

TEMPORAL EVOLUTION OF A PLAYA LAKE (QUIRICÓ FORMATION, LOWER CRETACEOUS, SANFRANCISCANA BASIN, MG-BRAZIL)

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Playa lakes are depositional environments developed in negative hydric balance areas of endorheic continental basins. Understood as a complex arrangement of sub-environments, these vary for several reasons. Tectonic setting, drainage basin and climate are the main control factors which characterize these environments. The sedimentary succession here analysed is localized close to the city of Presidente Olegário (NW of Minas Gerais, Brazil), this is constituted of two lithostratigraphic units (Quiricó and Três Barras Formations) deposited in the Sanfranciscana Basin during the Lower Cretaceous and represents the transition from a playa lake to an eolian dune field. Playa lakes constituted in shallow and widely extended basins are, from centre to margins, typically composed of pan salt, saline mudflat and sandflat sub-environments. Detailed sedimentological analyses allowed to distinguish five facies associations in Quiricó Formation. These facies associations are organized in the following vertical succession: (1) massive mudstone and local internally structured-sandstone lobules of inner saline mudflat; (2) horizontally laminated mudstone and subsidiary rippled-sandstone of freshwater shallow lake; (3) sandy mudstone with sandstone lenses of outer saline mudflat; and (4) medium-scale cross-bedded sandstone of eolian dune field. In addition to these, random occurrences of (5) low angle cross-bedded and horizontally laminated sandstone beds of fluvial sandflat are also observed in this sedimentary succession. The first stage of evolution of playa lake system in Quiricó Formation was marked by the dominance of an inner saline mudflat which was shortly substituted by the progradation of a fluvial sandflat. Subsequently, a temporary increase, in the order of thousands of years, of the moisture content caused the expansion of a freshwater shallow lake. A lake retraction and the establishment of an outer saline mudflat followed. Exotic deposits interbedded to the saline mudflat suggest system close to sandflat and eolian dune field. Finally, the last stage of evolution was marked by gradual advance of an eolian dune field until the permanent installation above the playa lake. In conclusion, the progressive reduction of the water input produced the contraction of the playa-lake environment that, providing an increase of clastic availability to eolian processes, resulted in eolian dune field accumulation on the playa lake surface.

KEYWORDS: PLAYA LAKE, MUDFLAT, QUIRICÓ FORMATION.