

Granitic magmatism in the Água Branca sub-crustal domain, Pernambuco-Alagoas domain: evidence for juvenile Tonian magmatism?

Valderez P. Ferreira, Bruna C. Borba, Alcides N. Sial, Marcos Filipe M. Pereira, Fernando C. Lima Filho

NEG-LABISE, Depto. de Geologia, UFPE, Recife, PE. valderez@ufpe.br

RESUMO: The Pernambuco-Alagoas crustal domain (PACD) in the Borborema Province, NE Brazil, is characterized by a large volume of Neoproterozoic granitic magmatism, of which the largest one forms the Águas Belas-Canindé batholiths, intrusive in the eastern portion of the domain. This batholith is limited by the Maravilha and Jacaré dos Homens shear zones, respectively at its southeastern and northwestern contacts with metasedimentary rocks, and by the Sergipano domain, to the south. It is composed of over 20 intermediate to acidic intrusions that forms batholiths and stocks formed mainly of syenogranites, monzogranites, quartz monzonites and monzonites. Silva Filho et al. (2010, and references therein) reported U-Pb zircon ages in granitoids ranging from 570Ma to 625Ma and Nd T_{DM} model ages ranging from 0.9 to 2.8 Ga., with bimodal distribution. A recent geological mapping of the northeastern part of the Águas Belas-Canindé batholith reveals two major granitic textural types: porphyritic coarse- to medium- grained quartz syenite to quartz monzonite, and equigranular medium-to fine-grained sienogranites and monzogranites. The two types are cut by fine-grained equigranular pink granites. The two major types occur in the region forming plutons (Cacimbinhas, Minador do Negrão, Tanquinho, Minador do Lúcio, Mata Burro) with irregular contacts against each other, some of them in high topographic relief forming hills up to 200 m above the surrounding areas. In spite of some differences in their texture and accessory minerals, whole-rock chemical analyses of the plutons have shown that they are metaluminous to slightly peraluminous (Cacimbinhas granites are metaluminous to slightly peralkalic) and have overlapping chemical variation, with silica varying from ca. 60 to ca. 75%. The Minador do Negrão and Mata Burro are the most differentiated among the analyzed plutons ($SiO_2 > 72\%$; Sr, Ba lower than in the other plutons) and the Minador do Lúcio has the largest SiO_2 variation (from ~60 to ~70%). Nb contents are low ($< 20\text{ppm}$) as well as Rb/Sr ratio (usually $< 0.15\%$), which is typical of magmas with strong mantle contribution. Chondrite-normalized REE patterns to all the plutons are overlapping and are light REE- enriched relative to heavy REE, showing negative Eu anomaly. The analyzed samples have rather low initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratios (back calculated ratios vary from 0.70587 to 0.70781) and slightly positive to negative ϵNd (0.6Ga), from +4.0 to -3.7. Nd model age for these granite vary from 1.2 to 0.8 Ga (sample that has $t_{DM} = 0.8$ Ga presents $\epsilon\text{Nd} = +4.0$). Rb, Y and Nb concentrations in these plutons are similar to those of volcanic-arc granites, except for the Mata Burro granite that has value similar to within-plate granites. Overall, the isotopic together with the chemical data are suggestive of mantle-derived source for these Neoproterozoic granites, with little crustal contamination. It is suggested that source material is mostly juvenile related to the Cariris Velhos

event, a contrasting behavior of granitoids from the Transversal Zone domain, to the north of the PACD, which, in their majority, have older Mesoproterozoic sources.

PALAVRAS CHAVE: GRANITOIDS, Sm-Nd ISOTOPE DATA, Rb-Sr ISOTOPE DATA