

Use of multiple isotope tracers to study coastal ecosystem

TAYASU, Ichiro^{1*} ; NAKANO, Takanori¹ ; KURITA, Yutaka²

¹Research Institute for Humanity and Nature, ²Tohoku National Fisheries Research Institute

Environmental traceability method is based on material cycling, thereby applicable to the studies on various environmental issues. Especially, the method is useful to evaluate human impacts on ecosystem properties. However, comprehensive use of the method is under development. In this study, we show potential applicability to use multiple isotope tracers in the study of coastal marine ecosystem, using isotope elements of terrestrial origin as well as the elements circulating in the system.

Elements constituting living organisms are obtained from the environments. From ecological point of view, the living organisms are obtaining environmental information where they live and what they eat. In other words, the living organisms record indicators of surrounding environmental conditions. Elements in hard tissue, e.g. otolith, sequentially record environmental variables as they grow. The calcium carbonate and trace metals in otolith are primarily derived from the water, therefore, they contain information of the water bodies that the fish have previously occupied. In contrast, elements in soft tissue are continuously metabolized and have each turnover time. Some elements in the organism are derived from the surrounding water, others are derived from the diet. These things considered, multiple tracers in organisms have various information.

Our project, "Development of multi-isotope tracer techniques for evaluating functions of coastal ecosystem" funded by JST-CREST, is aiming at developing a method to evaluate coastal ecosystem using multiple isotope tracers. We show potential advantage of the use of multiple isotope tracers to study coastal ecosystem.

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