



Paleozoic accretionary orogenesis in the eastern Beishan orogen: constraints from zircon U-Pb and $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology

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The continental growth mechanism of the Altaids in Central Asia is still in controversy between models of continuous subduction-accretion versus punctuated accretion by closure of multiple oceanic basins. The Beishan orogenic belt, located in the southern Altaids, is a natural laboratory to address this controversy. Key questions that are heavily debated are: the closure time and subduction polarity of former oceans, the emplacement time of ophiolites, and the styles of accretion and collision. This paper reports new structural data, zircon ages and Ar-Ar dates from the eastern Beishan Orogen that provide information on the accretion process and tectonic affiliation of various terranes. Our geochronological and structural results show that the younging direction of accretion was northwards and the subduction zone dipped southwards under the northern margin of the Shuangyingshan micro-continent. This long-lived and continuous accretion process formed the Hanshan accretionary prism. Our field investigations show that the emplacement of the Xiaohuangshan ophiolite was controlled by oceanic crust subduction beneath the forearc accretionary prism of the Shuangyingshan-Mazongshan composite arc to the south. Moreover, we address the age and terrane affiliation of lithologies in the eastern Beishan orogen through detrital zircon geochronology of meta-sedimentary rocks. We provide new information on the ages, subduction polarities, and affiliation of constituent structural units, as well as a new model of tectonic evolution of the eastern Beishan orogen. The accretionary processes and crustal growth of Central Asia were the result of multiple sequences of accretion and collision of manifold terranes.

Reference:

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