

**Gold  $\pm$  copper and gold + base metal deposits associated with  
granitic systems from the eastern sector of the Alta Floresta  
Gold Province (MT), Amazon Craton.**

*Rafael Rodrigues de Assis<sup>1,2</sup>; Roberto Perez Xavier<sup>1,2</sup>; Antonio João Paes de Barros<sup>3</sup>; Rosana Mara Rodrigues<sup>1</sup>; Rafael de Vasconcellos Teixeira<sup>1,2</sup>; Verônica Godinho Trevisan<sup>1</sup>; Giseli Ramos<sup>1</sup>; Emílio Miguel Júnior<sup>1</sup>.*

<sup>1</sup>Departamento de Geologia e Recursos Naturais, Instituto de Geociências (UNICAMP); <sup>2</sup>Instituto Nacional de Ciência e Tecnologia da Amazônia; <sup>3</sup>Companhia Matogrossense de Mineração (METAMAT).

The Alta Floresta Gold Province (Mato Grosso State, Brazil) extends between the Ventuari-Tapajós (1.95-1.8 Ga) and the Rio Negro-Juruena (1.8-1.55 Ga) geochronological provinces, in the southeastern portion of the Amazon Craton. This province consists primarily of plutono-volcanic sequences generated in continental arc settings during the Paleoproterozoic. Based on the ore mineral association and geochemical signature, gold mineralization may be subdivided into two groups: (1) Au $\pm$ Cu deposits that display close temporal and spatial relationships with relatively oxidized (magnetite-bearing) I-type, calc-alkaline to sub-alkaline, medium to high K, meta- to peraluminous granitic rocks and represented dominantly by pyrite and variable concentrations of chalcopyrite; and more subordinately, (2) Au+Zn+Pb $\pm$ Cu with abundant pyrite, sphalerite and galena, minor chalcopyrite and hosted in volcanic sequences.

Luizão (Novo Mundo pluton; 1.97-1.96 Ga), Edú (Santa Helena pluton; 1.96-1.98 Ga), Pé Quente (Pé Quente Suite; 1.97 Ga), X1 (age of the host granitic pluton is unknown) and Serrinha (Matupá Intrusive Suite; 1.87 Ga) are the main representative deposits within the Au $\pm$ Cu group. Gold mineralization occurs disseminated (e.g. Luizão, Pé Quente, X1 and Serrinha) or in shear zone-hosted vein sets (e.g. Edú). Within the ore zones of the Luizão, Edú, X1 and Serrinha deposits, the granitic rocks are strongly altered to

sericite/muscovite+chlorite+quartz, and contain abundant pyrite with variable concentrations of chalcopyrite+hematite, together with minor barite, galena and Bi-Te-bearing phases. These zones are enveloped by pervasive potassic alteration with orthoclase+microcline. Although these alteration types are also seen at the Pé Quente deposit, its gold-sulphide association is mainly related both to earlier sodic alteration as later quartz+albite veins.

The Au+base metal deposits represent a more restricted group and have the Francisco deposit as the main example. This deposit is hosted by an epiclastic volcanoclastic unit in the vicinity of an A-type quartz-feldspar porphyry intrusion (1.77 Ga). The gold-sulphide ore is confined to a N15-50°W-striking fault and displays a strong spatial relationship with silicification enveloped by an alteration halo with sericite+quartz±chlorite±muscovite. Outwards from these ore zones, potassic, argillic and propylitic are important hydrothermal alteration types. The gold (Ag=1.9-19.4%) ore association consists mainly of pyrite+sphalerite+galena+digenite±chalcopyrite±magnetite±bornite±pyrrhotite. Locally, rocks containing layers of fine-grained silica alternating with layers of alunite and clay minerals are observed and could represent either a residual quartz-alunite deposit formed as a result of alteration of the volcanoclastic unit by strongly acidic and volatile-rich magmatic condensates or deposited on the surface by fumaroles activity.

The major gold event associated with the emplacement of granitic systems in the eastern sector of the province has been constrained within the range of 1.89 Ga (e.g. Nhandu granite) and 1.87 Ga, with Serrinha deposit hosted by the Matupá granite. We propose, however, that the gold metallogeny to the easternmost portion of the AFGP may have initiated earlier, with the emplacement of the 1.98-1.95 Ga Novo Mundo, Santa Helena and Pé Quente granitic plutons followed by the formation of the Luizão, Edú and Pé Quente deposits. Collectively, the Au±Cu deposits may be genetically linked to magmatic-hydrothermal systems similar to gold-only porphyry systems, similar to gold-only, Cu-poor porphyry systems, as those from the Maricunga belt (Chile) and La Colosa (Colombia), whereas the Au+base metals deposits may be akin to polymetallic intermediate sulphidation epithermal systems.

**KEY-WORDS:** Alta Floresta Gold Province, gold-rich porphyry, epithermal deposit.