

Mesozoic magmatism and change of tectonic regimes in SE China

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The early Mesozoic granites are predominantly peraluminous, and regarded as pure crust-derived S-type granites. However, they coexist with alkaline syenites and A-type granites, indicating an extensional tectonic environment with possible basaltic magmatic underplating.

The closure of the paleo-Tethys Ocean and continent-continent collision of the Northern Indochina block with the South China block was dated at 258-242 Ma. The collision of the South China block with the North China block occurred at 240-225 Ma. Thus, the South China block was clamped between these two collision belts, resulting in an intra-continental orogenesis with significant compressional stress, strong folding and thrust faulting. The early Mesozoic intra-continental orogenesis resulted in crust thickening and the anatexis of metasedimentary rocks.

The late Mesozoic granitoids-volcanics are related to paleo-Pacific plate subduction. In middle Jurassic, under the forward subduction regime of the paleo-Pacific plate, reactivation of pre-existing structures can lead to lithospheric extension and spatially discrete and localized intraplate asthenospheric upwelling, decompression melting, and basaltic magmas underplating. The underplating mantle-derived magmas caused partial melting of the crustal materials to produce S-type granites. Interactions between mantle- and crust-derived melts may give rise to I- and A-type granitic magmas. Based on systematical researches on the Cretaceous volcanic rocks and a series of granitoid plutons in Zhejiang, it is also identified that the juvenile component involvement gradually occurred from the inland to the coast under an enhanced lithospheric extensional tectonic setting.