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CHARACTERIZATION OF THE RIO CAPIVARI COMPLEX, BASEMENT OF THE EMBU TERRANE: GEOCHEMICAL AND GEOCHRONOLOGICAL CONSTRAINTS

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The Embu Terrane outcrops in the central Ribeira Belt, which is part of the Mantiqueira Province in the southeastern of Brazil. The Terrane is characterized by a framework of basement orthogneisses (Rio Capivari Complex) and meta-supracrustal rocks, intruded by old orthogneisses (0.82 Ga) and voluminous granite occurrences (mainly in the interval 630-580).

Basement rocks are predominantly migmatitic with relict igneous textures and variable deformation and partial melting degrees, with structure varying from gneissic to protomylonitic and leucosome remobilizations associated with stromatic to diatexitic features.

Combined whole rock geochemistry, isotope, and U-Pb zircon geochronology results from basement selected samples reveal a Paleoproterozoic sector defined by a magmatic event at ≈2.16 Ga, followed by partial melting and metamorphism at 590-620 Ma, therefore synchronous to the main magmatic event in the Embu Terrane, which might indicate that basement rocks contributed as a source component to the granite magmatism. Rocks range from tonalite and granodiorite to granite *(TTGs)*, with minor intrusions of gabbros. They exhibit Magnesian signatures and are predominantly Alkali-calcic to Calc-alkaline and metaluminous.

Nd isotopes indicate that migmatites were produced via reworking of Archean crust (T_{DM} from 2.49 to 3.31 Ga), with the youngest component representing newly accreted, juvenile crust, as suggested not only by the proximity between T_{DM} and radiometric U-Pb zircon ages of a mesocratic tonalitic gneiss (2.49 and 2.43 Ga, respectively) but also by its markedly positive $\varepsilon Nd_{(t)}$ (+3.4) and $\varepsilon Hf_{(t)}$ (+4.6). More felsic migmatites have Rhyacian ages (from 2.05 to 2.19 Ga) and show $\varepsilon Nd_{(t)}$ ranging from -7.4 to -2.5 which combined with $\varepsilon Hf_{(t)}$ in the interval -48.1 to +4.2, suggests that these represent reworked crustal sources of prolonged residence times. Amphibolites occur as boudins and represent intrusive basaltic dykes, since T_{DM} are much younger, ranging from calymmian (1.50 Ga - Mesoproterozoic) to tonian (0.99 Ga - Neoproterozoic).

Chondrite normalized zircon chemistry reveals enrichment in light REE for rocks bearing larger proportions of felsic neosome. Th/U ratios are higher for magmatic cores (0.07-1.59, with predominance of higher values) compared to metamorphic overgrowths (mainly in the interval 0.007-0.049). All samples are enriched in HREE in respect to LREE. However, magmatic zircons show progressively steeper profiles compared to inherited and metamorphic crystals, as also denoted Lu/Sm_N ratios average of 82, 34, 14, respectively. Chemical data suggest a complex evolutionary path, involving either the preservation of Archean relict zircons during high-pressure anatexis or the entrapment of zircon xenocrysts from the overlying rocks during the ascent of deep magmas. Metamorphic overgrowths register a shallower process as indicated by lower Lu/Sm_N and higher oxidation (Eu/Eu* between 0.16 and 0.50, against 0.22-0.84, and 0.32- 0.72 observed for magmatic and inherited zircons, respectively). These results identify a relatively pristine Siderian rock suite that holds the potential for future investigation into the early evolution of continental crust in the Ribeira Belt.