Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

MIS27-13 会場:101B 時間:5 月 24 日 14:54-15:09

北大東島における過去 2,500 万年間の堆積・続成史
Sedimentary and diagenetic history of Kita-daito-jima atoll for the last 25 million years

井龍 康文 [1*], 高柳 栄子 [2], 石川 剛志 [3], 永石一弥 [4], 中山 裕樹 [1]
IRYU, Yasufumi[1*], TAKAYANAGI, Hideko[2], ISHIKAWA, Tsuyoshi[3], Kazuya Nagaishi[4], NAKAYAMA, Yuki[1]

[1] 東北大学・院・理, [2] 名古屋大学・院・環境, [3] 海洋研究開発機構, [4] マリン・ワーク・ジャパン
[1]Tohoku Univ., [2]Nagoya Univ., [3]JAMSTEC, [4]Marine Works Japan

An old borehole, 432.7 m deep, drilled in 1934 and 1936 on Kita-daito-jima, northern Philippine Sea, reveals the reef evolution on this island during the Late Oligocene to Miocene. Four depositional units have been defined by lithological changes and are numbered sequentially from the top of the hole downward. The major lithology varies from bioclastic packstone/grainstone (unit C4) to coral rudstone (unit C3) to coral bafflestone (unit C2), implying a gradual shallowing of the lagoon. However, the coral fauna suggests that unit C1, above, formed on a submerged platform. Reef formation on Kita-daito-jima was controlled by the combined effects of sea-level changes and tectonic movements (subsidence and uplift). Two modes of reef formation have been recognized: growth that kept pace with the subsidence of the island; and rapid reef formation that commenced at sea-level falls. The latter indicated that sea-level falls are key events that revived drowned reefs. Dolomites extend in Kita-daito-jima from the island surface to a depth of 100 m below the ground surface (units C1 and C2). X-ray diffraction analysis indicates that the island-surface and borehole dolomites comprise variable mixtures of multiple dolomite crystal phases. Deconvolution of whole-rock isotopic and elemental compositions based on the relative abundance of phases reveals that each phase has a distinct chemical and isotopic composition. Oxygen isotopic compositions of the island surface and borehole dolomites suggest that all dolomite phases formed in seawater.

キーワード: 北大東島, 浅海性炭酸塩岩, ドロマイト, 酸素同位体組成, ストロンチウム同位体組成, 海水ドロマイト化作用
Keywords: Kita-daito-jima, shallow-water carbonate, dolomite, oxygen-isotope composition, strontium-isotope composition, seawater dolomitization