THE PALEOPROTEROZOIC VOLCANO-PLUTONISM AND ASSOCIATED Au AND Cu-Mo MINERALIZATIONS IN THE TAPAJÓS GOLD PROVINCE, AMAZONIAN CRATON

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The acid to intermediate calc-alkaline volcanic and volcaniclastic rocks of the ~1.88 Ga *lato sensu* Uatumã magmatic event cover > 1.100.000 km^2 (30%) of the Amazonian Craton, excluded the Phanerozoic Amazon sedimentary basin. This event also resulted in a large volume of granites. Recent studies have enabled the individualization of younger volcanic sequences at the south of the Cachimbo graben (Morinu, Aripuanã and Teles Pires – ~1.76 Ga; Colíder – 1.79 Ga) and older units in the ~2.0 Ga Vila Riozinho and Surumu areas. Alkaline volcanic rocks (~1.87 Ga) are also present in the Moraes Almeida and São Felix do Xingu. These volcanic units are distributed in the Tapajós–Parima (TPP) and Central Amazon provinces (CAP), which were interpreted as formed in ocean–continent orogenies. The Tapajós Gold Province (TGP) is located in the CAP–TPP boundary and comprises the ~2.1 Ga volcano-sedimentary Jacareacanga Group and granitic rocks of the Cuiú-Cuiú Complex (~2.01 Ga), Creporizão Intrusive Suite (1.97–1.95 Ga), Rio das Tropas Tonalite (~1.90 Ga), and Parauari Intrusive Suite – PIS (~1.88 Ga). Calc-alkaline andesitic to rhyolitic volcanic and volcaniclastic rocks (Iriri Group – 1.88 Ga) overlie the plutonic rocks and are crosscut by the anorogenic Maloquinha Intrusive Suite (~1.87 Ga). Paleoproterozoic fluvial and marine units and several mafic intrusions also occur in the TGP. The Iriri Group was formed in ash-flow caldera complexes, which were genetically linked to the emplacement, in back-arc rifts, of shallow late- to post-tectonic calc-alkaline batholiths of the PIS. The pre-caldera units are composed of andesitic, rhyolitic, and ignimbritic flows. Syn-caldera units consist of several large ash-tuff eruptions and the post-caldera units are represented by rhyolite and ignimbrites, which encompass ring composite volcanoes and domes distributed along the border and within the calderas. Tuffs, epiclastic sandstone and lacustrine sediments form the intra-caldera deposits. Intrusion of granophyric stocks and dikes of rhyolitic and rhyodacitic porphyry marks the end of the caldera evolution. Intense hydrothermal alteration associated with these intrusions in ring volcanoes were responsible for the 1.86 Ga epithermal high- and low-sulfidation mineralizations. The HS Au mineralization occurs in hydrothermal breccia affected by advanced argillic alteration, with alunite, natroalunite, pyrophyllite, andalusite, woodhouseite–svanbergite, diaspore, kaolinite–dickite, and enargite–luzonite. Argillic and propylitic hydrothermal zones enveloped the breccias, and sericitic alteration predominates in deeper parts. Hematite-rich silica cap occurs on top of the hydrothermal breccia bodies. Similar geological setting is identified in the LS Cu–Mo–(Au) mineralization, which is characterized by adularia and sericite in the hydrothermal alteration ore zone. Mesozonal granites, similar to the reduced Au mineralized Batalha Granite, undergone early Na- and K-metasomatism followed by intense propylitic and sericitic hydrothermal alterations. The hydrothermal patterns and biotite halogen chemistry are similar to those observed in Au-rich porphyry systems. Shallow-emplaced granites, such as the Palito granite, host a possible Au–(Cu) porphyry-type mineralization. The Palito granite forms a dome-like intrusion in the contact of a porphiritic granite and granodiorite–quartz diorite bodies. All these intrusive rocks are cut by mafic dikes. In this scenario, Au, Cu–Au, and Cu–Mo porphyries could also be present in shallower and more oxidized late Parauri granites, close to and below the epithermal HS and LS mineralizations.

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