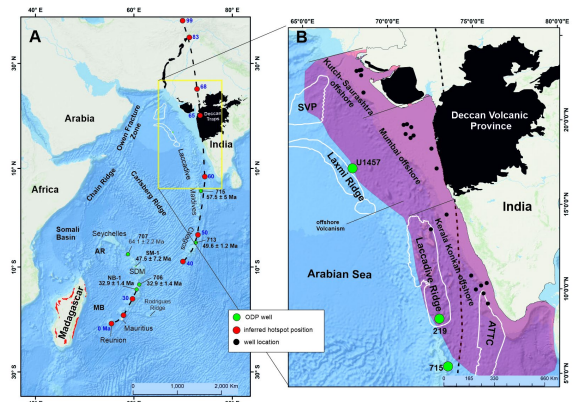
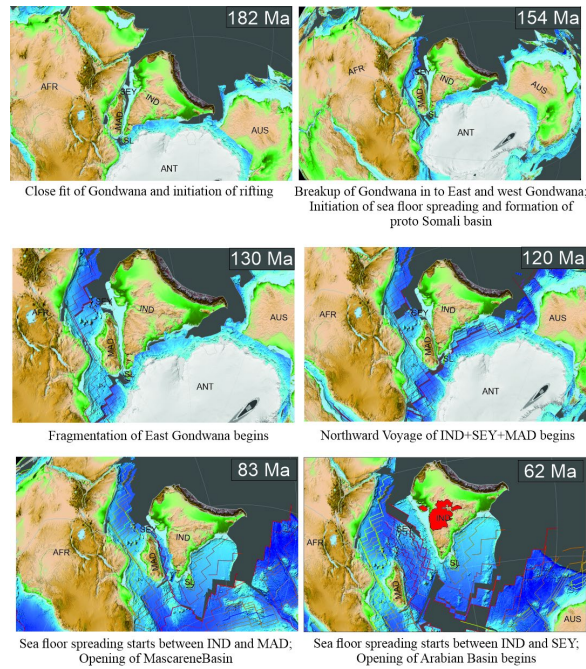


Ar-Ar geochronology and petrogenesis of Western Indian Offshore volcanics : A Geodynamic Perspective

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The Western Continental Margin of India (WCMI) formed due to the fragmentation of Gondwana from the Early Jurassic to the Early Paleocene. The Indian plate passed over the Réunion-plume during the Late Cretaceous, which led to the formation of the Deccan Large Igneous Province. The seismic and drilled well data established the presence of widespread volcanism in the adjacent Western Offshore Basins (WOBs). These volcanics are present at various stratigraphic levels, and their geochronology and petrogenesis are poorly studied. Even though the geochronology of the on-land Deccan volcanism is well-constrained, the eruptive history of the Western Offshore volcanism has been a considerable knowledge gap, primarily due to the unavailability of the samples. To bridge this gap, 20 volcanic drill core rock samples are selected from WOBs for geochemical and Ar-Ar geochronology studies. The results were correlated with the onshore volcanic rocks and drilled well data to reconstruct the spatio-temporal evolution of volcanism from a geodynamic perspective. The integrated interpretation of seismic, gravity, and geochronology data provided new insights into the genesis of Laccadive Ridge, the duration of offshore volcanism, and the comprehensive tectono-magmatic history of the WOBs. Many previous geochronology studies have attributed the magmatism on the Indian plate to the Reunion Plume activity only. In contrast, this study emphasizes some magmatic events that plume-plate interaction cannot explain because of their non-proximity in space and time. Plausible geodynamic models are explored to explain the volcanism on the Indian Plate and underlying processes over a protracted geological time.



(A) Regional map of NW Indian Ocean showing some important tectonic features modified after Mahoney et al., 2002. Dotted line shows the inferred Réunion hotspot track. (B) Tectonic map of WCMI showing offshore basins, magmatism, and well locations from which samples are selected