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LATE PROTEROZOIC CRUSTAL GRANITOGENESIS OF DOM FELICIANO BELT, SOUTHEASTERN BRAZIL: AGE AND GEOTECTONIC IMPLICATIONS

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Six granitoid intrusive suites are identified within the Dom Feliciano Belt, according to field relationships, age and petrographic characteristics. The Foliated Granitoids (GF) and Valsungana (V) suites are syntectonic and older compared to the Guabiruba (G) and São Pedro de Alcantara (SPA) suites. The Pedras Grandes (PG) and Subida (S) suites were emplaced during late to post tectonic events.

The available radiometric data (Rb-Sr, U-Pb in zircons) indicate three major granitoid emplacement episodes at 640 ± 20 Ma. (GF, V), 600 ± 20 Ma. (G, SPA) and 550 ± 30 Ma. (PG, S). From additional isotopic (Sm-Nd, Pb-Pb) and litho-geochemical analyses, this magmatism can be considered as predominantly crustal. The GF, V and G granitoids are "S" type, the SPA and PG are "I" Caledonian type, and the S are "A" type. This granitogenesis is interpreted according to an "A" subduction model which occurred during the Late Precambrian-Eo Paleozoic Brazilian Cycle.

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MESOZOIC PLUTONS OF NORTHEASTERN NORTH AMERICA - CRUSTAL CONTAMINATION AND MANTLE SIGNATURES

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A number of generally small and composite, mafic to felsic, alkaline to subalkaline Mesozoic plutons occur in northern New England (White Mountain Magma Series) and southern Quebec (Monteregian province). Isotopic and geochemical studies, detailed at some localities and reconnaissance at others, indicate several important and common petrogenetic features. Various lithologies at most localities were formed within restricted intervals and are cogenetic. With only one exception, these epizonal intrusions have escaped hydrothermal modification by meteoric waters and the isotopic signatures reflect magmatic processes. Both crystal fractionation and sorting and assimilation of Paleozoic or Precambrian crust were important processes at essentially all localities. The amount of contamination at any locality appears variable, from nil up to about 50%, with some small, felsic units extremely contaminated or generated by crustal melting. When the crustal effects are taken into account, the primary mafic magmas show restricted initial $^{87}\text{Sr}/^{86}\text{Sr}$ (~ 0.7032 to 0.7040) and $^{143}\text{Nd}/^{144}\text{Nd}$ ($\epsilon_{\text{Nd}} \sim +3.0$ to $+5.5$) ratios. The apparent Sr and Nd signatures of the primary magmas indicate generation from similar time-integrated, depleted mantle sources. Consideration of the crustal structure suggests sources deeper than the subcontinental mantle, possibly plume related.

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CALCIUM ISOTOPIC VARIATIONS IN GRANITIC ROCKS: IMPLICATIONS FOR PETROGENETIC MODELS AND THE COMPOSITION OF THE LOWER CRUST

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The isotope ratio $^{40}\text{Ca}/^{42}\text{Ca}$ of igneous rocks can give information about the K/Ca ratio of their magma sources. This information is complementary to that yielded by other isotope systems because the K/Ca ratio is closely tied to mineralogy and thus directly related to the petrology of the magma source. Because the K/Ca ratio of the earth's mantle is very low (0.01), there is no detectable change in the $^{40}\text{Ca}/^{42}\text{Ca}$ ratio of the mantle with time. However, crustal reservoirs commonly have much higher K/Ca ratios and develop elevated $^{40}\text{Ca}/^{42}\text{Ca}$ ratios. The enrichment relative to the mantle (based on achondrites) is given as ϵ_{Ca} . We have measured ϵ_{Ca} in island arc basalts, leucitite, and granitic rocks from the western U.S. that can be shown to have crustal sources on the basis of Nd isotopes. Island arc basalts have ϵ_{Ca} values of about +1.0 which suggest involvement of crustal calcium in their source regions. The leucitite, which has low ϵ_{Nd} (-13) indicative of derivation from enriched mantle, has ϵ_{Ca} of $+0.3 \pm 0.6$ (K/Ca ~ 0.1). The ϵ_{Ca} values of the granites are all elevated (+2.5 to +5.0), even for those with low initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratios indicative of lower crustal sources. The ϵ_{Ca} values correlate with the age of the crust from which the granites were melted. Assuming new crust forms with $\epsilon_{\text{Ca}} = +1$, the data suggest that the magma sources have K/Ca ratios of about 1.0 ± 0.5 , which in calc-alkaline suites corresponds to SiO_2 contents of 65 to 68%. The ϵ_{Ca} value of granodiorites and tonalite from the Sierra Nevada and Idaho batholiths are somewhat elevated relative to island arcs and indicate that granitic magmas generally get contaminated with (upper crustal) radiogenic Ca to some degree. This effect notwithstanding, the Ca isotopic data indicate that the lower crust has relatively high SiO_2 .

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ND-SR ISOTOPIC STUDY OF GRANITOIDS FROM SOUTHWEST JAPAN AND THE KOREAN PENINSULA

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Nd and Sr isotopes in late Cretaceous granitic rocks from three tectonically distinct provinces in the southwest Japan and Jurassic-Paleogene similar ones from the Korean Peninsula were studied in order to investigate the isotopic characteristics of the two region.

Each granitoids of the southwest Japan can be distinguished clearly on $\epsilon_{\text{Nd}}-\epsilon_{\text{Sr}}$ diagram (as indicated in the figure A).

Nd isotopic ratios decrease with the increase of the distance from the coast of the Sea of Japan both in the southwest Japan and the Korean Peninsula (as indicated figure B).

These systematic change suggests the important participation of materials derived from depleted upper mantle in the generation of younger coastal granitic rocks, whereas the pre-Cambrian sialic materials in Ogcheon Belt and Cretaceous Ryoque series played an important role in inland granitoids.