

**TITLE:** ACTINOMYCETALES COMMUNITY ANALYSIS ALONG SANDSTONE AND LIMESTONE CAVES OF CHAPADA DIAMANTINA, BRAZIL

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**ABSTRACT:**

Actinomycetales is an order of Actinobacteria phylum that comprises several species known as enzymes and secondary metabolites producers with potential to be applied in many areas of industry. These organisms are commonly prospected in several environments; however, the diversity in caves is mainly unknown. Caves represent an environment commonly associated with oligotrophy and largely unknown regarding the bacterial diversity and microorganisms with biotechnological potential. We decided to evaluate the presence and diversity of Actinomycetales in Gruta do Lapão, a 1.2-km metasandstone cave, and Gruta de Manoel loiô, a >1km limestone cave. Samples were collected along those caves (Entrance sample and three inner samples for each cave), and the DNA was extracted from those samples and amplified with specific primers for 16S rDNA of Actinomycetales (F243/R1378). A DGGE analysis was performed to evaluate the changes in Actinomycetales profile along the cave, and it was analyzed in a similarity dendrogram based on a binary matrix of profiles. Besides, bacteria were isolated using different media (soil extract agar, TSA, BHI 1/10) and Actinomycetales was prospect using specific primers for the group. Although all metagenomic samples amplified with specific primers, no bacterial isolates (n=63) amplified for Actinomycetales specific primers. The community analysis using DGGE showed different profiles in the inner sample in comparison with external samples (45% for limestone and 51% for metasandstone caves) suggesting that caves present an Actinomycetales community with a considerable difference from the external environment. Besides, both caves presented unique Actinobacterial communities' profiles observed in the similarity dendrogram that presented 39% of similarity among both caves; however, the samples with the highest similarity (inner samples from Manoel loiô cave) showed 86% of similarity. Actinomycetales community in the caves are not cultured in the media used in the present study; however, the DGGE analysis suggests a diverse Actinomycetales community that represents an interesting potential to prospect compounds with biotechnological interest.

**Keywords:** Actinobacteria, DGGE, culture-independent

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