

Tectonic evolution of the Kontum Massif in Vietnam and Indochina region

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The Kontum massif in central Vietnam consists of low-grade schists and amphibolite- to granulite-facies metamorphic rocks, that has been intruded by various igneous rocks. This terrane was formerly considered to be composed mainly of Archean granulites (the Kannak Complex), Proterozoic amphibolite-facies metamorphic rocks (the Ngoc Linh Complex) and low-grade schists (the Kham Duc Complex). They were considered to be the basement of the Indochina Craton in Southeast Asia. On the other hand recent detailed analyses of metamorphic evolution process and multi-isotope geochronology indicate a necessity of reconsideration on tectonic evolution of the Kontum Massif and related regions in Indochina area.

In the Kontum Massif, there are many shear zones (suture zones) with NW-Se to WNW-ESE strikes. They are named as Haivan Pass shear, Danang-Dailok shear, Tam Ky-Phuoc Son suture and Dac To Kan shear, from north to south, where characteristic gold mines and hot springs distribute along these shear zones. Metamorphic rocks in the Kontum Massif are subdivided into four types of rock units by these shear zoned due to lithologies, metamorphic characters and isotopic ages. So called Kham Duc Complex distributes between the Danang-Dailok shear and the Tam Ky-Phuoc Son suture zones. The northern part of the complex is underlain by very low-grade schists with 400-430 Ma ages and the southern part consists mainly of low-grade gneisses with ca. 250 Ma, which are indicating clockwise P-T evolution from St-Ky field to Sil-Crd field. The area between the Tam Ky-Phuoc Son suture and the Dac To Kan shear zones was considered to belong the Kannak and Ngoc Linh Complexes. However, the area is now subdivided into three different rock units of (1) amphibolite to low-granulite facies metamorphic rocks with 400-500 Ma in the northern part, (2) amphibolite facies rocks with 680 Ma in the southeastern part, and (3) UHT-HP granulites with 250 Ma along the Dac To Kan shear zones in the southern part. These shear zones are assembled at the western Hue city and extending to the north along the Chuong Son (Annan) Mountains. At the western part of Thanh Hoa city in north Vietnam, the shear zone join with the Song Ma suture zone and extend into the Yunnan province in China via northwestern part of Laos.

The Song Ma suture zone is still considered to be of the cratonic collision boundary between the South China and the Indochina Cratons. Another opinion for this cratonic boundary is as Danang-Dailok shear zone. However in this contribution, we consider that the boundary between the South China and the Indochina Cratons would be of wide area including Song Ma and many shear zone in the Kontum Massif during final collision event of Permo-Triassic age of ca.250 Ma. Older rocks of 400-500 and 680 Ma would be of some caught blocks made during previous collision event in Asia or derived from Gondwana Super Continent.