

On the information of ecosystem and biodiversity obtained from isotope ratios of living organisms

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Conservation of biodiversity is a key issue in a changing world. However, it is well known that biodiversity assessment itself requires much effort. Several levels are recognized in describing biodiversity: e.g. genetic, species, landscape and ecosystem level. Various indicators are proposed to describe the state of biodiversity.

Inland water ecosystems have been dramatically altered by recent human activities. Human impact including land use change has great influence on the ecosystems. Stable isotope ratios of nutrient in a river are indicators of nutrient status of a watershed. Stable isotope ratios of living organisms are one of the indicators to study a functional position (trophic position, dependency of food sources, nutrient status of the environment, etc.) of the organism, and thus provide useful information about the relationships between the organisms. Furthermore, stable isotope ratios of stored specimen contain information of the past environment; for example, trophic state of each watershed.

Various techniques are being applied to the monitoring of biodiversity and the isotopic signatures are potential tools. Nitrogen isotope ratios of individual amino acids are promising tools for determining trophic level of each organism, but application to ecosystem level study is limited. I present some results obtained from the project Stable isotope indicators for evaluating ecosystem functions of biodiversity of The Environment Research and Technology Development Fund D1102.

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