

Application of Edokko Mark I to biodiversity evaluation of deep-sea megafauna and amphipods at Arnold and Scripps guyots with cobalt-rich ferromanganese crusts in the Northwest Pacific

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To obtain high-resolution images of deep-sea megafauna and compare biodiversity between seamounts with cobalt-rich ferromanganese crusts, we deployed a free-fall deep-sea camera lander known as “Edokko Mark I.” We confirmed 32 taxa including Cnidaria, Annelida, Arthropoda, Echinodermata, and Vertebrata from the Arnold and Scripps guyots (seamounts JA03 and JA17). The community structures of megafauna clearly varied among depths. In addition, we mounted a custom-made cylinder-type baited trap on Edokko Mark I to simultaneously collect deep-sea amphipods, which are diversified group in deep-sea area. We succeeded in collecting many amphipods specimens, likely including several species with different life characters. With these amphipod specimens, DNA barcoding and MOTUs community analysis detected different community structures among depths and seamounts. Our trial with “Edokko Mark I around cobalt-rich ferromanganese crusts demonstrates its potential for facilitating environmental baseline studies and impact assessments in consideration of future deep-sea mining projects.

Keywords: Cobalt-rich ferromanganese crust, Edokko Mark I, megafauna, amphipods