

A precise India-Madagascar palaeo-fit

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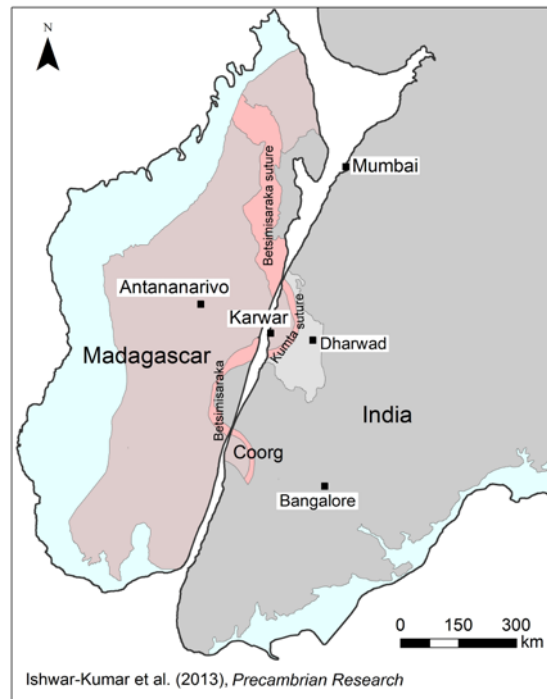
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The Kumta suture in western India (Ishwar-Kumar et al., 2013) is a westward-dipping suture that mainly contains mainly quartz phengite schist, chlorite schist and garnet biotite schist. Isochemical phase diagram estimation for quartz phengite schist suggests a near-peak condition of c. 18 k bar and 550° C. K-Ar dating of phengite from the quartz phengite schist and of biotite from garnet biotite schist give 1326 Ma and 1385 Ma, metamorphic ages respectively. The Bondla mafic-ultramafic complex, just NW of the Kumta suture, has the bulk composition of a supra-subduction zone arc. The Sirsi shelf on the eastern side of the suture contains mainly quartzite, sandstone, turbidite, banded iron formation and limestone. The basal quartzite is unconformable on ca. 2571 Ma Dharwar gneisses. West of the suture are ca. 3200 Ma tonalite-trondhjemite-granodiorite (TTGs), which were intruded into amphibolites. Our structural, geological and geochronological results integrated with published data suggest that the Betsimisaraka suture zone of Eastern Madagascar continues into western India as the Kumta suture and farther south as the Coorg suture, and we conclude that ambient ocean closed diachronously from 1380 Ma to 750 Ma from north to south during the amalgamation of Rodinia. The obtained palaeo-fit position of India and Madagascar is well corroborated by the geophysical models that demonstrate an excellent match of the mechanical strength (effective elastic thickness), Moho geometry, and bathymetry of their passive margins.



References

Ishwar-Kumar, C., Windley, B.F., Horie, K., Kato, T., Hokada, T., Itaya, T., Yagi, K., Gouzu, C., Sajeew, K., 2013. A Rodinian suture in western India: New insights on India-Madagascar correlations. *Precambrian Research* 236, 227-251.