ion concentrations for water and river small insect such as larva of mayfly, dragonfly and crane fly were measured in order to clarify its water chemistry impact for aquatic ecosystem and its heavy metal bioaccumulation. The Sekinomiya serpentine area in the north of Hyogo prefecture and the closed Ikuno mine area in the middle of Hyogo prefecture were selected as the studied areas.

In the Ikuno mine area, high concentrations of Ca²⁺, Mg²⁺, SO₄²⁻, and HCO₃⁻ for river water at the center of mine were found and Zn and other heavy metals were over the Japanese effluent standards, 5.0mg / L with the highest Zn concentration, 25.1 mg / L. This high concentration of mine waste water is thought to be derived from muck in the drift and dumping area in the mine, although mine company still treat mine waste water. Then, it is very difficult to treat waste water from an abandoned mine.

Generally, serpentine is high concentration of Mg and then weathering process brings out low concentration of Ca²⁺ and high concentration of Mg²⁺ and HCO₃⁻ for water and then in the Sekinomiya serpentine area, river water also shows the same water chemistry. However, in the Sekinomiya serpentine area, some high concentrations of dissolved ion such as Ca²⁺ and sulfate for river water were found near the abandoned Natsume mine and Nakase mine area and a high concentration is thought to be caused by the effects of mine drainage as well as the Ikuno mine. Further high concentration of Cr and Pb in the serpentine area was found and then Ni and Cd concentrations in crane fly reach 2.4 mg/kg and 1.2 mg/kg by dry weight in the Ikuno mine area. Then Ni and Cr concentrations in dobsonfly reach 14.6 mg/kg and 0.4 mg/kg by dry weight in the Sekinomiya serpentine area respectively.

Concentration of heavy metals in aquatic organisms depends on species, life term, and food. As crane fly and dobsonfly are carnivorous larger body and they are located on top of the ecological pyramid for the aquatic insect, they show the highest metal concentration in two areas.

Keywords: Rest abolition mine, Mine waste water, Serpentine geological feature, Heavy metal, Aquatic life, Biological magnification