

# Tectonic relationship between Taiwan and Asian continent deduced from provenance study of Tertiary sandstone

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Taiwan is composed of six geological provinces: Coastal Plane, western foothills, Hsuehshan Range, Backbone Range, Eastern Central Range and Coastal Range, from west to east. The provinces form long narrow belts roughly parallel to the long axis of the island. The ages of detrital monazites from sandstones and the sands from the probable provenance areas in the East Asia have been measured utilizing EPMA to elucidate provenances of the Tertiary sandstones. The Hsuehshan Range is a weakly metamorphosed Eocene to middle Miocene clastic rocks mainly of shallow marine in origin. Sedimentary rocks in the western foothills are different in degree of deformation and metamorphism from those in the Hsuehshan Range and Backbone Ridge. In spite of contrasting structure and parallel setting, their depositional ages overlap partially from the late Oligocene to middle Miocene.

Most of the sandstones in the western foothills have monazite ages with peaks at ca.150 Ma, 220-250 Ma, 430-450 Ma and 1870-1900 Ma. Comparison with the age data in the sands collected from the continental margin revealed that the late Oligocene to Pliocene sediments from the western foothills were derived mainly from the Korean Peninsula with a subordinate contribution from the paleo-Yangtze River. Supply from the nearby source region, the Fujian Province, is restricted in the sandstones from the western foothills. On the other hand, the Eocene to early Oligocene sandstones from the Hsuehshan Range have different age patterns with a major peak at 250 Ma and small peaks around 150 Ma and 450 Ma. The distribution pattern of monazite age is different from those in the western foothills, but clearly similar to that of the recent sand in the Zhu River running through the Guangxi and Guangdong provinces. As the paleo-currents of the Eocene to early Oligocene sediments indicate supply from the northwestern side, it is proposed that at least the Eocene to early Oligocene terrane in the Hsuehshan Range was formed at far southwestern part of the present position and was juxtaposed with the western foothills by left-lateral faults after the early Oligocene.