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SMP09-P04 Room:Convention Hall Time:May 27 18:15-19:30

A revised tectonostratigraphy for Late Archean supracrustal rocks in the Chitradruga schist belt, Dharwar craton, India

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In order to understand late Archean tectonic and climatic systems prior to the great oxidation event, we studied volcano-sedimentary sequence of the Dharwar Supergroup, distributed in the Chitradurga Schist Belt, Western Dharwar craton. The Chitradurga schist belt consists of >3.0 Ga greenstones (Sargur Group) and overlying 2.9-2.6 Ga volcano-sedimentary sequence (Dharwar Supergroup), which are surrounded by 3.2˜3.0 Ga TTG (tonalitic-trondhjemitic-granodioritic) gneiss (Chadwick et al., 2000; Jayananda et al., 2006). The Supergroup is classified into two major groups (lower Bababudan Group and upper Chitradurga Group). Preliminary studies on metamorphic conditions and geochronology of the Chitradurga Schist Belt have shown that this subdivision has to be reconsidered (Hokada et al., 2013). Therefore, we carried out a detailed lithostratigraphy, geochronology, metamorphism and tectonic evolution of the Chitradurga Schist Belt. Furthermore, it is important to compare the geological record with the other cratons for discussing any global events occurring in the late Archean. Our new field mapping and detrital zircon U-Pb dating allows us to reconstruct detailed lithostratigraphy of the Dharwar Supergroup. The lower unit consists of basal conglomerate, stromatolitic carbonate, silici-clastics with diamictite (Talya conglomerate), chert/BIFs and pillowed basalt in assending order, indicating that rift margin environment predominated at this time. The upper unit unconformably overlies the pillow lava, and consists of conglomerate/sandstone with ˜2536 Ma detrital zircons, mafic lava, BIFs and silici-clastic sequence with mafic volcanics. The provenance analysis by detrital zircons allow us to divide the Dharwar Supergroup into the lower and upper groups. Especially, the maxima in the age distribution in the upper group (Hiriyur Formation) shows a peak at around 2.55 Ga, suggesting the source from the Eastern Dharwar Craton. Three metamorphic zones are identified in the Ingaldhal basalts. The metamorphic grade increases from lower greenschist facies to sub amphibolite facies. The boundaries between three metamorphic zones are subparallel to the bedding of interbedded BIF and tectonic contact between the lower group and upper group. On the other hand, the Hiriyur metabasalts are characterized by extensive carbonatization, whereas most samples from the lower group do not contain carbonate minerals. These differences in metamorphic grade and carbonatization of the greenstone indicate that the two groups of the Dhawrar Supergroup might preserve key information about amalgamation and/or breakup of the Dharwar protocontinent in the late Arcehan.

Keywords: Late Archean, Soth India, Metamorphism, Geochronology, zircon, Supercontinent