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Copper accumulation and hepatic subcellular distributions of trace elements in Formosan squirrel

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Abstract:
In order to obtain basic information of trace element distribution in the liver of the Formosan squirrel that accumulates Cu at high level, subcellular and molecular weight distributions in this species were examined.
Mean Cu concentrations in the whole liver of the Formosan squirrel were 610±360 (μ g/g wet wt.). And Cu concentrations in the fraction containing nuclei, mitochondria and lysosome were the largest in the liver of the Formosan squirrel. Mean Cu burden in the fraction containing nuclei, mitochondria and lysosome in the hepatocytes was 73% of the total copper contain in the hepatocytes. On the other hand, the average Cu burden was 3.5% in the microsome and 23% in the cytosol of the hepatocytes.
The results of the gel filtration showed that most of the Cu in the cytosol was contained in the void volume fraction, the molecular weight of which is larger than that of metallothionein. About only 6.5% of Cu was associated with metallothionein fractions in the liver of the Formosan squirrel. In the metallothineine fraction, Cu was contained while zinc was not detected, suggesting that Cu accumulates beyond the capacity of metallothinein synthesis. These results suggest that the fraction containing nuclei, mitochondria and lysosome contributes the high level of Cu accumulation in the liver of this species.

Key words: Formosan squirrel, Copper accumulation, Subcellular distribution, Metallothionein, Wild mammals

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