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Late Quaternary climate and sedimentary history derived from n-alkanes and bulk organic carbon analyses in Fujian coast, China

XIAOYUN LI and YONGQIANG ZONG

Department of Earth Science, The University of Hong Kong, Hong Kong (lixiaoyunxenia@gmail.com)

Marine Isotope Stage 5 (MIS 5) is an important period for paleoclimate study due to its similarity in climate conditions to the present interglacial period. In this study, a 52 m long borehole was drilled in a coastal embayment of Fujian, China, within which a thick marine layer from 16.05 to 32.60 m deposited during the MIS 5 is found. Bulk organic geochemical analyses, containing total carbon content, carbon isotope ratio and n-alkanes, were analyzed for the Late Quaternary layers. The organic carbon isotope ratios (δ13C) of the sediment layers vary between -22.1‰ and -32.9‰ with higher values in the two marine sequences and lower in the two terrestrial sequences. In the MIS 5 sequence, the δ13C was relatively stable, and it became gradually enriched from the base upwards and depleted rapidly at the top, indicating a full cycle of marine transgression and regression. The n-alkanes exhibit a similar trend, with several indexes (carbon preference index, proportion of aquatic carbon, terrestrial-aquatic ratio and long chains verse short chains) showing a gradual increase in marine organic carbon input throughout the MIS 5 sequence and a sharp return to terrestrial conditions at the end of MIS 5. This result suggests the control of sea-level change in the sedimentary processes. Further analysis on sea surface temperature will show how close temperature change with the rise and fall of sea level.