Architecture and petrography of syn-D_2 Eburnean granitoids: example of Massawa and Sofia deposits (Kanoumba permit, Kedougou Inlier, Senegal)

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The West Africa Birimian terranes has been interpreted as polycyclic evolution resulting of a collision phase (D_1) followed by transcurrent phases D_2 and D_3 described as regional senestral and dextral shears zones postdating eburnean granitoids (Ledru et al., 1989, 1991; Milesi et al., 1992).

The area of study is located between the Mako volcanic belt and the Diale-Daleme Basin separated by the Main Transcurrent Shear (MTZ). It hosts two orogenic gold deposits (Massawa and Sofia) delineated by two majors structures: the NE trending MTZ and the Sabodala Shear zone (SSZ). Massawa deposit is located along the MTZ where andesitic to dioritic rocks with various volcanosedimentary to sedimentary formations are dominantly cropping out. Sofia deposit is located nearby the SSZ which constitutes its western limit, the lithological context are represented by basaltic and ultramafic rocks.

The study has highlighted a new structure parallel to this MTZ with 50 m average thickness and delineating a NE tuffaceous horizon intruded by sub-rounded to rounded granitoids. The western and eastern limits of this major accident are marked by coeval injections of felsic rocks. The detailed analysis of this structural interface shows that the main shear zones, foliations and lineations trend NE to NNE parallel to the MTZ. Additional ENE-WSW foliations network has also been identified. The schistosity shows two main directions NE and NW. Fold axis and axial planes are NS and NE to NW oriented, respectively. The general behavior of the structural interface could be related to the D_2 phase characterized by NE-SW to NS subvertical foliations associated with assymetric folds and a stretching lineation parallel to the axial planes of the fold.

Granitic plutons with different shapes, sizes and compositions appear concordant or discordant to the MTZ. The Tinkoto pluton is a concordant and locally elongated shape of leucocratic granodiorite to monzogranite composition with a grainy and equant texture associated with rare pegmatites. It is associated to other small intrusions all arranged along the MTZ accident. The Dioudioukounkou is a NS elongated granodioritic pluton with a notable modal composition of potassic feldspar and platinum anomalies.

Dioudioukounkou and Tinkoto plutons affiliated to the Mako volcanic belt are dated between 2082 Ma and 2076 Ma (Hirdes and Davis, 2002; Gueye et al., 2007, 2008). They exhibit a variety of geometric and petrographic characteristics suggesting differences in their context of emplacement. Dioudioukounkou associated to Sofia deposit is supposed syn-D_2 and Tinkoto associated to Massawa deposit could be late D_2 to D_3 related.

Keywords: Syn-D_2, MTZ, SSZ, granite, Massawa, Sofia, Kedougou

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