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#### Isotopic studies and Tectonic Setting of Late Proterozoic Granites of South Brazil

The Dom Feliciano Belt (DFB) is the major geological feature in the Precambrian areas of South Brazil and Uruguay. In the State of Santa Catarina, it shows a northeast-southwest trend with clear vergence toward the northwest. Two paired internal domains can be recognized: the northwestern schist belt and the southeastern granitic belt, which are separated by the Major Gercino Shear Zone that thrusts the granitic belt over the schist domain.

The granitogenesis in the schist belt is related to the major metamorphic event and was emplaced later on to the second deformational phase. Three granitic suites can be identified: (1) Valsungana Suite (V), coarse biotite-microcline monzo to sienogranite; (2) Nova Trento Suite (NT), medium-sized biotite (muscovite) grey granite; (3) Sao Joao Batista Suite (SJB), medium-sized muscovite-feldspar leucogranite, with biotite, garnet, and tourmaline subordinate.

All the granites in the schist belt are slightly deformed to isotropic and show an important metamorphic aureole contact. Their ages are close to  $650 \pm 50$  Ma (U-Pb in zircons, Rb-Sr and K-Ar).  $Nd_{(DM)}$  isotopic studies in the Valsungana granite and on two mica schists show 2000 Ma age.

In the granite belt, three major granitic suites can also be recognized: (1) Santo Amaro da Imperatriz Suite (SAI), highly deformed quartz monzonite; (2) Sao Pedro de Alcantara Suite (SPA), slightly deformed quartz diorite to monzogranite; (3) Pedras Grandes Suite (PG), an isotropic pink alcaí granite.

Ages ranging from 650 to 500 Ma on Rb-Sr, U-Pb in zircons, and K-Ar methods were obtained. The model  $Nd_{(DM)}$  ages in whole rock composites for SPA, SAI, and PG suites fall in the 1700–1200 Ma interval. In addition, a 2500 Ma  $Nd_{(DM)}$  age, was obtained on a small PG granite.

Lithochemical and isotopic (high Sr initial ratio and negative  $\epsilon_{Nd}$ ) data suggest that the magmatism of DFB was produced during the Late Proterozoic Brasiliano cycle mainly by melting of previous crust. The granites in the schist belt were derived from either supracrustal mica schist (SJB) or a more deep source (V and NT), but in both cases the precursor material was added to the crust at 2000 Ma ago. In contrast, the magmatism of the granitic belt probably originated from a Middle Proterozoic magmatic arc that was intensively reworked during the Brasiliano orogenesis.

No evidence of a mantle-derived granitoid emplaced during the Late Proterozoic has been found yet. The Brasiliano cycle is interpreted as a period of intensive lithospheric shortening related with an important collision process where the granitogenesis is the most expressive result.

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#### Pb-Pb, Rb-Sr, and K-Ar Systematics of Rock Types in Lagoa Real Uranium Province, South Central Bahia, Brazil

Geochronological investigation using different isotopic systems (Pb-Pb, Rb-Sr, K-Ar) has been carried in the granite-orthogneiss complex of Lagoa Real, Bahia, one of the most important uranium provinces of Brazil (Angeiras et al., 1981).

Rb-Sr whole-rock data for eight migmatitic gneisses of the so-called "basement complex" yielded an isochron age of 2650 /pmn 100 Ma with an initial ratio of 0.712 /pmn 0.004, corresponding to the peak of Jequié orogenic cycle, an important tectonomagmatic period in eastern Brazil, when the regional crystal province was probably formed.

The lead-lead isotope data for five underformed granites (São Timóteo Granite) and seven gneisses (Lagoa Real orthogneisses) defined a well-fitted isochron with a calculated age of 1710 /pmn 100 Ma and a model  $\mu_1$  value of 8.38. This overlapping range of lead isotope composition for granites and gneisses lends support to the hypothesis of the deformed rocks being equivalent to the granites; in consequence, the common lead isotopic composition seems not to have been affected by the process of gneissification. The granite samples analyzed for Pb isotopes also yielded similar Rb-Sr isochron age (1710 /pmn 45 Ma);  $(^{87}Sr/^{86}Sr)_i = 0.715$ , and the age values are in agreement with some already available U-Pb zircon dates (Turpin et al., 1988), indicating that 1700 Ma represents most probably the age of granite formation. The initial Sr isotopes ratio, as well as  $\mu_1$  value, suggests that the granites formed from the melting of crustal components.

In contrast to the Pb-Pb systematics, the Rb-Sr data for the orthogneisses showed that the Rb-Sr isotopic system has been highly disturbed as is evidenced by isochron diagrams with analytical points exhibiting some dispersion around best-fit lines with apparent ages of 1500 Ma, 1200 Ma, and 1000 Ma, which do not seem to have much geological significance. The disturbance of the Rb-Sr system appears to be the result of Rb gain and/or Sr loss, during one or more tectonothermal events in Mid-Late Proterozoic times. K-Ar data on minerals yield ages in the range of 500–570 Ma, which may be correlated with tectonic events associated to the Brasiliano orogenic cycle, representing the final regional cooling.

The present investigation complements the data already obtained by Turpin et al. (1988), which indicated ages of 1725 Ma, 1395 Ma, and 480 Ma, respectively, for granite formation, uranium mineralization, and tectonic rejuvenation. Altogether, the data do not provide an unequivocal age for the uranium mineralization, which could have occurred in several successive pulses.

#### REFERENCES

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