

[JJ] Evening Poster | H (Human Geosciences) | H-TT Technology & Techniques

[H-TT18]Development and applications of environmental traceability methods

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Modern society uses almost all the elements present in the natural world. Although there have long been calls for the sustainable use of the resources that provide these elements and the building of human societies that are in harmony with the environment, the survival of the human race is increasingly at risk as a result of qualitative changes to the environment as a whole. Implementation by the society of methodologies for diagnosing and tracking these various elements of the natural environment and their relationships with humans are now required.

Elements transport in the spheres on the surface earth and the human society and human body. Information on the concentrations and stable isotopes of elements is powerful in tracing the transportation of materials and have been applied in studies on the atmosphere-hydrosphere circulation, ecological service, and the life, health and history of humans. We propose a session to discuss development and applications of environmental traceability methods to achieve traceable system.

Especially, we encourage to present a research based on Environmental Isotope Study, which integrates isotopic studies in various disciplines, such as geochemistry, hydrology, ecology, geology, mineralogy, anthropology, food science (identification of origins), and forensics.

[HTT18-P10]Carbon and nitrogen isotope ratios and diets of *Corbicula japonica* and *Corbicula leana* in the Harai River (a branch river of the Kushida River, Mie Prefecture, central Japan) with rich riparian forests

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In order to eventually reveal factors controlling distribution and abundance of the bivalve *Unionidae* group in the Harai River, a branch of the Kushida River, Mie Prefecture, central Japan, the bivalve *Corbicula* as alternatives were analyzed for carbon and nitrogen isotope ratios. The Harai River is withdrawn from a dam constructed at the Kushida River, and has rich riparian forests. Samples collection was performed 4 times in 2016 and 2017, at 4 localities; *C. leana* from the two upstream and midstream sites (Sites 1 and 11) and *C. japonica* from the two estuary sites (Sites 15 and 16). Particulate organic matter (POM) in river water was also collected from 5 sites including those for *Corbicula* collections. We obtained 54 and 58 isotopic data for *C. leana* and for *C. japonica*, respectively, and 20 for POM. While carbon and nitrogen isotope ratios of *Corbicula* range widely from -26.3 to -22.2 per mil and from 5.6 to

10.8 per mil, respectively, samples from each site cluster closely (Figure). Seasonal variation is negligible, except for the *C. leana* of Site 11, compared differences between sites. Two populations of *C. leana* and one population of *C. japonica* comprise an array of negative correlation between carbon and nitrogen isotope ratios, which is parallel to the distribution of POM. Carbon and isotopic ratios of these three *Corbicula* populations are likely constrained by averaged available food sources (POM) at each site. Population of *C. japonica* from the lowermost site shows a positive correlation between carbon and nitrogen isotope ratios, implying their utilization of two end-members of POMs with distinct carbon and nitrogen isotopic ratios. *C. japonica* samples in this study was significantly lower in carbon and nitrogen isotope ratios than those reported by Kasai and Nakata (2005) (Fish. Sci. 71, 151-158), who demonstrated that terrestrial organic matter was significantly important even for *C. japonica* diet. The distinct result of this study may be explained by richness of riparian forests at Harai River, which have made *C. japonica* there further depend on terrestrial food sources. On the other hand, *C. leana* population from the uppermost site of the Harai River has heaviest carbon isotopic ratios, which could be attributed to an increase in utilization of planktons flourished in the dam.

Reference

Kasai, A. and Nakata, A. (2005) Utilization of terrestrial organic matter by the bivalve *Corbicula japonica* estimated from stable isotope analysis. Fisheries Science 71, 151-158.