

## Ultra-high temporal resolution foraminiferal isotope records during MIS 19 from the Chiba composite section

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The orbital configuration during Marine Isotope Stage (MIS) 19 are characterized by a weak eccentricity-precession forcing and an obliquity maximum associated with a precession minimum as well as MIS 1, although the both absolute values of obliquity are different (Tzedakis, 2010; Tzedakis et al., 2012). Thus, MIS 19c, one of the sub-stages during MIS 19, is assumed as the best analogue for the present interglacial suggesting the timing of the next glacial inception in the future when the anthropogenic influences are excluded.

Here, we report foraminiferal stable oxygen and carbon isotopic records from the 115 m stratigraphic interval from the Kukomoto Formation, Kazusa Group including the Chiba composite section. Siltstone samples were obtained from 345 horizons with 10-50 cm stratigraphic spacing. We carried out stable oxygen and carbon isotopic analyses by using benthic foraminifers, *Bolivinita quadrilatera*, and *Cibicides* spp., and planktic foraminifers, *Globigerina bulloides*, and *Globorotalia inflata*. Stable isotope measurements were performed by a Finnigan-MAT253 Isotope mass spectrometer coupled with a Kiel IV carbonate preparation device installed at the Department of Geology and Paleontology, National Museum of Nature and Science. In order to develop age models, the resultant  $\delta^{18}\text{O}_{\text{benthic}}$  curves were correlated to  $\text{GL}_T\text{-syn}$  curve, which is an 800-kyr synthetic record of Greenland climate variability based on the thermal bipolar seesaw model (Barker et al., 2011).

We carried out the spectral analysis to sub-orbital variabilities of oxygen and carbon isotope records. The results, except for  $\delta^{13}\text{C}_{\text{G. bulloides}}$  curve, shows that a 3.4-kyr frequency associated with the largest amplitude between 770 and 755 ka was detected. This may be attributable to variability of sea surface temperature and bottom water mass.

Keywords: Chiba composite section, MIS 19, Oxygen isotope, Carbon isotope