Sociedad Argentina de Microbiología General

XIX CONGRESO DE LA SOCIEDAD ARGENTINA DE MICROBIOLOGÍA GENERAL

22 al 25 de octubre del 2024
Centro cultural y Pabellón Argentina de la Universidad Nacional de Córdoba, Córdoba, ARGENTINA.

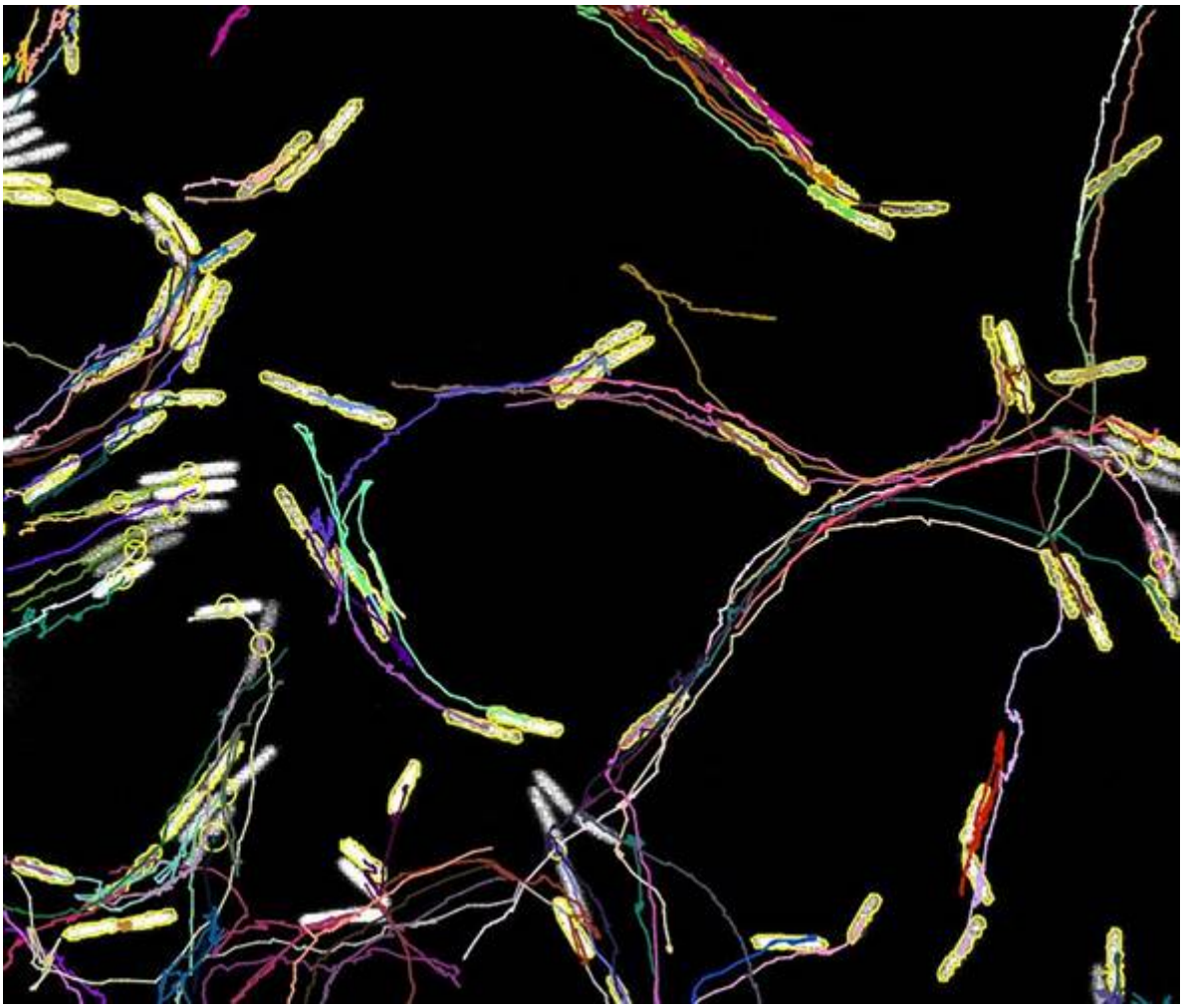

Foto: Se hace camino al andar. Celeste Dea. 1er puesto. Concurso fotográfico SAMIGE 20 años.

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CHARACTERIZATION OF A PIGMENT-ACCUMULATING MICROALGAL STRAIN ISOLATED FROM A NATURAL WETLAND IN NORTHERN PATAGONIA.

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Microalgae are ubiquitous, photosynthetic organisms that exhibit rapid growth. These organisms are highly valued for their utility in biotechnology, as they are capable of producing macromolecules of significant commercial value, including pigments, proteins, and lipids, among others. The evaluation of the potential of native and yet uncharacterized microalgae can provide valuable opportunities for industry. In this study, a microalgae strain was isolated from the sediments of a natural wetland in the Pilcaniyeu region of northern Patagonia and subsequently examined. This strain was identified under the genus *Chromochloris*, known as a Chlorophyte accumulator of carotenoid pigments, for which its characteristics were analyzed with a particular focus on their potential for biotechnological applications. To develop this work, studies were conducted to optimize the growth conditions in the laboratory, evaluating three typical culture media for algae of the chlorophyte division. The media employed were Bold's Basal Medium (BBM), Blue-Green -11 (BG-11), and TRIS-acetate-phosphate (TAP). The impact of varying agitation and aeration conditions was assessed. The growth curves were determined by cell counting in a Neubauer chamber, optical density, and dry weight. The characterization of the strain included an evaluation of the cell surface by Fourier transform infrared spectroscopy (FT-IR) and the extraction and characterization of pigments and lipids at different stages of the growth cycle. The accumulation of lipids was examined by Nile Red staining, followed by Bligh & Dyer extractions and subsequent lipid characterization through thin layer chromatography. The results indicated that the strain exhibited a faster growth in TAP medium, reaching an exponential growth rate (?) of 1.03 ± 0.06 day-1 at day 5. This could be attributed to the nitrogen source, the presence of acetate, or a combination of both factors. In contrast, the exponential ? of BBM and BG-11 was 0.77 ± 0.04 day-1 at day 7 and 0.75 ± 0.05 day-1 at day 5, respectively. These results suggest that the strain may exhibit a mixotrophic metabolic pattern. The strain displays a green coloration for a period of up to 30 - 40 days, subsequently assuming a brownish pigmentation, and ultimately attaining its characteristic orange coloration. The FT-IR spectrum in the

stationary phase of growth exhibited a peak indicative of the presence of lipids. The alga showed a rapid synthesis of pigments under nitrogen-free TAP culture conditions, which preceded the production of lipids. These findings indicate that the isolated strain has considerable potential for industrial applications due to its high carotenoid production, a valuable component for these sectors. The optimization of the culture conditions and the detailed characterization of the strain provide new prospects for the development of biotechnological products based on microalgae.

Palabras clave: microalgae - pigments - carotenoids - lipids