



## RELATIONSHIP BETWEEN PROTOZOA AND EFFICIENCY OF ORGANIC MATTER REMOVAL IN A BIOFILTER

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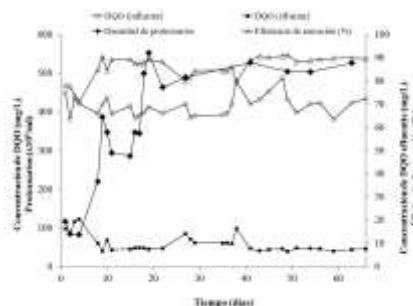
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**Introduction.** In wastewater treatment systems, it is known that bacteria play a fundamental role in degrading organic matter, and protozoa play a role of effluent polishers (1). Ciliate correlate with the biochemical oxygen demand (BOD<sub>5</sub>) value, therefore ciliate can be considered as indicators of the process efficiency (2). Several studies using conventional systems, such activated sludge, have been published. However, studies using Sequencing Batch Reactor (SBR) are scarce. In this study, relationship between diversity and amount of protozoa and the efficiency of organic matter removal in a SBR System packed with tezontle (volcanic rock).

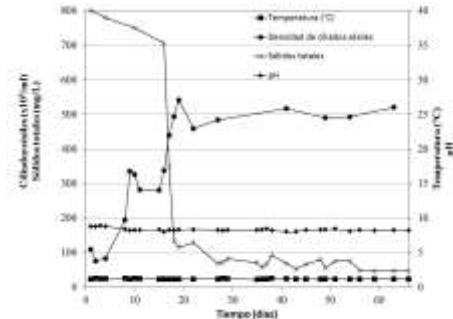
**Methods.** An automated SBR system packed with tezontle volcanic rock. BQD5 and total solids were determined during 63 days (3). Protozoa were quantified and identified. In order to identify the species, hematoxylin and silver nitrate stains were used (5). Protozoa were quantified every 24 hours by using 25-microliters samples, with five replicates. An optical microscope (Thomas Scientific) and a Neubauer chamber were used for counting.

**Results.** Results showed average removal efficiencies of 90% as indicated by BQD5 after 30 days of feeding the reactor (Figure 1).



**Fig.1** Behavior of BQD5 and protozoa during a 63-days period.

The greater the diversity and number of protozoa (sessile ciliate), the better the removal efficiency (Figure 2). Principal components analysis showed that sessile ciliates have a strong relationship with good efficiencies of organic matter removal. The sessile ciliate genus with more abundant counts were *Zoothamnium*, *Epystilis* and *Opercularia*.



**Fig.2** Behavior in total solids and protozoa number during a 63-days period.

**Conclusions.** Sessile ciliates are indicators of good efficiencies of organic matter removal in a SBR system packed with tezontle volcanic rock.

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