Goldschmidt 2022 Abstract
https://doi.org/10.46427/gold2022.13214

# Organic and Inorganic records in the Botijuella Travertine System, Central Andes, Puna Altiplano.

**LEONARDO CURY**[1], GUIDO ALONSO[1], TATIANA STEPANENKO[2], LARISSA ROCHA SANTOS[1] AND ANELIZE M BAHNIUK RUMBELSPERGER[3]

[1]Federal University of Paraná
[2]Federal Universiy of Paraná
[3]UFPR - Lamir Institute

Presenting Author: cury@ufpr.br

The Puna Altiplano is located in northwest Argentina, and consists of a plateau 3700 meters above sea level. This plateau is a closed basin encompassing salt deserts, active volcanoes and hot springs, and a large reservoir of high-altitude lakes, inhabited by several polyextremophilic microbial communities defined as the Andean Microbial Ecosystems. The extreme environmental conditions together with the geological and local geomorphological features influenced by magmatic water contribution, favor the development of supersaturated lakes and salt flats.

Botijuella is a complex travertine system divided in two different sites, recognized by the meadows color printed over the desert scenario. The first site is characterized by a white meadow is an active travertine system approximately 375 m-long, where the springs are scattered along the system being mainly fault-controlled. In the south a green meadow system shows along a single 530 m-long profile a major contribution of freshwaters. Microbial mats rich in cyanobacteria, stromatolite-forming communities, oncolites and biofilms with abundant EPS developing onto shrubby structures were the most representative AMEs.

The facies survey was completed by petrography and micro CT analyzes. The mineralogical study was carried out by XRD and SEM-EDS, geochemistry by XRF and ICP-MS, and C&O isotopes by IRMS, recognizing the chemical distribution from the spring, through the proximal, to distal deposits. The deposits are essentially formed by calcite with Ca (54,9 - 40,8 %), Mg (1,3 - 0,2%), subordinately with Mg-bearing calcite associated to microbial facies, laminated with gypsum layers. A spring influence zone is characterized by high Fe (~4,3 %), Pb (~4850 ppm), together with an expressive arsenic content (0,5 to 1,7%) with Zn (~139 ppm), probably related to the volcanic source. The Si content is significant nearby the spring, but in the distal facies with detrital minerals dissolved in high alkalinity session of the system could reach ~ Si 5-6 %, related to amorphous Si phase.

The relationship between the geochemical record and facies distribution suggests organic and inorganic controls, where the kinetic conditions switches the redox, and the presence of microbial component over the stream could shift or combine their influence in the carbonate deposit composition.