

**GEOLOGY, METAMORPHISM AND GOLD MINERALIZATION OF THE  
KENTICHA-KATAWICHA AREA, ADOLA BELT, SOUTHERN ETHIOPIA**

by

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The Kenticha-Katawicha area, which is situated in the Adola Belt of southern Ethiopia, is underlain by Precambrian rocks. The area comprises gneisses (including migmatitic-, granitic-, and quartzofeldspathic-gneisses), amphibolites, biotite schists/gneisses, ultramafic rocks (serpentinites and talc-tremolite/chlorite schists), metasediments (pelitic schists, graphite schists, marble, Fe-Mn-quartzite) and post-orogenic granite. With the exception of the granite all rock units have been variably deformed and metamorphosed.

The mineral assemblages and textural data obtained from the metamorphic rocks of the area indicate that the dominant metamorphic condition was of upper amphibolite facies. Garnet-biotite (garnet-core - matrix-biotite) and amphibole-plagioclase geothermometry gave estimates for peak metamorphic temperatures of 630–650°C. A clockwise P-T path is deduced from mineral thermometry and the textural and paragenetic relations. The estimated peak values suggest a burial to approximately 25 km depth.

The preliminary geochemical features of amphibolites, with immobile trace and rare earth elements chemistry, show mainly island arc tholeiite characteristics and most of the data from granitic rocks plot in the field of volcanic-arc granitoids.

The rock associations of the study area, i.e., high-grade gneisses, schists, amphibolites, ultramafics associated with podiform chromites, and the deep marine sediments, indicate a possible ophiolitic succession. This combined with the preliminary geochemistry of the magmatic rocks and clockwise P-T path is consistent with a collision setting for the emplacement of the rocks of the study area.

In the Kenticha-Katawicha area gold occurs in quartz veins and veinlets in lenses of biotite schists within ultramafics that are confined in shear zones. Fluid inclusion studies of gold quartz veins and veinlets indicate a H<sub>2</sub>O- and CO<sub>2</sub>-rich fluid with low salinity (< 5 wt.% NaCl-Equivalent). The gold mineralization in the area seems to date after the main regional metamorphism and is associated with low-grade wall-rock alteration.