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Zircon U-Pb Chronology，Geochemistry of the Late Triassic Acidic Volcanic Rocks from Dangchang Area in the West Qinling Orogenic Belt and Its Implications

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As an important part of China's central orogenic belt，Qinling orogenic belt is a multistage orogenic belt that experienced a long-term convergence of North China Block and Yangtze Block. In the Early Mesozoic，with the closure of A'nyemaqen-Mianlue ocean basin and the beginning of continental collision，a strong magmatic activity dominanted by the tectonic emplacement of two stages（245～234Ma and 225～205Ma）high-K calc-alkaline granitic magma developed in Western Qinling，which reached the peak of magmatic activity in the second stage，while the mafic magma activity or volcanic eruptions were relatively rare in the same period. A series of continental intermediate-acidic volcanic rocks exposed in the north of Dangchang County，Gansu Province. Previous stratigraphic correlation and whole rock K-Ar isotopic dating suggested that these rocks formed in the Early-Middle Jurassic，but the zircon LA-ICP-MS U-Pb dating in the paper limited that the volcanic rocks formed in the early stage of Late Triassic (229～228Ma)，rather than the Early-Middle Jurassic. What's more，these rocks erupted in the interim period between the two stages granite magmatism，and that may provide important constraints for understanding orogenic and crust-mantle evolution of West Qinling in the Indosinian.

Dangchang volcanic rocks consisting of alkali feldspar rhyolites，trachytes and potassium dacites belong to the shoshonitic to high-K calc-alkaline series，but these rocks don't show the characteristics of magmatic evolution. Most of these rocks have low $Mg^{\#}$ (19～35)，belonging to peraluminous rocks (A/CNK=0.98～1.26)，while some alkali feldspar rhyolites with relatively high $Mg^{\#}$ (43～48)，Cr (49.9～54.4μg/g) and aluminum saturation (A/CNK=1.57～1.66) may related with the adding of a very small amount of mantle-derived and upper crustal materials. Dangchang volcanic rocks are enriched in large-ion lithophile elements(LILE) Rb，Ba，Th，U，K，relatively depleted in Sr and high field strength elements (HFSE) Nb，Ta，Ti，P. The alkali feldspar rhyolites have $(^{87}Sr/^{86}Sr)_i$=0.7048～0.7050，$\varepsilon_{Nd}(t)$= -4.0～-4.3，with the depleted mantle model ages (T_{DM}) from 1.20 to 1.23Ga，while the potassium dacites have $(^{87}Sr/^{86}Sr)_i$=0.7063～0.7068，$\varepsilon_{Nd}(t)$= -3.0～-4.1，with T_{DM} from 1.19 to 1.24Ga. It suggest that Dangchang volcanic rocks were originated from the remelting of of Late Mesoproterozoic newborn crust，corresponding to the crustal accretion event of the periphery of the Yangtze plate in the Mesoproterozoic. In addition，Dangchang volcanic rocks with low $Mg^{\#}$ (19～35) indicate that the characteristic of K-rich is the inherent property of the lower crust of West Qinling，irrelevant to the contamination of K-rich mantle source.

Necessary to mention that the Sr-Nd isotopic composition of Dangchang volcanic rocks slightly differ from that of the West Qinling Indosinian granites，and its whole-rock Nd model ages (1.19～1.24Ga) is also different from the West Qinling Indosinian granite (1.30～1.66Ga)，but consistant with the South Qinling Neoproterozoic basement Yaolinghe Group (concentrated in 1.0～1.2Ga) and Late Triassic granites of South Qinling (1.1～1.3Ga)，implying South Qinling and southeast of West Qinling may still have a unified Mesoproterozoic basement of Yangtze Block. Considering the high $(La/Yb)_N$ ratio (19.28～30.04)，low content of Yb (0.96～1.83μg/g) and Y (9.8～22.6μg/g) and a weak negative Eu anomaly (δEu = 0.75 ~ 0.85)，the suitable protolith of Dangchang volcanic rocks should be the garnet amphibolite with minor amounts of metapelite. Several lines of evidence suggest that there may be a thickened crust (～45km thickness) in the West Qinling orogenic belt in the early Late Triassic (~230Ma).

According to the existing research results，it remains controversial that in the early Indosinian whether it is still in the subduction stage of Paleo-Tethys or in the post-collisional stage of West Qinling. Given Dangchang volcanic rocks formed in the interim period between the early Indosinian granite magmatism and the late Indosinian granite magmatism and hadn't been affected by apparent mantle assimilation，We infer that the disappearing age of Paleo-Tethys oceanic crust in West Qinling may be ~230Ma (after middle Triassic). In other words，the early Indosinian granites formed in the continental margin arc environment relating to the subduction of oceanic crust，and the Dangchang volcanic rocks formed in the crustal thickening process caused by the continental collision，while the larger amounts of the late Indosinian granite magmatism may be related to the lower crust delamination or slab break-off in the post-collisional environment.

Key Words：West Qinling；Late Triassic；thickened crust；Paleo-Tethys

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