

**Abstract** The Komombo Basin is a recently discovered mixed nonmarine-marine, petroliferous basin of Cretaceous age in South Egypt. It is an asymmetrical half graben, synchronous with the Neothys opening and filled with up to 4 km of continental to open marine strata ranging from Early to Late Cretaceous. Despite its great relevance, no detailed sedimentological study concerning this basin has been carried out to date. Here, we present an integrated approach to the borehole and core data, as well as unique outcrop sections to construct a new detailed sedimentological interpretation on depositional systems, controls on basin evolution, basin configuration and regional tectonic setting. Seven depositional systems were recognized: (I) a fluvial fan system, (II) a braidplain system, (III) a siliciclastic lacustrine system, (IV) a lacustrine/lagoonal system, (V) a fluvial-estuarine system, (VI) a tidally affected delta, and (VII) an open marine system. The Komombo Basin evolution can be compartmentalized into three main rifting phases: the Berriasian–Early Barremian, Late Barremian, and Aptian–Albian. The first and third rifting phases are comparable with the rifting phases reported for several basins in North and Central Africa. The second rifting phase represents a transitional event between the other two phases. The first three depositional systems consist mainly of continental siliciclastics and are dominant in the Berriasian–Early Barremian and Late Barremian rifting phases. The lacustrine/lagoon and fluvial-estuarine systems correspond to the Aptian–Albian rifting phase, while the Campanian–Maastrichtian open-shelf deposits represents the post-rift stage.

**Keywords** Cretaceous · Nonmarine · Rift · Komombo · Egypt