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# A Paleoproterozoic (Orosirian) Ophiolitic Mélange, North Yangzte Craton

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Ophiolites represent fragments of ancient oceanic lithosphere, tectonically incorporated into continental margins during plate subduction or remained in the subduction–collisional orogenic belt. They provide important information on the operating time, the mechanism of the tectonic plates, global tectonic evolution as well as the reconstruction of the supercontinent. As the only area exposed representative Archean continental crust, Huangling dome is an important window to study the early crustal evolution of the Yangtze craton. Recent research on Huangling dome provides important records of the high-grade metamorphism and post-collisional magma related to paleoproterozoic collisional orogeny.

In this contribution, we report for the first time a suite of Paleoproterozoic (Orosirian) ophiolitic mélange belt (named Shuiyuesi Ophiolitic Mélange) exposed in the Archean–Paleoproterozoic Kongling Complex from the northern Huangling Dome. The mélange belt is 3-12km wide, and contains a structurally complex tectonic mixture of garnet gneiss, mica-graphite schist, marble, quartzite, banded iron formation (BIFs), and tectonic blocks of metamafic-ultramafic blocks/slices and TTG gneisses. Metamafic-ultramafic rocks commonly occur as lenses, boudins and layers within the metamorphic supracrustal rocks are composed mainly of serpentinized harzburgite, meta-olivine pyroxenite, metapyroxenite and amphibolite (metadiabase, metagabbro and metabasalt). Geochemical characteristics show that serpentinized harzburgite are LREE-enriched metasomatic abyssal residual mantle peridotite, the meta-olivine pyroxenites, metapyroxenites are cumulates at supra-subduction zone influenced by subduction fluid. The amphibolites are tholeiitic rocks, and characterized by flat to light enriched LREE patterns, enriched LILE patterns (e.g. K, Rb, Ba, Th, Cs), and negative anomalies of HFSE (e.g., Nb, Ti) suggesting a supra-subduction zone (SSZ) environment. The amphibolites have formation age of ca. 2150Ma and eHf (t) values range from +5.35 to +10.26 (average=+7.2) and TDM1=2.24 Ga. All units in the mélange have suffered paleoproterozoic (2.0–1.95Ga) amphibolite-granulite facies metamorphism and strong deformation. In addition, the formation age of quartz monzonitic dyke crosscutting the serpentinized harzburgite is 1999 Ma, giving minimum emplacement age for the mafic–ultramafic complex. The field relationships suggest that the metamafic-ultramafic blocks are possible oceanic crust fragments incorporated into the suture zone during the accretionary-collisional process. So, we inferred a southeast-dipping subduction system (present orientation) in north Huangling Dome at middle paleoproterozoic (~2.15–2.0Ga) which is end up with collision between the eastern and western microcontinents mainlmy consistant of Archean TTG gneiss.

The metamafic–ultramafic complex and meta-supracrustal rocks combined into an ophiolitic mélange suffered paleoproterozoic (2.0–1.95 Ga) amphibolite-granulite facies metamorphism related to subduction-collision orogeny. The supra-subduction zone affinity indicate a subduction–collision orogenic event during the Paleoproterozoic in the Yangtze Craton, and it has experienced a complex tectonothermal evolution involving accretion of a number of continental blocks. In this case, the Shuiyuesi mélange belt may represent a relict suture zone between micro-continents that constitute the Yangtze Craton. And it provides important geological evidence for the Paleoproterozoic accretion-collision orogenic events associated with the amalgamation of the global Columbia supercontinent.

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