THE MALANI MAGMATISM: INTERNATIONAL STATUS

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It is heartening to note that the Malani magmatism including the Malani supercontinent has over 1700 entries in the Google Science Serch. The reason is not difficult to find. The bi-modal, anorogenic, A-type Malani magmation occurring in the Trans-Aravalli block of the NW Indian shield is critical for evaluating the various tectonic models related to the assembly of Rodinia and Gondwana.

During the past decade or so serious debate centred around the role of mantle plume versus Andean-arc type model for the petrogenetic evolution of the Malani igneous suite (MIS), the third largest felsic magmatism in the world, and its position in the assembly of Late Proterozoic supercontinent including the position of South China in the super continent assembly has been witnessed (Kochhar, 2008).

Li et al. (2004) have correlated syn-rift (780-745 Ma) magatism, the Chengjian with the Malani magmatism, as both the magmatism are anorogenic with coeval mafic magmatism attributed to plume techtonics. Li et al. (2008) place South China between Australia and Laurentia in the common reconstruction of the Rodinia supercontinent, thus in the centre of supercontinent and southeast of Australia. However Zheng (2003) based on similarities between magmatism of South China and the MIS in terms of paleomagnetism, oxygen isotyopic studies favour the position of South China in the configuration of supercontinent which is adjacent to both Australia and India rather than between Australia and Laurentia. Accoding to Torsvic et al. (2001) Laurentia, Baltica, India Seychelles and South China best define Rodinia at 750 Ma.

However, the similarities between the Yangtze craton (YC) of South China and TAB of the NW Indian shield in terms of bi-modal plume related syn-rift (Chengjian magmatism, 780-754 Ma), MIS, paleopoles (55°-70°N) for both YC and TAB at 745 Ma, Natua and Intua deposits (748Ma) of glacigenetic origin corresponding to Pokhan boulder bed and subsequent desiccation exemplified by mainly dolomite and phosphate deposits in YC correlatable with Hanseran evaporate sequence of Marwar basin has led Kochhar (2007) to suggest that the YC of South China was attached to the TAB of NW Indian shield in the configuration of the Malani supercontinent and the precursor to the Lesser Himalayan terrain was a contigous part of the TAB during Vendran time.

Jiang et al. (2003) based on Neoproterozoic stratigraphic comparison of the Lesser Himalayan rocks with the Yangtze block rocks have suggested that the Yangtze block was located highlighted close to the NW Indian shield during Neoproterozoic. Singh and Singh (20080 also similarities between evaporate bearing sequence of Lesser Himalaya and South China.

Torsvic et al. (2001) have suggested that Laurentia, Baltica, India and Seychelles and South China best define Rodinia at 750 Ma. Ashwal et al., (2002) have proposed that an eastward directed (present day coordinates) subduction beneath and associated magmatism into and onto western margin of Rodinia at ca.750Ma, the product magmatism (MIS) represented in India. Madagascar, Seychelles and India formed a tectonic trio, and since both Madagascar and Seychelles have volcanism attributed to the subduction of a Neoproterozoic ocean (The Mozambique), Gregory et al., (2009) believe that the undeformed Malani magmatism rock represent the in board result of subduction zone, and the deformed margin material has been eroded or buried.

Gregory et al. (2009) have also obtained paleomagnetic pole on MIS (mafic dykes of Jalor complex) at 750-770 Ma (Jodhpur rhyolite) with a combined pole that plots at 69°O N and 83°.2 E. They claim the samples have primary magnetization. Their data place India and Seychelles at higher latitudes than coeval poles from Australia (Mundine Well dikes) Interestingly there is no field relationship between Jalor dykes and the Jodhpur rhyolities. They are separated by about 200 kms. The Jalor magmatism is coeval with Siwana granites as established by field and geochronological data (Dhar et al., 1996).They claim that U-Pb age of 771± 5Ma of rhyolite tuff documents the lower age limit for Malani Volcanism. The rhyolite tuff and perlite from Mandli Volcanic cone should be the best candidates for providing the still lower age limit

Further the research work done by the Geological Survey of Indian (Bhushan, Kochhar (1995, 2000, 2004, 2008) (Eby and Kochhar, 1990) which established anorogenic, bi-modal, A-type geochemical signatures for the volcano-plutonic ring complexes or MIS has been conveniently ignored by Torsvic et al., Ashwal et al. and Gregory et al., 2009 because the 'within plate' setting does not fit in their Andean-arc type setting (subduction model)

Kochhar (2004, 2008) has emphasized that the Mahe and Praslin granites of Saychelles have A type geochemical signatures overlapping with both Jalor and Tushan granutes. But Ashwal et al. (2002) did not plot the tectonic discriminating diagrams because their set of data would have contradieted their subduction model.

In view of the fact that many international geoscientists with the collaboration of Indian counterparts are showing great interest in the Malani magmatism, it is suggested that the following attributes be kept in mind while proposing any configuration of supercontinent involving MIS:

1. Bi-modal, anorogenic, 'within plate', A-type signatures of Malani magmatism.
2. Ring structures, manifestation of plume activity indicative of rift (extensional) tectonic setting of the MIS (Kochhar, 2009).
3. Geology of Rajasthan and Haryana in toto: magmatism, Precambrian glaciation and subsequent desiccation in the TAB and their correlation with similar occurrences in the Lesser Himalayan terrane and South China.
4. Geochronology, palemagnetic data with strong field constraints and stable isotope data on carbonate sequences.
5. The position of India in term of and three suspect terranes viz. TAB, South Indian block and Bundelkhand block be considered in the configuration of a supercontinent.
6. The robust data on Malani magmatism generated by Indian geologists be not allowed to be polluted by western geoscientists to suit their whims and fancy.

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