

## **$^{87}\text{Sr}/^{86}\text{Sr}$ linkage between geological and biological materials**

M. MINAMI<sup>1\*</sup>, H. SAWADA<sup>2</sup> AND S. WAKAKI<sup>3</sup>

<sup>1</sup> ISEE, Nagoya University, Nagoya 464-8601, Japan

(\*correspondence: minami@isee.nagoya-u.ac.jp)

<sup>2</sup> Graduate School of Environmental Studies, Nagoya University, Nagoya 464-8601, Japan

<sup>3</sup> Kochi Institute for Core Sample Research, JAMSTEC, Kochi 783-8502, Japan

Strontium isotope ratio ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) is often used to identify the origin of agricultural products and tracing ancient human migration patterns, and a map providing such information nationwide can be of great use. Some studies on  $^{87}\text{Sr}/^{86}\text{Sr}$  distribution mapping using catchment outlet stream sediments in Japan have been made [1, 2, 3]. They clarified that  $^{87}\text{Sr}/^{86}\text{Sr}$  variation with grain sizes of stream sediments is much smaller than variations associated with different bedrock, and that  $^{87}\text{Sr}/^{86}\text{Sr}$  maps of fine stream sediments (<180  $\mu\text{m}$ ) largely reflect the  $^{87}\text{Sr}/^{86}\text{Sr}$  of underlying bedrock. However, it remains unclear whether the  $^{87}\text{Sr}/^{86}\text{Sr}$  values of stream sediments may instead also reflect the  $^{87}\text{Sr}/^{86}\text{Sr}$  values of the nearby vegetation and fauna. Therefore, we investigated the relationship between  $^{87}\text{Sr}/^{86}\text{Sr}$  values in biological samples and geological samples of their growth location [4]. The samples used are rice-plants, animal bones, paddy water and soil, and stream water and sediments collected from an area distributing of granite bedrocks in Toyota, Aichi prefecture, Japan. The result showed that water-soluble Sr and exchangeable Sr fractions in paddy soils and biological samples had almost the same  $^{87}\text{Sr}/^{86}\text{Sr}$  values, lower than bulk Sr fractions. This indicates that rice-plants absorb exchangeable Sr from soils through nutrients and water, and that herbivorous animals also ingest exchangeable Sr from soils through plants and water. Meanwhile, we also found that grasses with shorter roots than rice-plants sometimes have lower  $^{87}\text{Sr}/^{86}\text{Sr}$  from stream water and exchangeable Sr of stream sediments. This could be due to the up-take of lower  $^{87}\text{Sr}/^{86}\text{Sr}$  ( $\sim 0.7092$ ) of rainwater contained largely in near-surface soil. In the presentation, we will also discuss more about  $^{87}\text{Sr}/^{86}\text{Sr}$  relationship between geological and biological materials collected from an area distributing of different bedrocks from granite in Taga, Shiga prefecture, Japan.

[1] Jomori *et al.* (2013) *Geochem. J.* **47**, 321-335. [2] Jomori *et al.* (2017) *Appl. Geochem.* **86**, 70-83. [3] Minami *et al.* (2017) *Geochem. J.* **51**, 469-484. [4] Minami *et al.* (2018) *Chemical Geology* **484**, 224-232.