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Cretaceous shallow-water carbonates from the Hahajima Seamount and the Ogasawara Plateau

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The Hahajima Seamount is situated at the junction between the Izu-Bonin and Mariana forearc slopes and is located at a collision area between the forearc slope of the Philippine Sea Plate and the Ogasawara Plateau on the Pacific Plate. Shallow-water carbonates were recovered from the eastern slope of this seamount. Five seamounts (Katayama, Hanzawa, Yabe, Higashi, and Minami Seamounts), which are capped with thick sequences of shallow-water carbonates, are located on the Ogasawara Plateau.
The shallow-water carbonates on the Hahajima Seamount and the Ogasawara Plateau are similar in lithology and age. They are dominated by molluscan floatstone/rudstone with common intraclasts. Gravel-sized bioclasts include molluscs (e.g., Nerinea sp. and rudists) and, locally, calcareous sponges and minor amounts of coral. Sand-sized components include bioclasts of benthic foraminifers and dasycladacean algae and non-skeletal grains of intraclasts and peloids, generally with few ooids. Most of the bioclasts are bored and micritized and frequently have thick micrite envelopes. Their Sr isotope ages fall into two ranges, 112.3-113.6 Ma (Aptian) and 76.4-8 8.7 Ma (Coniacian to Campanian). These similarities in lithology and Sr isotope ages, as well as the limited occurrence of carbonates on the Hahajima Seamount, suggest that they were not deposited in situ but originated from the Ogasawara Plateau. The extensive bioerosion may indicate that a relatively high nutrient level existed in the tropical shallow marine environment during the Cretaceous.
The current reconstruction of plate motion based on magnetic anomalies of the ocean floors suggests that the oceanic crust on which the Ogasawara Plateau lies formed in the late Jurassic (about 153 Ma) at 20 degrees south latitude. Then, the plateau moved west-northwestward until 1 00 Ma, when carbonate platforms formed at about 15 degrees south latitude (Aptian). Subsequently, the plate moved north-northeastward from about 100-90 Ma (Albian-Turonian) and northward/ north-northwestward from about 90-80 Ma (Turonian-Campanian), during which time carbonate platforms extended from about 4-13 degrees north latitude on the plateau (Coniacian to Campanian).

Keywords: Hahajima Seamount, Ogasawara Plateau, shallow-water carbonate, Sr isotope age, Cretaceous