

Mid-Cretaceous Paleooceanographic change in Northwest Pacific based on benthic foraminiferal assemblage.

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Mid-Cretaceous period is characterized by significant global warming and frequent occurrences of Oceanic Anoxic Events. Although numerous studies of the mid-Cretaceous paleoceanographic changes have been conducted in the sections of the Atlantic Ocean and Tethyan Sea, little is known in the Pacific Ocean. In order to understand paleoceanographic changes during mid-Cretaceous in the Pacific Ocean, we studied benthic foraminiferal assemblages of the Yezo Group.

The Yezo Group is a coherent submarine sequences deposited in the Northwestern Pacific margin. The age of this strata is well constrained by macro-, micro-fossils as well as osmium- and carbon isotope stratigraphies (e.g., Du Vivier et al., 2015). We analyzed benthic foraminiferal assemblages of the Upper Albian–Lower Campanian intervals of the Yezo Group in order to detect the paleo-oceanographic and paleo-environmental changes in the Northwest Pacific.

1) Establishment of benthic foraminiferal zones.

Based on benthic foraminiferal assemblages, we divided the Yezo Group into following seven benthic foraminiferal zones; *Globorotalites* sp. A assemblage zone, *Textularia hikagezawaensis*–*Silicosigmoilina futabaensis* interval zone, *S. futabaensis*–*Nuttalinella florealis* interval zone, *N. florealis*–*Stilostomella stephensoni* interval zone, *S. stephensoni* interval zone and *Karrerulina hokkaidoana*–*S. futabaensis* assemblage zone. These zones are traceable throughout Hokkaido.

2) Paleo-depth changes

Based on paleodepth index species of the benthic foraminifera proposed by Sliter and Baker (1972) and Koutsoukos and Hart (1990), we inferred paleodepth changes in the Yezo Group. The depth of the Yezo Group ranges from about 150m to 1500m during the studied interval. The long term trend shows that the Yezo Basin deepened from Late Albian to Early Turonian, and then shallows toward Campanian. Short-term shallowing events were identified in the Albian/Cenomanian boundary, Mid-Cenomanian Event and around the Santonian/Campanian boundary.

3) Changes in dissolved oxygen level

According to oxygen index species of benthic foraminifera (Kaiho, 1994), we recognized change in dissolved oxygen in the studied interval. Low oxygen environment occurred around the OAE1d, Albian/Cenomanian boundary and Cenomanian/Turonian boundary in the Yezo Group. On the other hand, Late Cenomanian and Coniacian-Santonian interval is characterized by highly oxic environment.

References

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