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Acetic acid concentration in vinasse during off-season storage for use in bioprocesses

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Vinasse, a byproduct of ethanol distillation, is produced in large quantities and has a mineral-rich composition, making it a potential raw material for alternative substrates in bioprocesses, as well as offering more sustainable and economically viable ways to manage this byproduct. Since its production is tied to the sugarcane harvest, when considering its application in other bio-industries, it is necessary to consider the storage of vinasse during the off-season, when its supply is reduced. At this time, due to its high organic load, there may be microbial activity that degrades the material, such as acetic acid-producing bacteria, an important limiting factor in processes that utilize microorganisms. Thus, this study aimed to evaluate the formation of acetic acid during a 3-month storage period. To this end, the vinasse, provided by a processing plant located in the interior of the state of São Paulo, was concentrated to 20°Brix and stored for 3 months in 1-L test tubes, in triplicate, under static conditions, with samples collected at the beginning and end of this period for quantification of acetic acid via high-performance liquid chromatography (HPLC). Initially, the sample contained $4.89 \pm 0.36 \text{ g L}^{-1}$ of acetic acid, and after the storage period, its concentration was $4.42 \pm 0.05 \text{ g L}^{-1}$. Thus, it can be observed that, during this period, there was no significant activity of acetic acid-producing microorganisms, potentially due to the pH of 4.19 and the low sugar content in the vinasse, since the acid concentration remained constant, indicating that this organic acid does not limit the storage of vinasse.

KEYWORDS : Organic acids, bioindustry, sugarcane, HPLC, byproduct

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