

Amino Acid Profiling and Nucleic Acid Determination of Single Cell Protein

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Abstract: Overripe bananas and plantains - which are rich in carbohydrates - can be utilised in fermentation processes to produce microbial protein. Studies were conducted to determine the protein content, nucleic acid content and essential amino acid profile of the single cell protein (SCP) isolates recovered from the fermented pulps of bananas (Lacatan variety, *Musa acuminata*) and plantains (French variety, *Musa paradisiaca*). A standard buffer system of 65 % of a disodium salt ($\text{Na}_2\text{HPO}_4 \cdot 2\text{H}_2\text{O}$) to 35 % of a monosodium salt ($\text{NaH}_2\text{PO}_4 \cdot 2\text{H}_2\text{O}$) was used in the extraction process and the SCP isolates precipitated using alkaline/acid, salting out and ethanol precipitation. The salting out method of precipitation produced the highest protein content (97.1 %), followed by the alkaline/acid method (26.7 %). The nucleic acid content was highest when the alkaline/acid method of extraction and precipitation was utilised (8.5 %) while the salting out and ethanol precipitation methods produced the lowest (6.0 %). The essential amino acid content of the SCP isolates revealed relatively high levels of lysine in all samples (0.074-1.289 g/100 g of SCP). The samples obtained via alkaline/acid extraction and precipitation produced the highest overall yields (0.113-1.659 g essential amino acid/100 g of SCP). Those obtained via ethanol precipitation on the other hand did not contain valine or methionine.

Keywords: Single cell protein (SCP), nucleic acid and essential amino acids