U-Pb zircon SHRIMP and geochemical data of granitoids characterizing the evolution of shear zones in the Borborema Province NE Brazil

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Granitoids intruded along a large dextral sense E-W trending shear zone (Coxixola-Timbaúba shear zone) in the Central Domain of the Borborema Province show distinct crystallization ages and geochemical signatures. The oldest granitoids (Timbauba and Serra Inácio Pereira plutons - TSIPP) comprise 02 large calc-alkaline intrusions with composition ranging from granodiorite to granite, and enclosing enclaves of diorites. They show similar U-Pb zircon SHRIMP ages (616 ± 5 Ma and 618 ± 5 Ma). They are metaluminous to slight peraluminous, magnesian granitoids with high Ba (4440 to 6654 ppm) and Sr (2358 to 2962 ppm), medium to high Zr (321 a 378 ppm), low Y (19.5 a 25.4 ppm) and Nb (14.7 to 17.0 ppm) contents. Their REE patterns are characterized by absence of significant Eu anomalies (Eu/Eu*= 0.92 – 1.15) and $(Ce/Yb)_N$ ratios ranging from 28.34 to 40.09.

The TSIPP calc-alkaline granitoids are intruded by alkaline granitoids (Serra do Marinho Pluton) with crystallization age of 563 ± 4 Ma. They have low Sr (238 to 272 ppm) and high Zr (755 to 846 ppm) contents. The Y (40 to 75 ppm) and Nb (9.0 to 51.0 ppm) contents are higher and the Ba (1660 - 1680 ppm) contents lower compared to the values recorded in the TSIPP calc-alkaline granitoids. They have REE patterns characterized by negative Eu anomalies (Eu/Eu*= 0.39 – 0.59) and $(Ce/Yb)_N$ ratios ranging from 6.62 to 20.25. They are ferroan granitoids with composition similar to A_2-type granites. Later dykes of rapakivi granitoids show U-Pb zircon crystallization age of 527 ± 6 Ma and A-type geochemical signature. These dykes are intruded by dykes of grey leucogranites. Concordant ages of ca. 480 Ma, recorded in overgrowths of zircon grains from the Serra do Marinho Pluton, are probably associated to the intrusions of these leucogranite dykes.

The data suggest a long history of magmatism along the Coxixola-Timbaúba shear zone during the Brasiliano (=Pan-African) orogeny.