



## **Structure and climate controls on the evolution of a Mid-Late Jurassic alluvial fan-delta system in the western part of Yanshan fold-and-thrust belt**

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The Yanshan fold-thrust belt experienced several significant tectonic events during Mesozoic time and developed thrust fault-bounded intramontane sedimentary basins. However, elaborate works of sedimentology is inadequate in the Yanshan belt, particularly in its western segment, leading to a failure in comprehensively understanding how bounding-faults and climate change influence the basin filling processes. Our detailed sedimentological study of the Middle Jurassic Xiahuayuan Formation and Upper Jurassic-Lower Cretaceous Jiulongshan Formation in the Xiahuayuan basin of northern Hebei province, indicates a genetic relationship between the evolution of an alluvial fan-delta system and the tectonic and climate setting. The Xiahuayuan Formation was assigned to a debris flow-dominated Gilbert-type fan-delta composed of topset conglomerates, foreset massive siltstone-fine grained sandstone interbedded with lenticular conglomerate units and bottomset/lake bottom fine-grained deposits, spatially restricted to the northern part of the basin. While the lower Jiulongshan Formation was considered as a relatively small debris flow- and turbidity currents-dominated fan-delta with a single-ramp portrait, prograding into the middle part of the basin. And the upper part of Jiulongshan Formation contributed to the lake bottom component of the delta system during the forming of the Jiulongshan Formation. Our results reveal a transformation of a fan-delta from Gilbert-type to single-ramp type and the basinward migration of this fan-delta during Mid-Late Jurassic in the Xiahuayuan basin. And it is assumed that the activity of a thrust fault along the northern basin margin and the rapid switch of climate conditions from warm and humid to hot and dry triggered the transformation and migration of this fan-delta system.