A study on growth history of reef terraces deduced from the U-series method of dating

1998 Fiscal Year Final Research Report Summary

A study on growth history of reef terraces deduced from the U-series method of dating

Research Project

Project/Area Number

08454148

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Grant-in-Aid for Scientific Research (B)

Allocation Type

Single-year Grants

Section

一般

Research Field

Stratigraphy/Paleontology

Research Institution

Kanazawa University

Principal Investigator

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Quaternary / Coral Reef Terrace / Sea Level Change / U-Series dating / Kikai Island / Philippine Islands / Huon Peninsula / Fiji Islands

Research Abstract

The growth history of coral reef terraces at Kikai Island (Ryukyu Islands), Huon Peninsula (Papua New Guinea), Philippine Islands, and Fiji Islands, which were formed during the last several tens of thousands years, has been elucidated by using U-series dates of corals as a time scale. The main results obtained in this study are outlined as follows :

1. As the result of U-series dating and stratigraphic study, coral limestone younger than the isotope stage 5a was sporadically distributed at an altitude of ca. 10 to ca. 65 m in the Kikai Island. Such limestone overlies the fore-reef sediments assigned to stage 3 to 5e. These facts suggest that coral reefs have been formed on the sea floor being successively shallowed with the regression from isotope stage 5e to 3. In contrast, alpha-spectrometric

^<230>Th/^<234>U method was also useful for interpreting the growth history of Holocene coral reef terraces. The Holocene coral limestone at the island began to deposit at ca. 10 ka in water dep th of 5 to 10 m. Then the transgressive and highstand systems tracts were deposited during the times when sea level raised and attained to the maximum height (ca. 12 m) up to ca. 7.5 ka. As lowering of the sea level, the terriginous materials became gradually in short supply and a fringing reef started to grow around 7 ka.
2. A buried coral reef implying that the sea level at the last glacial maximum was 126 m in water depth, was found beneath the outer edge of insular shelf off the Miyako Islands.
3. It was explicated, from U-series dating and oxygen isotopic analysis of late Pleistocene corals at Huon Peninsula, that the rapid rise of sea level at ca. 140 ka has been interrupted at ca. 135-130 ka and restarted after it has been once lowered.
4. The distribution of coral reef terrace formed during the stage 5e was confirmed at Panglao, Bohol, and Mactan Islands. A tidal notch of the stage 5e also occurred at the west side of Palawan Islands. The altitude of those indicators for paleo-shoreline denotes that some areas in the Philippine Islands have not uplifted, even though they are situated in the active margin in the western Pacific region.▲ Less

Research Products (22 results)

All | Other

All | Publications (22 results)

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[Publications] Chappell,John: "Reconciliation of late Quaternary sea levels derived from coral terraces at Huon Peninsula with deep sea oxygen isotopes records." Earth and Planetary Science Letters. 141. 227-236 (1996)

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