



## Characterization and Size Distribution of Unripe Banana Flour Starch From the 35 Musa Varieties

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### Abstract

**Introduction:** The ripe dessert banana is consumed as part of the daily diet and nutrient enrichment. Unripe (green) bananas are reported to contain high starch content and low sugar concentrations, ideal for commercialization and increased market share. A common problem confronting banana taxonomists is the presence of numerous cultivars names and synonyms in different languages and dialects of a country or region. This study was done to determine the relationships and differences of starch granule characteristics from the 35 varieties of unripe banana grown in Mpumalanga. To reduce post-harvest losses by increasing product innovation and leading to job creation from banana farming.

**Methodology:** Banana flour was prepared from the pulp of unripe (green) bananas. Where the processing included peeling, dipping in  $\text{Na}_2\text{S}_2\text{O}_5$  solution, slicing, drying, milling, and packaging. The banana flour was stained with iodine solution, observed under a Nikon Eclipse Ni light microscope and the starch granules were measured using NIS elements imaging system. The length and width ( $\mu\text{m}$ ) measurements were made on 100 starch granules per variety, where the geographic mean diameter (GMD), surface area and sphericity were then determined.

**Results and Discussion:** The 35 varieties of banana starch exhibited irregular shaped elongated ovals with ridges and spheroid shaped granules. The starch granule average size (Ferret's diameter) ranged from 34.92 - 54.12  $\mu\text{m}$ , and the width ranged from 23.04 – 35.95  $\mu\text{m}$  for the 35 varieties of banana flour. The GMD ranged from 22.06 - 38.61  $\mu\text{m}$  and the sphericity was from 0.68 - 0.81. While the surface area ranged from 1894 – 5865  $\mu\text{m}^2$ . The different measurements were effective in establishing the similarities and differences amongst certain varieties. This may demonstrate that the banana flour could be useful in determining its influence on the genetic variety for their potential utilization and product development.

**Conclusion:** The different varieties in granule sizes observed were essential in understanding which methods can be further adopted for industrial applications. Where the smaller granules are said to be more digestible and large granules were discovered to develop a high paste viscosity in food.

**Biography:** Kayise Maseko

Kayise Maseko is currently registered for her MTech at Tshwane University of Technology, Arcadia Campus. Currently completing her research at Agricultural Research Council - ITSC Nelspruit, where she can source the bananas from the gene bank.