

Radiocarbon Variability Recorded in Coral from Kikai Island to Understand Oceanography in the North Pacific Region

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Atmospheric radiocarbon (^{14}C) rapidly increased after 1955 because of the nuclear test. This artificial ^{14}C called bomb- ^{14}C is diffused into the surface ocean and taken up by coral skeletons from ambient seawater. However, the deep ocean is isolated from direct CO_2 exchange from the atmosphere. Therefore, bomb- ^{14}C in coral can be used as a very sensitive indicator of vertical and horizontal advection of water masses, which contributes to the understanding of ocean circulation [1].

In this study, a challenge has made with a high vacuum gas treatment line that specially designed for small quantity of samples (ca. 100 $\mu\text{g C}$). This experiment is aiming at obtaining seasonal-resolution ^{14}C data between 1940 and 1990 using the coral obtained from Kikai Island and revealing physical oceanographic information around Kuroshio region. The age model was based on high resolution Sr/Ca data determined by Kawakubo et al. (2017) [2].

At present, the contamination level during experimental steps of our method has been confirmed to be relatively low and constant by several repeated tests using standard samples distributed from International Atomic Energy Agency (IAEA). Besides, samples from the top part of coral corresponding to summer and winter shown by peaks of Sr/Ca data after 1975 has been measured. The trend and value of current bomb curve are similar to previous studies in Kikai Island and at other sampling sites in the Pacific, which proves the reliability of our data in high confidence. In this presentation, we will show the ^{14}C results and discuss the oceanographic implications inferred from the data.

[1] Hirabayashi, S., Yokoyama, Y., Suzuki, A., Miyairi, Y., Aze, T., Siringan, F., & Maeda, Y. (2019). Insight into Western Pacific Circulation from South China Sea Coral Skeletal Radiocarbon. *Radiocarbon*, 61(6), 1923-1937.

[2] Kawakubo, Y., Alibert, C., & Yokoyama, Y. (2017). A reconstruction of subtropical western North Pacific SST variability back to 1578, based on a *Porites* Coral Sr/Ca record from the northern Ryukyus, Japan. *Paleoceanography*, 32, 1352– 1370.