



INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

"KEY ELEMENTS FOR A SUSTAINABLE WORLD: ENERGY, WATER AND CLIMATE CHANGE"

Modification of the Sour Cassava Starch Production Process to Improve Organic Acids in the Wastewater

V. Reginatto^a, D. Kurtz^b, M. J. A. Marcon^c, J. J. M. Xavier^d, V. M. Scussel^e, E. R. Amante^f

a. Universidade Federal de Santa Catarina, Departamento de Ciência e Tecnologia de Alimentos, Florianópolis, valeria@cca.ufsc.br

b. Universidade Federal de Santa Catarina, Departamento de Ciência e Tecnologia de Alimentos, Florianópolis, diegokurtz@gmail.com

c. Universidade Federal de Santa Catarina, Departamento de Ciência e Tecnologia de Alimentos, Florianópolis, janete@cidasc.sc.gov.br

d. Universidade Federal de Santa Catarina, Departamento de Ciência e Tecnologia de Alimentos, Florianópolis, jjmx@pop.com.br

e. Universidade Federal de Santa Catarina, Departamento de Ciência e Tecnologia de Alimentos, Florianópolis, yildes@cca.ufsc.br

f. Universidade Federal de Santa Catarina, Departamento de Ciência e Tecnologia de Alimentos, Florianópolis, eamante@cca.ufsc.br

Abstract

Sour cassava starch is a very typical Brazilian product used as raw material in bakery products. It is produced by a natural submerge fermentation, with about 20 cm of superficial water, during a period of 45 – 60 days. However its manufacture produces the fermentation wastewater with high organic matter content which is normally discharge in the environment. The chemical composition of this wastewater is not very well known. However, many compounds present in this wastewater could be commercially interesting. In this way could be cited the organic acids formed during the fermentative process. Lactic, acetic and propionic acids have been used in many kinds of industrial activities, mainly in the food and veterinary industries. In the present work, 0.5 % (w/v) of glucose syrup and different concentration of nitrogen, as ammonium chloride, was added in the cassava starch fermentation water. It was observed the effect of such nutrient supplementation on the organic acids production and on the characteristics of the final product, the sour cassava starch. The concentrations of ammonium chloride tested in the fermentation water were: 0.1, 0.25 and 0.5 % (w/v). The process was monitored during 45 days. In the fermentation water were periodically evaluated the pH, the acidity and the organic acids concentration (acetic, lactic and propionic) by high performance liquid chromatography (HPLC). It was verified that the nutritional supplementation, promote an increase on the organic acid concentration, mainly on the propionic one. The better results were obtained by the addition of 0.1% (w/v) of ammonium chloride, increasing about 50% in the organic acids content. On this condition the sour cassava starch maintained its expansion property. This work reveals that the enriched sour cassava starch wastewater could be used as organic acids source.

Keywords: Sour cassava starch, fermentation water, organic acids.

KEY ELEMENTS FOR A SUSTAINABLE WORLD: ENERGY, WATER AND CLIMATE CHANGE

São Paulo – Brazil – May 20th-22nd – 2009