

# NEW EDIACARAN DISCOIDAL STRUCTURES FROM SOUTH AMERICA AND THE IMPLICATIONS FOR THEIR BIOGENIC ORIGIN.

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**ABSTRACT:** Intriguing discoidal structures were identified in several Ediacaran deposits worldwide. They are often considered a common form of soft-bodied organism associated to the worldly recognized Ediacaran Biota. For many years, these structures were interpreted as impressions of medusoid cnidarians. However, due to their (a) simple shape, (b) the existence of a number of morphological variants and (c) their distinct taphonomic styles of preservation, their taxonomic classification and phylogenetic affinity are difficult to determine. Recently, morphologic and taphonomic studies have interpreted most of these discoidal structures as holdfasts of frondose organisms, with their morphological diversity explained as preservational variants within an evolutionary affinity still poorly understood. In South America, only doubtful impressions were so far identified as discoidal organisms. It is noteworthy the presence of few specimens assigned to *Aspidella sp.*, *Cyclomedusa sp.*, *Beltanelliformis sp.*, *Ediacaria sp.*, and *Charniodiscus sp.*, which were reported from the Ediacaran (or eo-Cambrian) deposits of the Itajaí, Jaibaras, Camarinha and Camaquã basins from Brazil. Here we report for the first time two assemblages of discoidal structures of possible biological origin, which were recently identified in the Sete Lagoas Formation (Bambuí Group, Brazil) and in the Cerro Negro Formation (La Providencia Group, Argentina). The Brazilian discoidal structures occur in close association with thrombolitic and microbial facies deposited in shallow-water environment. The specimens are dark-colored and preserve well-marked concentric ornamentation. Their sizes reach 20-40 mm in diameter. On the other hand, the Argentinian specimens occur in fine-grained micaceous sandstones, associated with abundant microbial induced sedimentary structures (MISS), which are interpreted as deposited in subtidal settings. In the Cerro Negro Formation, the discoidal forms are densely (hundreds to thousands) distributed in the bedding planes, as complete tridimensional casts (positive and negative epirelieves). Their diameters range from 5 to 130 mm, and diverse patterns of ornamentation are shown. Here we interpret the discoidal structures of the Bambuí Group as some form of microbial communities living in shallow water environments. In turn, the occurrences of the La Providencia Group appear to represent the casts and molds of benthic organisms, similar to discoidal forms found in other Ediacaran fossil assemblages. Both occurrences are still under study and represent a valuable material for understanding the affinity and paleoecological implications of discoidal structures as well as their significance to the South American Ediacaran fossil record.

**KEY WORDS:** EDIACARAN BIOTA, DISCOIDAL STRUCTURES, SOUTH AMERICA