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Early Paleozoic magmatism in the Baoshan-Tengchong block of the Tethyan Yunnan, China

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The western Yunnan belongs to one of the important branches of the eastern Tethyan tectonic belt and therefore bears significance of the Tethyan belt in the SE Asia. The geological evolution of SE Asia in Paleozoic to Mesozoic can be regarded as an accretion history by the amalgamation of several micro-continents or continental blocks to the Eurasian supercontinent due to successive closure of Tethys oceans [1-3]. In common view, these micro-continents rifted from the northern margin of supercontinent Gondwana and drifted northwards. The Tethyan terrain of the western Yunnan is composed of several continental blocks separated by tectonic zones or suture zones, e.g., the Simao and Tongchong-Baoshan blocks and the Changning-Menglian suture zone.

The Tengchong-Baoshan block is considered as a part of the Sibumasu micro-continent [1], in which Precambrian basement of Gondwana affinity is exposed. This basement is covered by Paleozoic low-grade metamorphic terrestrial sedimentary rocks. Two granites sampled from the basement section yield about 490 Ma U-Pb zircon ages (nearly concordant), suggesting an early Paleozoic emplacement. In addition, part of late Cretaceous granites having crustal origin contain inherited zircon cores giving ages around 500 Ma. Granite lenses of 486 Ma are also found in the late Paleozoic melange of the Nan-Uttaradit zone suturing the Sibumasu and Indochina blocks [4]. This early Paleozoic magmatism found in the Tengchong-Baoshan block and in the neighboring area imply a comparable history of the basements during early Paleozoic between SE Asia and the western Tethyan belt, e.g., the basement outcrops in the Alpine belt and probably in the European Variscides [5] as well, which are also considered as continental blocks having rifted from Gondwana prior to or simultaneously with those of SE Asia. This study is supported by the NSFC (No. 40372106).

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5.0.P19

A petrological study of basic dykes and sills of assumed Palaeoproterozoic age in central West Greenland

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Three suites of Palaeoproterozoic metadolerite dykes and sills in the northern Nagssugtoqidian orogen and southern Rinkian fold belt in central West Greenland were presumably intruded during a rifting phase prior to the Palaeoproterozoic orogeny [1]. These basic intrusions contain information about their mantle source and are also important markers of the tectonic and thermal history during the subsequent orogenesis.

The E-W trending Aasiaat metadolerite dykes in the northern Nagssugtoqidian belt show clear discordant relationships to their host rocks but are all completely recrystallized and dominated by metamorphic plagioclase, hornblende, orthopyroxene ± bio. ± Fe-Ti oxides ± grt. ± cpx. ± qrtz. Planar and linear tectonic fabrics are concentrated in the contact zones to the host orthogneisses, while the central parts of the dykes show relict subophitic textures. The Aasiaat dykes are moderately to highly evolved olivine and quartz tholeiites, and Rayleigh fractionation and AFC models indicate relative low pressure fractionation combined with crustal assimilation, and geochemically closely resemble the Kangâmiut in the southern Nagssugtoqidian orogen. Trace element ratios vary substantially between the Aasiaat dykes and the two other, more northerly groups in the southern part of the Rinkian belt, which however evidence similar petrogenetic evolutions. All the groups show LILE enrichments relative to the HFSE, and most show traces of contamination with crustal rocks. The new data presented here is compatible with the recent interpretation by e.g. [2] that the Nagssugtoqidian and Rinkian belts are both part of one major collisional orogen.

References

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