

Stable isotopic analysis of deep-sea benthic food web using red snow crab

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No research has been conducted on benthic food web at depths of more than 800 meters in Toyama Bay and Japan Sea, which is over 1000 meters and 3600m deep respectively. In this study, we analyzed $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ of red snow crab (*Chionoecetes japonicus*, n=60) and starfish (*Crossaster papposus* and *Ctenodiscus crispatus*, n=12) living on the sea floor to investigate the deep-sea benthic food web. These samples were caught in crab baskets at a depth of 800-1200m in Toyama Bay, and the southern area of Yamato Bank. The red snow crab caught in Toyama Bay had significantly higher $\delta^{13}\text{C}$ than those caught elsewhere ($p < 0.01$). This suggests that deep-sea benthic food web in the two areas use different sources of food. Also, the $\delta^{13}\text{C}$ of benthos in Toyama Bay was obviously higher ($p < 0.01$) than that of the surface fish and deep-sea organisms (at a depth of 200-400m) of Toyama Bay, both of which depend on phytoplankton (Otsuka et al., 2016). This suggests that the deep-sea food web in Toyama Bay uses carbon source with higher $\delta^{13}\text{C}$ other than phytoplankton in the surface layer. By the clarifying the factors of the high $\delta^{13}\text{C}$, we expect to understand environment and material dynamics of the deep-sea, which is far to be well known.

Keywords: red snow crab, $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$, deep-sea, Toyama Bay, Japan Sea