

The geology of Northern Sabah, Malaysia : Its relationship to the opening of the South China Sea Basin

Abstract

The northern part of Sabah, consisting of sedimentary and igneous rocks of Early Cretaceous to Pliocene age, has experienced three major episodes of deformation associated with NW-SE and N-S oriented compressions. The earliest episode deformed and uplifted an oceanic basement (Chert-Spilite Formation) to form an elongate basin, trending approximately NE-SW, during the Late Cretaceous to Early Eocene. This elongate basin became the site for the deposition of middle Eocene to Early Miocene quartzose sediments of the Crocker and Kudat formations, sourced from continental basement towards the southwest and north, respectively. These sediments were subsequently deformed by a second episode of deformation associated with NW-SE and N-S oriented compressions, during the latter part of the late Oligocene and the early Middle Miocene, to form a series of imbricate thrust slices. The N-S trending compressive direction controlled the development of approximately E-W trending basins during the deposition of the Upper Miocene sediments of the South Banggi and Bongaya formations. The continuation of N-S compression, which represents the third episode of deformation, gently deformed these sediments. The three episodes of deformation were related to the differential southward movements of continental blocks separated from the southern margin of China during the intermittent opening of the South China Sea subbasins. The first episode was related to the opening of the Southwest Subbasin, while the second episode was related to both the opening of the Southwest and East subbasins. The third episode was related to continued opening in the East Subbasins.