

Petrological and chronological constraints of UHT granulites from Highland Complex, Sri Lanka: implications on Gondwana correlation

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The high-grade ultrahigh-temperature regional metamorphism of Sri Lanka has a significant role in understanding the tectonics and formation of Gondwana super-continent. Sri Lanka in specific is important because of its position in Gondwana assembly, placed close to southern India, Madagascar and eastern Antarctica. The central Highland complex in Sri Lanka consists of UHT granulites intercalated with pelitic and mafic granulites along with calc-silicates, which preserves textural evidence for UHT metamorphism. The U-Pb zircon dating of sapphirine bearing granulites yielded two major age populations 565-620 Ma and 525-563 Ma without older zircon cores. Another granulite sample with Grt-Sil-Spl-Crd assemblage has similar metamorphic age ranging *ca.* 526, 563 and 602 Ma concordant clusters, with inherited zircon core ages from 1600 to 2040 Ma. The Fe-Al rich pelitic granulites also had undergone bimodal metamorphism (520-565 Ma and 590-622 Ma). Some of these samples have inherited zircon cores ranging from with 760 to 3060 Ma. The zircons in mafic granulite samples have age range of 533-566 Ma and 578-620 Ma. The scapolite bearing calc-silicate sample also has similar age populations at *ca.* 533 Ma and 560-570 Ma. The compilation of the new results and available ages from Sri Lanka and its adjacent continental fragments of the Gondwana, we propose the Northern Madurai Block, Southern Madurai Block, Wannai Complex and Highland Complex are alternate older and younger terranes formed in a major convergent regime, metamorphosed during Ediacaran-Cambrian regional UHT event. The petrological and geochronological similarities indicate that the Highland Complex, Sri Lanka, Madurai Block, southern India and Lützow-Holm Complex, Antarctica and central Madagascar should have been together during the closure of the Mozambique Ocean as part of the Gondwana amalgamation.

Keywords: U-Pb zircon LA-ICP-MS dating, Late Neoproterozoic, ultrahigh-temperature granulite, Highland Complex, Sri Lanka