

## **Origin and tectonic evolution of arc terranes along the northern margin of North China Craton**

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The early–middle Paleozoic tectonic evolution and origin of the arc terranes along the northern margin of the NCC are uncertain. Based on comparisons of age spectra of detrital zircons from early Paleozoic strata and igneous rocks in (from west to east) the Bainaimiao, Zhangjiatun, and Jiangyu arc terranes, we aim to constrain the origin and tectonic evolution of these terranes along the northern margin of the North China Craton (NCC). Detrital zircons from early Paleozoic strata in the three arc terranes exhibit comparable age groupings of 539–430, 1250–577, and 2800–1600 Ma. The Paleoproterozoic to Neoproterozoic ages and Hf isotopic characteristics of the detrital zircons imply the existence of Precambrian basement beneath the arc terranes. Given the spatial–temporal distribution and petrogenesis of early Paleozoic igneous rocks in the arc terranes, we propose that the early Paleozoic arc terranes along the northern margin of the NCC represent a united arc terrane with the buried Precambrian basement, and shared a common evolutionary history during the early–middle Paleozoic. Occurrences of late Mesoproterozoic to Neoproterozoic detrital zircons may exclude the NCC and Siberia as sources for the early Paleozoic strata. Considering that the age spectra and Hf isotopic characteristics of detrital zircons from early Paleozoic strata in the arc terranes are more similar to those of northeastern Gondwana, we favor this region as the source of the Precambrian crustal fragments in arc terranes along the northern margin of the NCC. The Precambrian crustal fragments within the arc terranes rifted from northeastern Gondwana during the late Neoproterozoic to Early Cambrian, and were incorporated into the accretionary belt along the northern margin of the NCC through arc–continent collision during the late Silurian to Devonian.

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