

Plio-Pleistocene stratigraphy and sedimentary environment in the Motobu Peninsula, Okinawa Islands

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The Plio-Pleistocene in Okinawa Islands is generally divided into the Pliocene Shimajiri Group and the Middle to Upper Pleistocene Ryukyu Group. The Shimajiri Group is considered to be deposited in deep to shallow sea environment, on the other hand the Ryukyu Group to be mainly deposited in coral reef in the south and in the shallow sea to fluvial environment in the north. However, many subjects have left far stratigraphically and sedimentologically in their sediments. Especially, there are many unclear points by stratigraphical relationship between the calcareous and clastic sediment, and by sedimentation process of the Ryukyu group. We have investigated the stratigraphy and sedimentary process of the Plio-Pleistocene series mainly consisting of non-calcareous clastic rock and partly accompanying with limestone in the base of Motobu Peninsula in the central Okinawa Islands. In this report, we report the stratigraphy, TL ages, and sedimentary facies of the Shimajiri and Ryukyu groups in this area.

Basement rocks mainly consist of phyllite, sandstone, and mudstone, and partly of limestone. It belong to the Motobu and Nago formations of the Kunigami Group, Shimanto Supergroup. The Goga Formation, Shimajiri Group overlying unconformably the basement rocks, is over than 60 m in thickness, and divided into lower Kogachi and upper Oyakawa members. The Kogachi Member mainly consists of alternated beds of pebbly gravel and bluish gray silt. Gravel layers include breccias of phyllite, and silt layers include carbonaceous materials. The TL dating of volcanic ash observed locally in Kogachi, Nago City indicated 1.68Ma, although FT age by H. Ohira (Shimane Univ.) is 2.14 Ma. The Oyakawa Member is mainly composed of alternated beds of pebbly gravel and brown silt. The black bands are intercalated in common within the brown silt.

Ryukyuu Group, 60 m in total thickness, covers unconformably the basement rocks and Shimajiri Group, and mainly consists of clastic sediments and partly of limestone. It is divided into three formations, that is, Nakaoji, Nakayama, and Okita formations in ascending order. Each formation covers unconformably the lower ones. The Nakaoji Formation is 15 m in thickness, and mainly consists of gravel and calcareous sandy gravel, and accompanies limestone in the top horizon. The Nakayama Formation (the Middle Terrace deposits) is 20 m in maximum thickness, and mainly consists of fluvial sandy gravel, partly of well-sorted calcareous sand. The Okita Formation (the Lower Terrace deposits) is 40 m in maximum thickness, and mainly composed of fluvial gravel, sandy gravel, and marine sand, and partly of limestone in the top horizon. Quartz grains from Okita Formation in Hara, Nago City, showed the TL ages of 0.59, 0.51. and 0.45 Ma.

The sedimentary facies and facies associations of Shimajiri and Ryukyuu groups were investigated. Three sedimentary systems were identified in them, that is, the braided river, estuary, and coral reef systems. Their temporal and spatial distribution shows the sequence from low-stand to transgressive processes.