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Terrane analysis and tectonics of the Nan-Chantha Buri Suture Zone

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The Nan-Chantha Buri Zone in eastern Thailand has been interpreted to mark a continental suture zone between the Shan-Thai and Indochina cratonic terranes located to west and east respectively. Recent detailed geological, paleontological and petrological studies have shown that the zone is identified as a serpentinite mélange zone.

The Indochina terrane bounding the eastern side of the suture zone is composed of coherent units such as volcanic-arc

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sequences and calcareous sediments on a continental shelf. On the other hand, the western margin of the Shan-Thai terrane bounding western side of the suture zone is composed of chert clastic sequence consisting of chert unit occasionally accompanied by greenstone and coarse clastic unit in ascending order. The sequence is tectonically piled up to form an imbricate structure. Because of this geologic structure, chert unit and coarse clastic unit alternately occur. This subterrane of the Shan-Thai terrane was formed by successive offscrape-accretion mainly during Late Triassic time.

Characteristic "rock mixture" of chaotic and "block in matrix" fabric are found in the Nan-Chantha Buri suture zone. Eastern part of the zone is mainly composed of large blocks of Middle and Late Permian limestone and chert. Middle part of the zone consists largely of sheet-like bodies of metamorphic rocks. Western half of the zone is a typical serpentinite mélange zone and is characterized by chaotic complex which are complicated admixtures incorporating a great variety of rocks of oceanic, island-arc and continental affinities and of various ages. The geochemical data of the basaltic rocks indicate that they are remnants of ancient oceanic crust. Fusulinids of eastern side of the zone are representative assemblage found in Cambodia and those of eastern side are comparable to fusulinids in Sara Buri. Most of radiolarian fossils extracted from red chert blocks indicate Early to Late Permian age. Zircon U-Pb dating was carried out on one granitic rocks from the melange zone. The four data points define a discordia yielding an upper intercept date of 486.5±5 Ma, which is Early Ordovician.

Rocks in the suture zone generally dip toward the west and stretching lineations generally plunging towards the west are observed. The kinematic indicators such as a partially rotated pebble and an asymmetric microstructure have been observed in outcrops and thin sections made parallel to the stretching lineations. The sense of rotation determined from these structures is regionally from west to east.

From these facts, it is concluded that the Indochina and Shan-Thai terranes separated from Gondwanaland at different time respectively, and their amalgamation may have occurred near the edge of the Eurasian Continent during Late Triassic.