

THE NEOARCHEAN A-TYPE PLANALTO GRANITE SUITE, CARAJÁS - AMAZONIAN CRATON

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RESUMO: In the north segment of the Carajás Province, several Neoproterozoic A-type subalkaline granites have been described. These embrace the Estrela Complex, the Serra do Rabo and Igarapé Gelado plutons and the Planalto suite. The latter is exposed in the Canaã dos Carajás area immediately to the south of the Serra dos Carajás and comprises numerous elongated plutons, generally limited by EW-trending shear zones, though small isolated plutons outside shear zones may also occur. They are intrusive in granulitic to charnockitic rocks (Pium complex) and diversified calc-alkaline granitoids of Mesoproterozoic age, and in the Neoproterozoic metavolcano-sedimentary sequence of the Itacaiunas Supergroup. Locally, the Planalto granite is intrusive and intimately associated with the granulitic rocks, including abundant xenoliths of the latter. In general, the Planalto granite is strongly deformed, showing penetrative ~EW subvertical foliation, mineral stretching lineation, and C-type shear bands. High-temperature mylonites are found along shear zones. The granite includes decimeter-sized mafic enclaves that present systematically dropped phenocrysts of K-feldspar indicating that they coexisted in the partially liquid state with the granite magma. The dominant rocks are biotite-hornblende monzogranite to syenogranite, with subordinate alkali-feldspar granite. The primary accessory minerals are zircon, apatite, ilmenite, allanite, and fluorite \pm clinopyroxene. The secondary minerals are titanite, magnetite, epidote, muscovite, chlorite, scapolite, and carbonate. The less deformed granites preserve the magmatic fabric and exhibit a coarse- or medium-grained equigranular to porphyritic texture, with K-feldspar phenocrysts locally showing plagioclase mantles (rapakivi texture) in a medium- to fine-grained matrix. The foliated rocks comprise porphyroclasts of quartz, perthitic alkali-feldspar, and plagioclase, which are surrounded by fine grains of recrystallized quartz and microcline showing core-and-mantle microstructures. The quartz occurs also as ribbons and recrystallized aggregates. Bulbous myrmekite are found replacing the borders of K-feldspar grains. The mafic minerals form oriented aggregates that define an anastomosing foliation. The granites of the Planalto Suite show a restricted range of silica content (70.4-75.7 wt.%), low Al_2O_3 (11.1-12.8 wt.%), high K_2O (4.0-5.5 wt.%) and $K_2O/Na_2O > 1$. They are ferroan and reduced [$FeO_t/(FeO_t+MgO) > 0.9$], metaluminous to slightly peraluminous A-type granites. Three REE patterns have been distinguished: the first presents low $(La/Yb)_N$ and moderate negative Eu anomaly; the second has low $(La/Yb)_N$ and insignificant Eu anomaly; the third group exhibits high $(La/Yb)_N$ and moderate negative Eu anomaly. These distinct REE patterns indicate differences in magma sources, pressure or degree of melting. Pb-Pb evaporation ages on zircon were obtained for granites representative of three different plutons of the Planalto Suite. The analyzed zircons are abundant and similar in all granites, being in general not intensely fractured. The resulting ages are analogous (2731 ± 2 Ma, 2734 ± 4 Ma and 2736 ± 4 Ma) and similar to that yielded by the Planalto granite in its type area (2747 ± 2 Ma). The available isotopic data is too limited to allow a deeper discussion on the origin of the studied granites, but our preliminary hypothesis is that their magmas were derived by high-temperature partial melting of undepleted granulitic rocks.

PALAVRAS-CHAVE: NEOARCHEAN; PLANALTO SUITE; A-TYPE GRANITE.