

2.0 Ga collisional dynamics unravelled in the São Francisco Craton, Brazil: paleotectonic matches with the North China Craton in the context of Columbia

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LA-ICPMS U-Pb provenance studies are conducted for key samples (khondalite-like) from the Itapeceira graphite-rich supracrustal succession in the São Francisco Craton. The Itapeceira rocks are hosted by Neoproterozoic crust that exhibits Late Paleoproterozoic reworking. The detrital zircon analyses indicated a maximum deposition age of ~2080 Ma. The age spectra suggested the precursor basin was essentially fed with detritus from the adjoining Mineiro accretionary belt (2470-2000 Ma), genetically related with the Minas Orogen. The Itapeceira rocks underwent granulite facies metamorphism, which was dated by zircon U-Pb ages at 1997 ± 20 Ma and 1971 ± 40 Ma in paragneiss and quartzite, respectively. These ages also constrained the timing of the conversion of carbonaceous material into graphite in the Itapeceira mine. The high-grade metamorphism was associated with the timing of collision of the Mineiro belt against the Neoproterozoic foreland. The Minas Orogen at a global scale has geologic and temporal matches with the Jiao-Liao-Ji Orogen located in the present eastern margin of the North China Craton, where khondalites, UHT granulites, anatectic charnockites are documented, as well as the Nashu graphite mine in the 1.97-1.88 Ga Korean arc. The paleotectonic similarities between the two cratons support a relatively close position at the time frame, as a result of the development of coeval accretionary/collisional belts along the active margins of distal Archean blocks. Progressive closure of the intervening Paleoproterozoic Ocean finally docked the São Francisco paleocontinent against the North China landmass. The work model allowed new insights into the paleogeography of the building blocks of Supercontinent Columbia at ~1.90 Ga.