

GEOLOGY OF THE AFONSO CLÁUDIO INTRUSIVE MASSIF BASED ON GEOLOGICAL MAPPING, PETROGRAPHY AND GEOCHEMISTRY: POST-COLLISIONAL BODY OF THE ARAÇUAÍ OROGEN

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ABSTRACT: The Afonso Cláudio Intrusive Massif (ACIM) is a circular shape igneous body with about 73 square kilometers, localized in Afonso Cláudio city, Espírito Santo's Mountain Region. It's part of the Araçuaí Orogen, localized in its crystalline core. The Araçuaí Orogen is a mobile belt with evolution related to the Brasiliano Orogeny, between the Neoproterozoic and Ordovician, that limits São Francisco Craton on Southeastern. During evolution of the Araçuaí Orogen many granitic rocks were generated. They are grouped in five supersuites: Pre-Collisional (G1 Supersuite), Syn-Collisional (G2 Supersuite), Late-Collisional (G3 Supersuite) and Post-Collisional (G4 and G5 Supersuites). The ACIM is part of the G5 Supersuite or post-collisional granitoids. This research was based in geological mapping, petrography and lithogeochemistry datas. The ACIM is hosted in garnet-sillimanite-biotite gneiss, garnet-cordierite-sillimanite-biotite gneiss (paragneisses from Nova Venécia Complex) and allanite gneiss (ortogneiss from G1 Supersuite). The limit among the ACIM and the surrounding rocks is abrupt, marked mainly for topography contrast. Vertical foliations and intrusions of acid rocks from ACIM in neighbor metamorphic rocks are also common feature on boundary. There are also millonitization and migmatization evidences nearby. Two dextral shear zones were identified next to limits east and west of the ACIM. The ACIM contains two mafic cores surrounded by felsic rocks. Among these rocks there are magma mingling zones. The main rocks from ACIM are monzogabbro, monzodiorite, quartz-monzonite and sienogranite. The monzogabbro and monzodiorite occur on low topographic regions while quartz monzonite is on high hills surrounding the mafic rocks. The mafic core in Empossado village is a huge flat region recovered by quaternary deposit. Between mafic and felsic rocks mingling zones are common. Jotunite and mangerite occur locally in mingling zone next to Graminha village. By all extension in quartz monzonite are mapped xenoliths of the host rocks and autoliths of the monzodiorite and monzogabbro rocks. Sienogranite occurs frequently as dykes, also are mapped quartz-feldspatic and pegmatite dykes and quartz veins. Sometimes the ACIM rocks show recrystallization features as quartz and feldspat crystals with undulose extinctions, subgrains and polygonal boundaries. The monzogabbro, monzodiorite, quartz monzonite, jotunite and mangerite were analyzed by lithogeochemistry. The lithochemistry reveals that ACIM belong to alkali-calcic series and has chemical signature of metaluminous and ferroan rocks. Its post-collisional nature is confirmed. The samples show high values of LILE if compared with HFS values. LREE, K, Ba, Sr, Rb, Ti, P, Zr, Ni, Zn and V show high values. In Harker Diagrams apparently there is a linear trend among the samples but also there are gaps between the groups of mafic and felsic rocks. It's a complicator for answer questions about magmatic evolution of ACIM. The ACIM evolution is related to mantellic intrusions and crustal melting or process of fractional crystallization of the mantellic intrusions. The mantellic intrusions used the deep shear zones to its emplacement, probably during the formation of these shear zones. The ACIM and these shear zones are related to the Araçuaí Orogen collapse stage.

KEYWORDS: AFONSO CLÁUDIO INTRUSIVE MASSIF; POST-COLLISIONAL GRANITOID; ARAÇUAÍ OROGEN'S G5 SUPERSUITE;