



Evidence for subduction-related magmatism during the Cretaceous and Cenozoic in Myanmar

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Myanmar's complex geological history, numerous controversies around its tectonic evolution and the presence of prospective hydrocarbon basins make it a key area of interest for geologists. Understanding whether a passive or an active margin existed in the region during the Cenozoic is particularly important for the production of accurate basin models; active Cenozoic subduction would imply that hydrocarbon basins in the forearc experienced extension due to slab rollback. The geology of Myanmar was influenced by the regional tectonics associated with the Cretaceous and Cenozoic closure of the Neotethys Ocean. During this time, India travelled rapidly from Gondwana to Asia at speeds up to 20 cm/yr. To accommodate the north-eastward motion of India, the Neotethys Ocean was consumed at the subduction zone along the southern margin of Eurasia. Based on our Global Plate Model, this subduction zone can reasonably be expected to extend for the entire width of the Neotethys Ocean as far as Myanmar and Southeast Asia at their eastern extent. Moreover, a) Cretaceous volcanism onshore Myanmar, b) the middle Cenozoic arc-related extension in the Present Day eastern Andaman Sea and c) the late Cenozoic uplift of the Indo-Burman Ranges are all contemporaneous with the subduction ages predicted by the global plate motions. However, because of the geological complexity of the area, additional evidence would augment interpretations that are based on structural data.

In an attempt to reduce the uncertainty in the existing interpretations, we have compiled published zircon geochronological data from detrital and igneous rocks in the region. We have used published zircon U-Pb ages and, where available, published Hf isotope data and CL images (core/rim) in order to distinguish 'juvenile' mantle-derived zircons from those of reworked crustal origin. The compilation shows that Upper Cretaceous and Cenozoic zircons, which are interpreted to have a volcanic provenance, are common across the Wuntho-Popa Arc and in the sedimentary basins onshore Myanmar (including the onshore Rakhine Basin and the Myanmar Central Basin), providing evidence for ongoing, although non-continuous, subduction in the region.