

Reconstruction of paleoceanographic environment using planktonic foraminifera fossils from the Mera Formation of the Chikura Group distributed in the southern most part of the Boso Peninsula

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The Mera Formation of the Chikura Group, distributed in the southern most part of the Boso Peninsula, is thought to be deposited during from the late Pliocene to the Early Pleistocene including the Northern Hemisphere Glaciation (NHG) onset time (Kotake et al., 1995). Because the Boso Peninsula faces the Kuroshio-Oyashio convergent area, the Chikura Group seems to have sensitively recorded paleoceanographic variations during the time. The aim of this study is to reconstruct the paleoceanographic environment off the Boso Peninsula during the onset time of NHG by assemblage analyses of planktonic foraminifera fossils and paleotemperature estimation using a transfer function method.

In this study, we used rock samples taken from 40 horizons in a succession at the middle part of the Chikura Group which corresponds to a period of 2.30-3.14 Ma defined by Tokoro et al. (2011) and Okada et al. (2012). We have extracted foraminiferal tests from collected rock samples by the sodium sulfate method, and identified a total of 10 genera 27 species of planktonic foraminifera fossils.

We reconstructed an influence of water mass from geographical zones (Arctic, Subarctic, Transition, Subtropical, Tropical), which are regulated by the water temperatures, deduced by a characteristic species assemblage observed at the each zone.

In addition, we performed a principal component analysis on the identified planktonic foraminiferal assemblage data to estimate water mass contribution and quantitative reconstruction of water temperature based on the method using factor loadings and a transfer function proposed by Takemoto and Oda (1997). As the result, we estimated that the cause of cooling at 3.1-3.0 Ma was by the influence of a cold water mass or the Tsugaru current, cooling at 2.7-2.5 Ma was by a domination of the Oyashio current, and warming at 2.5-2.3Ma was by the weakening of the Kuroshio current.