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# Facies architecture and sequence development of the Euphrates formation in western Iraq

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Abstract The Euphrates formation is widely exposed in western Iraq near Al-Qaim area. It extends eastward parallel to the Euphrates River on both sides, crossing Anah, Hadetha, and Al- Baghdadi vicinities. Based on the benthic foraminiferal assemblages and microfacies features, 12 different microfacies types have been recognized into two Stratigraphic sections that are lime mudstone, wackestone, bioclastic wackestone, miliolids wackestone, alveolinids wackestone, packstone, bioclastic packstone, peloidal packstone, miliolids packstone, peneroplids packstone, rotaliids packstone, grainstone, peloidal grainstone, oolitic grainstone, and miliolids grainstone. Accordingly, the depositional environments were recognized on the basis of microfacies identification and interpretation ranging from restricted marine, shoal, to open marine environments. The exposed Euphrates succession is represented by four fourth-order cycles (A, B, C, and D); they are mostly asymmetrical showing slightly lateral variation in thickness and symmetry. These cycles represent a succession episode of sea level rises and stillstands. The nature of these cycles reflects variation in the relative sea level resulted from eustatic and tectonic subsidence. Cycle A is underlain by SB1 of Sheik Alas formation in Al-Baghdadi section and by Anah formation in Wadi Hjar section. Cycle D is overlain by SB1 of Fatha formation in Al-Baghdadi section and by conformable contact of Nfayil formation in Wadi Hjar section. According to sequence development, the study area shows low rate of subsidence and the major controlling factor that affects eustatic sea level fluctuation.

Keywords Facies architecture sequences development . Microfacies analysis . Euphrates formation . Iraq