Quaternary sediment bodies, off northern Amami-o-shima Island: toward the IODP Ryukyu coral reef drilling

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Coral reefs are tropic to subtropic coastal ecosystems comprising very diverse organisms. Their community structure and geographic and local distribution are highly controlled by various environmental factors. In order to clarify relationships between reef formations and geoscientific events, it is necessary to investigate the reef deposits at relatively higher latitudes within reef provinces, because such reefs were considered to be more sensitive to the environmental changes than those in proximal areas. It can be, therefore, considered that the northern or southern limit of reef formation, herein termed the 'coral-reef front', may have migrated to higher and lower latitudes, respectively, responding to Pleistocene global warmings and coolings associated with rapid, cyclic changes in climate and oceanographic conditions and with glacioeustatic sea-level changes. We proposed the drilling plan with the following objectives in the Ryukyu Islands (called COREF Project) to IODP and ICDP: 1) to depict paleoclimatic and paleoceanographic fluctuations in tropic to subtropic shallow-waters in details by reconstructing the coral-reef front migration, 2) how and to what extent the reefs responded rapid environmental changes, and 3) to evaluate a role of coral reefs in a global carbon cycle. In the COREF Project, we will insist that the multiple drillings combined with ocean drilling (IODP) and land boring (ICDP) are the only way to complete our purposes.

We carried out the high-resolution single-channel seismic survey with 28 lines (784 km) around the Tokara Strait, where is the important area for reef formation during Quaternary climatic and oceanographic changes, as the site survey for IODP proposal.

The acoustic basement is commonly exposed in the eastward of Tane-ga-shima Island. The stratified sediment body with 0.3sTWT in thick overlies the acoustic basement in the upper slope to shelf margin of the southward of the Tane-ga-shima and Yaku-shima Islands.

In the northward of the Amami-o-shima Island, the following evidences are recognized:

1) The mound structure, 15 m high and 400 m wide, is present on the shelf and shelf margin of the Amami Spur and the southeastward of the Kikai Island.

2) These mounds overlie the acoustic basement or stratified sediment bodies, and are considered to be coral reefs or banks with coarse-grained bioclasts during LGM or earlier.

In our presentation, we'll show the preliminary results of Quaternary seismic units and the correlation of onland stratigraphy in the Amami-o-shima and the Kikai Islands.