

Dominance of One Archaeal Phylotype at a Newly Activated Juan de Fuca Hydrothermal Vent Site

M. Lin, J. A. Baross, and D. S. Kelley*

A study of microbial diversity conducted on 1-year old regrowth from a 300°C black smoker called Finn, from the Endeavour Segment of the Juan de Fuca Ridge, revealed an archaeal community with a very high abundance of deeply-branching Archaea related to Korarchaeota. Fluorescent in situ hybridization analyses indicated that this sulfide and anhydrite-rich chimney contained 23% of Korarchaeota, the highest abundance found in any eco-system (M. Schrenk, 2004). Based on results from Finn, we hypothesized that high-temperature, young sulfide edifices bathed in turbulent mixtures of oxygenated, cold seawater and reduced, high-temperature hydrothermal fluid preferentially enrich for a less diverse community dominated by deeply-branching Archaea. To test this hypothesis, samples were recovered from a young, 280°C chimney from the Sasquatch Hydrothermal Field, also at Endeavour. Similar to Finn, the Sasquatch samples are dominated by anhydrite and very fine-grained sulfide. Analyses of 16s rDNA from Sasquatch indicate that the eubacteria are primarily epsilon-Proteobacteria (92% of 77 sequences). In contrast, hyperthermophilic euryarchaeal sequences are the most abundant archaeal phylotypes. Palaeococcus and Geoglobus each comprise 60% and 23% of 82 archaeal 16s rDNA sequences, respectively. Sequences related to Palaeococcus in Sasquatch samples form a distinct group within all Palaeococcus phylotypes reported previously. Quantitative PCR analyses on the Sasquatch vent samples are ongoing to further characterize the relative abundance of each key group. This work supports the hypothesis that simple communities dominate nascent, vigorously venting chimneys. However, even though recently precipitated sulfide chimneys from Finn and Sasquatch are characterized by similar mineralogy and venting temperatures, the most abundant microbial group within Sasquatch is Palaeococcus, not Korarchaea.

Ongoing comparative analyses of finescale environmental parameters within Finn and Sasquatch are important to reveal what conditions enrich for Korarchaeota, an organism with one of the most ancient lineages on Earth.

**Presenting Author: University of Washington, School of Oceanography Box 357940, Seattle, WA 98115, USA*