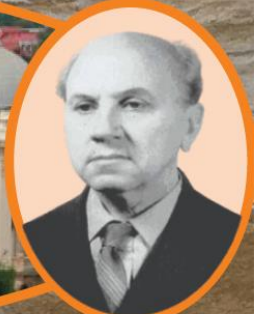


**”Alexandru Ioan Cuza ” University of Iași
Faculty of Geography and Geology
Department of Geology**



GRIGORE COBĂLCESCU
1831-1892



MIRCEA SAVUL
1895-1964



GEO-IAȘI-2024
Scientific Symposium

BOOK OF ABSTRACTS
Editor: Paul Țibuleac

IAȘI, ROMANIA

UPPER CRETACEOUS PALYNOFACIES AND MICROFOSSIL ASSEMBLAGES FROM THE NORTHWESTERN HAȚEG BASIN

Daniel ȚABĂRĂ¹, Ramona BĂLC², Raluca BINDIU-HAITONIC³, Gáspár ALBERT⁴, Gábor BOTFALVAI⁵, Ștefan VASILE⁶ & Zoltán CSIKI-SAVA⁶

¹“Al. I. Cuza” University Iași, Department of Geology, 20A Carol I Blvd., 700505, Iași, Romania; email: dan.tabara@yahoo.com

²Babeș-Bolyai University, Faculty of Environmental Science and Engineering, 30 Fântânele St., 400294 Cluj-Napoca, Romania

³Babeș-Bolyai University, Department of Geology and Center for Integrated Geological Studies, 1 Mihail Kogălniceanu St., 400084 Cluj-Napoca, Romania

⁴Eötvös Loránd University, Institute of Cartography and Geoinformatics, 1/a Pázmány Péter Prom., 1117 Budapest, Hungary

⁵Eötvös Loránd University, Institute of Geography and Earth Sciences, Department of Palaeontology, 1/C Pázmány Péter Alley, 1117 Budapest, Hungary

⁶University of Bucharest, Department of Geology, Mineralogy and Palaeontology, 1 Nicolae Bălcescu Blvd., 010041 Bucharest, Romania.

Key words: biostratigraphy, palynomorphs, calcareous nannoplankton, foraminifera, Upper Cretaceous

The present study synthesizes the results of complex geological-stratigraphical investigations carried out along nine geological sections in the northwestern part of Hațeg Basin, in the neighborhood of Ciula Mică, Vălioara, and Boița localities. The main outcropping units in the study area are represented by the marine deposits of the Răchitova Formation (in the Geat Valley succession), as well as by the vertebrate-bearing continental beds of the Densuș–Ciula Formation that covers the central-eastern sectors of the research area.

The largest part of the samples analyzed from the Geat Valley succession was collected from marine deposits (turbidites). These yielded a moderately abundant calcareous nannoplankton assemblage, dominated by *Watznaueria barnesiae* (>50%), *Micula staurophora*, and *Retecapsa crenulate* (Csiki-Sava et al., 2023). Foraminifers appear with a relatively low diversity and abundance, with reports of taxa such as *Rhabdammina* (agglutinated forms), *Laevidentalina* (small calcareous forms; Fig. 1f), and *Marginotruncana*, *Globotruncana*, *Globotruncanita* (planktonic forms; Fig. 1g, h). These marine deposits also yielded a palynological assemblage with diverse dinoflagellates (e.g. *Isabelidinium microarmum bicavatum*, *Odontochitina costata*; Fig. 1b, c) and continental palynomorphs (*Araucariacites australis*, *Hungaropollis* sp.). The occurrence of the nannofossil *Broinsonia parca parca* (Fig. 1e), together with the aforementioned dinoflagellates, supports the presence of lower to lower upper Campanian deposits in this sector.

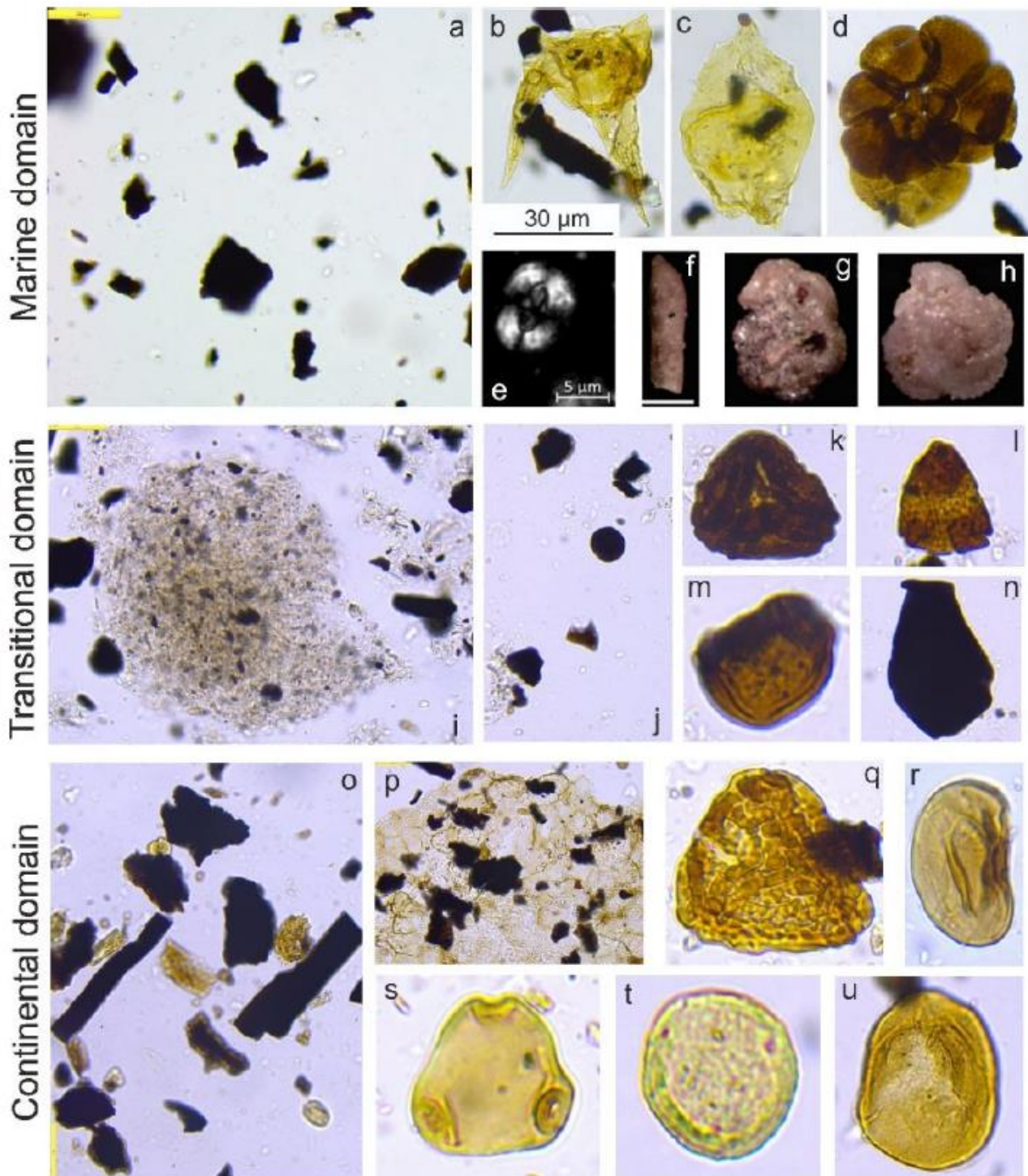


Fig. 1. Organic compounds of the palynofacies and representative marine and continental microfossils identified in the Upper Cretaceous deposits of the northwestern Hațeg Basin; a–h (marine Răchitova Formation, Geat Valley), i–n (transitional domain, Densuș–Ciula Formation, Ispas Valley - Ciula Mică), o–u (continental Densuș–Ciula Formation). a. Small-sized, coaly opaque phytoclasts; b. *Odontochitina costata*; c. *Isabelidium microarmum bicavatum*; d. foraminifer test lining; e. *Broinsonia parca parca*; f. *Laevidentalina gracilis*; g. *Marginotruncana* sp.; h. *Globotruncanita stuartiformis*; i. Granular amorphous organic matter of marine origin and coaly opaque phytoclasts; j. Coaly opaque phytoclasts with rounded shapes; k. *Cicatricosisporites* sp.; l. *Trudopollis* sp.; m. *Classopollis* sp.; n. Chitinozoa (potentially reworked from Lower Paleozoic); o. Translucent and “lath-shaped” opaque phytoclasts; p. cuticle large in size; q. *Polypodiaceoisporites hojrupensis*; r. *Laevigatosporites ovatus*; s. *Proteacidites* sp.; t. *Subtriporopollenites constans*; u. *Balmeiopsis limbatus*.

The analysis of several samples collected in the upper reaches of Ogrădiilor Valley (west of Vălioara) and Ispas Valley (south of Ciula Mică) suggests a transitional (inner neritic) environment for the outcropping successions. These samples revealed a palynofacies represented by opaque, commonly rounded phytoclasts (> 95%; Fig. 1j) and granular amorphous organic matter of marine origin (Fig. 1i), as well as rare specimens of marine phytoplankton and calcareous nannoplankton, together with continental palynomorphs. Geochemical investigation (using gas chromatography-mass spectrometry) of a sample from Ogrădiilor Valley also confirms the transitional sedimentary environment suggested by the palynofacies and microfossil assemblages.

Most of the palynological assemblages identified from the Densuș–Ciula Formation (Fig. 1q-u) originate from the Vălioara and Boița areas. Pteridophyte spores such as *Polypodiaceoisporites hojrupensis* in conjunction with primitive angiosperm pollen (i.e., *Pseudopapillopollis praesubhercynicus*, *Krutzschipollis crassis*, *Proteacidites* sp.) suggest a latest Campanian-earliest Maastrichtian age for the deposits cropping out in the western Vălioara area. Towards the east, at Boița, the rich and well-preserved palynological assemblage recovered from the Densuș–Ciula Formation consists of continental palynomorphs such as *Subtriporopollenites constans* (Juglandaceae, frequently found), *Trudopollis* div. sp. and *Myricipites* sp. (angiosperms, frequently encountered), alongside *Araucariacites australis* and *Balmeiopsis limbatus* (Araucariaceae), as well as diverse fern spores, and indicates a somewhat younger, early Maastrichtian age for these deposits. The common occurrence of cuticles and woody tissues of large size (Fig. 1o, p) within the palynofacies of these samples indicates a fluvial/lacustrine palaeoenvironment for this part of the Densuș–Ciula Formation.

Acknowledgments

This research was supported by a grant from the Ministry of Research, Innovation and Digitization, CNCS/CCCDI -UEFISCDI, project number PN-III-P4-ID-PCE-2020-2570, within PNCDI III UEFISCDI as well as University of Bucharest internal grants 10038/2023 and nn/2024 (to DȚ, RB, ȘV and ZCs-S). Field and laboratory investigations were supported by the Hungarian Scientific Research Fund and National Research, Development, and Innovation Office (Grants no. NKFIH OTKA PD 131557 and FK146097) and the HUN-REN Hungarian Research Network (to G.B).

References

- Botfalvai, G., Csiki-Sava, Z., Kocsis, L., Albert, G., Magyar, J., Bodor, E.R., Țabără, D., Ulyanov, A., Makádi, L. 2021. 'X' marks the spot! Sedimentological, geochemical and palaeontological investigations of Upper Cretaceous (Maastrichtian) vertebrate fossil localities from the Vălioara valley (Densuș - Ciula Formation, Hațeg Basin, Romania). *Cretaceous Research* 123, 104781.
- Csiki-Sava, Z., Țabără, D., Bălc. R., Bindiu-Haitonic, R., Botfalvai, G., Albert, G., Vasile, Ș. 2023. New biostratigraphic and palaeoenvironmental constraints in the uppermost Cretaceous deposits from the Ciula Mică (Geat Valley) – west Vălioara area, northwestern Hațeg Basin (Romania). *The 14th Romanian Symposium on Palaeontology, Bucharest*, 43–44.