BIOLOGICAL COLLECTIONS FROM THE GAKKEL RIDGE, A SLOW-SPREADING RIDGE IN THE HIGH ARCTIC; INVESTIGATING THE TROPHIC ECOLOGY OF NEAR VENT PORIFERA

A Thesis Presented to the Faculty
of
California State University, Stanislaus

In Partial Fulfillment
of the Requirements for the Degree
of Master of Science in Marine Sciences

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December 2008

ABSTRACT

The Gakkel Ridge is an 1800 km long mid-ocean ridge located in the Eurasian Basin of the Arctic Ocean. It reaches 5000m in depth and lies under persistent ice cover. In 1999 evidence of recent volcanic activity was discovered along the ridge, and initial sampling indicated the first deep water hydrothermal activity seen in the Arctic Ocean (Edwards et al., 2001). In 2001 biological samples were collected along the axial rift valley from walls, volcanic cones and ridges (82°59.94'N, 6°19.09'W to 86°7.97'N, 30°23.04'E), in water depths of ~150-5000m. Phyla represented include Sarcomastigophora, Porifera, Cnidaria, Ctenophora, Nemertea, Chaetognatha, Annelida, Mollusca, Arthropoda, and Echinodermata. One organism of interest is an unknown limpet-like gastropod suspected to be a vent or seep inhabitant. Delta ^{13}C and $\delta^{15}N$ isotope analysis performed on the near vent Porifera resulted in values averaging -18 and 11 respectively. Values showed no trends with distance from vents, but with increasing depth sponges became more enriched in $\delta^{13}C$. Delta ^{13}C and $\delta^{15}N$ values of sponges showed grouping by morphology, indicating different feeding abilities and/or food sources. This study has provided the first extensive faunal collection from this area of the Arctic Ocean, as well as a baseline for further stable isotope research of Arctic hydrothermal vents.