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Detritalzircon Geochronology and Hf Isotope of Triassic Sandstones in Inner Mongolia, China: Implications for the Provenance and Post-Accretionary Crustal Evolution of the Southeastern Central Asian Orogenic Belt

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The Central Asian Orogenic Belt (CAOB) or Altaids, located between the Siberia Craton to the north and Tarim and North China cratons to the south, is one of the largest and most complex Phanerozoic accretionaryorogenic belts on Earth, with considerable juvenile crustal growth (Şengör et al., 1993; Jahn et al., 2000, 2004; Windley et al., 2007; Kovalenko et al., 2004;Xiao et al., 2009). The Solonker suture zone lies in Inner Mongolia at the southernmost part of the CAOB (Fig. 1). It trends ENE-WSW and records the final closure of the Paleo-Asian Ocean and the termination of the CAOB (Xiao et al., 2003; Kovalenko et al., 2004; Li, 2006; Jian et al., 2010).

Although numerous studies have been undertaken on the Late Paleozoic subduction-accretion complexes, arc-related igneous rocks and sedimentary rocks in the area (Xiao et al., 2003; Shen et al., 2006; Jian et al., 2008, 2010; Johnson et al., 2008; Han et al., 2012; Xu et al., 2013), the Triassic sedimentary provenance, tectonic setting, and post-accretionary tectonic evolution of theorogenic belt still remains to be determined (Chen et al., 2009; Liu et al., 2009; Li et al., 2013). The Triassic Xingfuzhilu Formation is the youngest clastic sedimentary sequence in the area related to the evolution of the CAOB (Fig. 1; Zhu and Zheng, 1992; He et al., 1997), therefore, its depositional age and sedimentary provenance are of great importance in understanding the post-accretionary history of the southeastern CAOB. Young sediments typically contain zirconswith a wide range of ages, so they appear toprovide records that are more representative ofthe magmatic history of the crust than zirconsin igneous

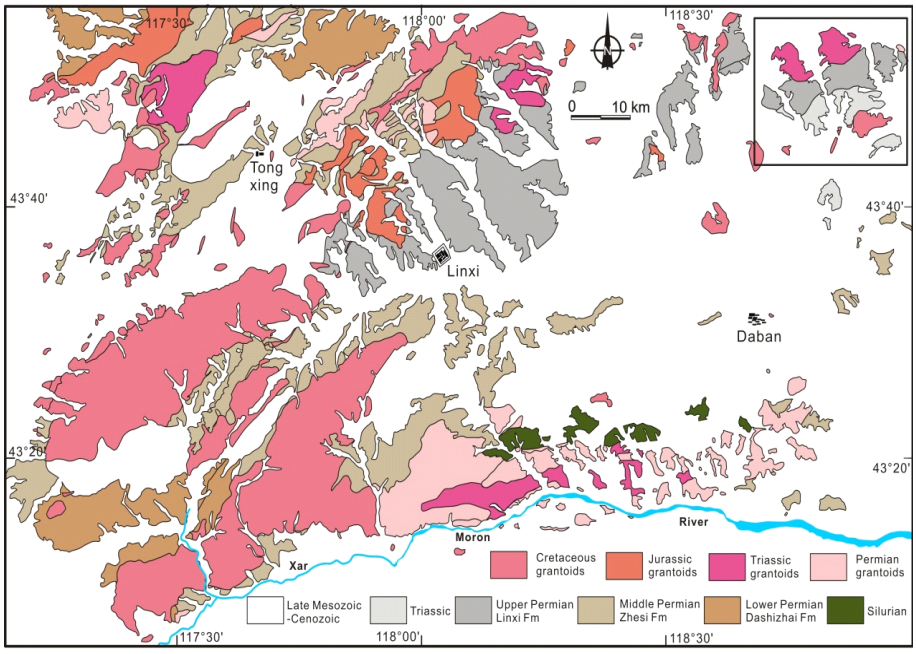

Fig. 1 Simplified geological map of the Linxi area, Inner Mongolia, China (modified after BGMRIM, 1991, 1996).

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rocks or in old sediments (Hawkesworth et al., 2010; Dhuime et al., 2012). However, because of the lack of systematic stratigraphic and geochronological studies, the exact depositional age, tectonic setting and their provenance still remains to be constrained. In this study, we present modal analyses, whole-rock geochemistry and systematic detrital zircon U-Pbstudy of sandstones from the clastic sedimentary sequence. Our results provide new constraints on the depositional age of the Xingfuzhilu Formation, includingits provenance and tectonic setting, and shed some new light on the tectonic evolution of the southeastern CAOB.

The distribution and provenance of Middle Permian strata including turbidite sequences recorded the final phase of distal marine deposition in a closing remnant ocean basin or narrow sea way immediately prior to final collision. Upper Permian and Triassic strata represent the clastic sedimentary response to the rapid uplifting and intra-continental shortening of orogeny, and collapse of post orogeny and regional anorogenic extension, respectively.

Key words: Triassic,Detrital zircon, Provenance, Crustal evolution,Paleo-Asian Ocean

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