

Possibility of the stable carbon isotope stratigraphy of planktonic foraminifera: case study of a sediment core at the Manihiki Plateau in the central Pacific

*MISAKI URAKAMI¹, Takuya Sagawa², Yoshimi Kubota³

1. Graduate School of Natural Science and Technology, Kanazawa University, 2. Institute of Science and Engineering, Kanazawa University, 3. National Museum of Nature and Science

Deep-sea sediment cores are dated using magnetostratigraphy, biostratigraphy, and oxygen isotope ($\delta^{18}\text{O}$) stratigraphy. Although the $\delta^{18}\text{O}$ stratigraphy does not give the absolute age, it provides orbital-scale age constraints by correlating the glacial-interglacial (G-IG) changes to a standard curve, which allows for much higher resolution compared to magnetostratigraphy and biostratigraphy. However, the $\delta^{18}\text{O}$ stratigraphy may not work when sedimentation rate is low. Sediments with low sedimentation rate are strongly affected by bioturbation, which smooths the $\delta^{18}\text{O}$ variations, making it difficult to identify the Marine oxygen Isotope Stages (MIS). In particular, the identification of MIS before 800 ka will be very difficult due to the smaller amplitude and higher-frequency (41 kyr) of the G-IG cycles compared to the later 100 kyr cycles with larger amplitude.

We constructed an integrated stratigraphy of a low sedimentation rate core at the central tropical Pacific Manihiki Plateau, KR99-12 PC05, for the last 2.2 Ma using magnetostratigraphy, planktonic foraminiferal biostratigraphy and planktonic foraminiferal $\delta^{18}\text{O}$ stratigraphy. Because benthic foraminifera are very rare in PC05, we use *Globigerinoides ruber* (sensu stricto) for the $\delta^{18}\text{O}$ analysis. The $\delta^{18}\text{O}$ shows clear G-IG variations for the past 800 kyr, but the amplitude of $\delta^{18}\text{O}$ was too small to capture MIS in earlier intervals. Therefore, there are few $\delta^{18}\text{O}$ age constraints in the 0.8-2.2 Ma interval. On the other hand, the stable carbon isotope ratios ($\delta^{13}\text{C}$) show a clear G-IG variation, the pattern of which is very similar to that in the western tropical Pacific IODP Site U1488, but with smaller amplitude. In this presentation, we will discuss the possibility of stratigraphic correlation between PC05 and U1488 based on $\delta^{13}\text{C}$ of planktonic foraminifera.

Keywords: planktonic foraminifera, tropical Pacific, Manihiki Plateau