



C and O isotope analysis of Paleo-Mesoproterozoic dolomitic limestones from Natividade Group - Tocantins, Brazil

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Natividade Group outcrops in southeastern Tocantins, a state in Brazil. Geologically, it corresponds to one of the sedimentary sequences that sets the Brasília fold and thrust belt. It represents a fining-upward sequence, where conglomerate prevails on the base, siltstones and limestones on the top.

Initially, Natividade Group was believed to have been deposited in intracontinental rift environment, developed after a Rhyacian orogeny. This interpretation was supported by the fact that Natividade Group lays discordantly over the Rhyacian granitic basement and by existence of coeval and vicinal rocks from Araí Group. Araí Group is a well described rift-sequence, dated Staterian by volcanic intercalations.

Natividade Group, on the contrary, has no intercalation of volcanic rocks and was recently interpreted as a platformal sequence by other authors. C and O isotope data from dolomitic limestones directly in contact with granitic basement were obtained in laminated and massif samples and corroborate this hypothesis.

Samples are from a small hill called Morro do Mutum. Results found show $\delta^{18}\text{O}_{V-SMOW}$ values from +19.51 to +23.85 ($\delta^{18}\text{O}_{V-PDB}$ between -11.01 and -6.63) and values of $\delta^{13}\text{C}_{V-PDB}$ are between -0.94 and +2.99. These data are coherent with values expected for marine carbonates, which $\delta^{13}\text{C}_{V-PDB}$ signature is around zero, or slightly positive. Similarly, $\delta^{18}\text{O}_{PDB}$ results are also consistent with values observed in marine carbonates, although $\delta^{18}\text{O}_{PDB}$ data are more ambiguous, knowing its variation is wide in the various reservoirs.

Differences between Natividade and Araí Groups are important to estimate the paleogeography of the region. While the former corresponds to a platformal deposit, the latter filled rifts within the continent. This continent is the São Francisco craton, one of the landmasses that would collide in the Neoproterozoic, forming fold and thrust belts. Brasília belt is one of them.