

Characteristics of bottom sediments off Sekisei Coral Reef in the Yaeyama Islands

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Coral reefs are tropic to subtropic coastal ecosystems comprising very diverse organisms. Their community structure is highly controlled by various environmental factors such as water temperature, depth, irradiance, salinity, nutrient level, terrigenous input, and substrate. The geographic and local distribution of reefs is also restricted by these factors. Thus, reefal deposits provide important, high-resolution records of geoscientific events in tropic to subtropic shallow waters, such as vertical and lateral tectonic movements, sea-level fluctuations, paleoclimatic changes, and paleoceanographic variations.

The Ryukyu Islands (Ryukyus) encompass several tens of islands and islets, extending from Tanega-shima Island in the northeast to Yonaguni Island in the southwest. These islands are arranged in a curved row called the Ryukyu Arc, bounded by the East China Sea on the northwest and by the Pacific Ocean on the southeast. The Kuroshio Current (North Pacific Current) represents one of the major western boundary currents in the world ocean. In the Ryukyus, it flows into the East China Sea through the Taiwan Strait, passes northeastward along the Islands, and then bifurcates to the southwest of Yaku-shima Island. The main current changes its direction and exits to the Pacific through Tokara Strait, while the subsidiary current flows northward along Kyushu. This northward-flowing current transports heat and planula of corals from tropics to the Ryukyus and the southern half of mainland Japan. It allows development of reefs with the highly diversified hermatypic coral fauna throughout the Ryukyus although the islands are located at relatively higher latitudes within reef provinces.

About 400 species of hermatypic corals live in the Yaeyama Islands, South Ryukyu Arc, and relatively large reefs such as the Sekisei Coral Reef are developed in this area. Although many studies of Recent coral reefs are present, the studies of transitional zone from reef margin to slope area are few because usable research vessels and ROVs are absent.

In January 2005, the survey using JAMSTEC deep-tow camera system with a newly-developed Deep-sea HDTV video camera (KY05-01) was carried out around the Yaeyama Islands. In this cruise, we got the high-resolution imagery data of organisms and bottom sediments in the upstream and slope of the Kuroshima Submarine Canyon in the south of the Sekisei Coral Reef and in the southeastern slope of the Aragusuku Island. We present mainly the characteristics of bottom sediments.