

# APTIAN MARINE POST-SALT ROCKS IN SANTOS, CAMPOS AND ESPÍRITO SANTO BASINS, BRAZIL: A BIOCHRONOSTRATIGRAPHICAL APPROACH

Lima, F.H.O. 1; Sanjinés, A.E.S. 1; Maizatto, J.R. 1; Ferreira, E.P. 1; Ng, C. 1; Costa, D.S. 1; Zeffass, G.S.A. 1; Alves, C.F. 2; Strohschoen Jr., O. 1; Viviers, M.C. 1; Lana, C.C. 1; Arai, M. 3; Beurlen, G. 1; Shimabukuro, S. 1; Galm, P.C. 1

1 Research & Development Center - Petrobras; 2 Gorceix Foundation; 3 Estadual Paulista University

**ABSTRACT:** The carbonate and mixed carbonate-siliciclastic sequences above the evaporites in the Santos, Campos and Espírito Santo basins had been assigned to the Early to Middle Albian ages since the 1970s. The biozones that supported this dating were defined in a shallow marine paleoenvironmental context, mainly represented by high-energy carbonates from oil fields, such as the Namorado, Garoupa, Pargo, Moreia and Pampo fields. Under these depositional conditions, no important index planktonic microfossils were found, which could allow accurate global and chronostratigraphic correlations. *Cyclopsiella* sp. (palynomorph), *Nannoconus truittii* (calcareous nannofossils), *Trocholina* sp. (benthonic foraminifera) and *Favusella* ex. gr. *washitensis* (planktonic foraminifera), shallow marine species, whose distributions are paleoenvironmentally controlled, were among the microfossils recorded in this shallow water setting. At the beginning of the 2000s, the successful prospects of the post-salt carbonate sections of the Santos and Campos basins promoted a growing campaign of drilling wells in deep and ultra-deep waters. Since 2007, more than one hundred wells and thousands of new samples were analyzed using all biostratigraphical methods available at the company (planktonic foraminifera, calcareous nannofossils, miospores, organic and calcareous dinoflagellates, calpionellids and radiolarians). The research on sedimentary rocks deposited in progressively more distal and deep environments revealed better-preserved microfossils, among them biostratigraphic markers mainly planktonic foraminifera. The identified assemblages enabled the use of a refined taxonomic approach, with the identification of more than 30 Aptian species of planktonic foraminifera. Based on their distribution, were recognized the global Late Aptian planktonic foraminifera *Globigerinelloides ferreolensis* to *Paraticinella rohri* biozones above the salt rocks. In addition, the systematic analyses of microfossils on thin sections from new wells of these basins, allowed the identification of new calpionellids bioevents. These bioevents are comparable to the succession of biohorizons present in the Aptian-Albian boundary of other basins around the world, such as the Gulf of Mexico and the Carpathians basins. The calpionellids species *Colomiella recta* and *C. mexicana*; the calcareous dinoflagellates *Cadosina* ex gr. *semiradiata* and *Colomisphaera heliosphaera*; the *incertae sedis* *Microcalamoides diversus*; and foraminifera on thin sections all occur in this interval. There have been significant advances in the study of calcareous nannofossils and palynology. Two new Aptian species of calcareous nannofossils were described, *Nannoconus troelsenii* and *Braarudosphaera pseudobatilliformis*. Among miospores *Complicatisaccus cearensis*, *Quadricolpites reticulatus*, *Trisectoris reticulatus*, *Dejaspollenites microfaveolatus*, *Sergipea tenuiverrucata* and *Equisetisporites maculosus* were spotlight linked to miospores whereas dinoflagellates were represented by *Pseudoceratium securigerum* and *Spiniferites/Pterodinium santosense*, *nomen nudum*. The studies carried out on planktonic foraminifera, integrated with those on calcareous nannofossils, palynomorphs and microfossils on thin sections, point to an Aptian marine sequence up to 800 m above the evaporites in the Santos, Campos and Espírito Santo basins, according to biochronostratigraphic correlation sections.

**KEYWORDS:** BIOSTRATIGRAPHY, MICROPALAEONTOLOGY, SOUTH ATLANTIC OCEAN.