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EVALUATION OF GROWTH AND SULPHATE REDUCTION BY *Chlorella vulgaris* IN MILKMAID WASTEWATER

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Introduction. The solid waste reflects the culture that produces it and affects the health of the people and the environment surrounding it (1)**.** Algae are a diverse family of photosynthetic eukaryotes species. *Chlorella sp.* is unicellular green microalgae with a high efficient photosynthetic and a huge capacity to absorb nutrients of the culture by periods of fast grown and stand out for its high capacity of elimination of nutrients of the wastewater (2). The concept of microalgae cultivation as an integrated system in wastewater treatment has optimized the potential of microalgal biomass production and application. According to the most recent scientific opinion, the near-term outcome for large scale algal biofuel production, based on current technologies, is not energetically and economically favorable without wastewater treatment as primary goal (3). It is well known that microalgae have a huge potential in a wide variety of applications. Concerning environmental ones, microalgae can play an important role in bioremediation of wastewater and carbon dioxide sequestration (4).
This investigation analyzed the application of microalgae *Chlorella vulgaris* as removal of organic contaminants dissolved in wastewater treated.

Methodology. Were evaluated four concentrations of milkmaid wastewater (25, 50, 75, and 100% v/v), adjusting the volume with sterile distilled water. The experiments development on glass jars of 250 mL and entrance of air and exit of gas. The wastewater was inoculated with *Chlorella vulgaris* (5% v/v) and cultured on a dark room having the unique source of light a white fluorescent light (45 µmol photons m^{-2} s^{-1}). A photoperiod of light/dark of 12:12 hours was applied. The culture was kinetic monitored taking samples every 24 hours with a final time of 240 hours, plus the production of the biomass. Were analyze the concentration of nitrates and nitrites on the beginning and finalizing the treatment time of the wastewater employing a commercial kit (Hach Nitrate-Nitrite Test Kit).

Results. Figure 1 show the growth of microalgae *Chlorella vulgaris*. According to the results the maximal biomass production (0.42 g/L) was obtained using low concentrations of residual water (25% v / v). The reduction of sulphates (Figure 2) was better in high concentration of wastewater. Beginning the experiment concentration was 240 g/L and the removal was of 37.5 % (150 g / L).

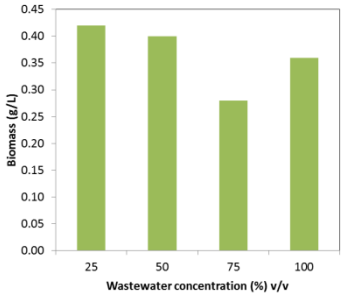

Figure. 1. Biomass production by *Chlorella vulgaris* at different ratios of milkmaid wastewater.

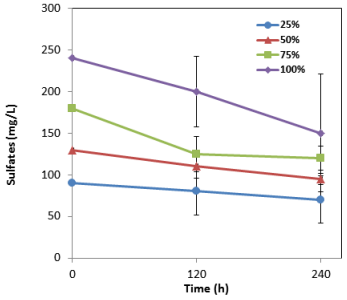

Figure. 2. Kinetics of changes in concentration of sulphates in the treatment of milkmaid wastewaters using the microalgae *Chlorella vulgaris*.

Conclusions. The results from this study demonstrated the feasibility of cultivating *Chlorella vulgaris* for the treatment of wastewaters. The results showed that concentration of 25 % of milkmaid wastewater was the appropriate medium for the growth of *Chlorella vulgaris*.

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