Tectonic affinity of the Permo-Triassic Hida Belt in Japan: Implication for the East Asian continental growth

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Since the finding of ultrahigh-pressure eclogites and garnet peridotites from the Chinese Sulu–Dabie orogen between the North China Craton (NCC) and South China Craton (SCC), the geological connection of the collisional orogen to East Asia has been discussed from various viewpoints by various researchers. Because of the similarity of the metamorphic age, some researchers considered the Japanese Hida Belt represents the eastern extension of the Sulu–Dabie orogen; consequently, geological and geochronological studies in the Hida Belt have mainly focused on the major tectonic framework of East Asia (East China, Korean Peninsula, and Far Eastern Russia). In this contribution, we outline the previous research on the Hida Belt and summarize the new geochronological studies in East Asia.

The Hida Belt represents a 'non-accreted' autochthonous basement in SW Japan. Permo-Triassic gneiss and granite of the belt along the Japan Sea have been considered to be the fragments of continental margin basement before the Miocene Japan Sea opening. The metamorphic lithologies are mainly of amphibolite, calcareous gneiss, granitic gneiss, quartzofeldspathic gneiss, marble, and minor pelitic gneiss (garnet–sillimanite–biotite gneiss); rare kyanite- and staurolite-bearing pelitic schists intercalated with marble occurs in a small area. Although skarn-type coarse-grained grossular–diopside rock occurs in the reaction zones between amphibolite and marble, no petrological evidence of eclogite-facies rock has not been found in the Hida Belt. Past geochronological studies revealed that the regional upper amphibolite- to low-pressure granulite-facies metamorphism and related igneous activity were ~260–230 Ma, and the younger undeformed granitic rocks were formed at ~200–190 Ma. The timing of the middle- and lower-crustal metamorphism of the Hida Belt is slightly older than either UHP event or post-collisional igneous activity of the Sulu Belt. Our age compilation of the Hida Belt indicated granitic intrusions would have occurred simultaneously with regional metamorphism. Although zircon age spectra of the Hida Belt overlap some Korean basement units, there are also some discrepancies in both lithology and zircon ages. In any case, the Hida Belt and the related Permo-Triassic East Asian continental basements unit still have the key to an understanding of the geodynamic process at the continental margin.