Late Mesozoic Tectonic Evolution of the Mongol–Okhotsk Ocean: Evidence from Igneous Rocks of Erguna Massif, NE China

MAO Anqi* and SUN Deyou

College of Earth Sciences, Jilin University, Changchun 130061, China

Citation: Mao et al., 2019. Late Mesozoic tectonic evolution of the Mongol–Okhotsk Ocean: Evidence from igneous rocks of Erguna Massif, NE China. *Acta Geologica Sinica* (English Edition), 93(supp.2): 200.

Abstract: The Mongol–Okhotsk Ocean existed in the late Paleozoic to the Cretaceous between the continental blocks of Siberia to the north and the Mongolia-North China continent to the south. Remarkably, both the Paleozoic and Mesozoic Great Xing'an Range Large Igneous Province (XRLIP) extend across NE China, East Mongolia, and the Russian Far East, Located in the western part of the Great Xing'an Range of the northwesternmost part of NE China, the Erguna Massif is optimal location in NE China, and it witness almost the entire evolution of the Mongol–Okhotsk Orogenic Belt in China. Many studies have found that various igneous records outcropped in the Erguna massifs clearly preserved the geological history of the Mongol–Okhotsk tectonic domain. Unfortunately, nearly no satisfactory explanation has been done on magmatism record of closure of Mongol-Okhotsk Ocean in the Erguna Massif, which might be the utmost significant magmatic evidence in NE China.

In order to decipher the potential tectonic implications/ geodynamic evolution of the Mongol–Okhotsk domain, this study was compiled large database on geochronological, geochemical and isotopic data for igneous rocks from Erguna Massif, East Mongolia, and the Russian Far East. By integrating and analysising the new zircon U–Pb ages, whole-rock major- and trace-element compositions, and Sr–Nd–Pb isotopes data with previous findings of large dataset (previous large dataset), we further discuss their source, tectonic settings and evolution as well as their implications in subduction, closed and post-accretionary orogenic processes of the Mongol–Okhotsk domain.

In order to decipher the potential tectonic implications/ geodynamic evolution of the Mongol–Okhotsk domain, we present new zircon U-Pb ages, Sr-Nd-Hf isotopic data, and whole-rock geochemical data for granites and volcanic rocks of the Erguna massif, NE China. These data are integrated with previous database on geochronological, geochemical and isotopic data for igneous rocks from Erguna Massif, East Mongolia, and the Russian Far East.to provide new insights into the subduction, final closure and late- and post-collisional stages related to the closure of the Mongol–Okhotsk Ocean. The geochronological and geochemical results indicate that Late Triassic–Early Jurassic normal and adakite-like calc-alkaline magmatism confirm the existence of subduction during this time. Late Jurassic–Early Cretaceous post-collision magmatism constrains the timing of the final closure of the Mongol–Okhotsk Ocean. There was a conspicuous lack of magmatic activity during the Middle Jurassic and an abrupt shift of magmatic style from Late Triassic–Early Jurassic normal and adakite-like calc-alkaline magmatism (pre-quiescent episode) to Late Jurassic–Early Cretaceous A-type felsic magmatism (post-quiescent episode). Evidently a significant change in geodynamic processes took place during the Middle Jurassic. Late Jurassic–Early Cretaceous post-collision magmatism constrains the timing of the final closure of the Mongol–Okhotsk Ocean and the collision between the Jiamusi–Mongolia block and the Siberian Craton to the Middle Jurassic

Key words: Early Cretaceous volcanism, Northwestern Great Xing'an Range, Erguna Massif, Geochronology, Geochemistry

* Corresponding author. E-mail: sundy@jlu.edu.cn (D.-Y. Sun)