Comparison of faunal assemblages by the hydrothermal chimney type at southern Lau back-arc basin revealed by high-resolution video image

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This study was conducted to investigate the community structure and distributional pattern of hydrothermal and adjacent deep-sea fauna at the hydrothermal vent fields of spreading axis and arc of the Lau Basin located the southern part of Tonga islands. Study area are composed two seamount sites with different depth (site A: 450~600 m deep, site B: 800~1300 m deep). Visual surveys were carried out by 34 dives of ROV MAGNUM (RV ARAON) and 12 dives of ROV ROPOS (RV SONNE) using HD video camera and high resolution digital still camera in March 2011 and February 2012. Quantitative samples were collected using the suction sampler and manipulator of ROV. Total 60 deep-sea species including 24 vent species (5 species of cnidaria, 4 species of mollusca, 3 species of annelid, 4 species of arthropoda, 2 species of echinodermata, 1 species hemichordate and 5 species of pisces) were found by analyzing of high definition photographs, video images and identifying of specimens sampled by ROV at 128 chimneys in study sites. There are 4 main types of chimney shape and characteristics (active tall chimney, active dwarf chimney, weak-active flat vent, dead chimney). Three types of faunal assemblages defined by biogenic taxa (a provannid snail, *Aviniconcha* spp. and a sessile mussel, *Bathymodiolus* spp. and a brachyuran crab, *Austinograea* spp.) identified based on high definition photographs and HD video images at active 3 chimneys of hydrothermal fields in the study sites. The differences observed in assemblage and substratum distribution were related to habitat characteristics. Density and diversity of vent fauna were significantly different between two sites. Although two sites are geographically so close, the hydrodynamics and vent geochemical properties of two sites were distinctively different. In comparison with the similarities of this community to other hydrothermal communities on the north Fiji basin, faunal composition were similar in active vents while there are difference in dead chimney community.