**Oncoidal microbialites in non-marine environments in Quaternary carbonate deposits of Central-Brazil.**

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Depositional environments supersaturated in bicarbonate molecules (HCO3-) and calcium ions (Ca2+) are highly favorable for the development of microorganisms that are able to extract CO2 (carbonic acid) from HCO3-. In these environments, the cyanobacterias are known to perform this photosynthesis type, also denominated as CO2-Concentrating Mechanism (CCM). One of the remnants of this process is the hydroxyl (OH-) that consequently increases the pH, binds with H+ from HCO3-, thus, causing the CO3- and Ca2+formation in which these newly-formed CaCO3 crystallites can be trapped onto a biofilm (extracellular polymeric substances - EPS). This biochemical interaction results in a carbonate construction that might be preserved in the geological record.

The oncoids exemplify one of these bioconstruction processes that usually consist of biogenic carbonate nodules formed from the interaction between cyanobacteria and supersaturated environments. In order to understand these bioconstructions, mineralogical (petrographic, scanning electron microscopy and x-ray diffraction) and geochemical (x-ray fluorescence, C&O stable isotopes) studies were carried out in oncoid samples of Quaternary carbonate deposits of the Serra da Bodoquena Formation, Central-Brazil, that occur overlying the Neoproterozoic metacarbonates of the Corumbá Group.

Our study showed the occurrence of calcite micritic lamination with well-preserved EPS sheath structures forming moldic porosity, interpreted as an evidence of CCM process, which indicates *In Vivo* precipitation. We also identified smooth rhomb crystals that might be consistent with *Post Morten* precipitation. Furthermore, we interpreted the bacterial shrub laminations as the remaining products of microorganism metabolism of the Rivulariaceae Family. The calcified cyanobacteria filaments were interpreted as Nostocaceae Family products. The chemical and isotopic results corroborated with the microorganism activity in a shallow freshwater environment, with absence of macroorganisms, such as predators and higher plants. Based on the stratigraphic position of the studied samples, our study might fill a depositional gap during the Pleistocene, where the oncoids might be related to deposition during a cold period in Central-Brazil from (18000 yr B.P to 11700 yr B.P) they possibly can be related to the Last Glacial Maximum (18000 yr B.P) and the Younger Dryas Event (12900 to 11700 yr B.P).