



Evaluation of the production of volatile acids in anaerobic fixed bed reactor using synthetic vinasse as substrate

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Abstract

Due to the great concentration of organic matter present in the vinasse, it was processed by means of anaerobic digestion aiming to produce volatile acids

Key words:

Vinasse, volatile acids, anaerobic digestion.

Introduction

Vinasse is generated in the process of distillation of fermented wine to obtain ethanol. This residue is currently used to fertirrigation of crops because of its high content of organic matter and nutrients. However, the uncontrolled practice of this type of fertirrigation causes the salinization of the soil, so it can be harmful to the crop.

Therefore, it is necessary to find an alternative use for this residue in view of that for each liter of ethanol produced, it is generated about ten to fifteen liters of vinasse.

In this project the anaerobic digestion is applied to vinasse using a continuous fixed bed anaerobic reactor with the objective of obtaining volatile acids.

Results and Discussion

The substrate used for this project is the synthetic vinasse with the same composition presented by Santos (2015). The reactor was fed at a constant flow of 187.5 liters per hour. Considering the reactor volume is 1.5 liters, it was obtained a hydraulic detention time of 8 hours.

Analyzing the reactor effluent, it was observed that the concentrations of volatile acids were higher in comparison to the concentrations present in the synthetic vinasse. In particular, productions of lactic acid and butyric acid were the most notable

Image 1. Concentrations in effluent in mg/L.

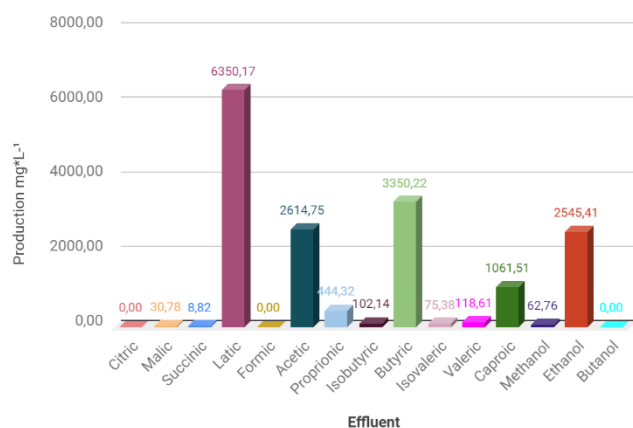


Chart 1. Concentrations of Acids with major concentrations

Concentrations (mg/L)	Affluent	Effluent
Ac. Butyric	746	3350
Ac. Lactic	0	6350
Ac. Acetic	1567	2615

Conclusions

The use of synthetic vinasse in a continuous anaerobic reactor has been proved to be effective for the production of volatile acids, such as lactic acid and butyric acid, and also for the production of alcohols, especially ethanol.

The project has been shown to be effective due to the controlled use of synthetic vinasse as a substrate.

Therefore, it can be modified and adapted to a possible use with real vinasse and an economically viable utilization for this residue.

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SANTOS, G. M. Efeito da vinhaça na produção biológica de álcoois e ácidos orgânicos voláteis por meio de consórcio microbiano. 110p. Dissertação (Mestrado em Engenharia Agrícola) – Universidade Estadual de Campinas, Campinas, 2015.Rocha (2012)