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HYDROTHERMAL ALTERATION AND GOLD MINERALIZATION OF THE PATROCÍNIO VILLAGE ON THE TAPAJÓS MINERAL PROVINCE, NORTHERN BRAZIL

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The Amazon Craton consists in one of the largest cratonic areas in the world. Its formation is interpreted as the result of a series of accretionary orogens that have been juxtaposed to a cratonic nucleus of archean age represented by the Central Amazonian Province. In this tectonic setting the Tapajós-Parima Province is one of the geochronologic units of the Amazon Craton. The formation of this particular province is attributed to continent-ocean orogenies of 2.10–1.87 Ga, whose consequences involve expressive plutonic and volcanic rocks formation. Among the igneous manifestations that took place during this period the formation of calc-alkaline magmatic arcs represented by the granitoids of the Cuiú-Cuiú Complex (2.01-1.90 Ga), the Parauari Intrusive Suite (1.89 Ga) and the Creporizão Intrusive Suite (1,97-1,95 Ga) should be highlighted. An extensive plutonic and volcanic rock formation process of calc-alkaline/alkaline affinity also played an important role on the formation of the province. This magmatic event is denominated Uatumã and its lithotypes cover an area of approximately 1,100,000 km^2. This is the tectonic context where the Tapajós Mineral Province (TMP) is located. This particular province shows an important metallogenetic significance, it has already been responsible for the production of more than 750 tons of gold since the late 50's. On the central portion of the TMP, precisely on the surroundings of the Patrocínio Village, many artisanal miners are currently exploring and producing gold without any previous study. Despite this strong potential only a few number of researches were developed on the area aiming the characterization of the primary gold occurrences. The Canadian junior company Belo Sun Mining performed during the year of 2013 an exploratory drilling campaign, and agreed to gently provided the drill cores for this study. Through geologic mapping on the area of interest it was possible to assume that monzo and syenogranites with different stages of hydrothermal alteration are the dominant host rocks of the gold mineralization. Macroscopic description of the drill cores shows dominantly porphyritic and leucocratic monzogranites and syenogranites with hydrothermalism represented by a well-developed potassic alteration characterized by the formation of K-feldspar and a strong, sometimes pervasive, propylitic alteration with epidote, chlorite, quartz, ±albite, ±calcite. The former alteration commonly shows intersections of pyrite rich, quartz bearing Au mineralized veins. Under optical microscope these alterations are recognized by the replacement of Na-Ca igneous plagioclase by hydrothermal K-feldspar and veins of chlorite+epidote+ quartz with minor albite and calcite. Another type of mineralization on the target is associated with monzonites and quartz monzonites with disseminated pyrite with good grades of Au. These rocks are intrusive on the monzo and syenogranites and typically show disseminated pyrrhotite and Fe-carbonates (possibly ankerite and siderite). A strong carbonatization event of pervasive characteristic cross cut all lithotypes and together with the paragenetic association of the monzonites may represent fluids of different geochemical characteristics (fairly reduced and CO_2 rich when compared to magmatic fluids) implying in at least two distinct fluid sources, different styles of mineralization and possibly different tectonic settings for these Au occurrences.