Mineralogical Characterization of Auriferous Occurrences in Stream Sediments in the Carangola Region, Minas Gerais, Brazil

Gabriela O. Carvalho, Alexandre N. Nogueira, Matheus R. Violante, Sofia G. d'Orsi, Gustavo Luiz C. Pires, Silvia R. Medeiros
Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

During the 1980s, artisanal gold mining was performed by local residents from riverbeds in the vicinity of Carangola/MG, SE Brazil. The area is located at the Neoproterozoic Ribeira and Araçuaí belts. The Archean/Paleoproterozoic basement is composed of migmatitic charnokitic orthogneisses from the Juiz de Fora Complex (JFC) followed by Neoproterozoic paragneisses from the Andrelândia Group (AG). Metagabbroic/dioritic bodies and granitoids cut the previous units. They occur as NNE-SSW tectonic slivers limited by regional post-peak metamorphic shear zones. Despite the gold discovery, there are no scientific works or descriptions about the geology of these occurrences. This work presents the mineralogical characterization of stream sediments collected at 20 points along three distinct drainage networks in order to investigate the detrital gold occurrences, their spatial distribution, and possible source rocks. Preliminary results show mineral association composed of magnetite, garnet, monazite, ilmenite, zircon, rutile, sillimanite, leucoxene, spinel, hypersthene, amphibole, and apatite, as well as quartz, muscovite, and biotite. Gold grains 0.2 to 0.4 mm in diameter were identified in four samples. Farther upstream, the grains have irregular contours, whereas downstream the grains are rounded, indicating greater transport. The gold occurrence is restricted to the courses that drain the rocks of the AG and JFC, cut by a high density of lineaments of the Manhuaçu Shear Zone, post-peak metamorphic and of NNE-SSW orientation. The presence of minerals poorly resistant to weathering and gold grains with irregular contours, concentrated near the head of one of the catchments, corroborates the proximity of the source rocks and primary mineralization. The results presented in this work allow for effective reduction of the areas with potential for the occurrence of auriferous mineralization in the region, besides providing prospective guides for the next stages of mineral research in the area in a conscious and responsible way.