

XI



CONGRESSO NACIONAL DE GEOLOGIA

GEOCIÊNCIAS E DESAFIOS GLOBAIS

XI CNG 2023 - Livro de Resumos



Coordenadores da Edição

F. C. Lopes, P. A. Dinis, L. V. Duarte, P. P. Cunha

16 a 20 de julho de 2023
Universidade de Coimbra

Edição: Departamento de Ciências da Terra da Faculdade de Ciências e Tecnologia da Universidade de Coimbra

Autores: Vários

Capa e contracapa: F. C. Lopes

Imagem de capa: Formação do Pulo do Lobo. Faixa Piritosa Ibérica

Imagem de contracapa: Protomilonito de Lagoa. Maciço de Morais

Conceção gráfica e paginação: F. C. Lopes

Data de publicação: julho de 2023

Tipo de suporte: Eletrónico

I.S.B.N.: 978-989-98914-8-7

Os trabalhos contidos no presente volume devem ser citados da seguinte maneira:

Autor, N. (2023) “Título do Resumo”. In Lopes, F. C., Dinis, P. A., Duarte, L. V. e Cunha, P. P. (Coords.). XI Congresso Nacional de Geologia: Geociências e Desafios Globais. Livro de Resumos. Coimbra, 16-20 julho de 2023, *Departamento de Ciências da Terra da Universidade de Coimbra (eds.)*. Págs. ISBN: 978-989-98914-8-7

Lower Cretaceous palynology and palaeoenvironments of Algarve Basin: the Arrifes section

Palinologia e paleoambientes do Cretácico Inferior da Bacia do Algarve: a secção dos Arrifes

M. Mendes (1*), G. Descamps (2), P. Fernandes (2), G. Lopes (2,3), R. Jorge (4) and Z. Pereira (1)

(1) LNEG, National Laboratory of Energy and Geology, Rua da Amieira, 4465-965, S. Mamede de Infesta, Portugal. *marcia.mendes@lneg.pt

(2) CIMA, Centre for Marine and Environmental Research, Universidade do Algarve, Campus de Gambelas, 8005-139 Faro, Portugal

(3) Plants, Photosynthesis and Soil, School of Biosciences, University of Sheffield, Alfred Denny Building, Western Bank, Sheffield S10 2TN, UK

(4) Instituto Dom Luiz (IDL), Faculdade de Ciências, Universidade de Lisboa, Campo Grande, Edifício C6, Piso 4, 1749-016, Lisboa, Portugal

Sumário: Uma análise sedimentológica e palinológica detalhada foi realizada na secção dos Arrifes, uma sucessão do Cretácico Inferior da Bacia do Algarve (sul de Portugal). A sucessão estudada é composta por calcáriosossilíferos intercalados, calcários margosos e margas, sendo que os palinómorfos identificados indicam uma idade entre o Hauteríviano superior e o Barremiano superior. As principais características deposicionais e palinológicas documentadas na secção dos Arrifes sugerem uma deposição geral sob condições rasas subtidais e intertidais, marcadas por pequenas mudanças climáticas com múltiplas oscilações do nível do mar. Face a estes novos resultados, a área foi correlacionada com outras secções circundantes do Cretácico Inferior, sugerindo uma influência Tethyana durante o Hauteríviano superior, prolongando-se até ao final do Barremiano.

Palavras-chave: Palinómorfos, palinologia, sedimentologia, Cretácico, Bacia do Algarve

Keywords: Palynomorphs, palynology, sedimentology, Cretaceous, Algarve Basin

The Algarve Basin is a Meso-Cenozoic basin located in southern Portugal, cropping out along the entire south coast, from Cape Saint Vincent in the West to the Portuguese and Spanish border in the East (Fig. 1). Although Lower Cretaceous successions crop out throughout this vast area, few studies based on palynostratigraphic and palaeoenvironmental methodologies were accomplished.

Despite the extensive micropaleontological, stratigraphic and lithostratigraphic studies (e.g., Rey and Ramalho, 1974; Rey, 1983, 1984, 1986, 2006; Berthou and Leereveld, 1990; Heimhofer et al., 2007) the Lower Cretaceous successions of the Algarve Basin still lack the characterization of detailed dating and environmental models, since they are often contradictory or challenging to constrain (e.g., Rey and Ramalho, 1974; Rey, 2006; Dinis et al., 2020).

Forty-eight samples of marls and marly limestones were analysed for palynological and palynofacies studies, together with detailed sedimentological descriptions in order to establish a detailed palynostratigraphy age and a depositional environmental setting.

Sedimentological and palynological results suggest deposition in a gentle slope carbonate ramp. Mid to outer carbonate ramp zones, characterised by subtidal conditions, make the most of the carbonate facies of the Arrifes section. The vertical organisation of the carbonate ramp depositional settings allows the recognition of several sedimentary intervals related to sea-level changes and the progradation of the carbonate ramp. Overall, there is an increase in the water column towards the top of the section.

Using key dinoflagellate cysts, the section is dated as latest Hauterivian to late Barremian, with three range intervals being recognised: i) latest Hauterivian-earliest Barremian, based on the occurrence of *Subtilisphaera perlucida*; ii) early to earliest late Barremian, based on the first occurrence of *Subtilisphaera scabrata*; and iii) late Barremian, based on the first occurrence of species of *Odontochitina*, such as *O. operculata*. These new data suggest that the Arrifes section is older than previously considered (Aptian age; Berthou et al., 1983). However, more studies are needed to reassess the models of the basin to a regional level.

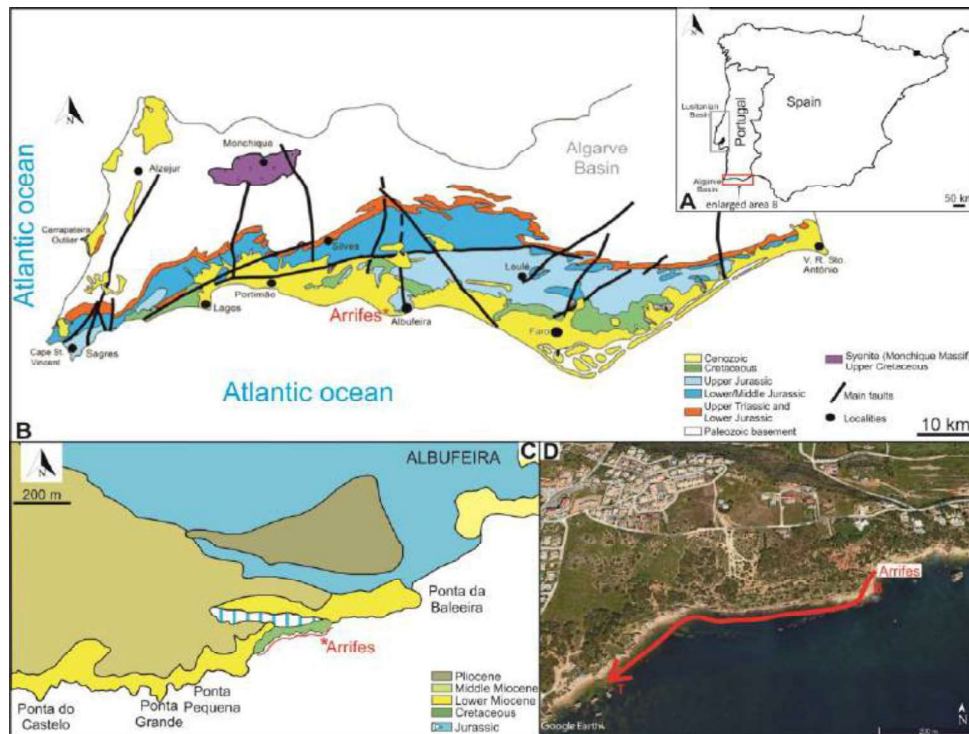


Fig. 1. A – the Iberian Peninsula with Lusitanian Basin (grey) and Algarve Basin (red) shown within the boxes; B – General geology of the Algarve Basin; C – Simplified geological map of the Albufeira region showing the location of the Arrifes section (adapted from Rocha et al., 1989); D – Location of the study area along the Arrifes section (red arrow indicates the stratigraphic sequence that becomes younger to the west; B=base and T=top of the Arrifes section, from Mendes et al., 2023 and references herein).

Acknowledgements: This work was funded by the Portuguese Fundação para a Ciência e a Tecnologia (FCT) I.P./MCTES through national funds (PIDDAC) – UIDB/50019/2020. Gabrielle Descamps, Paulo Fernandes, and Gilda Lopes would like to acknowledge the financial support of the FCT to CIMA through UID/00350/2020CIMA.

References

- Berthou, P.Y., Correia, F., Prates, S. & Taugourdeau, J. (1983) Essai de synthèse du Crétacé de l'Algarve: biostratigraphie, paléogéographie et sédimentation argileuse. I.: biostratigraphie et paléogéographie. Bulletin d'information des géologues du bassin de Paris, 20(2), 3-18.
- Mendes, M., Descamps, G.S., Fernandes, P., Lopes, G., Jorge, R.C.G.S. & Pereira, Z. (2023) The upper Hauterivian-Barremian (Lower Cretaceous) Arrifes section (Algarve Basin, Southern Portugal): A palynostratigraphic and palaeoenvironmental approach. *Cretaceous Research*, 144, 105433.
- Rey, J. (1983) Le Crétacé de l'Algarve: Essai de synthèse. *Comunicações dos Serviços Geológicos de Portugal*, 69, 87-101.
- Rey, J. (1984) Mégaséquences et séquences élémentaires du Crétacé inférieur portugais. Volume d'hommages au Géologue G. Zbyzsewski. C.N.R.S., Recherches sur les Civilisations, Paris, 87-99.
- Rey, J. (1986) Micropaleontological assemblages, paleoenvironments and sedimentary evolution of Cretaceous deposits in the Algarve (southern Portugal). *Palaeogeography, Palaeoclimatology, Palaeoecology*, 55, 233-246.
- Rey, J. (2006) Les formations Crétacées de l'Algarve Occidental et Central. *Comunicações Geológicas*, 93, 39-80.
- Rey, J. & Ramalho, M. (1974) Le Crétacé inférieur de l'Algarve occidental (Portugal). *Comunicações dos Serviços Geológicos de Portugal*, 5, 155-181.
- Berthou, P.Y. & Leereveld, H. (1990) Stratigraphic implications of palynological studies on Berriasian to Albian deposits from western and southern Portugal. *Review of Palaeobotany and Palynology*, 66, 313-344.
- Heimhofer, U., Hochuli, P.A., Burla, S. & Weissert, H. (2007) New records of Lower Cretaceous angiosperm pollen from Portuguese coastal deposits: Implications for the timing of the early angiosperm radiation. *Review of Palaeobotany and Palynology*, 144, 37-76.
- Dinis, P., Carvalho, J., Callapez, P., Mendes, M.M., Santos, V. & Fernandes, P. (2020) Composition of Lower Cretaceous mudstones of the Algarve Basin and implications for Iberian palaeoclimates. *Cretaceous Research*, 110, 104404.