

Petrogenetic relationship and rare metal mineralizations (Nb-Ta, Li, Be, Cs ...) in the Issia placer, Côte d'Ivoire: petrography, geochemistry and metallogenic implications

Joseph K. Brou^{1,*}, Marieke Van Lichtervelde², David Baratoux², Alain N. Kouamelan¹

¹*University F.H.B. of Abidjan-Cocody, UFR-STRM, 22 B.P. 582 Abidjan 22, Côte d'Ivoire;* ²*IRD, GET, University of Toulouse III, 14, avenue Edouard Belin 31400 Toulouse, France*

The frequently observed spatial link between the rare-metal mineralizations of alluvial, eluvial and colluvial placers and the granitoids led very early to many questions about the possible existence of a genetic link. In order to constrain the primary source of niobium-tantalum oxides and to propose an implementation model, several studies were carried. A geochemical study by total rock analyses of the granitoids distributed over all the study area. Except the sample DAL06 which is an enclave in DAL05 massif, all the granitoids are peraluminous of type S and I and of the highly potassium calc-alkaline series. The S-type granitic formations are those located in the south of the Issia region and around the metasediments and have the lowest K/Rb (<170), K/Cs (<2500) and Nb/Ta (<8.5) ratios. A mineralogical study focused on the electron microprobe analysis of granite micas as well as pegmatites and Nb-Ta minerals from the different columbo-tantaliferous sites were performed. LA-ICPMS analyses revealed the presence of lithic micas and significant Cs₂O concentration (17.27%) in some pegmatites, characteristic of highly evolved granitoids resulting in LCT (Lithium-Cesium-Tantale) pegmatites. The analysis of the Nb-Ta minerals (colombo-tantalite and tapiolite) of the different placer deposits shows that the columbo-tantaliferous material has been slightly remobilized and mixed, allowing the reconstruction of the initial distribution of pegmatites around their granite precursor. The Nb, Ta and Be mineralization of the Issia placers are located south of the study area and more precisely at the limit of the metasediments and the S-type granitoids.

Keywords: colombo-tantalite, pegmatite, granitoides, metasediments, lithium, cesium