MULTI-PULSE MAGMATIC EVOLUTION OF THE QUATRO ILHAS GRANITOIDS IN THE DOM FELICIANO BELT, SOUTHERN BRAZIL

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ABSTRACT: The Dom Feliciano Belt is an important orogen extending from eastern Uruguay to southern Brazil. Its western section is composed of Meso- to Neoproterozoic volcano-sedimentary rocks whereas in its eastern part granitoids are widespread. In Neoproterozoic times, major strike-slip shear zones merged into the Southern Brazilian Shear Belt (SBSB), which acted as a path for mantle- and crustally-derived magmas to ascend and emplace. One of the structures that compose the SBSB in the state of Santa Catarina, Brazil, is the Major Gercino Shear Zone (MGSZ). The MGSZ strikes NE-SW and has dextral displacement, although oblique movement is locally found. At the northeastern end of the Porto Belo Peninsula, the MGSZ has controlled the emplacement of several magma bodies, the Quatro Ilhas Granitoids (QIG) among them. The QIG are coarse granodiorites to monzogranites, with ages of ca. 625 to 615 Ma (LA-MC-ICP-MS U-Pb in zircon) obtained for the granodiorite and the monzogranite varieties, respectively. They are porphyritic rocks, with foliation marked by the alignment of euhedral or stretched K-feldspar phenocrysts, dipping gently to steeply to SE. Several sheets of diorite, fine-grained grey granite and aplite-pegmatite crosscut the porphyritic granites, either parallel or oblique to the foliation. This assemblage is affected by mesoscale, NW-verging asymmetrical folds coeval to local steeply-dipping strike-slip shear zones. The contemporaneity of strike-slip and contractional structures points to transpression over the QIG. The fine-grained granite sheets are 10 to 30 cm thick and strike NE, with gentle to subvertical dips to SE. The flat-lying fine-grained granite sheets are often surrounded by 5 to 10 cm-thick pegmatite haloes, which may be generated by the increase of H_2O content in the residue as the fine granite crystalizes, followed by segregation of residual melt by gas-driven filter pressing. The fine-grained granites are grouped in 6 varieties based on differences in fabric and colour index (M'). They are: 1) fine- to medium equigranular granite with gently-dipping mylonitic foliation and M' 7; 2) fine- to medium equigranular granite with steeply-dipping igneous foliation and M' 5; 3) microporphyritic granite of M' under 5 and some larger feldspars mechanically ripped from the porphyritic granite; 4) microporphyritic fine-grained granite of M' over 10 and some feldspars mechanically ripped from the porphyritic granite; 5) microporphyritic granite of M' under 10 surrounded by pegmatite haloes, crosscut by variety 4; and 6) fine- to medium-grained equigranular granite with steeply dipping mylonitic foliation and M' 5 that crosscut varieties 1 and 5. The diffuse contacts and interfingered termination of the sheets against the host porphyritic granite suggest mingling between them in magmatic stage. The indicators of the coeval character of fine-grained and porphyritic granites, just as the compositional and textural differences of each variety, suggest that the growth of QIG was not static. In fact, they register the accretion of different magma batches into a single magma chamber in transpressive environment.

KEYWORDS: MULTI-PULSE MAGMATIC SYSTEM; SYNTECTONIC MAGMATISM; TRANSPRESSION.