

## 固着性二枚貝イワガキ貝殻の炭素・酸素安定同位体比を用いた海底湧水環境の評価

### Evaluation of the environmental condition of Submarine Groundwater Discharge (SGD) using carbon and oxygen stable isotope ratio of the sessile bivalve *Crassostrea nippona* shell

\*富永 修<sup>1</sup>、竹内 優<sup>1</sup>、杉本 亮<sup>1</sup>、石田 健大<sup>1</sup>、平井 タケル<sup>1</sup>、中島 壽視<sup>1</sup>、小路 淳<sup>2</sup>、本田 尚美<sup>4</sup>、谷口 真人<sup>3</sup>

\*Osamu Tominaga<sup>1</sup>, Takeuchi Masaru<sup>1</sup>, Ryo Sugimoto<sup>1</sup>, Ishida Tatsuhiko<sup>1</sup>, Takeru Hirai<sup>1</sup>, Toshimi Nakajima<sup>1</sup>, Jun Shoji<sup>2</sup>, Hisami Honda<sup>4</sup>, Makoto Taniguchi<sup>3</sup>

1. 福井県立大学、2. 東京大学大気海洋研究所、3. 総合地球環境学研究所、4. 福井県庁

1. Fukui Prefectural University, 2. Tokyo Univ. AORI, 3. RIHN, 4. Fukui Pref Gov

Submarine Groundwater Discharge (SGD) results in various biogeochemical changes in the coastal environments, such as coastal primary production, eutrophication, and benthic production. The SGD condition of 6 sites along volcanic mountain coast in northern Japan was evaluated by using carbon and oxygen stable isotope ratio ( $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$ ) in the shell of sessile bivalves *Crassostrea nippona*. In order to estimate the proportion of fresh water flow rate in SGD (FR) from the respective  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  of *C. nippona* shell, we used the three end member (sea water, riverine water and fresh underground water) bayesian stable isotope mixing model. The significant positive correlation was found between  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  of the shell and those of ambient water, respectively. FRs estimated from three source model were 3.1 -8.6% at low  $^{222}\text{Rn}$  sites and 21.9-28.5% at high  $^{222}\text{Rn}$  sites. At the site (Nishihama) of river mouth, the  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  of the shell collected were low (estimated FR 10.6-25.0%) and  $^{222}\text{Rn}$  concentration was also low. The contribution of DIC in SGD and riverine water for shell formation was estimated to be 19.8 % and 7.8%, respectively. In the present study, we demonstrated the effectiveness of  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  of *C. nippona* shell as the tool for estimating FR.

キーワード：海底湧水、炭素安定同位体比、酸素安定同位体比、イワガキ貝殻、ベイズミキシングモデル

Keywords: Submarine Groundwater Discharge, carbon stable isotope, oxygen stable isotope, rock oyster shell, bayesian stable isotope mixing model