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PALEOENVIRONMENTAL RECONSTRUCTION OF THE EASTERN MARGIN OF THE IVORIAN OFFSHORE SEDIMENTARY BASIN USING SEDIMENTOLOGICAL AND MICROPALAEONTOLOGICAL ANALYSES OF BENTHIC MICROFAUNAL ASSEMBLAGES FROM THE J1 WELL.

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ABSTRACT

Drill cuttings from the J1 well, corresponding to the 2160-2480 m interval and located on the eastern margin of the Ivorian offshore sedimentary basin, were subjected to integrated lithostratigraphic, biostratigraphic, and micropaleontological analyses. Sixteen samples were processed following a protocol that included washing, sieving, and examination under a binocular microscope. The results reveal a lithology dominated by black clays (70%), associated with fine-grained sandstones (25%) and limestones (5%), with intercalations of pyrite and carbonaceous debris. The microfauna is mainly composed of agglutinated benthic foraminifera, representing 77% of all identified foraminifera, grouped into 12 genera and 18 species. Biostratigraphic analysis allowed the identification of four intervals assigned to the Cenomanian (2480-2390 m), Turonian (2390-2245 m), Santonian (2235-2205 m), and Campanian (2205-2160 m). The combined sedimentological and micropaleontological data suggest a relatively deep marine environment ranging from the outer shelf to the upper bathyal zone, characterized by reducing conditions favorable to the preservation of organic matter.

Keywords: Sedimentology, Micropaleontology, Benthic Foraminifera, Biostratigraphy, Paleoenvironment, Sedimentary Basin, Côte d'Ivoire.

1 INTRODUCTION

The Ivorian offshore sedimentary basin, which possesses significant petroleum potential, remains underexplored in its eastern sector despite the discovery of several offshore oil fields, including Lion, Baobab, Foxtrot, and Eni. Several areas are still poorly investigated and require detailed characterization to better assess the petroleum potential of the eastern part of the Ivorian sedimentary basin.

From a scientific perspective, the studies conducted by [1,2,3] contributed to a better understanding of the geology of the eastern margin of the Ivorian offshore sedimentary basin, particularly regarding the age of formations and depositional environments. Furthermore, micropaleontological investigations have enabled the characterization of the microfaunal assemblages present in this part of the basin and provided valuable insights into depositional settings [4, 5, 6, 3]. These studies demonstrate the importance of microfossils in paleogeographic reconstructions, paleoenvironmental interpretations, and the identification of bioevents.

With regard to petroleum exploration, various exploration campaigns carried out on the eastern margin of the Ivorian offshore basin, particularly by the national oil company PETROCI (Société Nationale d'Opérations Pétrolières de Côte d'Ivoire), have led to the discovery and development of several oil fields, including Lion, Panthère, Espoir, Foxtrot, Baobab, and Eni. Although these studies have yielded significant results, they are still insufficient to comprehensively characterize the microfaunal assemblages of the eastern margin of the Ivorian sedimentary basin or to fully evaluate its petroleum potential.

This study aims to characterize the microfaunal assemblages of the J1 well, located on the eastern margin of the Ivorian offshore sedimentary basin (**Figure 1**), through an integrated sedimentological and micropaleontological approach. The specific objectives are to:

- Characterize the lithology of the J1 well;
- Identify the benthic microfaunal assemblages present in the J1 well;
- Determine the age of the microfaunal assemblages;
- Reconstruct the depositional conditions and paleoenvironmental setting of these assemblages

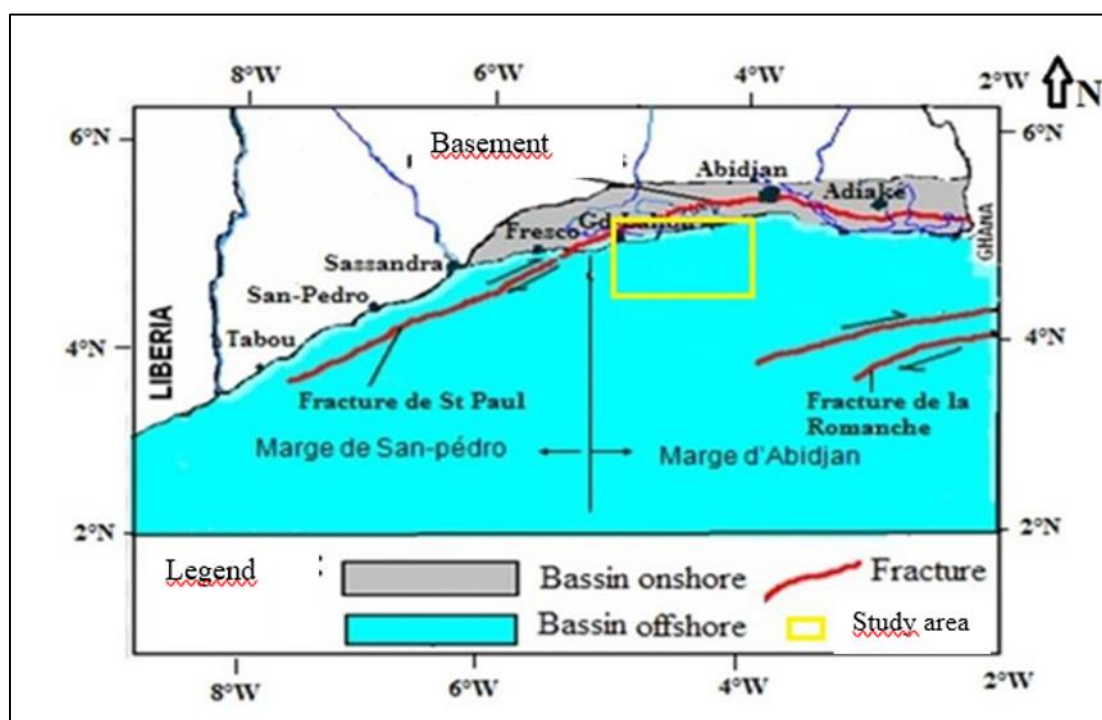


Figure 1: Location of the J1 well on the eastern margin of the Abidjan offshore basin.

2 GEOLOGICAL SETTING OF THE IVORIAN SEDIMENTARY BASIN

The Ivorian sedimentary basin is part of the series of West African Atlantic marginal basins formed during the opening of the South Atlantic Ocean. It extends along the Gulf of Guinea and is bounded to the east by the Ghanaian sedimentary

basin and to the west by the Liberian basin. The basin developed as a result of the fragmentation of the Gondwana supercontinent and the subsequent separation of the African and South American plates.

Structurally, the basin is divided into onshore and offshore domains. The offshore domain, which hosts the J1 well, is characterized by a thick sedimentary succession deposited from the Early Cretaceous to the Quaternary. The basin evolution is closely related to major tectonic events associated with rifting, subsidence, and passive margin development.

The stratigraphic succession of the Ivorian sedimentary basin generally comprises three major phases:

- The syn-rift sequence (Early Cretaceous): dominated by continental deposits including conglomerates, sandstones, and lacustrine sediments accumulated during the initial rifting stage.
- The transitional sequence (Aptian): characterized by mixed continental and marine deposits resulting from progressive marine incursions into the basin.
- The post-rift sequence (Albian to Recent): mainly composed of marine sediments including shales, marls, limestones, and sandstones deposited during the passive-margin stage.

The eastern offshore sector of the basin contains several petroleum-bearing structures and has been the focus of numerous exploration campaigns. The sedimentary record preserved in this area provides valuable information on depositional environments, sea-level fluctuations, and paleoceanographic conditions that prevailed throughout the basin's geological history. Micropaleontological studies conducted in the eastern offshore basin have demonstrated the abundance and diversity of benthic and planktonic foraminifera, which constitute reliable indicators for biostratigraphic correlation and paleoenvironmental reconstruction. These microfossil assemblages are particularly useful for determining water depth, oxygenation conditions, salinity variations, and sedimentary dynamics during deposition.

The J1 well, located in the eastern offshore margin of Côte d'Ivoire, offers an excellent opportunity to investigate these aspects through an integrated sedimentological and micropaleontological study. The analysis of lithological characteristics and benthic microfaunal assemblages enables the reconstruction of the depositional environments and the paleoenvironmental evolution of this sector of the basin.

3 METHODS

3.1 Sedimentological Method

The lithological characterization of this study was carried out using data obtained from preliminary macroscopic observations and the analysis of drill cuttings under a binocular microscope. This approach allowed for a detailed characterization of the properties and compositions of the sedimentary layers penetrated by the well.

3.2 Micropaleontological Method

This study was based on the analysis of sixteen (16) cutting samples collected from the J1 well. The samples were subjected to a rigorous preparation protocol, including washing with ammoniated water for 24 hours, wet sieving through 63-250 μm mesh sizes, and oven drying at temperatures ranging from 80 to 90°C.

Microscopic examination of the dried sieve residues was conducted using the taxonomic classification proposed by [7, 8], based on criteria such as test composition, chamber arrangement, aperture characteristics, and other diagnostic morphological features. This procedure enabled the identification and quantification of the species encountered, as well as the assessment of their stratigraphic distribution throughout the studied interval.

The interpretation of living environments and depositional settings was based on the Planktonicity Index (PI%), Shannon Diversity Index (H'), and lithological data. The integration of these parameters provided valuable information for reconstructing the paleoenvironmental conditions prevailing during sediment deposition.

4 RESULTS

4.1 Sedimentological Analysis

The J1 well is composed of claystones, limestones, and fine-grained sandstones, with intercalations of pyrite and carbonaceous debris. Two (02) lithological units were identified, highlighting a certain degree of facies homogeneity and alternation.

4.1.1 Unit I: 2200 m to 2480 m

Unit I is characterized by a thickness of 280 m. The sediments are predominantly composed of black claystones (70%), limestones (5%), and closely spaced beds of fine-grained sandstone (25%). This unit is also marked by continuous intercalations of pyrite and carbonaceous debris between 2275 m and 2500 m. The microfaunal assemblages recovered from these sediments occur between 2310 m and 2480 m.

4.1.2 Unit II: 2160 m to 2200 m

Unit II, with a thickness of 60 m, is exclusively composed of dark clayey sediments. It is characterized by a low abundance of pyrite and the absence of carbonaceous debris. These lithological features suggest depositional conditions that differed from those recorded in Unit I, particularly with regard to organic matter input and redox conditions during sediment accumulation.

This interval reflects a relatively homogeneous sedimentary environment dominated by fine-grained deposits, indicating low-energy depositional conditions. The scarcity of pyrite and the absence of carbonaceous remains may point to reduced organic matter preservation and less restricted depositional settings compared to those prevailing during the deposition of Unit I.

4.2 Micropaleontological Analysis

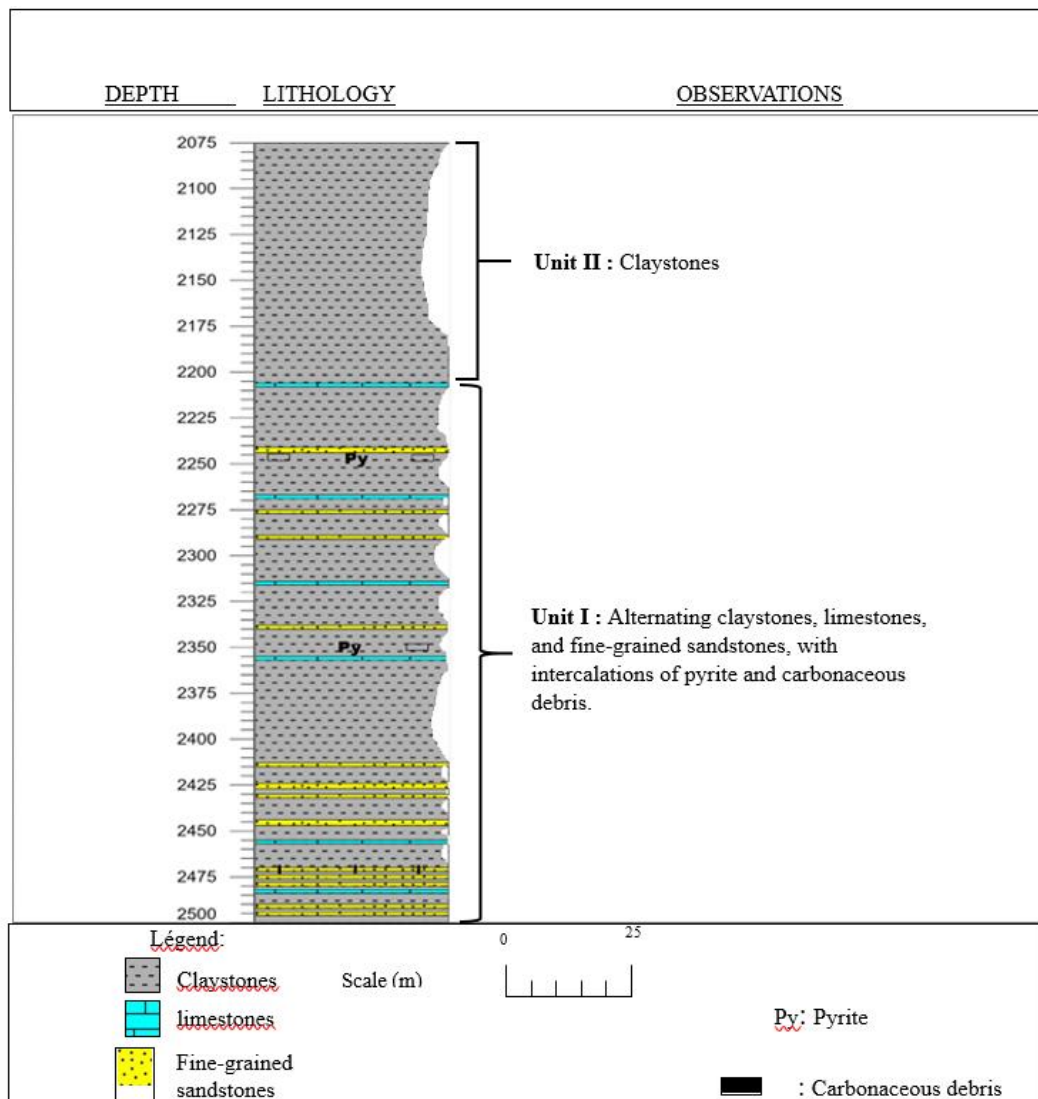


Figure 2: Simplified Lithological Log of the J 1 Well.

Micropaleontological analysis was conducted on sixteen (16) drill-cutting samples and revealed a rich microfaunal assemblage comprising 2,195 foraminiferal specimens. The assemblage is dominated by benthic foraminifera, including both agglutinated and calcareous forms, which represent 77% of the total population (Figure 3). The predominance of benthic foraminifera indicates favorable bottom-water conditions and reflects the influence of depositional

environments characterized by specific ecological and sedimentological conditions. The distribution and abundance of these benthic forms provide important information for the reconstruction of paleobathymetric conditions and the paleoenvironmental evolution of the study area.

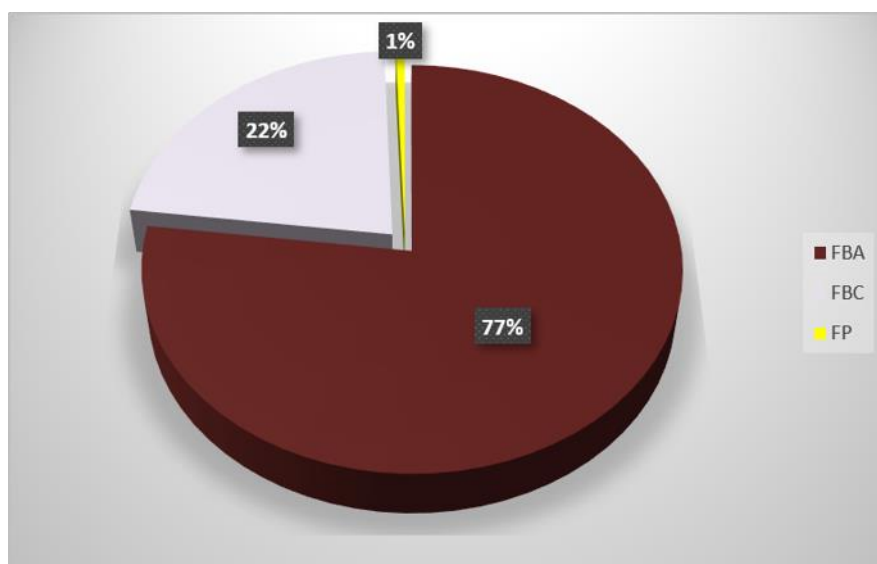


Figure 3: Relative proportions of planktonic and benthic foraminiferal assemblages in the J1 well. Agglutinated Benthic Foraminifera (FBA), Calcareous Benthic Foraminifera (FBC), and Planktonic Foraminifera (FP).

Agglutinated benthic foraminifera constitute 1,690 specimens, representing 77% of the total identified population. They are distributed among 12 genera and 18 species. The most abundant genera are *Trochammina*, *Spiroplectammina*, *Haplophragmoides*, and *Rzehakina*.

The dominance of these agglutinated benthic taxa suggests depositional conditions favorable to their development and preservation. Their abundance provides valuable paleoenvironmental information, particularly regarding bottom-water conditions and sedimentary dynamics within the study area.

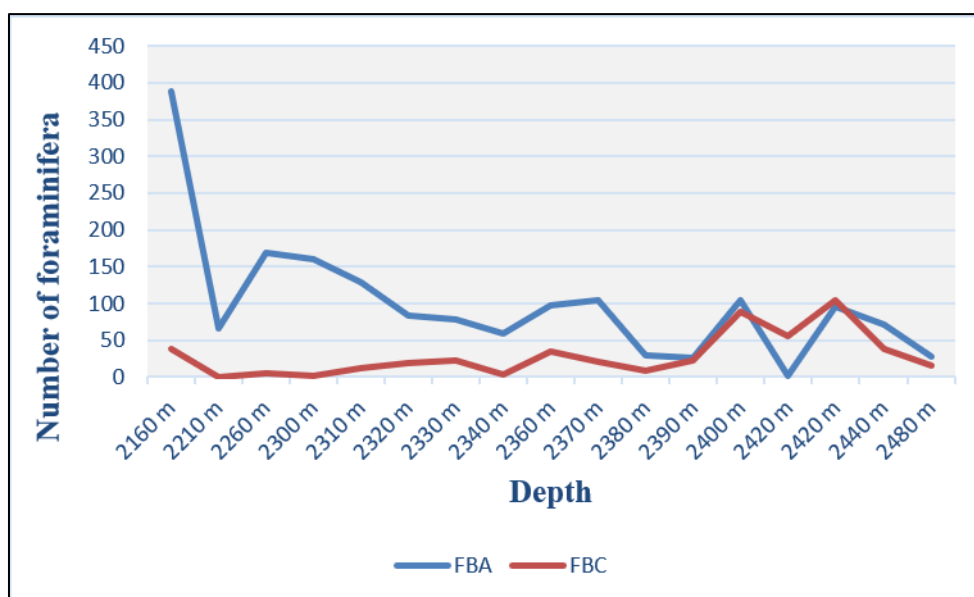


Figure 4: Distribution of agglutinated and calcareous benthic foraminifera in the J1 well as a function of depth.

A total of 492 calcareous benthic foraminifera were identified, representing 22% of the total foraminiferal assemblage. They are distributed among 3 genera and 7 species. The main genera recorded are *Lenticulina*, *Bulimina*, and *Gyroidina*. Only 13 planktonic foraminifera were recovered, accounting for approximately 1% of the total foraminiferal population.

These specimens belong to 2 genera and 2 species identified during the analysis (Figure 10). The most significant genera are *Heterohelix* and *Archaeoglobigerina*.

The marked dominance of benthic foraminifera over planktonic forms indicates a strong benthic signal within the assemblage and suggests depositional environments largely controlled by bottom-water conditions. The low abundance of planktonic taxa may reflect limited open-marine influence or taphonomic and ecological factors affecting their preservation and distribution in the studied interval.

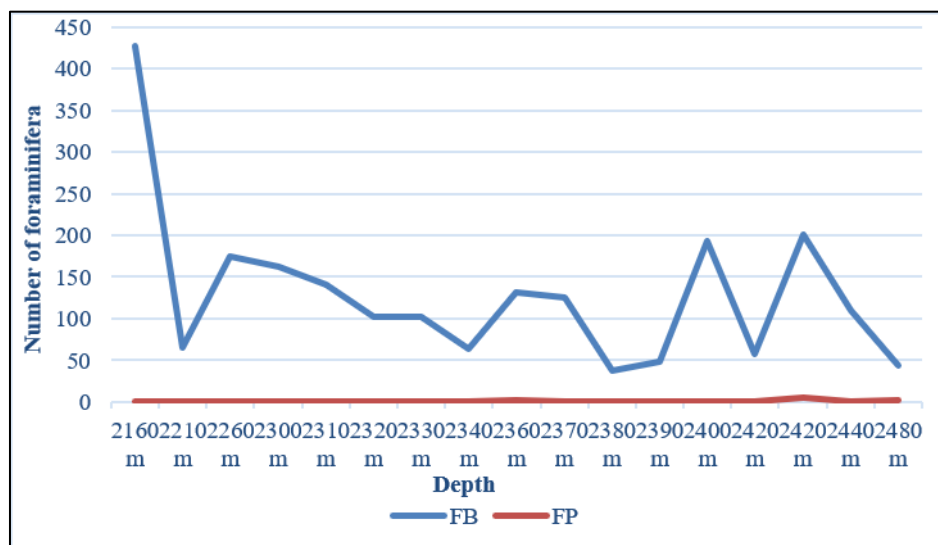


Figure 5: Distribution of planktonic and benthic foraminifera in the J1 well according to depth.

The biostratigraphic framework of the J1 well was established from the base to the top of the succession, following the direction of sedimentation. Based on the identified microfaunal assemblages, four (4) principal stratigraphic stages were recognized (Table 1).

Interval 2480 m - 2390 m: Cenomanian

The association of *Haplophragmoides* sp., *Trochammina* sp., *Gyroidina vortex* (White, 1928), *Lenticulina rotulata* (Lamarck, 1804), and *Dorothyia conulus* (Reuss, 1845) indicates a Cenomanian age for this interval.

Interval 2390 m - 2245 m: Turonian

The occurrence of *Haplophragmoides herbichi* (Neagu, 1968), *Lenticulina rotulata* (Lamarck, 1804), *Bulimina tabascoensis* (Galloway & Morrey, 1931), *Rzehakina epigona* (Rzehak, 1895), *Spiroplectammina navarroana* (Cushman, 1932), *Glomospira charoides* (Jones & Parker, 1860), *Caudammina ovulum* (Grzybowski, 1896), and *Dorothyia indentata* (Cushman & Jarvis, 1928) characterizes this interval and supports its assignment to the Turonian stage.

Interval 2235 m - 2205 m: Santonian

The continuous presence of *Trochammina* sp. and *Spiroplectammina* sp. throughout this interval suggests a Santonian age.

Interval 2205 m - 2160 m: Campanian

The association of *Gaudryina cretacea* (Karrer, 1870) with *Reophax duplex* (Grzybowski, 1896), *Hormosina trinitatis* (Cushman & Renz, 1948), *Spiroplectammina anceps* (Reuss, 1860), *Trochammina* sp., *Haplophragmoides* sp., *Lenticulina rotulata* (Lamarck, 1804), *Bathysiphon alexandri* (Cushman, 1933), *Caudammina gigantea* (Geroch, 1960), *Gyroidina umbilicata* (d'Orbigny, 1840), and *Ammodiscus cretaceus* (Reuss, 1845) indicates a Campanian age for this interval.

Table 1: Biostratigraphic distribution and age attribution of microfaunal assemblages identified in the J1 well.

DEPTH INTERVALS (m)	STAGES	CHARACTERISTIC SPECIES
2160-2205	Campanian	<i>Reophax duplex</i> , <i>Hormosina trinitatensis</i> , <i>Spiroplectammina anceps</i> , <i>Trochammina sp.</i> , <i>Haplophragmoides sp.</i> , <i>Lenticulina rotulata</i> , <i>Bathysiphon alexandri</i> , <i>Caudammina gigantea</i> , <i>Gyroidina umbilicata</i> , <i>Ammodiscus cretaceus</i> , <i>Gaudryina cretacea</i>
2205-2235	Santonian	<i>Trochammina sp.</i> , <i>Spiroplectammina sp.</i>
2245-2390	Turonian	<i>Haplophragmoides herbichi</i> , <i>Lenticulina rotulata</i> , <i>Bulimina tabascoensis</i> , <i>Rzehakina epigona</i> , <i>Spiroplectammina navarroana</i> , <i>Glomospira charoides</i> , <i>Caudammina ovulum</i> , <i>Dorothia indentata</i>
2390-2480	Cénomanien	<i>Haplophragmoides sp.</i> , <i>Trochammina sp.</i> , <i>Gyroidina vortex</i> , <i>Lenticulina rotulata</i> , <i>Dorothia conulus</i> , <i>Reophax</i> ,

4.3 Systematics and Ecology of Benthic Foraminifera

The classification of organisms is essential for ecological studies and for the effective application of paleontological investigations. Consequently, a systematic and detailed study was carried out to improve the identification of the recovered specimens, with particular emphasis on agglutinated benthic foraminifera. Systematic analysis provides a reliable taxonomic framework for the recognition and classification of species, while ecological interpretation allows the reconstruction of environmental conditions that prevailed during sediment deposition. The identification of benthic foraminiferal assemblages, especially those with agglutinated tests, contributes significantly to the assessment of depositional environments, paleobathymetric conditions, oxygenation levels, and other paleoecological parameters.

The ecological distribution of these taxa reflects their adaptation to specific environmental conditions and constitutes an important tool for paleoenvironmental reconstruction of the eastern margin of the Ivorian offshore sedimentary basin.

- Family : AMMODISCIDAE Reuss, 1862
- Genus : *Ammodiscus* Reuss, 1962
- *Ammodiscus cretaceus* (Reuss, A.E., 1845 (figure 6))

**Figure 6: *Ammodiscus cretaceus* (Reuss, A.E., 1845)**

The test is relatively large, planispiral, and circular to slightly elliptical in outline. Microspheric individuals may exhibit up to eleven whorls, whereas megalospheric specimens generally possess about eight whorls. The coiling is evolute, and the test displays a distinct coiling suture. The last three to four whorls are disproportionately wider than the preceding ones. The test surface is typically marked by fine radial striations. The test wall is finely agglutinated and characterized by a smooth surface.

Ecology: This species is a superficial epifaunal form, exhibiting passive to active deposit-feeding behavior. It occurs across a wide bathymetric range, from shelf environments to the upper abyssal zone.

Genus : *Bathysiphon* Sars, 1872



Figure 7: *Bathysiphon* sp.

The test is tubular and laterally compressed. The wall consists of sponge spicules arranged subparallel to the direction of growth and embedded within a matrix of fine quartz particles. The cement is organic in composition and is often well silicified.

Ecology: This species is an epifaunal organism inhabiting marine sediments. It is typically associated with cold-water environments of the upper bathyal zone.

Family : HAPLOPHRAGMOIDIDAE Maync, 1952

Genus : *Haplophragmoides* Cushman, 1910



Figure 8: *Haplophragmoides* sp.

The test is planispiral, involute, compressed, and circular to slightly lobate in outline, with an oval cross-section, a small open umbilicus, and an acute periphery. Approximately seven to nine flattened and slightly inflated triangular chambers are present in the final whorl, increasing rapidly in size as growth progresses. These chambers are separated by

sigmoidal and slightly depressed sutures. The chamber walls are non-calcareous, finely agglutinated, and smoothly finished. The primary aperture consists of an interiomarginal slit.

Ecology: This species is a shallow infaunal organism inhabiting sandy and muddy substrates. It is a detritivore commonly found in temperate to cold marine environments, ranging from bathyal to abyssal depths.

Family : Hormosinellidae Rauser & Reitlinger

Genus : *Caudamina* Montanaro-Gallitelli

Caudamina ovulum (Grzybowski, 1896 modifié. Geroch, 1960)

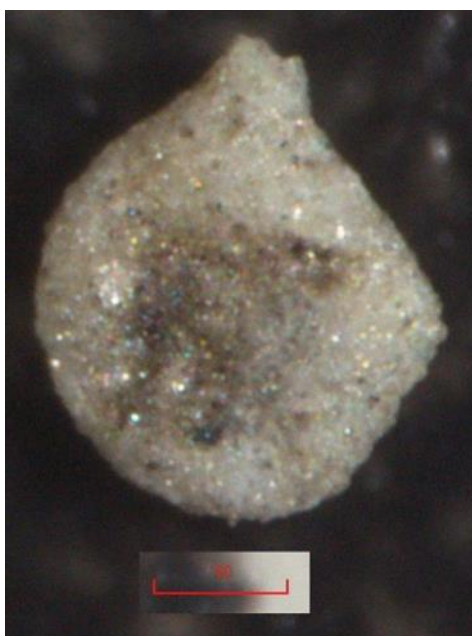


Figure 9: *Caudamina ovulum* (Grzybowski, 1896 modifié. Geroch, 1960)

The test is composed of oval chambers arranged in a straight or slightly curved series, although it is most commonly encountered as isolated chamber fragments. The chamber wall is multilayered, in contrast to the stolon connections, which are thin and generally consist of a single layer often made up of coarse quartz grains. The primary aperture is terminal and located at the end of a tubular neck. The chamber walls are thick, finely agglutinated, and firmly cemented with organic cement.

Ecology: This species inhabits deep-marine environments, ranging from bathyal to abyssal settings. It is commonly found in flysch-type assemblages and is generally associated with low-energy deep-water depositional environments.

Family : REOPHACIDAE Cushman, 1927

Genus : *Reophax* Montfort, 1808

Reophax duplex (Grzybowski, 1896)



Figure 10: *Reophax duplex* (Grzybowski, 1896)

The test is relatively small and consists of two, rarely three, interlocking spherical chambers of nearly equal size. The wall is coarsely agglutinated and composed of angular quartz grains, giving the test a rough surface texture.

Ecology: This species is a deep infaunal form and an active deposit feeder. It is typically associated with bathyal environments, where it inhabits fine-grained marine sediments.

Family: RZEHAKEINIDAE Cushman, 1933

Genus: *Rzehakina* Cushman, 1927

Rzehakina epigona fissistomata (Grzybowski, 1901)



Figure 11: *Rzehakina epigona fissistomata* (Grzybowski, 1901)

The test is similar to *Rzehakina epigona* in its overall morphology, being elliptical with pointed anterior and posterior ends, but it is flatter and more evolute. The test outline may be more asymmetrical than that of *R. epigona*. The chambers of the final whorl do not envelop the test, and a distinct coiling suture is present. The aperture is located on a well-developed neck.

Ecology: This species is a superficial epifaunal form exhibiting both passive and active deposit-feeding behaviors. It is typically found in bathyal environments.

Rzehakina epigona lata Cushman & Jarvis, 1928

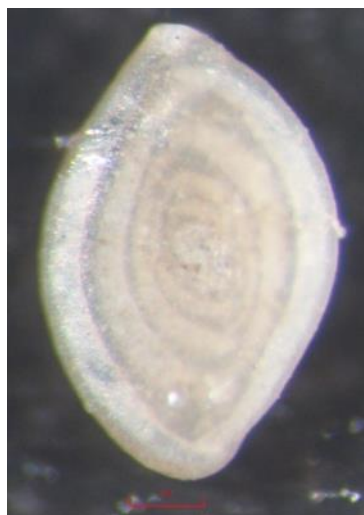


Figure 12: *Rzehakina epigona lata* Cushman & Jarvis, 1928

The test is similar to *Rzehakina epigona* in its overall morphology but is generally larger, broader, and more tightly coiled. The final whorl is usually thicker than that observed in *R. epigona*. The collapsed terminal chambers form an acute periphery that was probably originally rounded to angular in shape.

Ecology: This species is a superficial epifaunal form exhibiting both passive and active deposit-feeding behaviors. It is characteristic of bathyal environments and commonly occurs in deep-marine sedimentary settings.

Family : SPIROPLECTAMMINIDAE Cushman, 1927

Genus : *Spiroplectammina* Cushman, 1927

Spiroplectammina navarroana (Cushman, 1932)



Figure 13: *Spiroplectammina navarroana* (Cushman, 1932)

The test is elongated, curved, and conical. It exhibits a planispiral juvenile stage and becomes biserial during the adult stage, with a broadly rounded periphery. The chambers are approximately as high as they are wide and increase gradually in size throughout growth. The last two chambers may be slightly more inflated than the earlier ones. Sutures are distinct, initially oblique to the test axis and later becoming perpendicular to it, while becoming increasingly incised toward the distal end. The wall is imperforate and composed of medium- to fine-grained agglutinated particles.

Ecology: This species is a superficial epifaunal form and an active deposit feeder. It is typically found in bathyal to upper abyssal environments.

Spiroplectammina spectabilis (Grzybowski, 1898 revised by Kaminski, 1984)

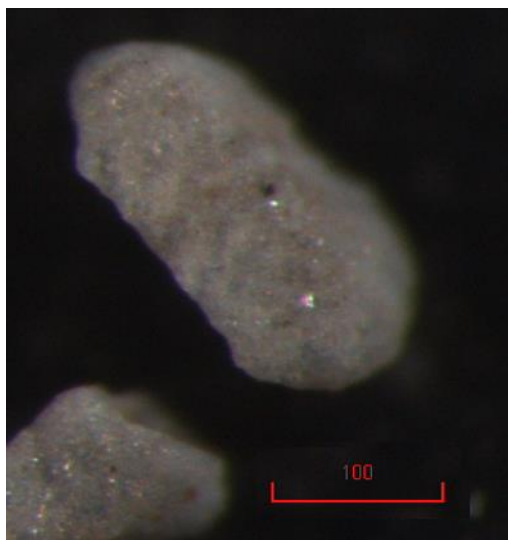


Figure 14: *Spiroplectammia spectabilis* (Grzybowski, 1898 revised by Kaminski, 1984)

The test is elongated with an angular, often serrated periphery. The early chambers are arranged in a planispiral coil, followed by a biserial arrangement during the adult stage. The chambers are distinct and approximately twice as wide as they are high. Sutures are oblique and slightly curved. The test wall is imperforate, finely agglutinated, and cemented with organic material.

Ecology: This species is a superficial epifaunal form and an active deposit feeder. It typically inhabits bathyal to upper abyssal environments.

Family : Trochamminidae Schwager, 1877

Genus : *Trochammina* Parker & Jones, 1859

Trochammina sp.



Figure 15: *Trochammina* sp.

The test is coiled in a high trochospire comprising up to four and a half whorls, with approximately three and a half chambers per whorl. The wall texture changes throughout ontogeny, with smaller specimens exhibiting a uniformly fine agglutinated wall. The aperture is umbilical, small, and usually indistinct.

Ecology: This species may occur as either an epifaunal or infaunal free-living form within marine sediments. It is herbivorous or detritivorous and is found across a broad bathymetric range extending from shelf to abyssal environments.

5 DISCUSSION

5.1 Sedimentological Interpretation

Lithological analysis revealed two distinct lithological units: a completely clay-dominated interval and a second unit characterized by an alternation of claystones, limestones, and sandstones, with claystones being predominant.

The texture and laminated arrangement of the clay beds indicate deposition under low-energy conditions. The abundance of claystones associated with limestones suggests sedimentation in a calm deep-water environment, corresponding to an outer shelf setting, as reported by [9]. Furthermore, according to [10], the occurrence of limestones reflects a period of geodynamic stabilization.

The sediments contain pyrite, an indicator of reducing and anoxic conditions, as well as carbonaceous debris, which suggests proximity to a continental source area. These observations are consistent with the findings of [11]. The claystone-sandstone alternation observed in the deeper intervals reflects past variations in hydrodynamic and depositional energy conditions. This pattern suggests that the J1 well area initially evolved in a relatively shallow continental environment before progressive basin infilling and marine deepening.

5.2 Micropaleontological Interpretation

The study of benthic microfaunal assemblages reveals a predominance of agglutinated benthic foraminifera over calcareous forms, a characteristic feature of deep-marine environments ranging from the outer shelf to the upper bathyal zone.

This faunal composition can be explained by relatively great water depths, which are unfavorable to many calcareous species, as well as by the influence of the Carbonate Compensation Depth (CCD), resulting in the dissolution of calcareous tests [12].

Four geological stages were identified based on the faunal assemblages:

- Cenomanian, characterized by *Haplophragmoides* sp. and *Trochammina* sp.;
- Turonian, marked by the occurrence of the genus *Haplophragmoides*;
- Santonian, represented by *Trochammina* sp. and *Haplophragmoides* sp.;
- Campanian, identified through species such as *Gaudryina cretacea*, *Ammodiscus cretaceus*, and other benthic foraminifera.

The absence of typical Senonian forms suggests either erosion or a sedimentary hiatus [11], in agreement with previous studies reporting Lower Santonian erosion within the Ivorian sedimentary basin [13].

The recognition of the Campanian stage is based mainly on benthic foraminiferal assemblages and on the absence of planktonic and keeled forms. These findings are consistent with the works of [3, 11, 14], conducted on the Abidjan Margin.

6 CONCLUSION

This study can be summarized under two main aspects: sedimentological characterization and micropaleontological characterization.

The sedimentological analysis revealed two (02) lithological units. Unit I is predominantly clayey, whereas Unit II consists of an alternation of claystones, sandstones, and limestones, with local intercalations of pyrite and carbonaceous debris. This lithological assemblage reflects deposition under relatively calm conditions at considerable water depths and suggests a reducing, poorly oxygenated environment with significant continental influence.

The micropaleontological investigation showed a clear predominance of agglutinated benthic foraminifera, which are considerably more abundant than calcareous and planktonic forms. Analysis of these microfaunal assemblages led to the identification of four major geological stages:

- Campanian, characterized by species such as *Reophax duplex*, *Hormosina trinitatensis*, and *Spiroplectammina anceps*;
- Santonian, represented by species including *Trochammina* sp. and *Haplophragmoides* sp.;

- Turonian, characterized by *Haplophragmoides herbichi*, *Rzehakina epigona*, *Spiroplectammina navarroana*, *Glomospira charoides*, and *Dorothia indentata*;
- Cenomanian, identified by the occurrence of *Haplophragmoides* sp., *Trochammina* sp., *Gyroidina vortex*, *Dorothia conulus*, *Karreriella* sp., and *Reophax duplex*.

The predominance of agglutinated benthic foraminifera supports the interpretation of a deep-marine depositional environment, in agreement with the sedimentological evidence. The integration of sedimentological and micropaleontological data allowed for the reconstruction of the paleoenvironmental evolution of the eastern margin of the Ivorian offshore sedimentary basin and highlighted the importance of benthic microfaunal assemblages as reliable indicators of depositional conditions and paleoenvironmental changes

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The authors declare that they have no conflicts of interest. Compliance with ethical standards. The authors declare that they participated in the drafting and compilation of the article and give their consent for publication in your journal.

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