

Detrital zircon geochronological research of Upper Permian-Lower Triassic from the central Great Xing'an Ranges

WEN QUANBO¹, LIU YONGJIANG¹
AND FENG ZHIQIANG¹

¹College of Earth Sciences, Jilin University, Changchun
130061, China, wenquanbo@jlu.edu.cn

Timing of the collision of Paleo-Asian Ocean between the north margin of the North China Plate and the blocks to the north links to reconstruction of the tectonic evolution of Paleo-Ocean and Continent. The Late Permian and Early Triassic was the important time for the tectonic evolution of the Great Xing'an Ranges related to the switching from the Paleo-Asian Ocean tectonic regime to the western Pacific regime. In this paper, the U-Pb dating for detrital zircons of sandstones in Upper Permian Linxi Formation and Lower Triassic Laolongtou Formation in Longjiang area of the central Great Xing'an Ranges has been studied. The geochronological data show three age populations of 280 Ma, 370 Ma and 500 Ma. It is suggested that the provenances should be derived from the volcanic rocks of the Late Devonian, Early Carboniferous and the Early Permian magmatic arcs and the basement of the blocks in the research area, respectively. The youngest U-Pb zircon age of 254 Ma and 247 Ma respectively for the Linxi Formation and Laolongtou Formation, imply that the Linxi and Laolongtou Formations in the central Great Xing'an Ranges were continuously deposited. The 1:200 000-Scale geologic map shows that the Triassic strata in the most areas of the Great Xing'an Ranges were absent. Regionally, the Late Jurassic Manketouebo Formation and the Baiyingaolao Formation overlay unconformably the Late Permian Linxi Formation. Considering the scattered outcrops of the Early Triassic strata on the surface and the bore-hole sample with Early Triassic age from the Can 1# drill in the Erlian Basin, we propose that the Early Triassic strata should develop in a larger area than previously considered in NE China. The reason for the absence of the Early Triassic strata in the most areas might be attributed to the subsequent regional uplifting and erosion due to orogenic processes. According to the detrital zircon U-Pb age of 1800 Ma, which is the age of typical basement in North China Plate, from both the Linxi and Laolongtou Formations, along with the granitoids with 244 Ma from Hegenshan suture zone, and the plutons with the post-orogenic geochemical features from Shuangjingzi, Halatu, Dayushan areas as well, we conclude the final collision between the northern margin of the North China Plate and the blocks to the north took place during Late Permian to Early Triassic time.

Keywords: Zircon U-Pb age, Linxi F.m., Laolongtou F.m.