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Tectonic Evolution of the Dongbo Ophiolite in Western Yarlung Zangbo Suture Zone, Xizang(Tibet)

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The Dongbo ophiolite in the western part of the Yarlung-Zangbo suture zone in southern Tibet rests tectonically on the middle- late Triassic and Cretaceous flysch units, and consist mainly of peridotites, mafic dikes, and volcanic-sedimentary rocks. Massive basalt flows and basaltic hyaloclastic rocks are interlayered with or overlain by mudstone and silty shale, radiolarian chert, and siliceous to oolitic limestones. The peridotites display “spoon-shaped”, chondrite-normalized REE patterns with relative depletion from Lu to Nd, followed by slight enrichment from Nd to La. Tithonian to Valanginian (150-135 Ma) OIB-like basalts occur between the peridotite and the silty shale. These basalts display higher TiO₂ (3.27 wt.%) contents, higher ratios of (La/Yb)_N (16.70) and (¹⁴³Nd/¹⁴⁴Nd)_t= 0.512596~0.512630, but lower values of ε_{Nd}(t)= +2.6~ +3.3 and (⁸⁶Sr/⁸⁷Sr)_t= 0.70378~0.70439. The 128-130 Ma doleritic dikes intruding the upper mantle

peridotites exhibit N-MORB-like REE patterns with negative Nb, Ta and Ti negative anomalies in N-MORB normalized spider diagrams, have higher ratios of (¹⁴³Nd/¹⁴⁴Nd)_t = 0.512904~0.512909 and higher ε_{Nd}(t)= +8.9~ +9.0, and show slightly low (⁸⁶Sr/⁸⁷Sr)_t = 0.70489~0.70531. The peridotites are compositionally and geochemically similar to those of fore-arc peridotites. The OIB -like basaltic lavas erupted directly on the serpentinized peridotites that were exhumed on the seafloor by the earliest Cretaceous, originated from an asthenospheric window due to oceanic slab subduction. Doleritic dikes have a supra-subduction affinity and were formed in fore-arc or back basin settings. The mafic-ultramafic and sedimentary rocks in the Dongbomassif probably represent fragments of an early Cretaceous intra-oceanic supra-subduction zone within the Neo-Tethys.

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