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Abstract

The current paper provides a high resolution sequence stratigraphic study of the Raha Formation from the productive Bakr Oil Field, central Gulf of Suez, Egypt. Sixty cutting rock samples spanning the Cenomanian from three wells (Bakr-114, B-115 and B-109) in the Bakr Basin, were palynologically investigated. The documented palynomorphs assemblage of either terrestrially-derived sporomorphs or marine inhabited dinocysts, allowed two palynological zones as well as their encompassing depositional palaeoenvironment to be recognized. These zones are *Afropollis jardinus–Crybelosporites pannuceus* Assemblage Zone (early-middle Cenomanian) and *Classopollis brasiliensis-Tricolpites sagax* Assemblage Zone (late Cenomanian). Detailed analysis of the particulate organic matter compositions suggested that the depositional palaeoenvironment of the Raha Formation was fluctuating between supratidal and distal-inner neritic conditions, due to successive oscillations of the Neo-Tethyan Ocean during the Cenomanian.

The pronounced peaks of particulate organic matter versus gamma ray are markedly used in delineating the depositional sequences of the Raha Formation and their bounding surfaces. The Raha Formation probably corresponds to a second-order depositional sequence, which can be further subdivided into eight third-order depositional sequences, of which six are complete and two are incomplete ones. These depositional sequences are significantly synchronized based on a simple 2-D correlation model between the three wells. According to the hierarchical duration system, the Cenomanian herein was approximately attributed to 6 Myr, each of which has lower order depositional sequences that took approximately 0.9 Myr. Based on the sequence stratigraphic approach together with palynofacies analysis and gamma ray data, a condensed section was defined in the B-115.

Key words