Igneous activities and tectonic evolution of the Ogcheon rift basin, South Korea

JI-HOON KANG

Andong National University, Andong 36729, South Korea
(*correspondence: jhkang@anu.ac.kr)

The pre-Cenozoic tectonic structures of the Ogcheon Belt, South Korea, were formed at least through five times of tectonic phases [D* Gyemyeongsan phase of Neoproterozoic ~Middle Permian, D1 Ogcheon-Cheongsan phase (Songnim orogeny) of Late Permian~Middle Triassic, D2 Honam phase (Daebo orogeny) of Early~Late Jurassic, D3 Cheongmari phase of Early Cretaceous, D4 Geumgang phase before Late Cretaceous] and three times of metamorphism [M1 medium-pressure type metamorphism of Late Permian, M2 contact metamorphism of Middle Jurassic, M3 retrograde metamorphism of Early Cretaceous]. The D* is marked by the rifting of the original Gyeonggi Massif into North and South Gyeonggi Massifs. Its associated bimodal type volcano-plutonism occurred at least four times in the Ogcheon rift basin (ORB). The Early and Middle Neoproterozoic riftings took place in its northwestern part, and the Gyemyeongsan and Munjuri types of metaconglomerate rocks with a mess of volcanic and plutonic acidic rocks, respectively. The Early and Middle Paleozoic riftings took place in its southeastern and central parts, respectively, and a mess of volcanic and plutonic basic rocks and the Hwanggangri type of metaconglomerate rocks were produced, respectively. The D1 is characterized by the coupling of North and South Gyeonggi Massifs with the closing of ORB and the M1 metamorphism of Ogcheon Supergroup (OSG) at its earlier phase, and by the coupling of South and North China blocks and the Cheongsan dextral strike-slip shearing and the formation of Middle Triassic Dadong basin in its later phase. The D2 is marked by the Honam dextral strike-slip shearing and the M2 metamorphism of OSG by the intrusion of Daebo granitoids at the inter-tectonic phase. The D3 is marked by NNE-trending sinistral strike-slip shearing and the M3 metamorphism of OSG. The D4 occurred along Geumgang fault, and formed a giant-scale Geumgang drag fold which was intruded by Late Cretaceous acidic dykes. The (N)NE trending main geological structures in the Ogcheon Belt were formed by the D1 and D2 tectonic phases, and partially reoriented by the D4. The D1 Ogcheon-Cheongsan phase played important roles in constructing the present tectonic framework of the Korean Peninsula.