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The correlation between the deposition and its regional tectonics in the Jurassic Yabulai Basin, Northwestern China

Cao, H.Y.[1], Wang, H.[1] and Jin, S.D.[1]

[1]Faculty of Earth Resources, China University of Geosciences, Wuhan, Haiyang.cao1003@gmail.com

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The Yabulai Basin is one of the small to medium Meso- Cenozoic faulted basins in Hexi Corridor in NW China. Tectonics is extremely important to the depositional record preserved in continental sedimentary basins, affecting both the formation of sequence boundaries and the filling characters of these sequences [1]. According to the regional tectonic structures and Jurassic sedimentations in northwestern China, the basin can be subdivided into three sub-sags, which are the Yanchang sub- sag, the Xiaohu sub- sag and the Suotuo sub- sag from west to east. It has experienced four evolutionary stages: the initial forming stage of the rifting graben phase (J_1-J_2), the depression stage(J_2-J_3), the uplifting and atrophying stage (J_3-K), the reconstructed stage (K-N). During the Early-Middle Jurassic, the Yabulai Basin was mainly controlled by the activities of a series of W-E normal faults [2]. The Late Jurassic, it developed a series of W-E thrust faults in the basin. During the Cenozoic, in addition to a series of W-E over thrust faults, some part of the Early-Middle Jurassic stratigraphic formed inverted normal faults.

Five third- order sequences were interpreted, which are SQJ_1j, SQJ_2q, SQJ_2x_1, SQJ_2x_2 and SQJ_3s in Jurassic of Mesozoic in the Yabulai Basin. Six sedimentary facies associations are identified: the shoreland plain, fan delta dominated sedimentary system, braided river delta dominated sedimentary systems, turbidite deposits, shallow lakes and half- deep lake systems.

The correspondence of sedimentary infill and its response to tectonic movements have been demonstrated in the Yabulai Basin [3]. Controlled by two boundary faults (Yabulai Mountain fault and the Beida Mountain fault), two main sources of sediment supply were around the basin. The active part of the Beida Mountain fault has an important influence on the migration of depocenters in the Early Jurassic. During the graben stage, the depocenters migrated to the north which are dominated by the Yabulai Mountain normal fault.

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