

Review of the Chinese Altai: a single accretionary complex

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The Chinese Altai located in the North Western Central Asian orogenic Belt in China has been regarded as an area formed of 5 multiples tectono-stratigraphic terrane supposedly limited by faults. Study of the distribution of the granitoids, the stratigraphy, the metamorphism, the Ar-Ar ages and the deformation allowed us to reconsider this terrane separation. The granitoids show a syn orogenic affinity from 480 to 360 Ma, a post-orogenic setting from 300 to 250 Ma and an anorogenic setting from 220 to 150 Ma. The detrital samples show that the Chinese Altai sediments are composed of two main formations, the Habahe group which represents an Ordovician sequence which is the basement stratum and the Altai Formation which represents Devonian marine clastic sediments. The Ordovician sequence is composed of a large number of Cambrian zircons probably inherited from the Khantaishir Arc, in the Lake zone, Mongolia. The Middle to Upper Devonian Altai Formation have Devonian zircons formed from the Chinese Altai arc and also have inherited zircon from the Ordovician sequence. Data for metamorphic zircons and monazites imply that the entire Chinese Altai witnessed two HT-LP events, one in the Devonian (i.e 389 Ma) and one in the Permian (i.e 299–280 Ma). These two events were preceded by a Pre Devonian Barrovian event. Ar-Ar ages show cooling of the area from 265 to 230 Ma. The Chinese Altai experienced 3 distinct deformations, of which the second and third deformations made the migmatite domes to juxtapose with the low grade meta-sediments. The differences in deformation and metamorphism were regarded as terrane boundaries, but a NE-SW transect across the Chinese Altai can be regarded as a single Cambro-Ordovician accretionary complex with the development of a Devonian magmatic arc.

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