

Characterization of the gold mineralization of the Tondabo gold prospect in the Brobo region (Ivory Coast, West Africa)

Seydou Mathurin Daï Bi, Gbele Ouattara*, Gnammytchet Barthélémy Koffi
*Laboratory of Geosciences, Living Environment, Environment and Geographical Sciences, National
Polytechnic Institute Felix Houphouët-Boigny, Yamoussoukro, Ivory Coast*

*E-mail: gbele.ouattara@yahoo.fr

The Brobo region in central Côte d'Ivoire, located in the north of the Hiré-Toumodi-Fettékro volcano-plutonite greenstone belt, has been the target of gold mining research by several mining companies. Despite these numerous works, no mine has been identified, unlike the southern part of this greenstone belt which has three active mines. Our work aims to better characterize the mineralization. The metallogenic study of the Tondabo prospect is based on the detailed study of the mineralized zones and their surrounding areas, using diamond drilling and the 12 reverse circulation holes. The study combines lithostructural analysis, alterations and gold analysis results to better identify the characteristics of the mineralization.

Regarding the gold mineralization of the Tondabo prospect, it is mainly hosted by rhyodacites and to a lesser extent by mafic volcanics (volcanic lava and volcanoclastics). These rocks were affected by hydrothermal alteration marked by quartz veins and veinlets associated with carbonates, sericite, epidote and sulphide crystals. This hydrothermal alteration induced a pervasive alteration of the surrounding areas with chloritization, carbonation, hematization and sericitization of feldspars. This mineralization presents a lithological control. The mineralized beds are generally affected by a foliation S_1 oriented mainly $N000-010^\circ$ and in a minority $N040-050^\circ$ with a general dip of $60-80^\circ$ westwards; with however rare NS orientations with a dip of $60-80^\circ$ eastwards. The sampling intervals showing the highest gold grades are related to quartz veins and veinlets, which are located in deformed areas. These veins are of three types that are chronologically: (i) transverse veins that intersect the flow foliation; (ii) planar veins subparallel to each other and to foliation, sometimes presenting an extrusion; and (iii) late planar veins which intersect the whole complex (veins i, ii and foliation).

The metalliferous paragenesis consists of pyrite (main sulphide), pyrrhotite and rarely chalcopyrite. We note in this prospect a first phase of pyritization, disseminated, and which seems to be contemporaneous with regional foliation. The second phase of pyritization is recent, and associated with the emplacement of quartz veins associated with sericite-carbonate crystals that would have favored mineralization.

Key words: Gold mineralization, hydrothermal alteration, lithologies, deformations, Tondabo