

THE STRATIGRAPHY AND PALYNOLOGY OF OWAN/ OKPANAM/OBA TERTIARY SEDIMENTS, NIGERIA OF OWAN/ SOUTHERN

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Abstract

The analytical results of the Owan/Okpanam/Oba sediments revealed the presence of some diagnostic Eocene miospores. These include *Proxarthites cursus*, *Retirevitricolpites triangulatus*, *Spinizonocolpites baculatus*, *Verrucatosporites usmensis*, *Retimonocolpites obaensis*. These sediments also contained septate algal filaments and spores of varying morphological structures. The lithology of these sediments varies from Sandy shales at Owan to the lignites series at Okpanam and Oba. The miospore content of the Owan/Okpanam/Oba sediments indicates that they could be parts of the lateral equivalents of the Ogwashi-Asaba, Ameki, Ilaro and Oshosun formations.

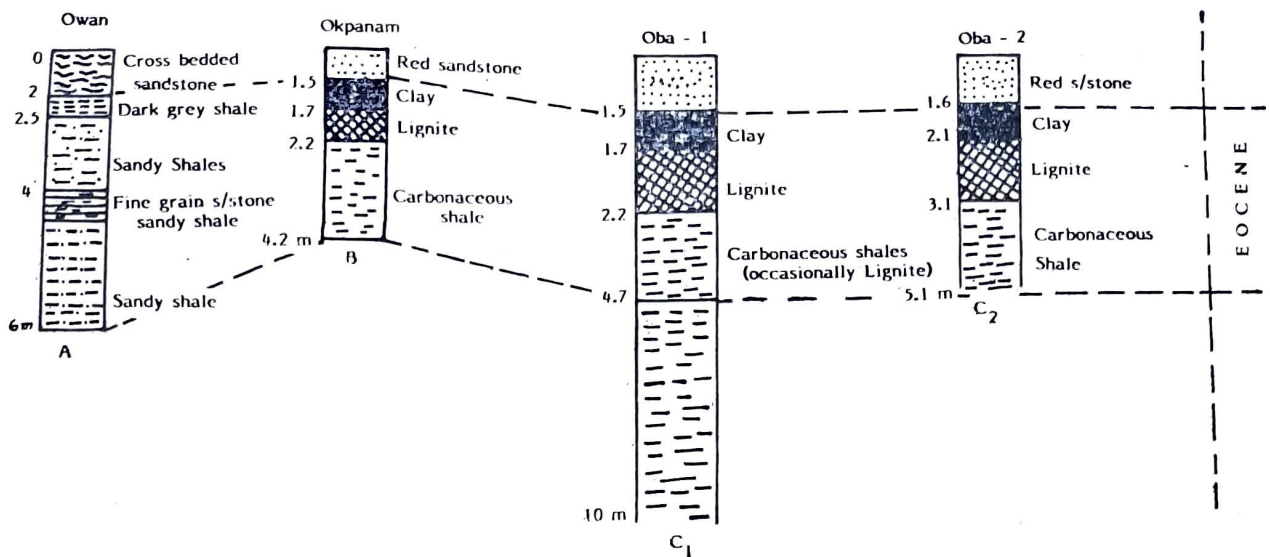
Introduction

The Owan sandy shales are on the outskirts of Owan along the Benin-Ifon Road, while the Okpanam lignites (at Okpanam) is off the Asaba-Utulu Road, both in Bendel State, and the Oba lignite (at Oba) is off the Onitsha-Enugu Road, in Anambra State. Micropaleontological analysis was also carried out but yielded no recognisable foraminifera. The palynological analysis indicated the absence of marine palynomorphs (dinoflagellates and microforaminifera). The presence of abundant septate algal filaments could probably suggest that these sediments were accumulated in shallow depositional environment.

Stratigraphy

The rock types in the three locations vary :

- (a) Owan sandy shales (Owan). This section (Text-fig. 1) consists of an overburden (2m) of Lateritic soil, laminated darkgrey shales, series of Sandy shales and thin bands of sandstone, and could be part of the lateral equivalent of the Oshosun/Ilaro Formations.
- (b) Okpanam lignite (Okpanam) section (Text-fig. 1) consists of overburden (reddish Benin sandstone-1.5 m, 0.2 m Clay, 1 m lignite, and 1.4 m of sandy shales).
- (c) Oba lignites (Oba) section (Text-fig. 1) The top soil (1.5 m), thin bandy of clay (.2 m) lignite (estimated thickness of the lignite (Oba 1) could be 15 m), but only about 3 m of it could be sampled because of some ecological problems; while in Oba 2, the top soil (overburden) is 1.5 m, clay is about 0.2 m, and lignite 2.5 m. The Okapanam/Oba lignites are most likely to part of the lignite series (Parkinson, 1907), Lignite group (Wilson, 1925; Reyment & Barber, 1956). Ogwashi-Asaba Formation and Ijebu Formation (Reyment, 1965) Ogwashi—Asaba Formation and Ameki Formation (S. W. Petters & C. M. Ekweozor, 1982), while the Owan Sandy shales could be part of the lignite Formation/Bende



Text-fig. 1. Palynostratigraphic correlation of Owan, Okpanam and Oba sediments.

Ameki Group (Okezie, 1974), Ameki Formation (Dessauvagie, 1974) and Ogwashi Asaba Formation (S. W. Petters & Ekweozor, 1982).

There is a change in lithology from sandy shales in the Owan area to the lignite series in the Okpanam and Oba areas.

Palynomorph assemblages :

(a) Owan sandy shales comprise *Diporites* sp., *Tricolpites* sp., *Monocolpites* sp., *Retimonocolpites scabratus*, *Ericipites crassiexinus*, *Psilatricolpites crassus*, *Gemmastephanocolpites gemmatus*, *Proxapertites cursus*, *Spinizonocolpites echinatus*, *Retimonocolpites asabaensis*, *Retimonocolpites obaensis*, *Monocolpites spheroides*, leaf cuticles, algal spores and septate algal filaments.

(b) Okpanam lignite consists *Echitriporites trianguliformis*, *Spinizonocolpites echinatus*, *Retibrevitricolpites triangulatus*, *Verrucatosporites usmensis*, *Psilatricolpites crassus*, *Proxapertites cursus*, leaf cuticles, algal spores and algal filaments.

(c) Oba lignites contains *Spinizonocolpites echinatus*, *Psilatricolpites crassus*, *Psilatricolpites kingwensis*, *Gemmastephanocolpites gemmatus*, *Retibrevitricolpites triangulatus*, leaf cuticles, algal spores and algal filaments.

These three assemblages, though slightly different in content, contain some diagnostic Eocene miospores and also characteristic of these sediments are the leaf cuticles and fairly common abundant algal spores and septate algal filaments.

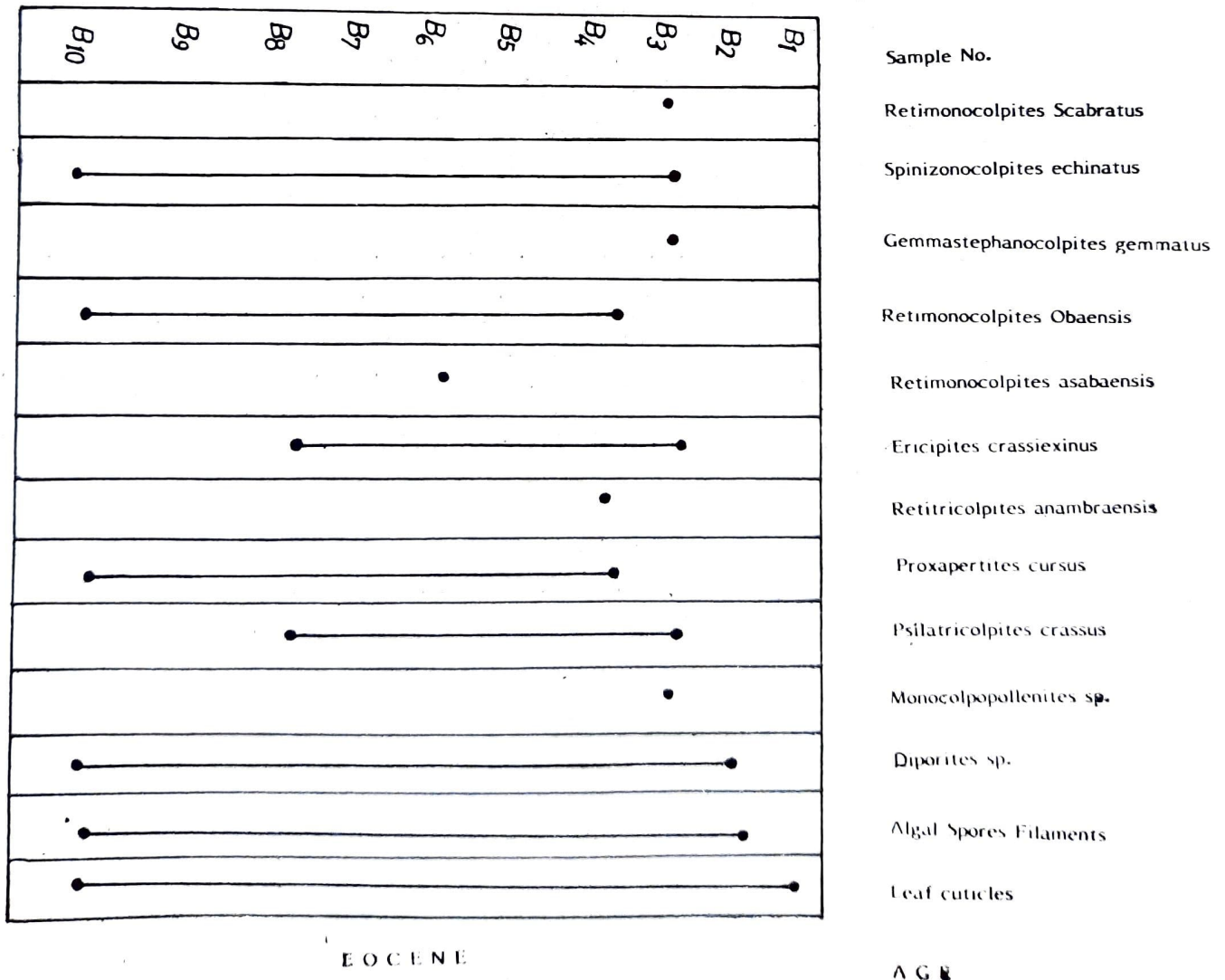
Discussion

There is a definite variation in the rock types from sandy shales at Owan, to clay, indicated lignite and sandy shales at Okpanam and clay, lignite and dark grey shales at Oba. The Owan sandy shales are possibly part of the lateral equivalent of the Oshosun/Ilaro formations. Reyment (1965) regarded the Oshosun Ilaro Formation as Lower to Middle Eocene. The Okpanam/Oba lignites series definitely belong to the Ogwashi-Asaba Formation. The age assigned by other workers in the past is shown in Table 1. The age of Eocene is being assigned to the Owan/Okpanam/Oba sediments on the basis of its miospore content. Marker species include *Retibrevitricolpites triangulatus*, *Verrucatosporites usmensis*, *Spinizonocolpites echinatus*, *Spinizonocolpites baculatus*, *Proxapertites cursus*, *Retimono-*

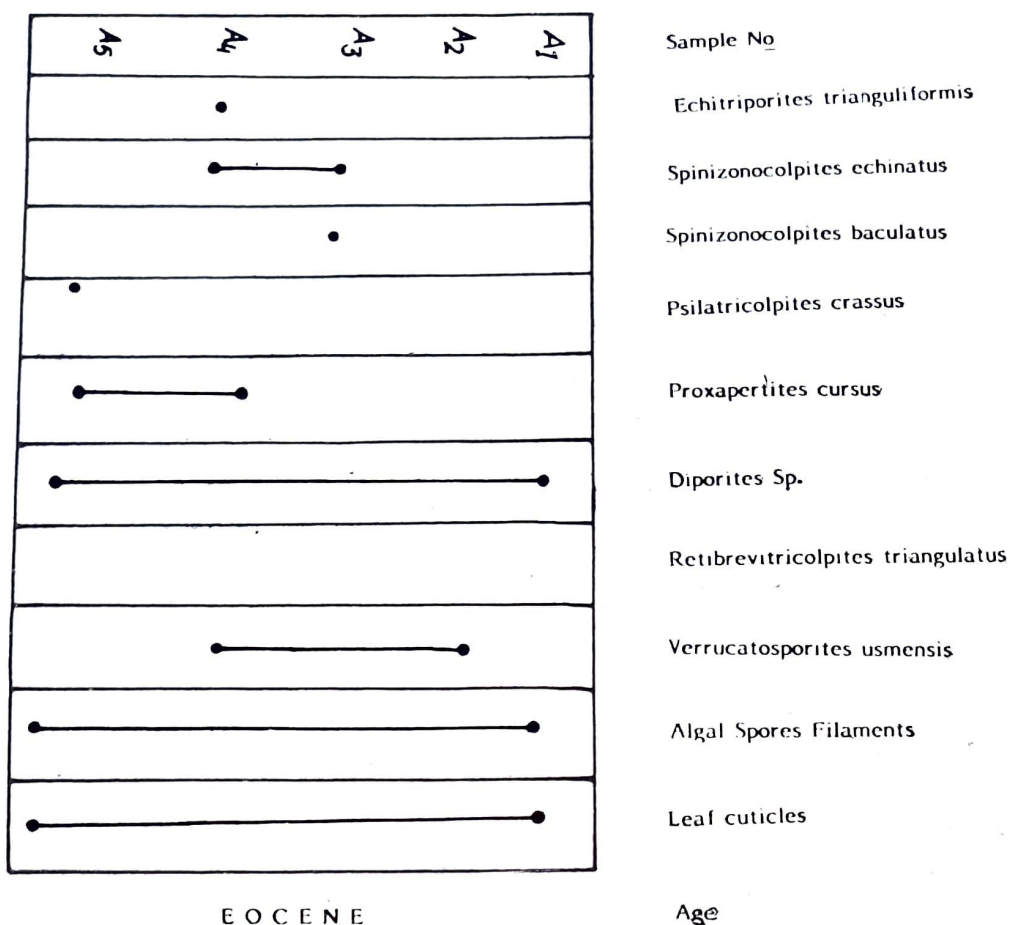
Table 1 – Correlation of Okpanam/Oba lignites and Owan sandy shales with some other Eocene sediments in Nigeria

Age	Geological Survey of Nigeria (1974)	Dessauvagic (1974)	S.W. Petters and C.M. Ekweozor (1982)	Western Nigeria Adegoke (1969) and Jogbe (1970)	Mebradu <i>et al.</i> (1984)
Oligocene	Benin Formation	Ogwashi-Asaba Formation	Benin Formation		
Eocene	Lignite Formation Bende Ameki Group	Ameki	Ogwashi-Asaba Formation Ameki Formation Nnaka Sst.	Ameki Formation Ilaro Fm. Oshosun Formation	Okpanam/Oba lignites, Owan sandy shales

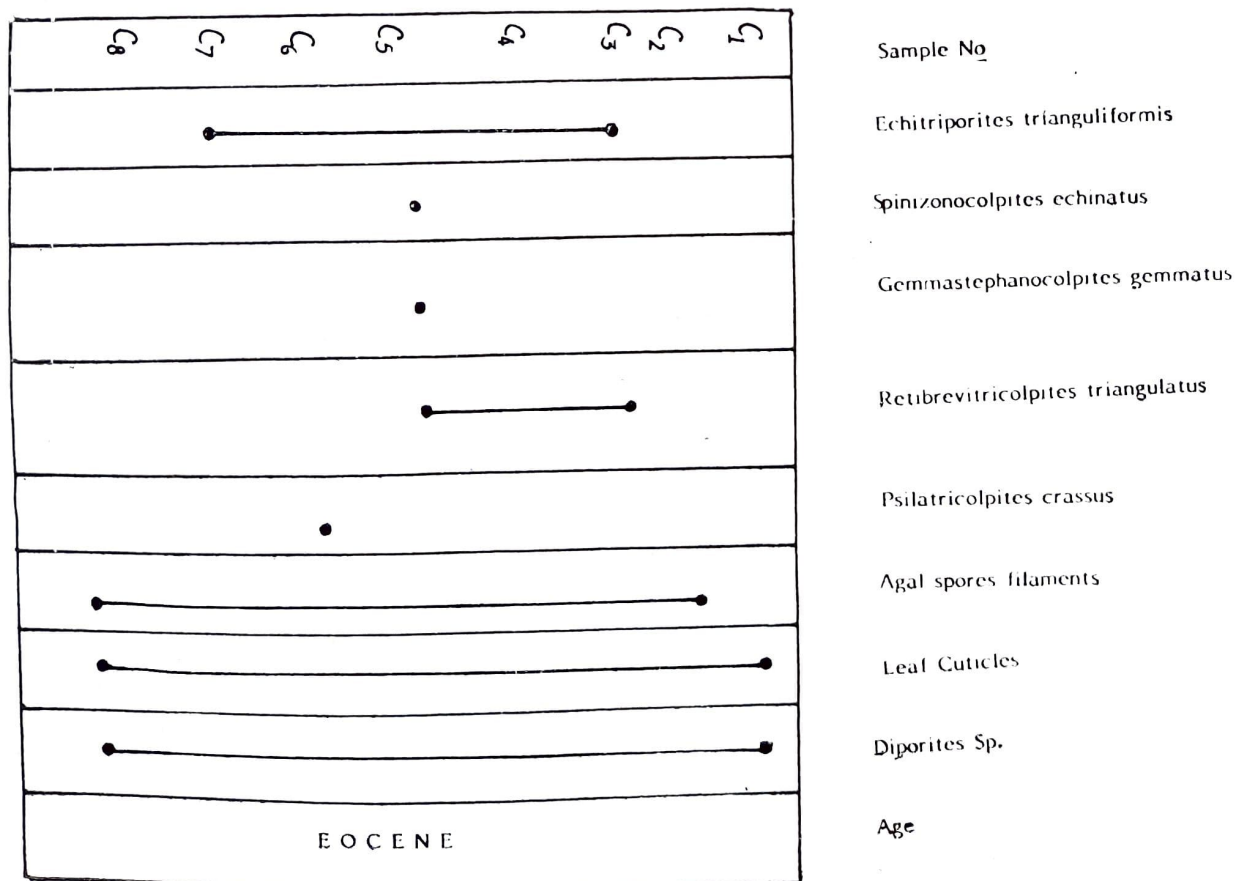
colpites obaensis, *R. asabaensis*, *Gemmastephanocolpites gemmatus* and *Psilatricolpites kingwensis*. These species are important in the Nigerian Eocene (Chene *et al.*, 1978 and Germeraad *et al.*, 1968 and Hoeken-Klinkenberg, 1966). On the basis of comparison with some of the miospores from the Ogwashi-Asaba Formation (Jan du Chene *et al.*, 1978), and the range of some of these miospores in the Caribbean, Borneo and Nigeria (Germaraad *et al.*, 1968), the authors are of the opinion that the Owan, Okpanam and Oba sediments are of the Eocene age (Text-figs. 2, 3 and 4).



Text-fig. 2. Range chart (Owan Sandy shales)



Text-fig. 3. Range chart (Okpanam lignites)



Text-fig. 4. Range chart (Oba lignites).

Conclusion

The Okpanam/Oba/Owan sediments are parts of the lateral equivalents of the Ogwashi-Asaba/Oshosun/Ilaro formations (Table 1). The change from sandy shales at Owan to the lignites at Okpanam and Oba could be due to differential sedimentation taking place at the same time in different places. The occurrence of relatively the same species of Eocene in these three areas indicates that the sediments deposited during the same time, though the slight difference in the species content could be due to different sources of miospores supply to the transporting medium.

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