

CARBON ISOTOPES, CAP CARBONATES AND BIF, JUCURUTU AND FRECHEIRINHA FORMATIONS, NORTHEASTERN BRAZIL

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RESUMO: BIF associated with Neoproterozoic glaciations are an important pillar of the Snowball Earth hypothesis and are regarded as accumulation of Fe+2 in anoxic, ferruginous oceans. BIF at Jucurutu (Mina do Bonito), Florânea (Cabeço da Mina) and São Mamede (Riacho Fundo) towns, Seridó Belt in Rio Grande do Norte and Paraíba (itabirite and Fe ores, amphibole-itabirite, and tremolite schist), are overlain by Jucurutu marbles. Marbles from the Jucurutu Fm. at Mina do Bonito exhibit $\delta^{13}\text{C}$ values from -12 to -5‰ in the first 20m, and a shift to positive values (+4 to +10‰) upsection. $\delta^{13}\text{C}$ values for carbonates that overlie itabirites at Riacho Fundo and at Cabeço da Mina are all positive. The difference of C isotope behavior between basal carbonates at Mina do Bonito (negative) and Riacho Fundo and Cabeço da Mina (positive) may reflect topographic control during deposition. Carbonates of the Jucurutu Formation. show negative $\delta^{13}\text{C}$ values in their base followed upsection by positive values, typical of cap carbonate deposition. Low-grade carbonates of the Frecheirinha Formation of the Neoproterozoic Ubajara Group, northwestern Ceará, rest on reddish to purple slate of the Caiçara Formation. At the Angostura Farm, carbonates (rhythmites) overlie itabirite although the weathering has precluded seeing a sharp contact between these two units. Marls in the base of the carbonate sequence show negative $\delta^{13}\text{C}$ values (-8 to -1.2‰) which are replaced upsection by positive values up to +4‰. According to the Snowball Earth hypothesis, BIF overlain by Jucurutu and Frecheirinha formations were likely deposited in a glacial environment and the overlying carbonates, in the aftermath of one of the Cryogenian glaciations. However, until now no glacial features were found in these units. $^{87}\text{Sr}/^{86}\text{Sr}$ ratios for Jucurutu Formation (~ 0.7074) and Frecheirinha Formation (~ 0.7075) carbonates do not allow an unambiguous age assignment. Similar values and associated BIF without glacial features occur in the Ediacaran Arroyo del Soldado Group of Uruguay. These two cap carbonates are the northernmost Neoproterozoic cap carbonates known in Northeastern Brazil and the only ones where BIF, instead of diamictites, have been found directly below the cap carbonates. This peculiar behavior is, perhaps, an indication that these two carbonates had similar history of deposition and age.

PALAVRAS-CHAVE: BANDED IRON FORMATION; ISOTOPE STRATIGRAPHY; CARBON ISOTOPES.