3-D CYCLOSTRATIGRAPHIC ARCHITECTURE OF FLUVIAL-LACUSTRINE DEPOSITS IN A NONMARINE RIFT BASIN, LOWER-TRIASSIC JIUCAIYUAN LOW-ORDER CYCLE, BOGDA MOUNTAINS, NW CHINA

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Abstract

The latest Carboniferous to Early Triassic eolian-fluvial-lacustrine deposits of Turpan-Junggar Basin, NW China, record the nonmarine sediment-filling processes in continental rift basins in mid-latitude NE Pangea. An in-depth analysis of fluvial-lacustrine strata in multiple half-grabens within Turpan-Junggar Basin is needed to establish cyclostratigraphy to interpret the factors and processes controlling nonmarine deposition in a half-graben.

This study focuses on Lower Triassic Jiucaiyuan low-order cycle (JCY LC) in the southern and northern foothills of Bogda Mountains, Turpan-Junggar Basin, northwest China. Outcrop and petrographic studies will be used to interpret (1) the provenance (location, lithology, and climatic and tectonic settings), conditions and environments of deposition (EODs), depositional systems, and cyclostratigraphic architecture; and (2) the processes and factors controlling the lateral changes and temporal evolution of EODs during the formation of JCY LC.

Cyclostratigraphic correlations on the basis of repetitive changes of EOD and critical chronostratigraphic surfaces will discern the regional and environmental changes within JCY LC within and in-between half grabens. Delineating environmental changes as well as understanding the processes that control stratigraphic architecture of genetically linked fluvial and lacustrine deposits in Tarlong-Taodonggou half-graben are essential for development of a three-dimensional process-response depositional model. The model will serve as an important analog for hydrocarbon exploration and exploitation in nonmarine Turpan-Junggar and other petroliferous rift basins worldwide.

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