Metamorphic evolution of Kontum Massif, cental Vietnam (II) -Metamorphism and tectonics-

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The supra crustal metamorphic and intrusive rocks from Indo-China carton are exposed in central part (Kontum Massif) and in northern part (Red River shear zone area) of Vietnam. Kontum Massif of central Vietnam is consisting of amphibolite to granulite facies metamorphic rocks, which are intruded by S-type and I-type granites. This terrane has been considered to have mainly Archean granulites (Kannak Complex) and Proterozoic amphibolites (Ngoc Linh Complex) which forms a discontinuity in the correlation among East Asian continental fragments. Recent studies from central Vietnam includes new ages for the metamorphic and intrusive rocks were reported by Nam et al. (2000). The present study is a part of our attempt to recognise the relationship between continental fragments during Triassic collision in eastern Asia. The present investigation is about the deep crustal metamorphic processes and plutonic/volcanic activity in Kontum massif.

Kan Nack Complex is dominated by pelitic-semipelitic gneisses metamorphosed in high- to ultrahigh-temperature condition under granulite facies. A minor amount of mafic and calc silicate rocks are also exposed intercalated within the gneisses. Kan Nack complex can be subdivided into four stratigraphic units like Kon Cot, Xa Lam Co and Dal Lo Formations. This complex is rich in later granitic intrusives. One of the most widely exposed pluton is Plei Man Ko granitic complex in the Kan Nack area. The intrusion of plutonic rocks into the gneisses disturbed the foliation and gets highly migmatised in some locations. The major pelitic rock types of this complex are Grt-Crd-Sil-Bt+/-Spl+/-Opx gneiss, Grt-Bt+/-Opx gneiss and Grt-Sil gneiss. Minor amounts of mafic granulites and calc-silicate granulites are also exposed. The highest grade metamorphic rock of Grt-Opx-Sil gneiss indicates multi-stage symplectite formation during isothermal decompression at UHT condition (1000 C-) owing to high-Prp mole (up to 58%) in Grt and high-Al in Opx (up to 11 wt%). Monazite U-Pb chemical age for Grt-Opx-Sil gneiss shows c.248 Ma. Mafic granulites from Ngoc Lihn Complex of high-pressure granulite to eclogite facies condition are also indicating similar P-T condition and P-T evolution with a Sm-Nd internal isochron age of 247 Ma. These Triassic metamorphic rocks distribute along the shear zone bounded on LTHP metamorphic rocks of Kham Duc Complex. On the other hand, undeformed and slightly lower temperature metamorphosed pelitic and mafic granulites in the innner part of Kannak and Ngoc Lihn Complexes show c.670 Ma with well defined Sm-Nd internal isochron.

The metamorphic rocks of Kontum Massif mainly contain of LTHP schsits unit and HT-UHT granulite unit, which form two sets of pair. The boundary between both units are large shear zone with remarkable mylonite formation. The southern border of the Kontum Massif is also large shear zone extending to north along Chuong Son Mountains up to southern China. The 250 Ma high-grade metamorphic rocks showing strong relationship with the Triassic collision in eastern Asia as well as Dabie Mountains between North and South China Cratons. The result giving c.680 Ma showing the possibility of Pan-African event also affect in this terrane. So the present study is a step ahead for the juxtaposition of eastern Asia as a part of Gondwana super continent.