

Tectonics of deformed and undeformed Jurassic-Cretaceous strata of Peninsular Malaysia

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The Jurassic-Cretaceous (JK) strata in Peninsular Malaysia occur as folded sequences (Tembeling Group, Koh Formation, Bertangga Sandstone) but also as undeformed, slightly tilted strata (Gagau Group, Ulu Endau Formation, Panti Sandstone). In recent years, some workers have claimed that the middle-upper Triassic strata (Semantan Formation, Gemas Formation) exhibit structural styles similar to the folded JK strata. This led them to suggest that the upper Triassic-lower Jurassic Titiwangsa granitoid complex resulted from anorogenic emplacement, and that the latest major deformation in the peninsula was of Cretaceous-Tertiary age. This hypothesis does not explain: (1) the regional extent of late Triassic to early Jurassic granitoids throughout continental Southeast Asia and Sundaland; (2) the occurrence of deformed strata adjacent to some of the granitoid bodies; (3) sharply bounded, thin thermal aureoles consisting of cross-cutting contacts with country rock; (4) the absence of regional cleavage in the JK strata in contrast with its presence in the older Triassic rocks. A study of good quality, remotely-sensed images covering Peninsular Malaysia has resulted in the following conclusions: (a) the JK Koh, Tembeling and Bertangga Sandstone sequences were laid down in pull-apart depressions; (b) these depressions were developed through dextral slip motions on its major, bounding faults that trend north-south; (c) after the depressions were filled, dextral strike-slip motions continued in a transpressive regime which caused the sediment fill to be deformed into NNW-striking drag folds (These strike-slip movements persisted until middle Eocene as reset ages of cataclastics from major fault zones of the peninsula seemed to indicate); (d) the JK-strata (Gagau, Panti Sandstone) outside the influence of renewed fault movements remained essentially undisturbed; (e) the structural style of the JK-strata is favourable for the entrapment of hydrocarbons, if source material are present. This study further re-establishes the widely accepted concept that during late Triassic-early Jurassic time, Southeast Asia experienced strong tectonic deformation that was accompanied by the emplacement of the Titiwangsa and coeval granitoid complexes.
