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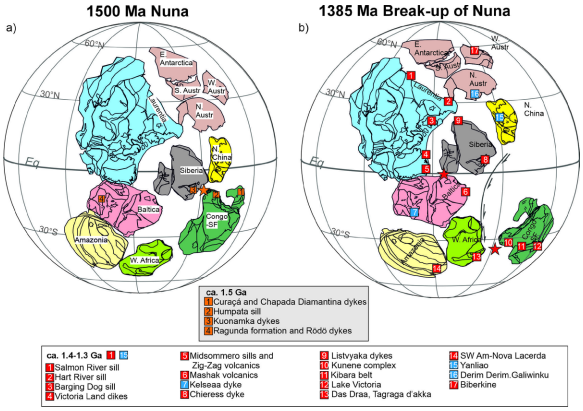
Mesoproterozoic large igneous provinces of Congo/São Francisco - Implications on transition from Nuna to Rodinia supercontinent

JOHANNA M. SALMINEN

University of Helsinki

Presenting Author: johanna.m.salminen@helsinki.fi



Reconstructing ancient paleogeography is a key to exploring Earth's evolution in deep time. Currently three supercontinents have been identified and named from oldest to youngest: Nuna/Columbia, Rodinia and, Pangea. Supercontinents have been suggested to be preceded by ~200 Myr by the assembly of a smaller landmass [1], such as Umkondia before Rodinia and Gondwana before Pangea. While the Congo-São Francisco (C/SF) craton is a main building block in Gondwana due to its central location and it has been suggested to be part of Umkondia (C/SF-Kalahari-India-Amazonia) [2], its participation to Rodinia and Nuna has been controversial.

Here the Mesoproterozoic large igneous province (LIP) record (1500 Ma, 1385 Ma, and 1100 Ma) of the C/SF craton is used together with paleomagnetic directions from LIP components to reconstruct paleogeography of C/SF during the supercontinent Nuna cycle. Comparison of high quality 1500 Ma Curaça paleomagnetic pole of C/SF [3] with coeval global robust poles and LIP record indicates the proximity of C/SF with Amazonia-West Africa and Nuna core cratons (Baltica-Laurentia-Siberia), therefore supporting C/SF participation in Nuna. However, when using the recent 1385 Ma Virei paleomagnetic pole of C/SF [4] together with coeval global poles, a distinct reconstruction is obtained. The 1385 Ma Virei pole requires a substantial transform motion and large-magnitude azimuthal rotation (~85°) of C/SF craton between 1500 Ma and 1385 Ma, which could be related to early stages of the Nuna break-up. It also requires a large rotation of C/SF relative to Laurentia, between 1385 Ma and the Neoproterozoic assembly of Rodinia. In addition, during the Nuna-Rodinia transition C/SF has been suggested to be assembled to Umkondia at 1100 Ma with a direct link to Kalahari [2, 5,6] that broke up post-1100 Ma and rejoined again in Rodinia.

[1] Wang et al. (2020), *Geology,* 49, 402-406

[2] Choudhary et al. (2019), *Precambrian Research,* 332, 105382.

[3] Salminen et al. (2016), *Precambrian Research,* 286, 195-212.

[4] Salminen et al. (submitted), *Precambrian Research*

[5] Ernst et al. (2013), *Lithos,* 174, 1-14.

[6] Salminen et al. (2018), *Geology,* 46, 1011-1014.

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