BAJO DE VÉLIZ STROMATOLITES REVISITED

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The discussion about the true biogenicity of Ca-rich deposits has been extensive, and in the past, abiogenic structures have been referred to stromatolites when their origin was linked to inorganic precipitation of carbonate. Later on, different types of carbonate precipitation have been described including: mineralization (inorganic); and biogenic precipitation of carbonates, namely: biologically controlled, biologically induced and biologically influenced mineralization. The Bajo de Véliz subbasin, located on the east margin of the Paganzo basin, in the NE of San Luis province, presents the Bajo de Véliz Formation, referred to as Permian. The unit is a siliciclastic succession, well known by its extraordinary fossiliferous content and includes carbonate levels. The carbonates have been previously described as stromatolites based on microfacies analysis with the identification of bryophyte and cyanobacteria as producers. Nevertheless, new polished sections and thin section microfacies analysis under low magnification binocular microscope along with SEM-EDS analysis shows no trace of biogenicity at a microstructure level. New data shows that the microfabric is formed by a combination of Ca-rich parallel and subparallel veins (spar), included in a Si-rich matrix with Fe content. These microstructures were previously identified as bryophyte remains but no feature other than morphological resemblance was found. This point to a genesis linked to a probable carbonate rich seep that caused Ca and Si mineralization in the form of complex dendrites. Further cathodoluminescence analysis can confirm the timing and different phases of mineralization and if there was incremental growth.

HETEROCHRONY, A PERVASIVE MECHANISM IN GENERATING EVOLUTIONARY TRENDS IN BRACHIOPODS: SOME EXAMPLES FROM ORDOVICIAN AND SILURIAN RHYNCHONELLIFORMS

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Evolutionary lineages preserved in the fossil record are critical to interpreting evolutionary processes (*e.g.*, gradual *vs.* punctuated phyletic change) but interpretation of the underlying mechanisms is challenging. Among the many causes invoked to produce evolutionary trends –defined as a persistent directional change in one or more character states through time– heterochrony has been recognized as a crucial factor not only as an agent in speciation but also in macroevolution. All of the Ordovician successions of Argentina (NW basin, Famatina Range, Cuyania terrane) provided well documented examples of evolutionary trends in orthoid, plectorthoid and plectambonitoid brachiopods. Such trends involve size, shell morphology, ornamentation and, more importantly, changes in the development of such internal structures as cardinalia, which are often considered to be 'stable' and thus taxonomically (and phylogenetically) informative. The lineage found in the Santa Victoria Group leading from the basal plectorthoid *Protorthisina* (Furongian) to the lower to upper Tremadocian 'nanorthids' *Kvania*, *Gondwanorthis*, *Lampazarorthis* and *Tarfaya* is a good example of a long-term trend (ca. 10 Ma) directed mainly by heterochronic processes, but perhaps the best documented hypothesis of heterochrony (peramorphosis) is the *Panderina-Productorthis* lineage recorded in the Floian–Dapingian Famatina Group. There is also compelling evidence supporting that the Silurian rhynchonellide *Clarkeia* (Uncinuloidea) evolved from *Harringtonina* (Rhynchotrematoidea) by peramorphosis. More striking is the case of the plectambonitoid *Ahtiella famatiniana* (Strophomenata), which on the basis of empirical and cladistic evidence evolved from the orthoid *Monorthis transversa* (Rhynchonellata) showing that in brachiopods heterochrony may have played a substantial role in originating higher taxa (macroevolution).