

## CRONOSTRATIGRAPHY AND PALEOENVIRONMENTAL EVOLUTION OF STRATIGRAPHIC UNITS OF THE PARECIS BASIN

*Figueiredo, M.F.1, Vasconcelos, C.S.2, Ferreira, E.P.1, Brandão, M.V.1, Caetano Filho, S.3,  
Tobias, T.C.4*

1 Research Center of Petrobras; 2 Exploration Sector of Petrobras; 3 University of São Paulo; 4 University of  
Brasília

**ABSTRACT:** The Parecis Basin covers an area of 350,000 km<sup>2</sup> on the SE portion of the Amazon Craton that comprises part of Mato Grosso and Rondônia States. Most of its thick sedimentary succession was sampled for the first time through the stratigraphic well 2-SM-1-MT (Salto Magessi), drilled in the 1990s to a depth of 5,777 m. Originally, the ages of the sampled rocks were attributed to the interval between the Devonian and Cretaceous periods by comparing its lithostratigraphy and geophysical logs with the adjacent Phanerozoic basins. The more recent acquisition of seismic lines showed compressive deformation of the lower stratigraphic units of the basin that correlated with those units from the Paraguay Fold and Thrust Belt, Neoproterozoic in age. Studies of chemostratigraphy, micropaleontology and provenance were performed at the Research Center of PETROBRAS and provided new data for the chronostratigraphic positioning of this sedimentary succession. Two thick carbonate shelves are intercalated with two glacial intervals and yielded a sequence of positive C-isotope anomalies (up to +6 permil) and negative (down to -6 permil) and <sup>87</sup>Sr/<sup>86</sup>Sr lower than 0.7085, associated with the presence of Vase Shaped Microfossils with honeycomb pattern and a diverse assemblage of Leiosphaeridia. According to present international criteria, all these different pieces of evidence confirm a marine environment and allow this interval to be divided into Tonian (Salto Magessi Carbonate), Cryogenian (shale, sandstone and diamictite of the Puga and Bauxi Formations) and Ediacaran (limestone and dolostone of the Araras Group and diamictite and siltstone of the Serra Azul Formation) periods. Palynomorphs and ostracods were recovered from the upper units in the well, mainly sandstones and shales of the Utiriti Formation and sandstones of the Salto das Nuvens Formation (Parecis Group), and permitted the inference of an Early Cretaceous age or older. Based on a semi quantitative analysis, the palinological association indicates a paleoflora from high lands dominated by gymnosperms represented by bisaccate and inaperturate pollen grains produced by Podocarpaceae and Araucareaceae. Additionally, the record includes a paleoflora from a flood plain or shore face region indicated by *Classopollis* pollen grains from the Circumpollis Group, which are particularly produced by conifers Cheirolepidiaceae. Algae remains from fresh water (*Botryococcus*) were also recognized. Likewise, non-marine ostracods were found (*Reconcavona?* spp.) and reinforce the interpretation of a continental environment for those upper units. The alteration indexes based on major elements were applied to identify the paleoclimate variations between dry and humid climates along the whole section. The distribution of Rare Earth Element concentrations normalized to the upper crust were associated with U-Pb ages (0.2 to 3.3 Ga) in detrital zircons to identify the main basin inversions and respective changes of sedimentary provenance, attributed to the major tectonic events that affected the Amazon Craton and the South-American Plate.

**KEYWORDS:** PARECIS BASIN, NEOPROTEROZOIC, CRETACEOUS.