

# **C and Sr-isotope Stratigraphy, Ce and Eu Anomalies and Mercury concentrations in Neoproterozoic Carbonates of the Serra do Paraíso (Rio Pardo Basin) and São Desiderio (Rio Preto Belt) formations, Bahia, Brazil**

*Wilker dos Santos Cezario<sup>1</sup>; Alcides Nóbrega Sial<sup>1</sup>; Valdevez Pinto Ferreira<sup>1</sup>; Luiz Drude Lacerda<sup>2</sup>, Marcio Martins Pimentel<sup>3</sup>, Aroldo Misi<sup>4</sup>, Augusto José Pedreira<sup>5</sup>*

<sup>1</sup> NEG-LABISE, Dep. Geol. UFPE, Recife, Brazil; <sup>2</sup> LABOMAR, UFC, Fortaleza, Ceará, Brazil; <sup>3</sup> UFRGS, Rio Grande do Sul, Brazil, <sup>4</sup> UFBA, Salvador, Bahia, Brazil, <sup>5</sup> CPRM, Salvador, Brazil

**RESUMO:** The Rio Pardo Basin and Rio Preto Belt surround, respectively, the southeastern and northwestern portions of the São Francisco Craton, eastern Brazil. We examined the possibility that carbonates of the Serra do Paraíso Formation (Rio Pardo Basin) that overly diamictite/arkose of Panelinha Formation or basement, and those of the São Desiderio Formation (Rio Preto Belt) that covers the Canabravinha Formation, represent Neoproterozoic cap carbonates. In the Serra do Paraíso Formation, the  $\delta^{13}\text{C}$  values for carbonates with stromatolites at Serra do Paraíso Farm are  $\sim -5\text{‰}$  and upsection values jump to around  $+9\text{‰}$  towards the top of this formation. In the Rio Preto Belt, representative sections of São Desiderio Formation have the following  $\delta^{13}\text{C}$  values: at the Mineração do Oeste Quarry, limestones show  $\delta^{13}\text{C}$  values from  $+1.2$  to  $+2.2\text{‰}$  in the first 16m changing abruptly upsection to values between  $+10$  and  $+12\text{‰}$  in organic matter-rich limestones. At Sítio Rio Grande, limestones show values from  $+13.5$  to  $+15\text{‰}$  in the first 30m, and from  $+14$  to  $+16\text{‰}$  upsection, in organic matter-rich limestones. Carbonates from Serra do Paraíso Formation display negative Ce anomaly values in the base of the formation and positive values upsection, as an indication that the depositional environment passed from anoxic into oxic conditions. Their positive Eu anomalies probably resulted from influence of hot exhalation of hydrothermal fluids. Carbonates from the São Desiderio Formation exhibit just positive Ce anomaly values, indicating an anoxic environment, and display negative Eu anomaly values that suggest reduced environment. Hg values have been used as a proxy of volcanism intensity and  $\text{CO}_2$  buildup during Snowball Earth events. Hg contents in cap carbonates are usually over 10 times higher than background values ( $<1 \text{ ng.g}^{-1}$ ), in Serra do Paraíso Formation Hg values are 0.92 in the base changing upsection to  $10.64 \text{ ng.g}^{-1}$  supporting the idea of mantle-origin for the  $\text{CO}_2$  in cap carbonates, transferred to the atmosphere by volcanism. The values of  $^{87}\text{Sr}/^{86}\text{Sr}$  for carbonates of both formations vary from 0.707584 to 0.708061, compatible with a depositional age bracketing the end of Cryogenian (Marinoan) glaciation. Our current data set is compatible with the hypothesis that Serra do Paraíso and São Desiderio formations represent two cap carbonates.

**PALAVRAS CHAVE:** SERRA DO PARAÍSO FORMATION, SÃO DESIDERIO FORMATION, CAP CARBONATES.