Early Mesozoic granitoids from SW Vietnam and SE Cambodia – an example of the southeastern extension of the Southeast Asian granite belt

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Early Mesozoic magmatism in Indochina and its vicinities in Sundaland (SE Asia) has been usually ascribed to be in connection with one of three approximately coeval tectonic regimes: 1) the Indochina-Sibumasu amalgamation leading to the closure of the Paleotethys during the Late Paleozoic – Early Mesozoic forming the Thai-Malaysia tin-bearing granite belt, 2) the Indochina-South China amalgamation along the northern boundary of Indochina closing another branch of the Paleotethys during Late Paleozoic – Triassic times, and 3) the early stage of an active margin with subduction of the Paleo-Pacific plate during Triassic-Jurassic times.

Scattered granitic plutons (185–210 Ma) located in southern Cambodia and some islands in southernmost Vietnam are distributed along the N-S Rach Gia-Nam Can fault which is a large-scale fault active during the Early Mesozoic. The studied rocks can be distinguished based on petrological features: weakly foliated biotite-rich granite (Hon Khoai Island, SW Vietnam), biotite-tourmaline-bearing granite (Hon Da Bac Island, SW Vietnam), and coarse-grained biotite granite (Tamao, SE Cambodia). The Honkhoai granites are a range of dark to light coloured granites due to a variation in biotite content and display a foliation. They usually contain amphibole, ilmenite, and monazite. The Hondabac granites comprise dark-colored granodiorites and granites with biotite, tourmaline, ilmenite, apatite, fluorite, epidote, and subordinate titanite. The Tamao granites are mainly composed of biotite aggregates with sporadic muscovite and accessary phases such as ilmenite,apatite, and fluorite.

Zircon U-Pb ages yield 189 ± 1 to 206 ± 2 Ma for the Honkhoai rocks, 192 ± 1 to 202 ± 1 Ma for the Hondabac rocks, and 189 ± 2 Ma for the Tamao rocks. Apparently, these Late Triassic - Early Jurassic granitoids are chronologically consistent with all three tectonic events. However, geographical and geochemical arguments favor a connection to the Thai-Malaysia tin-bearing granite belt. The Honkhoai granites are a range of dark to light colored granites due to a variation in biotite content and display a foliation. They usually contain amphibole, ilmenite, and monazite. The Hondabac granites comprise dark-colored granodiorites and granites with biotite, tourmaline, ilmenite, apatite, fluorite, epidote, and subordinate titanite. The Tamao granites are mainly composed of biotite aggregates with sporadic muscovite and accessary phases such as ilmenite, apatite, and fluorite.

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of the Honkhoai rocks using the Al-in-amphibole geobarometer yields crystallization pressure up to 3 kbar.

We conclude that the studied rocks formed during the closure of the Palaeotethys along the western boundary of the Indochina block, particularly similar to the Thai-Malaysia granite belt. Hence, the Sukhothai-Chantaburi Terrane may be extended southeastward as far as to the Hon Khoai Island (Southernmost Vietnam).