平成２１年度　環境科学院　修士論文内容の要旨

Development of a biomarker for heavy metal contaminants using hepatic and renal

metallothioneins in *Hyposarcus pardalis*

Course of integrated studies

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Abstract

The heavy metal is assumed to be the cause in the pollution-related disease, and the metallic pollutions such as Hg, As, Cd, and Pb are environmental problems about the earth scales. In addition, water pollution by heavy metals has been one of the most serious problems in the developing countries, because river and lake water play important roles in transport and economic activities. In this study, to examine whether the fish (*Hyposarcus pardalis*), widespread fish species in Indonesia freshwater environment can used as a biomarker for pollution of metals, liver and kidney metallothioneins (MTs) in the fish and metal contents in the Lake and fishes were measured using Inductively Coupled Plasma Mass Spectrometry. In addition, clarify the relationship between MT levels and exposed metals, the amounts of the induced MTs and metal contents in the liver and the kidney of fishes exposed to 0, 50 and 500 ppb Cu and 500 ppb Mn were also determined in the laboratory.

As results in this study, it was considered that the fishes could retain a history of the pollution in their organs for long term and the metals bound to MTs in the liver

and kidney could be replaced with Cu at high concentrations exposure. The levels of hepatic and renal MTs in *Hyposarcus pardalis* showed significantly different values between Lake Rawakalong and Lake Sunter, whereas there was a poor correlation between contents of MT and metals in the fishes caught in the both lake. From the results, the hepatic and renal MTs in *Hyposarcus pardalis* are useful candidate for monitoring system of heavy metal contaminants as a biomarker, however further studies will be necessary to clarify the relationship between MTs and metal exposure in *Hyposarcus pardalis.*