

# CAMBRIAN PRE TO POST-COLLISIONAL SHOSHONITIC ROCKS IN THE RIBEIRA OROGEN (SE BRAZIL): GEOCHEMISTRY AND ISOTOPE GEOLOGY

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**ABSTRACT:** In the central Ribeira belt, southeastern Brazil, shoshonite rocks has been rarely observed. This work presents a detailed study on the second occurrence in this segment of the orogen, highlighting the role to its Late-Neoproterozoic early Paleozoic tectonic evolution. The hornblende-biotite orthogneiss, with shoshonitic affinity, the Tinguí unit, along with undeformed dykes with similar composition, crop out along the contact between the Costeiro (part of Oriental Terrane of Ribeira belt) and Cabo Frio Tectonic domains. Within the Neoproterozoic Oriental Terrane occurs also an arc-domain, represented by the Rio Negro Complex, cross cutting all supracrustal sequences. The Cabo Frio Tectonic Domain is a Paleoproterozoic crust interpreted as the continental margin of the Congo Craton that collided with the Oriental Terrane in the Cambrian. The Tinguí unit is mostly represented by fine- to medium-grained mesocratic gneiss, ranging from quartz-diorite, quartz-monzodiorite, tonalite to granodiorite in composition showing plagioclase, biotite, quartz, hornblende, microcline, titanite, apatite, allanite, zircon, opaques and rare epidote as the main minerals. Tonalitic to granodioritic fine-grained dykes, with similar composition, cross cut the Tinguí orthogneiss. A conspicuous igneous flow foliation is evidenced by biotite and hornblende aggregates. Besides mineralogical similarities, analyzed samples from both the orthogneiss and the dykes have shoshonitic geochemical signature and hybrid Nd-Sr isotopic results. They are basic to intermediate rocks with low Fe contents and high alkalis, Ba, Rb, Sr, Zr, and LREE values. In addition, high K<sub>2</sub>O/Na<sub>2</sub>O (0.79 to 2.06) and LREE/HREE ratios, low Nb contents and lack of negative Eu reinforce the shoshonitic nature. Sm-Nd and Sr-Sr data point to negative  $\epsilon_{\text{Nd}}$  values of -13.2 to -4.38, and Paleo- to Mesoproterozoic T<sub>DM</sub> Nd model ages (1.7 to 1.2 Ga). Although the <sup>143</sup>Nd/<sup>144</sup>Nd ratios indicate a predominance of lower continental crust heritage, the <sup>87</sup>Sr/<sup>86</sup>Sr ratios ranging from c. 0.705 to 0.707 suggest an enriched mantle contribution. Nevertheless, the U-Pb zircon SHRIMP data from Tinguí orthogneiss and tonalitic dykes reveal a gap of c. 50 m.y. in their crystallization ages: concordant ages of 551.3 ± 3.4 Ma for the orthogneiss, and 494.5 ± 2.7 Ma for the tonalitic dykes. The latter presents inherited zircon cores of 530 to 550 Ma. Comparing our new data and the magmatic and tectonic events recorded in the Oriental Terrane, we propose a tectonic model emphasizing the role of this shoshonitic magma, interpreted as pre- and post-collisional intrusions regarding to the Buzios Orogeny, and possibly derived from the same magma chamber. This protracted magmatic activity is attributed to a long-term maintenance of high temperatures and low cooling rates in the Ribeira Orogen, considered as a hot orogen. The 50 m.y. crystallization interval between the studied rocks could be assigned to the collisional event metamorphic/deformational peak (530-510 Ma), which may have inhibited in this interval the emplacement of new batches of shoshonitic magma.

**KEYWORDS:** RIBEIRA OROGEN; ORIENTAL TERRANE; SHOSHONITE ROCKS.