

## **Late Proterozoic Magmatism within the Dabie-Sulu Collisional Belt, Eastern China: Response of the Yangtze Block to the Break-up of Rodinia?**

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The Dabie-SuLu ultrahigh pressure (UHP) collisional belt represents the eastern part of the Qinling-Dabie orogenic belt that resulted from the collision between the Yangtze and North China Blocks in Early Mesozoic (e.g., Mattauer et al., 1985; Liu and Hao, 1989; Ames et al., 1993). In the Dabie terrane several major metamorphic rock units are tectonically juxtaposed, i.e. from north to south, the Beihuaiyang low-grade metamorphic zone, the North Dabie gneiss zone, the South Dabie UHP metamorphic zone, and the Susong LT/HP metamorphic zone. Comparable rock units are also found in the Sulu area, but the UHP zone is dominant there. Numerous post-collisional granitoids have intruded into all the major zones in these two areas.

Apart from radiometric ages around 220 Ma to 240 Ma that date the collision, U-Pb zircon dating demonstrates that magmatism of 700 Ma to 800 Ma can be traced in various types of metaigneous rocks exposed at least in the gneiss zone as well as in the low-grade and UHP zones in the Dabie-Sulu belt (Ames et al., 1996; Xue et al., 1997; Rowley et al., 1997; Hacker et al., 1998, 2000; Chen et al., 2003; Zheng et al., 2003; Chen et al., unpublished data). Metagranites in the LT/HP zone of the Dabie terrain contain zircons that have recorded magmatic event at about 780 Ma to 800 Ma, coinstantaneous with the magmatism in the other areas (Chen et al., 2003). Precursors of the UHP eclogites exposed in the Dabie-Sulu belt are mostly Late Proterozoic in age and probably represent as magmatic products related to an extension environment (Ames et al., 1996). More significant is that zircons of numerous orthogneisses and eclogites of Late Proterozoic crystallization age from the Dabie-Sulu belt are noticeably depleted in <sup>18</sup>O isotope, implying meteoric-hydrothermal alternation of magma sources probably related to the "Snowball Earth" event in Late Proterozoic (Zheng et al., 2003).

This magmatism in the Dabie-Sulu belt is roughly contemporary and is probably related to the break-up of Rodinia, although immediate evidence for an extensional environment in Late Proterozoic is still lacking and an exact position of the Yangtze Block within Rodinia is debated. Many studies nevertheless show that this break-up can be traced along the periphery of the Yangtze Block, e.g., there are bimodal volcanic rocks of about 820 Ma to 800 Ma at the western margin (Ma et al., 1989; Li et al., 2001), mafic to ultramafic dykes at the southern margin (Li et al., 1999), and volcanic rocks of about 750 Ma and mafic dyke swarms of about 800 Ma at the northern margin in the Wudan Mountains (Ma et al., 1984; Zhou et al., 1998).

Granitoids having U-Pb zircon ages of  $703 \pm 3$  Ma to  $809 \pm 2$  Ma with a mode of 750 Ma to 755 Ma are reported to occur in the Seychelles of Indian Ocean (Stephens et al., 1997; Tucker et al., 2001), which also show low  $\delta^{18}\text{O}$  values (Taylor, 1968, 1977; Harris and Ashwal, 2002). Granitoid having SHRIMP U-Pb zircon age of  $823 \pm 5$  Ma is also identified in the Lesser Himalayan granite belt in NW India (Singh et al., 2002). The coeval occurrence of the Late Proterozoic granitoids in Indian Ocean (also low  $\delta^{18}\text{O}$ ) and Indian continent with those in the northern margin of the Yangtze Block may point to a correlation in the geotectonic setting of magmatic activity during the break-up of Rodinia. This may have potential implications for localization of South China Block in reconstructing Rodinia, i.e. close to Indian continent in northwest rather than Australian continent in east as previously proposed by Li and co-workers (Li et al., 1995; Li, 1996).

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