

THE PIRANHAS GRABEN, CENTRAL BRAZIL, AS AN EARLY MANIFESTATION OF THE PARANÁ BASIN

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ABSTRACT: The Piranhas Formation occurs in a N-S 2 km wide and 15 km long graben – the Piranhas Graben - located 10 km south of the city of Piranhas in the Brazilian state of Goiás (16°25'37"S, 51°49'20"W). Of Ordovician age, it is formed by basal green polymictic conglomerate grading upwards to green arkoses and interbedded purple mudstones deposited over the Neoproterozoic granitic - gneissic basement of the Brasiliano - Pan African Brasília Orogenic Belt. New zircon U-Pb ages obtained by laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) for four detrital samples allow further source area investigation. In addition to a consistent ca. 500 - 600 Ma Brasiliano Orogeny population present in all samples, likely from proximal sources in the Brasília Belt, a statistically significant up-section increase is observed in zircons populations yielding Neoproterozoic ages (ca. 600 - 1,200 Ma), which are consistent with magmatic ages obtained for the Barro Alto, Niquelândia, and Cana Brava mafic - ultramafic complexes located farther north in the Brasília Belt. Those ages are also possibly compatible with more distal sources such as the Sunsás Province in the Amazonian Craton. Less frequent Paleoproterozoic and Archean populations (ca. 2.0 - 2.2 Ga and 2.5 - 3.5 Ga) also appear and increase in frequency progressively up-section. These ages, in turn, match those obtained for the Paleoproterozoic low grade metasedimentary rocks of the Ibiá, Jequitiá and Paranoá Groups, as well as the Archean granite-greenstone belt associations of the Goiás Massif, all located in the Brasília Belt, north of the Piranhas Graben. The results demonstrate a progressive increase in the sediment catchment area with higher frequencies of older ages throughout the filling of the graben with progressively finer, better sorted and more rounded sediments. The zircon radiometric ages for the Piranhas Formation are remarkably similar to those obtained for the Ponta Grossa Formation of the Devonian Paraná Supersequence of the Paraná Basin, which suggests that the rocks share inferred source areas for those ages. As such, it is possible to suggest that the Piranhas Graben could be an early manifestation of the Paraná Basin, sharing characteristics with the Ordovician rifts underlying the cratonic basin.

KEYWORDS: PIRANHAS GRABEN, BRASÍLIA BELT, ZIRCON U-Pb