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The systematic metamorphic pattern along the Qinling-Dabie-Hongseong collision belt between the North and South China blocks and its tectonic meaning

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As a last step of formation of the Pangea supercontinent, the North China block collided with the South China block during Permo-Triassic time forming the Qinling-Dabie-Sulu collision belt which was identified by the finding of ultrahigh- and high-P/T eclogites along the belt. After the Qinling-Dabie-Sulu collision belt was found, the continuation of the collision belt into Korean Peninsula became a hot issue. Although the Imjingang belt in Korean Peninsula was suggested as an extension of the belt, evidences of collision belt such as eclogite and ophiolite, were not found from the belt. Whereas recent studies on Korean Peninsula reveal that Triassic eclogite (ca. >230 Ma) formed in the Hongseong area and Triassic post collision igneous rocks (with ca. 230 Ma intrusion ages) occurred throughout the Gyeonggi massif locating to the north of the line connecting the Hongseong, Yangpyeong and Odesan areas (Oh et al., 2005; Kim et al., 2011). These new findings derive the tectonic model in which the Permo-Triassic Qinling-Dabie-Sulu collision belt between the North and South China blocks extends into the Hongseong-Yangpyeong-Odesan collision belt in Korean Peninsula (Oh and Kusky, 2007). The collision had started from Korea at ca. 250 Ma and propagated towards China. The collision completed during late Triassic. The metamorphic conditions systematically change along the collision belt; ultrahigh-temperature metamorphism occurred in the Odesan area (at 245 Ma; 9.0-10.6 kbar, 915-1160°C), high-P/T metamorphism in the Hongseong area (at > 230 Ma; 17.0-21.9 kbar, 835-860°C), ultrahigh-pressure metamorphism in the Dabie and Sulu belts (at 230-220 Ma; 30-40 kbar, 680-880°C), ultrahigh-pressure metamorphism in the Hongan belt (at 225-212 Ma; 31 kbar, 590-650°C) and blueschist facies metamorphism in the Qinling belt. The systematic increasing peak pressure condition and decreasing peak temperature condition from the Odesan to Dabie-Sulu belt, may be due to the increase in the depth of slab break-off towards west, which might be related to the increase of the amounts of subducted oceanic slab towards west (Oh, 2010). However, after the slab break-off in the Dabie-Sulu area, the depth of slab break-off decreased towards west resulting the decrease of peak metamorphic conditions from the Dabie-Sulu to Qinling belt. Post collision igneous activities occurred at 230 Ma in the eastern part of the collision belt between the Odesan and Hongseong area and 215-200 Ma in the Qinling belt. The wide distribution of Permo-Triassic arc-related granitoids in the Yeongnam Massif, southern part of Korean Peninsula and in the southern part of the South China block, indicate the Permo-Triassic subduction along the southern boundary of the South China block which may be due to compression caused by the Permo-Triassic collision between the North and South China blocks.