

A new model to explain the enigmatic occurrence of fossil vertebrates in Miyako-jima, Ryukyu Islands

*Nana Watanabe¹, Kohsaku Arai², Hidetoshi Ota^{3,4}, Yasufumi Iryu¹

1. Department of Earth Science, Faculty of Science, Tohoku University, 2. The Research Institute of Geology and Geoinformation, Geological Survey of Japan, 3. Institute of Natural and Environmental Sciences, University of Hyogo, 4. Museum of Nature and Human Activities

The Ryukyu Islands are situated to the southwest of mainland Japan and encompass approximately 200 islands and islets, extending from Tane-ga-shima in the northeast to Yonaguni-jima in the southwest. The islands are located in the subtropical climate zone and mostly rimmed by fringing reefs. The fauna and flora of the islands are characterized by many endemic species and those whose closest phylogenetic relatives are found in Southeast Asia.

Fossil vertebrates commonly occur from sediments infilling cavities and fissures in limestones of the main body of the Ryukyu Group (>0.4 Ma), Pleistocene coral-reef and associated shallow lagoon and fore-reef to island shelf deposits. The fossil vertebrates include amphibians and reptiles that have no ability to cross the sea and common in present Okinawa-jima, including a famous poisonous snake *Protobothrops flavoviridis*. It is obvious that these amphibians and reptiles migrated from Okinawa-jima to Miyako-jima after the deposition of the Ryukyu Group (<0.4 Ma). However, Miyako-jima is 290 km apart from Okinawa-jima and there are no island and islets between the two islands. We present a new model to resolve this enigma based on biogeographic history of the amphibians and reptiles with limited migration ability as well as land and marine geology of the Central and South Ryukyus.

Keywords: Ryukyu Islands, Cenozoic, Paleogeography, Biogeography, Vertebrate, Kerama Gap