ABSTRACT

Citric acid production by Cane juice and Molasses.

Everton W. D. Younger

Citric acid is a most important food additive to the food industry in the Caribbean and indeed the world. It can be produced by isolating it from fruits which contain it naturally, or, more commonly, by fermentation of molasses, and to a lesser extent sugar cane juice, by strains of *Aspergillus niger*.

The fermentation is usually carried out by the surface fermentation method or the submerged fermentation method. In this project the submerged method was used, along with various additives, in an attempt to produce citric acid using *Aspergillus niger* NRRL 1996 and *Aspergillus niger* NRRL 2354. This method involved the growth of the micro-organism throughout the body of the substrate, the aeration being provided by small air pumps in this experiment. Batches of 250 mLs were used in an attempt to ascertain the appropriate conditions and then 3 litre batches were fermented using *Aspergillus niger* NRRL 2354 which was reputed to be a better citric acid producer than the NRRL 1996 strain.

Attempts were made to extract citric acid crystals from the 3 litre batches with fair degrees of success. The yields however, were quite low. Results obtained indicate that citric acid can definitely be produced and extracted from Trinidadian varieties of molasses and cane juice. Best yields from cane juice were obtained when vegetable oil, and methanol were added. The yield ranged from 16.47 to 16.73% in the case of vegetable (soya bean) oil and 18.33 to 18.67% in the case of methanol. Molasses solutions gave best yields when treated with 30 ppm potassium ferrocyanide. This yield ranged from 8.47 to 8.80%.

Infrared spectroscopy showed that the citric acid extracted was of an acceptable purity after recrystallization.