ABSTRACT

Protein Recovery From Fermented Banana (Musa spp.) Pulp

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Experiments were carried out on an unstrained slurry of fully ripe fermented banana (Musa spp.) pulp of the "Silk fig" variety. The pulp was fermented with active dried commercial Bakers' yeast of *Saccharomyces cerevisiae*.

Yeast cells in the fermented pulp were disrupted mechanically by using a commercial blender with ice cubes as grinding elements and a pressure homogenizer. A sonicator adjusted to an energy output level for disrupting mammalian cells was also used for comparison purposes. Microscopical assessment of cell disintegration yield showed less disruption efficiency for the blender as compared to the pressure homogenizer. Yeast cell disruption was not possible with the sonicator. Protein was extracted with alkali (a 3N NaOH solution) at low temperatures with continuous adjustment of pH and the supernatant containing protein was separated by centrifugation. The protein was precipitated from the alkali extract by acidification with a 3N HCl acid and the precipitate was separated from the mixture by centrifugation.

Analytical methods were conducted to determine protein and nucleic acids concentration, dry matter, ash, fat and carbohydrate content of the protein isolate. In determination of protein concentration the Biuret and Lowry methods were unsuitable due to the presence of interfering compounds derived from the banana pulp. The ultraviolet spectral and the Kjeldahl methods were therefore used throughout the experiment. Maximum protein concentration determined by the two methods was 65.63% (dry wt. basis) and 30.84% for the UV and Kjeldahl methods respectively. The average determined nucleic acid concentration was 0.52% (dry wt. basis) and no micro-organisms were detected. The yield of the process varied depending on the method of cell disruption used, the maximum obtained being 54.56% by pressure homogenization.

The recovered protein was used to fortify a cereal based baked product (biscuits). Protein determination before and after fortification showed an increase in the protein content of the biscuits.

The results obtained revealed that food grade protein can be recovered from ripe fermented banana pulp, further research, however, is required to improve its functionality.