

STRONTIUM ISOTOPIC EVIDENCE FOR SOURCE MIXING IN THE POST-COLLISIONAL ITAOCA GRANITE, CENTRAL RIBEIRA BELT, RIO DE JANEIRO STATE, BRAZIL

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The Itioca Granite is located nearby Campos dos Goytacazes, eastern Rio de Janeiro State, comprising a 5 km stock intruded within metapelitic paragneisses of the São Fidelis unit, in the Costeiro Domain of the Ribeira Belt. A U-Pb monazite age of 476.4 ± 1.8 Ma places this granite among the youngest of the ~ 485 Ma post-collisional magmatic episode of the Ribeira-Araçuaí belt, related to late-orogenic collapse. It is an undeformed biotite-bearing leucogranite with equigranular to porphyritic texture, displaying a well defined magmatic flow foliation.

Throughout Rio de Janeiro and Espírito Santo states many of these late leucogranites show mafic enclaves and other field evidence of magma mingling between mafic and felsic components. Several authors also have presented litho-geochemical evidence of melting of continental crust and mixing with a tholeiitic mafic component.

The Itioca granite comprises homogeneous leucocratic biotite-monzogranites and minor alkali-granites of metaluminous high-K affiliation with SiO₂ between 68% and 73%. Black biotite-rich enclaves with SiO₂ from 50% to 60% and very anomalous K₂O and Rb occur locally. In Harker diagrams, good trends between the enclaves and the granites for MgO, Fe₂O₃tot, MnO and incompatible trace elements suggest common a differentiation origin or that they are the result of magma mingling processes.

The ⁸⁷Sr/⁸⁶Sr isotopic ratio of the granite samples varies between 0.7352 and 0.7461 (Rb/Sr = 1.2-1.85), and of the enclaves between 0.7737 and 0.8997 (Rb/Sr = 3-11). A very good linear fit (R² = 0.995) between the enclave and granites samples in a correlation diagram of ⁸⁷Sr/⁸⁶Sr versus 1/Sr (ppm⁻¹) is indicative of mixing between a tholeiitic mafic component with mantelic initial (t= 476 Ma) ⁸⁷Sr/⁸⁶Sr ratio ~ 0.67 and a crustal granitic component with initial ⁸⁷Sr/⁸⁶Sr ratio ~ 0.712 , compatible with melting of the enclosing rocks of the Rio Negro Magmatic arc.

Key Words: Sr isotopes; leucogranite; magma mixing; Brasiliano orogeny;

