

Strontium isotope stratigraphy of an Ediacaran–Cambrian epicontinental basin in West Gondwana

C. GUACANEME^{1*}, M. BABINSKI¹, G. PAULA–SANTOS², S.
CAETANO–FILHO¹, C. BEDOYA–RUEDA¹, M.
KUCHENBECKER³, H. REIS⁴, R. TRINDADE⁵

¹Instituto de Geociências, Universidade de São Paulo, São Paulo 05508-080, Brazil

²Universidade de Campinas, Campinas 13083-855, Brazil

³Universidade Federal dos Vales do Jequitinhonha e Mucuri, Diamantina, 39100-000, Brazil

⁴Universidade Federal de Ouro Preto, Ouro Preto 35400-000, Brazil

⁵Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Universidade de São Paulo, São Paulo 05508-090, Brazil

The Bambuí Group is exposed within the São Francisco craton (Brazil) and represents the sedimentary record of a late Ediacaran to Cambrian foreland basin system that evolved during the West Gondwana assembly. Carbonates from its basal 2nd-order sequence show an increase in Sr/Ca ratios (0.001 to 0.004) coupled to a progressive decrease in ⁸⁷Sr/⁸⁶Sr ratios (0.7086 to 0.7076) from lower transgressive to upper regressive strata. We argue that the high variability of both Sr/Ca and ⁸⁷Sr/⁸⁶Sr ratios do not mark changes in the strontium isotope compositions of the global Ediacaran–Cambrian oceans. Instead, these variations are related to the progressive restriction of the Bambuí basin system due to the tectonic uplift of the Neoproterozoic orogenic belts at the margins of the São Francisco paleocontinent, in the core of West Gondwana. The decrease of the Sr isotope ratios and the concomitant enrichment in [Sr] content precedes the up to +16‰ δ¹³C positive excursion recorded in the middle Bambuí Group, which is also considered an effect of paleotectonic restriction. The isolation of the foreland basin resulted in a smaller marine Sr reservoir and a higher isotope variability, controlled mainly by weathering fluxes from source areas. Thus, the input of Sr derived from the surrounding orogens played an important role in the Sr isotope system of the Bambuí basin. Similar anomalies in the strontium budget are also recorded in coeval marine basins developed within the West Gondwana and suggest that tectonics might have played an important role on chemistry of other tectonically (?) restricted seas at the late Ediacaran and early Cambrian times.