上総層群国本層のマツヤマーブリュンヌ境界付近の高分解能石灰質ナノ化石層序

A high-resolution biostratigraphy of calcareous nannofossils around the Matuyama-Brunhes boundary in the Kokumoto Formation, Kazusa Group, in the Boso Peninsula, central Japan

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The middle part of the Kokumoto Formation in the Kazusa Group, exposed in the Chiba composite section (along the Yoro River and its nearby areas), is a candidate for the GSSP (Global Stratotype Section and Point) of the lower/middle Pleistocene boundary. This section has been studied in order to establish standard chronostratigraphy and clarify environmental changes around the Matuyama-Bruhnes geomagnetic boundary (MBB) based on microfossil biostratigraphies, magnetostratigraphy and chemostratigraphy (e.g., Suganuma et al., 2015; Okada et al., 2017; Haneda et al., 2016, 2017). Among recent investigations, marine microfossils have been utilized because the Kazusa Group, including the Kokumoto Formation, contains abundant and various kinds of calcareous and siliceous microfossils. This study summarizes calcareous nannofossil biostratigraphy of the Kazusa Group based on pioneer studies (Sato et al., 1988; Tsuji et al., 2005) and recent higher-resolution biostratigraphic data. Then, we focus on calcareous nannofossils of the Kokumoto Formation in the Chiba composite section (Kameo et al., 2017a, b) with some new additional assemblage data and discuss sea-surface environmental changes around the Matuyama-Bruhnes boundary in the Pacific side of Japan.

Based on biostratigraphic results of the Kokumoto Formation in the Chiba composite section, it is slightly difficult to find clear bioevents because of the lack of apparent disappearances and/or appearances of any nannofossil species. However, a possible biohorizon composed of the re-appearance of larger *Gephyrocapsa* specimens was recognized below the MBB (Kameo et al., 2017b). This event may correspond to the base of occurrence of *Gephyrocapsa* sp. C (Matsuoka and Okada, 1990) and/or of *Gephyrocapsa* sp. 3 (Rio et al., 1982) but these specimens in the section are slightly larger than those of *Gephyrocapsa* sp. C and/or *Gephyrocapsa* sp. 3.

Floral changes of calcareous nannofossils as surface water indicators are characteristically observed in the Chiba composite section. *Florisphaera profunda*, indicating warm, pelagic and stratified surface water conditions (Ahagon et al., 1993), gradually increased above the boundary of MIS 20/19. It suggests that warm and open ocean waters may strongly affect during MIS 19. The northward shift of the Kuroshio front, however, was possibly earlier because *Umbilicosphaera sibogae*, a warm Kuroshio water indicator (Tanaka, 1991), became suddenly abundant after 790 ka, prior to increasing of *F. profunda*. Other environmental indicators, a possible cool and upwelling indicator *Coccolithus pelagicus braarudii* (e.g., Parente et al., 2004) and an offshore dweller *Calcidicus leptoporus* (Tanaka, 1991), are also found characteristically and their occurrences may relate to sea-surface environmental changes.

References

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