

REVIEWER'S REPORT

Manuscript No.: IJAR-59315

Title: DU DOMAINE CONTINENTAL AU DOMAINE MARIN OUVERT : ÉVOLUTION PALÉOENVIRONNEMENTALE DE L'ALBIEN AU MAASTRICHTIEN SUR LA MARGE D'ABIDJAN (CÔTE D'IVOIRE),

Recommendation:

Accept after minor revision.....

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

Reviewer Name: Dr. Abdul Haseeb Mir

Detailed Reviewer's Report

General

The manuscript presents a detailed, integrated study reconstructing the palaeoenvironmental evolution of the Abidjan transform margin (Côte d'Ivoire) from the middle Albian to the Maastrichtian. Utilizing cuttings samples from well AB-9X (4,740–11,750 ft), the authors establish six lithological units and ground them within a biostratigraphic framework based on the last appearance datums (LADs) of miospores and dinoflagellate cysts.

The paper effectively demonstrates how palynology fills in the gaps of purely sedimentological interpretations (e.g., proving marine influences in sandstone-dominated intervals where classic marine mineral indicators like glauconite are absent). Overall, the manuscript is well-structured, logical, and provides valuable regional insights into Equatorial Atlantic opening dynamics.

Main Scientific Strengths

- **Methodological Rigor:** The explicit separation of lithofaciès analysis (conducted age-independently) from palynostratigraphy before integrating both datasets ensures an unbiased evaluation of depositional signals.
- **Regional Tectonic Alignment:** The identified palaeoenvironmental shifts match key regional geodynamic events well, particularly:
 1. The progradational fluvio-deltaic sandstones in the upper Albian (Unit 3/7,030 ft), which reflect tectonic uplift and final continental separation.
 2. The Santonian–Campanian transgressive surface and associated hiatus (5,400 ft boundary), corresponding to thermal subsidence during passive margin setup.
- **Detailed Palynofacies/Palaeoclimate Synthesis:** The transition from hot, arid *Elaterate*- and *Classopollis*-dominated microfloras in the Albian to *Longapertites* (palm pollen) in the Maastrichtian nicely documents the mid-to-late Cretaceous humidification trend in West Africa driven by oceanic expansion.

Key Issues & Areas for Improvement

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A. Biostratigraphic & Methodological Limitations

- **Sampling Resolution & Cuttings Limitations:** Since the study relies strictly on ditch cuttings, downhole contamination (*caving*) is an inherent risk. While the authors correctly rely on Last Appearance Datums (LADs) to establish upper age limits, the resolution across critical boundaries (e.g., the Santonian–Campanian hiatus or the Turonian interval) remains constrained.
- **Fragile Datations:** The Turonian assignment relies on a single miospore in open nomenclature (*Tricolpites* sp. SC.I 13 at 5,460 ft). The authors openly acknowledge this fragility, but additional micropalaeontological datasets (e.g., planktonic foraminifera or calcareous nannofossils) would significantly strengthen this section.
- **Absence of Core/Wireline Log Integration:** Integrating wireline log curves (Gamma Ray, Resistivity, Density) would greatly assist in refining bed boundaries, identifying sequence boundaries/flooding surfaces, and verifying whether the 5,400 ft contact represents a transgressive ravinement surface or a condensed section.

B. Data Inconsistencies & Divergence Interpretations

- **Maastrichtian Bathymetric Trend vs. Condensation:** In Section 3.3.6 and Section 4.5, a minor divergence is noted between the sedimentological signal (abundant glauconite suggesting condensation/low sedimentation rates) and the palynological signal (reduced dinocyst abundance suggesting a potential shallowing trend). The authors correctly attribute this to taphonomic bias or changes in marine primary productivity rather than a true regressive event. Quantitative palynomorph counting (palynofacies ratio analysis) in future work would resolve this uncertainty.

Summary of Lithostratigraphic & Palaeoenvironmental Progression

Depth Interval (ft)	Age	Lithology & Key Features	Depositional Environment
11,750 – 7,920	Middle Albian	Dark, non-calcareous micro-charcoal-bearing argillites with fine, well-sorted sandstones.	Low-energy continental to paralic (floodplain/lacustrine) under hot, arid conditions.
7,920 – 6,830	Upper Albian	Dark argillites transitioning at 7,030 ft into coarse, immature progradational sandstones.	Fluvio-deltaic progradation closing the rift phase.
6,830 – 5,830	Cenomanian	Calcite-cemented, immature sandstones alternating with dark argillites; first occurrence of dinocysts.	Proximal marine (inner neritic/delta front) in an aggradational regime.
5,830 – 5,460	Turonian	Continuation of Unit 4 sandstone-argillite alternations.	Aggradational proximal marine setting.
5,460 – 5,400	Lower Senonian (Santonian)	Sand-argillite alternations with minor silty-sandy micritic limestones.	Proximal marine with reduced terrigenous supply and freshwater inputs.
5,400 –	Campanian	Dark, subfissile, glauconitic	Outer shelf, open marine

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Depth Interval (ft)	Age	Lithology & Key Features	Depositional Environment
5,000		argillites; abundant dinocysts, absence of miospores.	maximum transgressive drowning.
5,000 – 4,740	Maastrichtian	Glaucconite-rich dark argillites with local minor carbonate influence.	Slow-sedimentation open marine shelf environment.

Verdict & Recommendation

Recommendation: Accept with Minor Revisions.

The manuscript is a comprehensive contribution to the understanding of West African transform margin geology. To finalize the paper for publication, the authors should address the following points:

1. Clarify sampling intervals across key stratigraphic boundaries (specifically around 5,400 ft and 7,030 ft).
2. Add a brief paragraph noting the limitations of relying solely on cuttings and how future wireline log or core integration could refine the sequence stratigraphic model.
3. Ensure figures and plates remain clearly referenced in the final typesetting phase.