

GEOLOGY OF SOUTHERN SONGKHLA, YALA, NARATHIWAS AND PATTANI AREAS, SOUTHERN PENINSULAR THAILAND

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The area is covered by sedimentary rocks of Middle Paleozoic to Quaternary age. The western part of the Middle Paleozoic rocks can be classified into two formations, the Lower part and the Upper part. The Lower part is characterized by low grade regional metamorphic rocks consisting of phyllite, mica schist, quartzite and recrystallized limestone/marble. The Upper part of the Middle to Devonian is the series of alternating sandstone, shale with tentaculites siliceous shale, chert and limestone lenses. The Silurian-Devonian rocks at the eastern part are mainly phyllite and meta-tuff/volcanic?. Carboniferous marine clastic sediments of shallow water environment unconformably overlying the Silurian-Devonian rocks are conformably overlain by Permian massive limestone. Middle to Upper marine Triassic rocks consists of conglomerate at the base, conglomeratic sandstone, sandstone, siltstone, shale with *Daonella* and limestone. Fluvial Tertiary rocks are predominantly conglomerate. Gravel beds, beach sand, swamps are alluvial deposits and probably Pleistocene.

Igneous rocks, predominantly granite, are elongated in shape and trending north-south. They may be classified into three phases by their textural differences, gneissic granite, coarse-grained porphyritic biotite granite and fine-grained tourmaline-muscovite granite. Isotopic dating is available for the granite rocks at Pin Yo mine (Yala province) and Songkhla province yielding Rb/Sr whole rock ages of 229 ± 7 m.y. and 171 ± 5 m.y. respectively. Diorite and andesitic dikes intruded and extruded along the NS and NW fracture zones as well as serpentinized - periodotite.

The rocks in the mapped area have been affected by many orogenic and epeirogenic movements and igneous activities. Structurally they trend in a north-south direction. The Middle Paleozoic rocks had suffered at least two successive deformation phases during the Early Carboniferous orogeny. The regional metamorphism probably developed

contemporaneous with the first deformation phase which produced isoclinal folds with schistosity/slaty axial plane cleavage. The second phase developed tight folds with crenulation/fracture axial plane cleavage. Late Triassic orogenic movements had affected the Upper Paleozoic and the Middle to Upper Triassic rocks producing tight folds with slaty axial plane cleavage. Four sets of directions of faults and fractures, NW, NE, NS and EW are recognised. Strike-slip conjugated faults of NW and NE direction are sinistral (left-lateral) and dextral (right-lateral) respectively.

Cassiterite-wolframite mineralisation which occurred in quartz veins system is confined to tourmaline-muscovite granite. Lead-zinc is associated with lode tin deposits. Chromite is related to serpentinite-peridotite. Gold deposit which occurs in quartz veins may be related to diorite.
