

## Development and Characterization of a Cinnamon-based Cereal Using Low-Pressure Cold Extrusion for Hyperglycemia Management

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Diabetes mellitus is a chronic disorder with increasing prevalence worldwide. The use of bioactive compounds from medicinal plants with antidiabetic activity is becoming more popular because of the adverse effects of synthetic medications for diabetes. Therefore, dietary supplements containing biologically active ingredients are being explored for their potential to control hyperglycemia in diabetic patients. Sri Wijaya accession of *Cinnamomum zeylanicum* has demonstrated significant anti-diabetic effects. Previous studies have shown that pressurized water extraction of cinnamon quills yields a higher concentration of bioactive compounds. This study aimed to develop and characterize a cinnamon-based cereal using cold extrusion, incorporating medium pressurized water extract of cinnamon (0.103 MPa, 121°C, 100 mL for 20 minutes), finger millet powder and coconut flour, to manage hyperglycemia. The cereal was prepared using a ratio of 9:5:1 (finger millet powder: cinnamon extract: coconut flour) determined through a trial-and-error method. Proximate chemical analysis was performed on raw materials to assess their nutritional composition. The anti-diabetic properties of the cereal product were evaluated through *in-vitro* alpha-amylase and alpha-glucosidase inhibition assays. The IC<sub>50</sub> value of the cereal product for the alpha-amylase inhibition assay was 128.70 ± 0.46 µg/mL and the positive control, Acarbose gave an IC<sub>50</sub> of 44.58 ± 0.01 µg/mL. In the alpha-glucosidase inhibition assay, the IC<sub>50</sub> value of the cereal product was 118.0 ± 0.06 µg/mL, while Acarbose exhibited an IC<sub>50</sub> of 87.06 ± 0.01 µg/mL. The results suggest that the developed finger millet-based cereal has potential as a dietary supplement for managing hyperglycemia, leveraging the antidiabetic properties of cinnamon extract.

**Keywords:** *cereal, cinnamon, coconut flour, cold extrusion, finger millet, hyperglycemia*