

GREAT QUESTIONS REGARDING THE PRECAMBRIAN FOSSIL RECORD FROM BRAZIL AND THEIR POTENCIAL RELATION TO ASTROBIOLOGY. Morais, L.P.C.¹, Barroso, F.R.G.², Romero, G.R.¹, Kerber, B.B.¹, Pacheco, M.L.A.F.³. ¹PPG. Geoquímica e Geotectônica, Instituto de Geociências da Universidade de São Paulo (Rua do Lago, 562. Zip code: 05508080, Cidade Universitaria, SP-Brazil. Email: lumoraiss@ymail.com) for first author,

Introduction: The Precambrian record of Brazil (2,4 Ga – 541Ma) embraces almost one-quarter of the total surface area, comprising great paleontological potential with a wide range of fossil groups [1]. It can help answering some open questions regarding Precambrian biospheric evolution and geological changes on early Earth.

Relevant issues: (i) Microbialites in 2.1–2.4 Ga old carbonates of the Minas Supergroup in the Quadrilátero Ferrífero, Minas Gerais (the oldest Brazilian fossils) might be related to the development of the early oxygenic atmosphere and penecontemporaneous global tectonic and climatic events;

(ii) The evolutionary significance of Mesoproterozoic to Ediacaran organic-walled microfossils in central–western Brazil and their diversity and paleoecological significance. For example, the acquisition of test in VSMs can reflect the staggering of predation already in microorganisms. It would explain the dawn of hard parts (in a lot of clads, including animals) by the means of selective pressure, mainly;

(iii) At the base of the Paraguay Belt (MT and MS) - early Ediacaran- microbialites of kilometric extension occur in “cap carbonates” after the Marinoan Event and together with other fossil (acritarchs and biomarkers) aids to determine how much life proliferated in extreme climate intervals and to provide important information for the understanding of biodiversity that preceded the complex life of explosion in the Ediacaran (Item- iv). Additionally, the occurrence of complex assemblies of prokaryotic and eukaryotic organisms, including microbialites, in deposited layers both during and after the times of severe glaciations seems to indicate that these drastic paleoenvironmental changes do not affect the diversity or the extinction of species;

(iv) Insights into the record of paleoecology of latest shelly Ediacaran metazoans and other weird vendobiont-like beings. Enigmatic colonies of cnidarian-like fossils (not similar to other parts of the world) at Jaibarras Basin, Ceará (dated in more than 540 Ma.)[2]. Colonial animal forms may represent one of the first

strategies against predation. At Itajaí Basin, Santa Catarina, putative sponges could announce profound changes in ocean chemistry, still in Ediacaran. Remains of *Corumbella* and *Cloudina* shells from Corumbá Group, Mato Grosso do Sul, attest the late evolutionary moment of Ediacaran period with the appearance of predator-prey relations, even with some of the first direct evidences of predation, in the form of boreholes in calcitic shells of *Cloudina*[3].

Future perspectives: Traditional paleontological techniques coupled with non-destructive techniques used in research on astrobiology are assisting in the taxonomic, paleoenvironmental, paleoecological and evolutive studies regarding the highlighted questions above. Through the understanding of Precambrian environments and its relation to the evolution of life in adverse conditions not found on present Earth, these scenarios can contribute to astrobiological models.

References: [1] Fairchild, T.R.; Sanchez, E.A.M.; Pacheco, M.L.A.F.; Leme, J.M. (2012). *Intern. Jour. Astrob. (11)*: 309-323. [2] Barroso, R.F.G.; Viana, M.S.; Filho, M.F.L.; Agostinho, S.M.O. (2014). *Ann. Acad. Bras. Sci. (86)*: 89-103. [3] Kerber, B.B.; Rosa, A.L.Z.; Gabas, S.G.; Leme, J.M.; Pacheco, M.L.F. (2013). *Geol. Usp, Sér. Cient. (13)*: 51-64.