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TECTONIC HISTORY OF THE BENTONG-BENGKALIS SUTURE

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The Bentong segment of the suture in Peninsular Malaysia is a southerly trending 13-km wide zone that extends from Tomo, Thailand via Bentong to the coastline east of Malacca. The suture consists of partially sheared packets of olistostrome among non-olistostromal rocks showing subvertical attitudes. The visible olistoliths may reach sizes scores of metres across and consist of pre-Silurian schists, Ordovician to Lower Triassic clastics, volcaniclastics, chert and minor limestone. Within the suture are also isolated bodies of serpentinised mafic-ultramafic rocks representing ophiolite. Its lithology, fabric and deformation style indicate that the suture is a highly compressed accretionary prism that developed first through subduction westward (early tectonic vergence was east), then subduction eastward (tectonic vergence towards west) before the rocks finally experienced tectonic transport eastward along reverse faults. The subduction process probably terminated by Early Triassic time. In the central part of the Peninsula, faults striking parallel to the suture posses dextral slip components that probably developed in pre-Cenozoic time.

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Across the Straits of Malacca the suture continues in southerly direction as the approximately 20 km wide Bengkalis Depression and is traceable for more than 200 km until it abuts against the Tigapuluh Mountains, a pre-Tertiary basement high N-S faults with distinct right-lateral slip components occur within and outside the depression. These strike-slips faults created drag folds that trapped the hydrocarbons in the Lalang, Mengkapan, Kerumutan, Kayuara and other fields in Central Sumatra. In addition, the gouge along these wrench faults became lateral seals to the pools. The geothermic gradient is exceptionally high and played a major role in the maturation process. In late Cretaceous-Early Tertiary time the Bengkalis segment of the suture experienced normal faulting that created the depression, while lateral faulting occurred in the Oligocene (?) and the Miocene, before finally NW-striking reverse faults during the Pleistocene became superimposed upon the earlier trend. The Oligocene (?) and younger fault motions have been consistent with the oblique convergence of the Indian-Australian Plate and the Southeast Asian region of the Eurasian Plate.