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Campanian-Maastrichtian paleotemperature and paleodepth changes along Tethyan transect, North Sinai, Egypt

Hatem F. Hassan[*] and Magdy S. Nassif[**]

[*]Geology Department, Faculty of Science, Port Said University, Port Said, Egypt.

[**]Geology Department, Faculty of Science, Suez Canal University, Ismailia, Egypt.

ABSTRACT

Planktic foraminiferal analyses of the Campanian-Maastrichtian sediments from four sections a long a Tethyan transect in north Sinai, enabled to recognize twelve planktic foraminiferal zones and subzones ranges from CF11 to CF1, in addition to *Globotruncanita elevata* Zone. The planktic morphotypes were basically subdivided into three groups, Deep taxa (DT), Surface taxa (ST) and subsurface e Taxa (SsT) to provide insights into paleotemperature changes. Q-mode cluster analysis as well as the relative dominance of planktic groups revealed the recognition of long term warming in the Campanian with warmest interval in *Globotruncana ventricosa*. Whereas minor cold events intervened at 80, 78.4, 75.4, 73.6 and particularly at 72 Ma indicates the Campanian/Maastrichtian boundary. The Maastrichtian (CF7-CF1) were characterized by successive warm-cool intervals superimposed on long term cooling, the late Maastrichtian (CF3-CF1) in particular, is characterized by alternate warm cold interval, where the last event was cooling, prior to K/T boundary. The Campanian- Maastrichtian paleodepth in North Sinai indicate that the cooling event much consistent with regression phases and equivalent to global eustasy whereas, the warm interval is consistent with the transgression phases. It is concluded that the late Maastrichtian was much controlled with local tectonics since CF3 and prior the K/T boundary.

Keyword; Campanian- Maastrichtian; planktic morphotypes; paleodepth; paleotemperature; North Sinai; Egypt.

1. Introduction

Planktic foraminifera form the basis of many marine biostratigraphic zonations in the Cretaceous and Tertiary intervals (e.g., Caron, 1985; Bralower et al., 1995). The evolution of planktic foraminifera from the Turonian to the Maastrichtian were characterized by an increasing richness of species and morphological complexity (Hart, 1999; Premoli Silva and Sliter, 1999). Paleotemperature analysis encountered two approaches, the isotopic ratios analyses (O and C) have updated Mesozoic and Cenozoic paleoclimatology and paleoceanography (Barrera and Huber, 1990; Barrera, 1994; Barrera et al., 1997; and Li and Keller, 1998a; Clarke and Jenkyns, 1999 and Huber et al., 2002). Caron and Homewood (1983) and