



## **The Landscape Evolution of Ulan Buh Desert in North China during Late Quaternary**

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Desert evolution was one of the major environmental changes in northern China during Quaternary. Ulan Buh Desert (UBD), at margin of present summer monsoon, is one of main desert fields and dust source areas in the north and northwest China. In this paper we present the results of lithology, Optical Stimulated Luminescence (OSL) dates, grain-size, carbonate content, organic content and pollen analysis from the drilling cores in the different parts of UBD. Our results show that most area of the present Ulan Buh desert was covered by the Jilantai-Hetao lake-paleolake before ~90 ka ago, a uniform paleolake of about 34,000 km<sup>2</sup> covering the whole Hetao plain, and serious eolian and desert environment was prevailing during the last glacial and early Holocene. Then an Ulan Buh paleolake (UB paleolake), likely a desert-wetland environment, formed in the northern part of UBD and Jilantai salt lake at around 8-7 ka, leaving dry lake bed landform in northern UBD, while high dune landscape probably prevailed in south UBD. After that, the modern UBD landscape formed. The Jilantai Salt Lake in western UBD continued to exist until present with high lake level during UB paleolake period. During the recent 2000 years aeolian sand from Badain Jaran desert invaded the north UBD through Langshan mountain to form dune landform covered on dry UB paleolake bed and separated main Ulan Buh desert and Jilantai Salt Lake. Human activities such as changing low wetland to farmland and following abandonment resulted the formation of eastern Ulan Buh desert in Han dynasty since 200 BC. The formation of UBD landforms was suggested to be related to disintegration of Jilantai-Hetao lake-paleolake, and was also likely to correspond to summer monsoon changes during the last glacial and Holocene.