Biodiversity and spatial distribution of vent fauna in the hydrothermal fields on the spreading axis of North Fiji Basin based on ROV visual survey

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Deep-sea vent ecosystems have extreme but unique environment which holds diverse and exotic faunas. To examine biodiversity and spatial distribution of vent faunas in regional scale, we explored two areas (KF2 and KF3 (~39 km²)) on the central spreading axis in North Fiji Basin, from November to December 2016. Parts of these areas have been explored previously locating vent community sites named 'White Lady' and 'Mussel Valley'. This study further investigates KF2 and KF3 areas thoroughly, which extends the regions from previously found vent sites by visual inspections. During the ROV surveys by ROPOS, we obtained a total of ~160 hrs of video clips and ~14,000 still images along with specimen samples. In these areas, more than 30 species from active and inactive vent sites were identified and most taxa showed close affinity with nearby Manus and Lau Basins in Southwest Pacific Ocean. Among the observed taxa, several species seemed either unreported from these areas before or new to our knowledge. Species composition between two areas and between the sites within each area differed. Particularly, between sites, species composition varied slightly depending on the activity of a vent, whether it is active, fading, or inactive. Furthermore, we analyzed significant amount of imagery data of active and inactive vent communities in this area revealing Bathymodiolus, Alviniconcha, or Ifremeria sp. dominant assemblages in active sites, and Chrysogorgiidae, Brisingiidae, or Porifera sp. dominant assemblages for inactive sites. These visual survey data with further genetic data would aid the comprehension of North Fiji Basin vent fauna and extend our knowledge on overall biogeography of vent faunas in Western Pacific Ocean.