

Depositional and metamorphic events recorded in voluminous metasedimentary rocks from northwestern Vietnam: Tectonic implications for eastern Paleo-Tethys evolution, Tibetan Plateau

FANG WANG

Institute of Geology, Chinese Academy of Geological Sciences

Presenting Author: wangfang_mr@163.com

Metasedimentary rocks in the Son La area of northwestern Vietnam provide unique geochronological and metamorphic evidence for constraining Paleo-Tethys evolution. In this study, detrital zircons from the metasedimentary rocks in the Nam Co Complex were dated and yield ages between 2787 and 618 Ma. Their maximum depositional ages are constrained to ca. 870 Ma and ca. 835 Ma for the lower and upper formations, respectively. Similarly, the ages of detrital zircons from metasedimentary rocks in the Ta Khoa antiform cluster from 3280 to 749 Ma. The depositional ages of the metasandstone and gneisses are constrained at ca. 800 Ma and ca. 760 Ma, respectively. The age patterns and Hf isotope compositions of the Nam Co Complex and the Ta Khoa antiform are similar to those of the western Yangtze Block, suggesting that the metasedimentary rocks in northwestern Vietnam represent the southeastern extent of the western Yangtze Block.

Metamorphic zircon and monazite from metasedimentary rocks in northwestern Vietnam constrain Triassic tectonic events at 247–240 Ma. The P-T conditions of the metasedimentary rocks from the Ta Khoa antiform were defined at $P = \text{ca. } 7.0\text{--}7.5$ kbar and $T = \text{ca. } 685^\circ\text{C}$. Additionally, mineral chemical analyses indicate that phengites occur in Grt-Ph schists from the Nam Co Complex. The phengites have high Si contents (up to 3.542 p.f.u.), indicating that the Grt-Ph schist experienced a high-pressure metamorphic event. Previous studies have also reported that eclogites and granulites in the Jinshajiang, Ailaoshan, and Song Ma zones record Triassic high-pressure metamorphism with a clockwise P-T-t path. These results suggest that the Jinshajiang-Ailaoshan-Song Ma suture zone (JASSZ) is a Paleo-Tethyan oceancontinent subduction-collision orogenic belt. The spatial distribution and tectonic evolution of the metasedimentary rocks in the Son La area support the hypothesis of west-dipping subduction of the Yangtze Block beneath the Indochina Block along the JASSZ.