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Evidence for A Neoproterozoic LIP Remnant in the Singhbhum Craton, Eastern India: Implications to Vaalbara Supercontinent

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We report eight new Pb-Pb baddeleyite ages and paleomagnetic results on a series of hitherto unknown Neoproterozoic NNE-SSW trending mafic dyke swarms intruding the Paleoproterozoic basement rocks in the Singhbhum craton, eastern India. Being the most dominant dyke swarms in the region, they occur over the entire Singhbhum craton with an areal distribution extending to about 30,000 km². Of the eight dyke samples analysed across the entire dyke swarm, six of these dykes were emplaced at ~2762 Ma, two with similar strike directions, yielded marginally older and younger ages of ~2800 Ma and ~2752 Ma respectively. The older ~2800 Ma dyke event appears to be coeval with several other magmatic events reported earlier from the Singhbhum craton. Emplacement of dacite tuffs within the Malaigiri basin, on the southern margin of the craton, the Rengali granite from the south-western and southern parts of the craton, along with the Temperkola granite activity and associated acid volcanics in the western part of the craton, and perhaps the Mayurbhanj (fine-grained phase) are also contemporaneous,

suggesting a fairly wide spread thermal event in the region at this time.

Well defined craton-wide magmatic events contemporaneous to the ~2762 Ma Singhbhum dyke activity have been reported from the Pilbara at 2763.2±2.5 Ma. The younger ~2752 Ma age dyke event occurring in the Singhbhum is also known from the eastern Pilbara at 2757.3±2.6 Ma. A marginally older event at 2783±1.2 Ma (Gaborone-Kanye-Plantation Porphyry-Derdepoort-Modipe episode) was identified in the Kaapvaal craton. Comparison of paleomagnetic data obtained on the Singhbhum Neoproterozoic dyke swarms with the Pilbara and Kaapvaal, show all these continents were located at steep northern latitudes and could have been proximal to each other during this time. If Pilbara and Kaapvaal formed supercontinent Vaalbara during the Neoproterozoic time, we propose Singhbhum could also have had its ancestry in the same supercontinent. We assign a new name to it, Kaapbumbara supercontinent.

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