**MICROBIALITES OF LAGO STROBEL, SANTA CRUZ, ARGENTINA: ENVIRONMENTAL AND ASTROBIOLOGICAL SIGNIFICANCE**.

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Microbialites are organosedimentary deposits formed by the interaction between benthic microbial communities, detrital sediments and mineral precipitation. Thrombolites are microbialites characterized by a clotted mesostructure and lack of lamination. Understanding geobiological processes involved in their formation helps to inform their significance in modern and ancient environments.

The Strobel Lake (SL, GPS S 48° 26’ 52,9’’, W 71° 14’ 46,9’’) is a freshwater closed lake, its pH is 9,3 and its alkalinity range from 450 to 585mL/L CaCo3. It is located on a basaltic plateau in the province of Santa Cruz, Argentina. This lake has an area of 110 km2 approximately and a depth of more than 50 m. Carbonate deposits (microbialites and carbonate crusts) are distributed in four levels or terraces (**L1, L2, L3, L4)** that represent the current and previous positions of the lake level. The altitude difference between the current (**L1**) and highest level (**L4**) is about 15-20 m, suggesting significant changes in lake level and volume. Whereas **L1** and **L2** respectively represent the most recently deposits underwater and slightly subaerially exposed, **L3** and **L4** apparently represents older terraces developed over small hillocks composed of clusters of basaltic blocks.

**L1 and L2** are represented by dome to columnar shaped, white to light grey colored discrete and compound bioherms that are usually encrusted on a basaltic clast or block and mostly isolated (not typically laterally linked). These range from 0,15 m to 1m in height and up to 0,8 m in diameter. The domes or “active” microbialites from **L1** are currently growing underwater or partially exposed (typically 0,10 and 0,50 m water depths). These are generally colonized by ball-to pustular- shaped, dark colored (dark green to black) cyanobacterial communities (similar to formed by *Nostoc*).These form subspherical aggregates that are up to 1 cm in diameter and are an important component in the microbialites conditioning their microtexture. Within the clotted, white colored carbonate framework that characterize the microbialites, a light gray colored, fine grained (micrite) carbonate mud has been observed as well as small gastropods and very fine grained detrital sediments. In **L2**, the domes are generally bigger than at **L1**, reaching 1 m high and 0,8 m in diameter and are totally exposed. At the mesoscale a clotted mesostructure also characterize microbialites in **L2.** **L3** is characterized by thick carbonate crusts that reach 0,3 m thick, developed over meter-sized basaltic blocks. Although, these appears as discrete microbialites, the shape, size and distribution is conditioned by the size and shape of the basaltic blocks over which these are nucleated. The crusts are thicker at the top and laterally thin out to disappear. In **L3**, the colors, textures and mesostructures of the crusts are very similar to those recorded in the **L1** and **L2** microbialites. **L4** is represented by thinner (mm to 15 cm scale) carbonate crusts and stains covering the basaltic bedrock. The **L4** carbonate crusts are whiter when compared to other crusts and microbialites.

The geological setting of the Strobel lake (arid environment, a basaltic bedrock, a carbonate belt and associated delta deposits) makes it an excellent analogue for the putative lacustrine deposits recently discovered in the Jezero Crater of Mars by NASA. Understanding the main controls in carbonate precipitation may help to understand what is recorded on Jezero and highlights the astrobiological significance of the Strobel lake as a planetary analogue.