

Paleocene to Eocene calcareous nannofossil zonation in the western Tarim Basin, Central Asia

Dangpeng Xi

China University of Geosciences, State Key Laboratory of Biogeology and Environmental Geology, Beijing, 100083, China; xdp1121@163.com

Xuejiao Wang, Dan Liu, Xiaoqiao Wan

China University of Geosciences, State Key Laboratory of Biogeology and Environmental Geology, Beijing, 100083, China;

xuejiaowang410@hotmail.com, ld2276088@163.com, wanxq@cugb.edu.cn

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The western Tarim Basin, which is located between the Tianshan Mountains and the Kunlun Mountains of Central Asia, was covered by the shallow, epicontinental, northeastern part of the Tethys Sea from the Late Cretaceous to Eocene. According to previous studies, marine sediments containing calcareous nannofossils are found in the Paleogene Qimugen, Kalataer, Wulagen, and Bashibulake Formations. In this study, calcareous nannofossil assemblages from four sections (Bashibulake, Kuzigongsu, Simuhana, and Aertashi) were correlated to discuss the biostratigraphy in the western Tarim Basin. The Qimugen Formation is placed in nannofossil Zones NP7–10 (Thanetian to Ypresian) in the Tianshan Mountain area, in which the first occurrences of *Heliolithus riedelii*, *Discoaster multiradiatus*, and *Rhomboaster/Discoaster* (RD) assemblages (namely, *Discoaster araneus* group and *Rhomboaster* spp.) have been recorded. The Paleocene–Eocene Thermal Maximum (PETM) is well defined by the RD assemblages in the western Tarim Basin. The top of the Qimugen Formation is placed in Zones NP10–11 (Ypresian) as identified by the last common occurrence of *Discoaster multiradiatus* in the Tianshan Mountains region. In the Kunlun Mountains area, the Qimugen Formation is placed in Subzones NP9a and NP9b based on the first occurrence of *D. multiradiatus* and the *D. araneus* group in the Aertashi section. The Kalataer and Wulagen Formations are placed in Zones CNE12–13 (Lutetian) based on the occurrences of *Nannotetrina* spp., *Discoaster bifax*, *Reticulofenestra umbilicus*, *Criboecentrum reticulatum*, and *Chiasmolithus solitus* in the Tianshan Mountains area. In the Kunlun Mountains area, by analyzing the extension of the co-occurrence of *R. umbilicus* and *C. solitus* in the Aertashi section, the calcareous nannofossil layer in the Wulagen Formation is placed in Zone NP16 (late Lutetian to Bartonian). The middle part of the Bashibulake Formation is placed in Zone CNE17 (Bartonian/Priabonian) based on the common occurrence of *Criboecentrum erbae*.