TECTONIC AND MAGMATIC EVOLUTION OF THE OROSIRIAN MAGMATISM IN THE TAPAJÓS MINERAL PROVINCE: SR-ND ISOTOPE CONSTRAINTS

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ABSTRACT: The Tapajós Mineral Province is located in the southeast portion of the Amazonian Craton. At the Tapajós, extensive units of volcanic, volcanoclastic, porphyry and granitic rocks occur. These rocks show little- to no metamorphic features and are genetically linked with the Uatumã magmatic event. The volcanic associations have basaltic andesite to rhyolitic composition, defining a magmatic series of medium to high-K calc-alkaline rocks. Geochemical studies evidence an evolution linked with a long ocean-continent subduction, with several magmatic events that occurred between ca. 2.00–1.87 Ga. Furthermore, in the area, extensive sequences of late- to post-orogenic alkaline volcanic to intrusive A-type rocks are identified. The area of study is located in the surroundings of Novo Progresso and Castelo dos Sonhos towns, in an area with several gold "garimpos", the leading commodity produced in the province. Geochemical and petrographic studies reveal the majority of the rocks ranging between syeno- to monzogranite composition, with subordinated monzonites, syenites, and granodiorites, evidencing similar evolutionary trends related to syn-collisional magmatism. In general, petrographic analyses indicate a strong hydrothermal alteration in all the studied rocks, occurring both in pervasive and fissural style, including especially sericitic, propylitic alteration and potassic alteration. The study aims the petrogenetic characterization of the felsic units through isotopic geochemistry studies using representative whole-rock strontium and Sm-Nd data, supplying interpretations relative to the tectonic evolution at Tapajós. The samples have εNd values between –8.36 and +1.69. In general, granites have εNd values around –2.0, whereas a granodiorite sample from the Creporizão Suite has the lowest εNd value (–8.36). The highest εNd value was calculated from a quartz-syenite. The $^{143}Nd/^{144}Nd$ ratios vary between 0.511030 and 0.511679, with the lowest values associated with the Parauari Suite, which has εNd values between –5.85 and –4.77. Lastly, the $^{87}Sr/^{86}Sr$ ratios of the Uatumã rocks range from 0.70369 to 0.79297. This new isotopic data contributes to elucidate the tectonic evolution and petrogenesis of the Tapajós Mineral Province. The results will also contribute towards a better characterization of the metallogenetic processes that resulted from the Uatumã magmatism in this region, supporting the elaboration of metallogenetic models for base and precious metals in the Tapajós Mineral Province.

KEYWORDS: TAPAJÓS, MAGMATIC ARC, UATUMÃ, OROGENIC VOLCANISM, ISOTOPE GEOCHEMISTRY

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