

## DETRITAL ZIRCON POPULATIONS IN THE NEOARCHEAN TO PALEOPROTEROZOIC SEDIMENTARY COVERAGE OF CARAJÁS, AMAZON CRATON, BRAZIL.

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**ABSTRACT:** Detrital zircon U-Pb systematic is applied on an isotopic provenance study of the sedimentary coverage sequences from Carajás Basin and its spatially associated sedimentary paleoenvironments. Sampling of seventeen fine- to coarse-grained siliciclastic rocks prioritized regional reference sites in Carajás, such as Serra Norte (2 samples); Serra Sul (2); Azul Mine (5); spatially distributed samples into “Carajás Synclinium” (4); Serra Pelada (3) and Serra do Sereno (1). Challenged by a yet non-consensual regional lithostratigraphy for the region, sampling strategy was concentrated on siliciclastic rocks deposited over the main BIF deposition interval of the basin (Carajás Formation), which corresponds to the intermediate portion of the volcano-sedimentary pile of the Grão Para Group. For simplification purposes, this main BIF interval is here considered a regional paleoenvironmental marker, probably related to a tectonically stable stage of the geodynamic evolution of the Carajás Basin. A total of 1144 U-Pb detrital zircon analysis (*LA-MC-ICP-MS*) were performed, and 866 analysis provided U-Pb concordant ages or displayed <5% discordance, between the  $^{207}\text{Pb}/^{235}\text{U}$  vs.  $^{206}\text{Pb}/^{238}\text{U}$  ratios. Results suggest maximum depositional ages (MDA) for sedimentary deposits and associate relative probability zircon ages to the main periods of continental crust generation known for the region. Based on our critical analysis, the samples are tentatively subdivided into four main lithostratigraphic units, and we present MDA for each one, based on the youngest zircon founded in the studied samples: 1) Grão Pará Group (Itacaiúnas Supergroup) shows the youngest zircon of age  $2768 \pm 3$  Ma; 2) base of the Águas Claras Formation in Serra dos Carajás, interpreted here as the Igarapé Boa Sorte Formation and discordantly superimposed on the Grão Pará Group, displays youngest zircon of age  $2373 \pm 4$  Ma and shows carbonaceous pelites (Serra Pelada) and Mn deposits/occurrences (Azul/Sereno/Cinzento) as intrinsic features of correlation with the suggested chronocorrelated units; 3) upper portion of the Águas Claras Formation, with youngest zircon of age  $2796 \pm 36$  Ma, does not show the younger provenance characteristic of its base; 4) informally defined Caninana Unit, which partially corresponds to the Gorotire/Rio Fresco formation, presents the youngest zircon age among all the samples,  $2055 \pm 54$  Ma. The deposition of this unit must have occurred from 2.0 to 1.88 Ga, and its major zircon population suggests the volcanic rocks of Grão Pará Group and associated Neoproterozoic granitoids of the Carajás Domain (2.78-2.73 Ga), as its main provenance. Mesoarchean TTG-GB affinity magmatism of the Rio Maria and Carajás domains, together with spatially and temporally related granitoids (2.83-3.01 Ga) are the main sources rocks for the upper Águas Claras Formation. In its base (Igarapé Boa Sorte), both Mesoarchean and Neoproterozoic sources show equivalent importance, besides a minor and persistent zircon population between 2.55-2.69 Ga, which may be related to a not well documented, but existent, magmatism in the Amazon Craton. Restricted to the Caninana Unit, rare Paleoproterozoic zircon grains (~2.0 Ga) may be related to sources derived from calcium-alkaline intrusions of the Bacajá Domain. Few zircon crystals between 3.04-3.69 Ga were founded in almost all samples, attributed to the Carajás protocontinental crust.