



## **Tectonic evolution of Boromo and Houndé belts (western Burkina Faso) : contemporaneous crustal scale folding of volcano-sedimentary sequences and granitoid plutons emplacement ( $\sim 2.2 - 2.0$ Ga)**

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Interpretation of regional scale airborne geophysical data of western Burkina Faso integrated with structural, geochemical and petrological data suggest that the Boromo and Houndé belts were parts of the same volcano-sedimentary basin characterised by basalts and gabbros of tholeiitic composition at the base, evolving to calc-alkaline mafic and intermediate volcanics followed by flysh sediments, typical for the volcanic island arcs. A specific lithology, consisting of basalts with plagioclase megacrysts was observed at the eastern margin of the Houndé belt as well as at the western part of the Boromo belt, representing an important stratigraphic marker allowing us to make the link between the two belts. The equivalent structural evolution of stratigraphic sequences in the two belts is consistent with NNE-SSW trending regional scale synforms with an antiform localized in between the Boromo and Houndé belts and also at their eastern and western limits, respectively. The antiform structures are obliterated by numerous tonalite-trondjemite-granodiorite-granite plutons, characterized by the same structural grain as the adjacent greenstone belts. Magnetic and radiometric data show a previously unrecorded NNW-SSE oriented regional scale shear zone affecting the the granitoids between the Houndé and Banfora belts. In the south, this shear zone joins by a fan-like relationship another large scale (200km) N-S trending shear zone bordering the Houndé belt in the west and running down to the Côte d'Ivoire border. In the eastern part of the Houndé belt, continuous N-S unit of detrital "Tarkwaian" type metasediments occurs, reaching up to 400km in length. They are affected at the eastern and western limits by a crustal scale belt-parallel shear zone.

Based on regional scale structural correlations, we suppose that a D1 deformation event affected the volcanic sequence of Houndé and Boromo belts. However, it was almost entirely overprinted by the major deformation phase D2, responsible for the structural grain present in all western Burkina Faso. Most of the NNE-SSW steeply dipping penetrative metamorphic fabrics and isoclinal folds in greenstone belts developed contemporaneously with the subvertical magmatic banding in the TTG's during the D2a. Deformation partitioning between dominant flattening and sinistral NNE-SSW shearing is typical for this phase. Metavolcanic rocks are affected by regional metamorphism of greenschist facies and only narrow zones adjacent to granitoid plutons reach amphibolites facies conditions. Continuous transition into transcurrent ENE-WSW and NNW-SSE trending conjugate shear zones is assigned to D2b. Late D3 deformation characterized by spaced crenulation cleavage and kink folds with subvertical E-W oriented shear zones occurs mainly in highly anisotropic fine grained metasediments and it is either late Eburnean or perhaps Pan-African.