

ルソン海峡および琉球列島における完新世のローカル海洋リザーバー年代変動

Local marine reservoir age variability at Luzon Strait and Ryukyu Islands during the Holocene

*平林 頌子^{1,2,3}、横山 祐典^{2,3}、鈴木 淳⁴、Tezer Esat⁵、宮入 陽介²、阿瀬 貴博²、Fernando Siringan⁶、前田 保夫⁷、菅 浩伸¹

*Shoko Hirabayashi^{1,2,3}, Yusuke Yokoyama^{2,3}, Atsushi Suzuki⁴, Tezer Esat⁵, Yosuke Miyairi², Takahiro AZE², Fernando Siringan⁶, Yasuo Maeda⁷, Hironobu Kan¹

1. 九州大学大学院比較社会文化研究院、2. 東京大学大気海洋研究所、3. 東京大学大学院理学系研究科、4. 産業技術総合研究所、5. オーストラリア国立大学、6. フィリピン大学、7. 兵庫大学

1. Graduate School of Social and Cultural Studies, Kyushu University, 2. Atmosphere and Ocean Research Institute The University of Tokyo, 3. Department of Earth and Planetary Science, Graduate School of Science, The University of Tokyo, 4. Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology (AIST), 5. Research School of Physics and Engineering, The Australian National University, 6. Marine Science Institute, University of the Philippines, 7. Institute of Natural and Environmental Sciences, University of Hyogo

The local marine reservoir age (ΔR) varies not only spatially, but also temporally because of changes in ocean circulation associated with climatic changes. Holocene ΔR values have mainly been reported from the South Pacific, while only a few spatio-temporal reconstructions of ΔR have been published in the western Pacific. Present day, short term variations in ΔR at the Ryukyu Islands, South Japan, were previously associated with variability in the El Nino-Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO). Further studies will better delineate this connection and establish the magnitude of the variability in ΔR in the western Pacific.

In this study, we measured high-resolution radiocarbon(¹⁴C) ages and U/Th dates obtained from fossil corals on Luzon Island in the South China Sea (SCS) and Kikai and Kodakara Islands in Ryukyu Island Chain during the Holocene. A large ΔR variability of ~400 years was recorded at both Luzon Island and the Ryukyu Islands for the last 6000 years. An abrupt ΔR shift occurred between 5.5 ka BP and 4.0 ka BP in the northwest Pacific. Compared with the previously reported data from the Tropical East Pacific and Great Barrier reef, the timing of the shift was different because the ¹⁴C content of the northwestern Pacific was affected by not only the intensity of upwelling at the Peru-Chile coast, but also by the East Asian monsoon.

This variability influences the calibration of local marine reservoir effect significantly when calibrating ¹⁴C ages to calendar ages. High-resolution ¹⁴C dating of marine samples became possible over the years, raising the need and importance of ΔR values to be reconsidered in high-resolution for different time periods.

Reference:

Hirabayashi et al. (2019) Local marine reservoir age variability at Luzon Strait in the South China Sea during the Holocene, *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions*

with Materials and Atoms, in press.

キーワード : U/Th年代測定、放射性炭素年代測定、ローカル海洋リザーバー年代、サンゴ
Keywords: U/Th dating, Radiocarbon dating, Local marine reservoir age, Corals