

NEW INSIGHTS INTO THE BASIC POST-COLLISIONAL EDIACARAN MAGMATISM (591 Ma) IN SOUTHEAST DOM FELICIANO BELT, RS: GEOCHRONOLOGY OF PASSO DA FABIANA GABBROS

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SUMMARY: The eastern domain of Dom Feliciano Belt (DFB) is characterized by the widespread occurrence of Neoproterozoic granitoids, with minor intrusive kilometric-length basic bodies, in the area of Pinheiro Machado and Pedro Osório-RS. These basic rocks were divided in two main associations, named Association I (AI), composed of commonly cumulated and sometimes layered gabbroic rocks (Passo da Fabiana, Passo da Olaria, Arroio Santa Fé, Desvio Herval); and Association II (AII), composed mainly by massive dioritic to subordinate gabbroic rocks (Alto Alegre, Passo dos Machados and Campo Bonito). Both associations are subalkaline, with high-alumina contents ($Al_2O_3 > 17\%$), even for the non-cumulated rocks. They present medium-K (AI) and medium to high-K (AII) calc-alkaline affinity, showing higher CaO and Mg# contents in AI; and alkalis, P_2O_5 , Zr, Nb, Y and total REE in AII, as well as distinct REE patterns, supporting the proposed division. None of the bodies mentioned were dated until now, except for Alto Alegre Diorite (AAD), included in AII. The AAD is an equigranular medium-grained hornblende-rich diorite, that presents an Ediacaran crystallization age of 562 ± 3.7 Ma ($n=11$; 1σ ; MSWD=0.73). New geochronological studies were carried out to determine the crystallization ages of the largest and most representative occurrence of AI, the Passo da Fabiana Gabbros. These gabbroic cumulated rocks contain plagioclase, clinopyroxene, orthopyroxene, olivine and hornblende as essential minerals, while biotite-phlogopite, apatite, opaques and minor or rare zircon are accessories. Sometimes these rocks exhibit modal layering marked by cm-thick leucocratic layers, formed mainly by Ol leucogabbros, Hbl leucogabbros and leucogabbros, due to plagioclase accumulation. These ones are interlayered with more mafic cm-thick layers, formed by Px-Hbl gabbroite to Hbl gabbros, which are enriched in hornblende, olivine and pyroxene. Other important data observed in the field are the local occurrence of decimeter-thick granitic apophyses, with pegmatoid or aplitic texture, as well as localized zones with mm-thick white veins with chaotic orientation cutting the gabbroic rocks, and pointing to the fact that the last ones are older than the wall-rock granites. The sample GPF-1, an Ol leucogabbro, was analyzed by U-Pb SHRIMP method, based in zircon dating. This rock showed typically magmatic zircons, with regular parallel or oscillatory concentric zoning patterns. The crystallization age obtained is of 591 ± 3.5 Ma ($n=12$; 2σ ; MSWD=1,3), which represents an essential data to evaluate the geological evolution of the southeast DFB. Besides the fact that basic intrusive magmatism with Ediacaran ages below 600 Ma was not reported in the area, this sheds light to the meaning of these basic intrusions in the geodynamic evolution of the Neoproterozoic magmatism of DFB. Regionally, the basic rocks are surrounded by Dom Feliciano Granitic Suite, which has reference isochronic crystallization ages (Rb-Sr whole-rock) between 544-572 Ma; and Pb-Pb (TIMS) of 583 ± 3 Ma (Capão do Leão Granite). Could the basic rocks represent fragments of the lower crust extracted during the ascent and emplacement of the post-collisional granitoids? Or alternatively, it may represent precursor magmatic pulses or replenishment events, by basic magmas, in upper crustal silicic chambers?

KEYWORDS: BASIC MAGMATISM; EASTERN DOM FELICIANO BELT; BASIC NEOPROTEROZOIC ROCKS.