

**TITLE:** PRODUCTION OF DIFFERENT CAROTENOIDS IN MEMBERS OF ACIDOBACTERIA IN RESPONSE TO LIGHT

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**ABSTRACT:**

Bacteria belonging to the phylum Acidobacteria are commonly detected in Cerrado soil by molecular approaches. However, little is known about their biological roles in terrestrial ecosystems. Some Acidobacteria of subdivision 1 produce pigments that provide color to their colonies, so they are usually yellow, orange, red, or pink-pigmented. This pigmentation has been previously associated with the presence of carotenoids. Bacterial pigments may be associated with mechanisms of protection of adverse environmental factors, and may be contributing to the abundance of Acidobacteria in soil. The present work aimed to confirm the presence of carotenoid pigments in member of Acidobacteria. To confirm the presence of carotenoids, two bacteria belonging to subdivision 1 of Acidobacteria, *O. savannae* AB23 and Acidobacteria AB60 were used in this study. These bacteria were cultured in VL-55 medium at 22°C for 3 weeks in the presence or absence of light. Pigments were extracted from the cell fraction of the culture by lysing the cells using ultrasound followed by an extraction with acetone and methanol solution (7:2 v/v). The extracted pigments were analyzed by MALDI-ToF/ToF. The mass spectra were acquired in a positive reflected mode, by external calibration in the mass range of 300 to 1200 (m / z), and the ions were identified based on the literature. The profiles obtained by mass spectrometry revealed ions with the same mass of carotenoids:  $\xi$ -carotene, neurosporene, lycopene,  $\gamma$ -carotene and  $\beta$ -carotene in the presence of light for *O. savannae* AB23, while the ions of carotenoids phytofluene and phytoene were found only in treatment with absence of light. For Acidobacteria AB60, ions with the same carotenoid mass described above were observed, but they were present in treatments with and without light, however the carotenoid ions described were less intense in the treatment in absence of light. The experiment showed that *O. savannae* AB23 produces some carotenoids only when cultured in light, whereas Acidobacteria AB60 produces the same carotenoids, and in greater quantity when exposed to light. This result is consistent with our current hypothesis that Acidobacteria success in Cerrado soil is due to the presence of multiple mechanisms to persist in soil adverse conditions.

**Keywords:** Acidobacteria, carotene, absence and presence of light

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