



Detrital zircon U-Pb geochronology of late Miocene-Pleistocene formations: implications for exhumation history of Taiwan orogenic belt

Shih-Chuan Li and When-Shan Chen

National Taiwan University, Geosciences, Taipei, Taiwan

The sediment provenance has changed from the southeast China (Cathaysia Block) to Taiwan orogenic belt due to the arc-continental collision during late Miocene (~6.0 Ma). In this study, we focused on detrital zircon U-Pb dating and sandstone petrography analysis from the late Miocene to Pleistocene strata, which can be provided to understand the exhumation history of orogenic belt. The evolution of sandstone petrography shows that the sedimentary and low-grade metamorphic lithics fragments increased in sequence order. In addition, the detrital zircon U-Pb age populations for late Miocene to Pleistocene strata are similar to Eocene-Miocene strata, suggesting that the synorogenic sediments were derived from the orogenic belt.

In northern Taiwan, the late Pliocene strata consist mainly of the older detrital zircon U-Pb age populations (1800 and 2500 Ma), implying that the provenance of Miocene strata on the Hsuehshan Range were widely exposed. Then, the younger population (200-65 Ma) gradually increased since early Pleistocene, indicating that the low-grade metamorphic provenance was exposed. After that, the old populations increased again, suggesting that the source area was largely linked a sedimentary provenance of the Western Foothills.

In central Taiwan, the sedimentary provenance on the Hsuehshan Range was also widely exposed during early Pleistocene. Subsequently, the low-grade metamorphic provenance on the Hsuehshan Range was exposed.

Apparently, the temporal variations of zircon U-Pb age population and sandstone composition from late Miocene to Pleistocene which were verified statistical significant. The exhumation history of Taiwan orogenic belt reveals the southward propagation.