



Late Mesozoic tectonics of the Southern-Thai Peninsula: from transpression to basins opening

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The petroleum basins of the Southern Thailand Peninsula are poorly known and their final geometry is controlled by the Tertiary stress variations applied on pre-existing Paleozoic and Mesozoic basement structures. From the end of Mesozoic times, the arrival of Indian plate was accommodated by transpressional deformation along the Western Margin of Sunda Plate. Evidences of this strain are the motions along several regional strike Slip Faults (Sagaing, Three Pagodas, Mae Ping, Red River, Ranong and Klong Marui Faults) as well as compressional features (folds and thrusts) evidenced onshore. Due to changes in the boundary forces, these structures were reactivated during the Tertiary, leading to the opening of basins in this part of Sundaland.

We present a structural analysis based on geomorphology, fieldwork and seismic interpretation of the Southern Thai Peninsula with emphasis on the deformation's style onshore from Ranong to Satun and offshore from Eastern Mergui to Songkhla.

By analyzing morphostructures and drainage anomalies from Digital Elevation Model (SRTM and ASTER), we highlight a predominance of N-S structures in the Southern Thai Peninsula: both in the granitic belt and in the sedimentary cover. The Triassic-Jurassic (Indosinian) post-collision granitic belt is intensely fractured, with 2 penetrative directions: N140 and N50. On both sides, the sedimentary units appear folded at a large wavelength (~20km).

On most of the studied outcrops, Triassic to Early Cretaceous series are gently tilted and weakly fractured whereas the Paleozoic ones shows intense fracturation and steep dipping beds. Moreover, all the Paleozoic stratas display a constant N-S S1 which does not appear in the Mesozoic sediments. Although most of the post-Mesozoic sediments do not crop out due to thick vegetal cover, several Tertiary basins can be easily seen from seismic data both onshore and offshore. These data suggest that rifting started in the Eocene and was accommodated by large crust-scale Low Angle Normal Faults reactivating basement fabrics including intrusive edges and folds hinges.

We propose a tectonic scenario for the southern Thai Peninsula according to which the northward motion of giant morphostructures (the Wharton Ridge followed by the Indian Plate) induced first right-lateral transpressional tectonics at the End of the Mesozoics. This system is illustrated by the 2 sets of fractures of the Indosinian Belt, the large-scale folds of Early Cretaceous Strata and the strike slip motions of the Ranong and Klong Marui Faults. Following the path of Indian Plate, a collapse of this hot and thin crust occurred accommodated via LANF's along the granitic belts and the sedimentary basement morpho-structures.