
MAGMATIC-HYDROTHERMAL MINERALIZATION PROCESSES OF TAPAJOS MINERAL PROVINCE: CONSTRAINTS FROM WHOLE-ROCK AND ZIRCON GEOCHEMISTRY

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ABSTRACT

The Tapajos Mineral Province have been responsible for hundreds of tons of gold production since its discovery in the late 50's and yet is a fairly unknown and understudied region. While remarkable efforts have been made in the last fifteen years to improve its geological knowledge, this area still lacks metallogenetic studies and a better understanding of its tectonic environment and petrogenesis. Studies over the last fifteen years describe a variety of magmatic-hydrothermal mineral systems, including well-preserved Au epithermal, Cu-Au porphyry-like and intrusion-related gold systems. Special attention must be driven to the TMP since it may represent one of the last remaining mineral frontiers in the Americas to not have its potential unraveled yet, especially as the classic arc-related porphyry and epithermal deposits of this continent have already reached its production peak. The TMP is located in the southern area of the Amazonian Craton and is mainly composed by Orosirian igneous suites within the 2.1 – 1.86 Ga age interval, presenting geochemistry and petrological characteristics compatible with arc-, evolved magmatic-arc and collisional tectonic settings. In this contribution, we gathered whole-rock geochemistry data from selected TMP deposits through published and unpublished works and present new trace-element and U-Pb analyses in zircon grains. We assess the tectonic framework and magmatic evolution of the TMP and how it affects and translates into the metallogenetic potential of the magmatic-hydrothermal mineralizations in the region. Mineralized systems from both older magmatic sequence (OMS, ca. 2.1 – 1.95 Ga) and younger magmatic sequences (YMS, ca. 1.90 – 1.86 Ga) were studied. The OMS presents characteristics of arc-related rocks, correlating to rocks belonging to the Cui -Cui Complex and the Creporizao Suite, here in this study separated in three groups of granitoids. The YMS represents the evolution of the arc towards a post-orogenic setting comprising of intermediate to acid rocks related to the Parauari Intrusive Suite and the Iriri Group. This study aims to contribute to the discussion revolving pre-Cambrian magmatic-hydrothermal mineralizations and may represent a step forward in developing an metallogenetic model for the magmatic-hydrothermal mineralizations in the TMP.

Keywords: Magmatic-hydrothermal; Tapajos; Amazonian Craton; Metallogenesis; Petrogenesis.

