Late Paleozoic siliciclastics of the Changning-Menglian Belt: indications for the evolution of Paleo-Tethys in western Yunnan, China

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Abstract

The Changning-Menglian Belt in western Yunnan, China, separating the Baoshan Block of Gondwana-affinity to the west and the Simao Block of Cathaysia-affinity to the east, is one of the key regions for deciphering the evolution of Paleo-Tethys. Late Paleozoic stratigraphic units with various ages, provenances and tectonic backgrounds blended in this orogenic belt of high complexity. Two types of siliciclastic strata with different characteristics, deposited almost simultaneously, can be identified. One is quartzose sandstone sequence represented by the Nanduan Formation in the east zone of the Changning-Menglian Belt. The other is lithic sandstone sequence represented by the Nanpihe Formation in the west zone of this belt.

The Nanduan Formation is mainly consisted of quartzose sandstones, silty mudstones and shales. Early Carboniferous ammonoids, like *Syngastrioceras* sp., *Somoholites* sp., *Epicanites* sp., *Stenopronorites* sp., *Prolecanites*? sp., accompanied with some bivalves and crinoids, were found in the shales. Sedimentary structures, petrographic indices and geochemical features indicate that these siliciclastic rocks were deposited in a neritic shelf to deep shelf environment on the passive continental margin. Detrital zircon geochronological analyses, showing significant age groups with peak age of ca. 550 Ma and ca. 950 Ma, suggest that these rocks are Gondwana-derived, and were possibly deposited on the east flank of the Baoshan-Shan Block with the metamorphosed Cambro-Ordovician siliciclastic successions in this belt.

The Nanpihe Formation located in the west zone of the Changning-Menglian Belt comprises lithic sandstones, silty mudstones, shales and bedded cherts. Late Devonian conodonts *Palmatolepis* spp. were found in the shales. And Late Devonian-Early Carboniferous sporo-pollen assemblages, *Retispora lepidophyta* and *Grandispora spiculifera*, were identified. Sedimentary structures, petrographic features and geochemical analyses of the clastics indicate they were near-source turbidity deposits and continental island arc related. Detrital zircon ages of these rocks, which record remarkable age clusters of ca. 435 Ma and ca. 950 Ma, show similar distribution patterns with those from the Simao and South China Blocks. These rocks were probably deposited along the western margin of the Simao Block, and then thrust onto the east flank of the Baoshan-Shan Block together with other rock units of the accretionary wedge during the closure of Paleo-Tethys.

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