

ZIRCON GEOCHRONOLOGY OF RHYACIAN PERALUMINOUS MAGMATISM FROM THE BASEMENT OF THE NEOPROTEROZOIC DOM FELICIANO BELT, SOUTHERNMOST BRAZIL: A RECORD OF COLLISIONAL EVENT RELATED TO THE ASSEMBLY OF COLUMBIA SUPERCONTINENT?

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Paleoproterozoic evolution in the eastern portion of South America is marked by crustal accretion and reworking events, mainly of Rhyacian age and recorded as remnants in the basement of Neoproterozoic mobile belts. The complex tectono-stratigraphic framework of these remnants reflects a prolonged history, marked by multiple tectonic and magmatic events resulting from continental collision and accretion regimes. Because they comprise vestigial records, their genesis and evolution are poorly understood, and their study requires integrated approaches covering lithological, structural and temporal relations. This study presents new data on the peraluminous Rhyacian magmatism recently identified in southern Brazil, exposed in the eastern segment of the Dom Feliciano Belt. The magmatism is recorded as granodioritic rocks intrusive in a peraluminous orthogneiss. Their main structure is an L>>S fabric consisting of moderate to poorly-developed foliation (S₁) dipping about 46° towards 290° which bears a very well developed stretching lineation (L₁) plunging on average 44 towards 298°. Folding of S₁ develops a cleavage (S_{2a}) dipping at about 83° towards 188°, and bearing a slightly oblique lineation (L_{2a}) of average orientation (40°; 269°). A third set of planar structures comprises discrete, EW- to ENE-striking shear zones synchronous to S_{2a} and therefore called S_{2b} which dip steeply to SSE. Structural data indicate synchronous development of contractional and transcurrent structures characteristic of transpressive regimes common in collisional orogens. Age data from three samples are used to establish the chronology of magmatic and metamorphic events. Crystallization age of peraluminous orthogneiss defines a concordia age of 2126 ± 8 Ma, with crustal contribution evidenced by the inherited ages of 2.2 Ga. A magmatic age value of 2083 ± 25 Ma was determined for the porphyritic biotite granodiorite in crystals of concentric zoning pattern, with inheritance ages also of ca. 2.2 Ga. Paleoproterozoic (ca. 2.0 Ga), Archaean (2.7 Ga) and Mesoproterozoic (1.1 Ga) inheritance ages are consistent with sources related to crustal recycling. Based on the geochronological results combined with structural, petrographic and field data, this rock association is interpreted to represent the record of a Rhyacian (2.1 - 2.0 Ga) collisional orogen. In order to instigate further discussions and studies, an attempt is made to correlate this orogen with the global geotectonic setting established in Paleoproterozoic times linked to the development of Columbia Supercontinent.

KEYWORDS: RHYACIAN MAGMATISM, PERALUMINOUS MAGMATISM, PALEOPROTEROZOIC