

Evolution of mafic and ultramafic magmatism in the Carajás Mineral Province, southern part of the State of Pará, Amazon, Brazil

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The Carajás Mineral Province – CMP, situated in the south-eastern part of the Amazon Craton, contains volcanic and plutonic rocks of mafic and ultramafic composition that formed from the Middle Archaean to the Mesozoic. The oldest rocks (3.0 Ga) represent lower crustal fragments and consist of tholeiitic granulite found in the Pium and Rio Preto complexes. In the south of the CMP occur greenstone belt sequences attributed to the Andorinhas Supergroup, the lower parts of which consist of tholeiitic volcanites to komatiite with gold mineralizations. The greenstone belt sequences are intruded, locally, by mafic-ultramafic bodies such as the Serra Azul Complex (2.97Ga). In the Upper Archaean, volcano-sedimentary sequences formed in the northern part of the CMP. These volcano-sedimentary sequences include the Grão Pará, Rio Novo, and Aquiri groups that host deposits of Cu, Fe, Au and Mn. These sequences contain tholeiitic and andesitic basalt (2.76Ga), but locally there may occur ultramafic rocks related to continental rifting or transcurrent continental collision. In this connection, a distensive regime that affected mantle levels permitted the ascension of tholeiitic magma resulting in the emplacement of mafic and/or ultramafic bodies such as the Luanga Complex (2.76Ga), the Cateté Intrusive Suite, mafic sills (Aguas Claras Gabbro), bodies of the Santa Inês Gabbro type, and mafic dyke swarms. The bedded bodies of this magmatic event are found to contain Ni, Cr and PGE mineralization. In the Proterozoic, and still related to distensive events, there were intruded mafic dykes associated with granite (1.86Ga). In the Phanerozoic, distensive reactivation resulted in the formation of dykes (500 and 225Ma). The Mesozoic intrusives are known as the Cururu Diabase.