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ISOLATION AND CHARACTERIZATION OF DIATOMS FOR LIPIDS OF INTEREST PRODUCTION. COMPARISON OF SAMPLES OBTAINED FROM SITES WITH DIFFERENT GRADES OF POLLUTION.

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Diatoms are a microalgae group that has acquired great biotechnological importance due to their capacity to produce lipids that can be used as food supplements, for the production of biodiesel or in pharmaceuticals. On the other hand, several studies have postulated that lipid production is increased when microorganisms are subjected to stress conditions. However, one of the challenges in the development of some biotechnological processes, is the management of wastes and co-products that are generated. In the case of diatoms, the silica wall (frustule) is obtained as a residue (after solvent extraction of the oils accumulated inside the cells) and the use of these in many industrial and biotechnological processes have been proposed.

The aim of this work is to compare the biodiversity of diatoms isolated from different environments (pristine and polluted); and to compare the amount of lipid accumulation of diatoms from both sites to evaluate their biotechnological potential.

In this study, diatoms from a pristine site were isolated (Reserva Municipal de Rivera Norte), characterized and compared with diatoms isolated from a highly polluted site (Río Luján).

Enrichment of all samples was performed by using modified Diatom medium. After 5 days of growth, samples were analyzed by optical microscope and diatoms were isolated by a Combination of serial and drop dilutions, and transferred to Erlenmeyer flasks. Cultures were kept at 24°C with photoperiods of 16:8 hours (light:darkness).

For the determination of neutral lipids accumulated into diatom cells, Nile Red spectrofluorometric technique was used. Extraction of lipids from diatoms was achieved by using Methanol and Chloroform. The quantification of the extracts was performed by gravimetric analysis. Lipids accumulation was compared between isolated strains.

Frustules, before and after lipids extraction, were studied by SEM in order to analyze their potential biotechnological use in future studies.

The biodiversity found in Rivera Norte was significantly higher than that found in Río Luján. Some of the genus found in Rivera Norte were e.i.: *Fragilaria* sp., *Gomphonema* sp., *Encyonema* sp., *Cyclotella* sp., *Navicula* sp., *Nitzschia* sp. While in Río Luján only a few genus were found.

Results of lipids extraction from the isolated strains (6 from Rivera Norte and 3 from Río Luján) indicated that lipid production was species related and species from Río Luján tended to accumulate lipids at earlier stages of the culture.

SEM images allowed to determine frustule structural analysis for future uses and to determine taxonomic classification.

Results indicated that diatoms could be used for the production of lipids of interest and their frustules could be applied as bio-product for several applications.

This study provides the basis for the development of a cycle of production of a substance of commercial interest while a co-product with potential industrial, agricultural or biotechnological use is being developed.