

Microfacies analysis and integrated biostratigraphy from an Aptian–Albian section in the Tamaulipas Formation, western Hidalgo State, Mexico

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A microfacies analysis of 114 samples from a section cropping out in the western portion of Hidalgo State, Mexico, provided palaeoenvironmental and biostratigraphic information on the Aptian–Albian transition in the lower and upper Tamaulipas Formations (Tampico–Misantla Basin). The 92-m-thick section consists of a succession of mudstones and wackestones that were deposited in open-marine conditions below the storm wave base and contains abundant planktonic microfossils.

Using a biostratigraphic analysis of planktonic foraminifera and colomiellids, it was possible to infer that this section was deposited in the time interval between the *Globigerinelloides blowi* and *Ticinella primula* Zones, and the Aptian–Albian boundary was established at the top occurrence of *Paraticinella eubejaouaensis* and the base occurrence of colomiellids such as *Colomiella mexicana* and *C. recta*.

As an initial approach to the calcareous nannoplankton analysis, variations in the abundance of this group were observed. Wide-canal nannoconids, which were absent in the basal portion of the section, became abundant and exhibited a gradual increase in size throughout the transition of the *Leupoldina cabri-Globigerinelloides ferreolensis* Zones. This nannoconid assemblage was dominated by *Nannoconus kamptneri*, *N. wassallii* and *N. circularis*. At the Aptian–Albian boundary, the sedimentary succession was characterised by thin shale levels that are interbedded with wackestones and mudstones, and coccoliths were recovered from here. The nannofossil assemblage was composed primarily of species of the Watznaueriales group, such as *Cyclagelosphaera margerelii*, *Watznaueria barnesiae* and *W. biporta*.

The U/Th index from the gamma ray curve for the studied section indicated levels of high organic matter content. This suggests a correlation with episodes of global anoxia, as previously recorded in the lower Tamaulipas Formation (Li et al., 2008). Therefore, a detailed characterisation of the nannofossil associations and bioevents can support our understanding of Aptian and Albian anoxic events and their expression in Mexican basins, as well as their palaeogeographic implications in the Tethyan realm. This is a contribution of the DGAPA-UNAM grant PAPIIT IN 108919.

References

- Li, Y.X., Bralower, T.J., Montañez, I.P., Osleger, D.A., Arthur, M.A., Bice, M.D., Herbert, T.D., Erba, E. & Premoli-Silva, I. 2008. Toward an orbital chronology for the early Aptian Oceanic Anoxic Event (OAE1a, ~120 Ma). *Earth and Planetary Science*, **271**: 88–100.