

The Pedra Branca Granitic Complex, Rio de Janeiro, Brazil: Petrology and Evolution

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The Pedra Branca Granitic Complex (PBGC) is an igneous body, mainly granitic in composition, which outcrops within an area of 150 Km² in western Rio.

Two distinctive groups of gneisses comprise the country rocks of the PBGC: an older one includes orthogneisses and migmatites of several compositions whereas a younger group includes several kinds of paragneisses.

The granitic rocks of the PBGC are grouped into three lithostratigraphic units as follows: Tonalitic Unit, Pedra Branca Granite Unit and Biotite Granite Unit. The geochemical data indicate two main differentiation trends for those units. One of the trends can be related to the origin and evolution of the Tonalitic Unit, possibly as a consequence of lower crust melting processes.

The emplacement of the tonalites was probably coeval with the most important deformational event recorded in the area. The other geochemical trend can be related to the origin of the Pedra Branca Granite and the Biotite Granite units as a consequence of the melting of the base of the crust due to advection of mantle-derived magmas. Restite unmixing and *in situ* fractional crystallization were the most important processes of magmatic evolution. Both units represent metaluminous, calc-alkaline magmatism and can be associated with compressive tectonic settings related to the Brasiliano/Pan-African Orogeny.