



## REVIEWER'S REPORT

Manuscript No.: IJAR-58013

Title: Petrogenesis and geochemistry of Birimian granitoids in the eastern Korhogo belt: Geodynamic implications

**Recommendation:**

Accept after minor revision

Rating	Excel.	Good	Fair	Poor
Originality			✓	
Techn. Quality		✓		
Clarity		✓		
Significance	✓			

Reviewer's ID: JPR-Bilqees Hamza

### Detailed Reviewer's Report

#### General Overview

The manuscript titled "*Petrogenesis and geochemistry of Birimian granitoids in the eastern Korhogo belt: Geodynamic implications*" provides a rigorous and comprehensive investigation into the Paleoproterozoic crustal evolution of the West African Craton. The primary objective of the research is to characterize the petrological, geochemical, and geotectonic features of poorly documented granodiorite and granite complexes within the eastern branch of the Boundiali-Korhogo greenstone belt in northern Côte d'Ivoire. To achieve this, the authors utilize a well-integrated methodological framework linking systematic field observations, microscopic petrography, and advanced whole-rock major and trace element geochemistry determined via inductively coupled plasma methods. The key findings successfully differentiate the plutonic suites into calc-alkaline, potassic, and I-type magmatic series, providing critical insights into their source material, alumina saturation, fractional crystallization histories, and subsequent post-magmatic alterations.

The research topic holds exceptional relevance within Precambrian geology and petrology, as characterizing the generation of Paleoproterozoic juvenile crust is vital for regional tectonic correlation and global supercontinent reconstructions. A major strength of the work lies in the high precision of its geochemical datasets and the exceptional detail provided in the petrographic descriptions. The narrative flow is highly logical, guiding the reader smoothly from regional geologic frameworks and localized

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outcrop descriptions to microtextural analyses, chemical classification diagrams, and geotectonic configurations. The authors' interpretations are generally well-grounded, thoroughly documented, and contextualized within existing West African literature.

In terms of overall contribution, the manuscript significantly enhances the existing literature by bridging an empirical geographic gap in the Baoulé-Mossi domain. The integration of trace-element and rare-earth element patterns effectively models a subduction-related continental arc environment, successfully refining the geodynamic models of the Eburnean orogeny. The study presents publication-quality research that advances our collective understanding of Paleoproterozoic magmatism and related metallogenic frameworks.

### Suggestions for Improvement

While the manuscript is fundamentally sound and well-executed, a few minor adjustments and structural clarifications would further elevate its impact, clarity, and overall presentation prior to final publication.

- 1. Elaboration on Geological Map Details:** The geological map provided in Figure 1 is highly informative and delineates the study area effectively. To improve its clarity, it is suggested that the authors add a small inset or clear text annotations explicitly identifying the precise geographic positions of the key sampling localities mentioned in the text, such as Nielle, Diawala, and Fapoha. This would immediately assist the reader in visually correlating the sample names with the mapped lithologies.
- 2. Clarification of Hydrothermal Alteration Intensity:** In the petrography section, the text meticulously details pervasive alteration features, including plagioclase breakdown into sericite, carbonates, and epidote, as well as biotite chloritization. The manuscript would benefit from a brief statement in the results or discussion explaining if this alteration varies systematically between the specific geographic localities or if it represents a homogenous regional overprint.
- 3. Integration of Cross-Cutting Relationships:** The results section notes that the granites are intrusive into metabasalts and are traversed by quartz veins. Adding one or two sentences describing the field-scale structural orientation or thickness of these veins would provide valuable context for researchers interested in the fluid circulation pathways and local metallogenic potential mentioned in the text.
- 4. Refining Major and Trace Element Descriptions:** The geochemical results sections describe major and trace element patterns very well. To streamline the reading experience, the authors should verify that all specific element values discussed in the narrative text are easily identifiable within the companion data tables, ensuring complete parity between the written results and tabulated indices.

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5. **Standardization of Element Ratios in the Narrative:** In the discussion regarding subduction zone signatures and mantle-crust interactions, the text attributes certain enrichments and depletions to continental arc magmatism. It is recommended that the authors explicitly mention the numerical values of the key tracer element ratios calculated from their dataset directly within the body text of Section 5.2 to reinforce their petrogenetic conclusions without requiring the reader to recalculate them from the raw data.
6. **Legibility Pass for Figure Text and Labels:** The geochemical classification plots, primitive mantle-normalized diagrams, and chondrite-normalized patterns are accurately drawn and clear. However, the lettering on the coordinate axes and internal legends of Figures 3, 4, and 5 should be slightly enlarged or sharpened to maintain high readability when the figures are scaled down for standard single-column journal formatting.

### Recommendation

**Recommendation:** Accept with Minor Revisions

### Justification

The manuscript makes a meaningful and highly relevant contribution to Paleoproterozoic petrology, offering a well-conceptualized and robustly executed study that resolves critical data gaps in the eastern Korhogo belt. The methodology is sound, the data analysis is transparently handled, and the geotectonic conclusions are supported by the empirical whole-rock geochemistry. The areas identified for improvement are entirely minor and relate directly to minor visual enhancements, textual clarifications, and local structural details. These adjustments can be readily addressed by the authors and will further polish an already strong piece of scientific scholarship, making it fully suitable for publication.