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Benthonic foraminiferal biostratigraphy and faunal turnover events during the Late Paleocene-Early Eocene at Darb Gaga, Western Desert, Egypt: Paleoenvironmental and sequence stratigraphic interpretations

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Abstract

The present study depends on qualitative and quantitative analyses for the Late Paleocene-Early Eocene benthonic foraminifera at Darb Gaga area, Baris Oasis, Western Desert, Egypt. The study Late Paleocene-Early Eocene succession consists of two rock units; Esna Formation at base and Thebes Formation (lowermost part) at top. Esna Formation is subdivided into four members stratigraphically arranged as follow: El Hanadi, Dababiya Quarry, Darb Gaga and Abu Had. Dababiya Quarry Member (marker of the P/E boundary) is characterized by the occurrence of glauconitic grains at the base confirming a minor hiatus at the P/E boundary. This hiatus led to the missing of the beds no. 1 & 2 of the five beds (lowermost part) of Dababiya Quarry Member. Four benthonic foraminiferal events are defined during the Late Paleocene-Early Eocene interval. The first one is global event at the Paleocene/Eocene (P/E) boundary, and the remainder events are local and define during the Ypresian (Early Eocene). The first event is characterized by a rapid extinction and abrupt faunal changes for the benthonic foraminiferal assemblages. This event led to the extinction of about 80 % of the Paleocene foraminiferal taxa. About 72% of these taxa are temporarily extinct and reappeared soon. This event is characterized by carbonate dissolution which suggesting oxygen deficiency of oceanic bottom waters and food supply changes. Afterwards, a recovery phase of the benthonic foraminifers is directly recorded above this event and probably due to improved depositional environmental conditions. Quantitative analyses of benthonic foraminiferal assemblages at Darb Gaga section, suggest an outer shelf paleoenvironmental setting during the deposition of El Hanadi, Dababiya Quarry and Darb

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