

Evaluation of enzymatic extract with lipase activity of *Yarrowia lipolytica*. An application of data mining for the food industry wastewater treatment

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Abstract

The object of this research was to obtain the Crude Enzymatic Extract (CEE) of *Yarrowia lipolytica* ATCC 9773, in the medium of 30% Water of Sales (SW) applying a biological treatment to three different concentrations yeast inoculum food wastewater, collected from cheese and whey production. It was evaluated the behavior of the inoculum in a suitable medium that stimulates lipids biodegradation. The standard liquid-liquid partition method SM 5520 B was used to quantify fat and oil removal for each concentration of yeast, before treatment and post treatment. The Industrial Fat effluent was characterized by physical chemical patterns, and two treatments were evaluated; Treatment 1 consisted of pH 5.0 and treatment 2 with a pH of 6.5, both with the following characteristics; Concentration of inoculum 8% 12% and 16% at 27 °C temperature and evaluation time 32 h. The best results (2.702 mg/L fat and 83% degradation oil) were found to be pH 5.0, 16% concentration and 27 °C, BOD₅, and COD decreased by 43.07% and 44.35%, respectively during the 32 h; For pH 6.5, 8% concentration at 32 h and at room temperature, degraded 2.177 mg/L fat and oil (67% degradation); The BOD₅, and COD decreased by 37.93% and 39.19%, in the same time span. The treatment at pH 5.0 inoculum concentration of 16% was effective in removing 83% of the volume of fats and oil in the effluent, representing a useful tool for the wastewater treatment.

Keywords:

Biodegradation, Crude enzymatic extract, Lipases, Wastewater treatment, *Yarrowia lipolytica*, Yeast inoculum