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## ANTI- $\alpha$ -AMYLASE, ANTI- $\alpha$ -GLUCOSIDASE, ANTIGLYCATION AND GLYCATION REVERSING POTENTIAL OF SRI LANKAN FINGER MILLET (*Eleusine coracana*) VARIETIES

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### ABSTRACT

Finger millet has been known as a therapeutic food for diabetes mellitus since ancient times. However, there is a lack of scientific evidences on antidiabetic potential of finger millet varieties (FMV) which are commonly cultivated and consumed in Sri Lanka. The objective of this study was to evaluate anti- $\alpha$ -amylase, anti- $\alpha$ -glucosidase, antiglycation and glycation reversing properties of locally grown FMV. Flours of whole grains of Sri Lankan FMV, Ravi, Rawana and Oshadha, were extracted with ethanol and methanol separately and abilities of the extracts to inhibit the catalytic actions of  $\alpha$ -amylase and  $\alpha$ -glucosidase enzymes as well as inhibit and reverse the protein glycation process were evaluated. Data of each experiment were statistically analysed. All extracts showed dose dependent anti- $\alpha$ -amylase, anti- $\alpha$ -glucosidase, antiglycation and glycation reversing activities. Among the three varieties, Oshadha showed the highest anti- $\alpha$ -amylase activity and Ravi showed the highest anti- $\alpha$ -glucosidase activity. Among the six extracts, ethanolic extract of Oshadha indicated the highest anti- $\alpha$ -amylase activity (IC<sub>50</sub> value:  $1.62 \pm 0.04$  mg/ml) and methanolic extract of Ravi indicated the highest anti- $\alpha$ -glucosidase activity (IC<sub>50</sub> value:  $47.96 \pm 0.79$   $\mu$ g/ml). However, all extracts showed significantly low ( $p < 0.05$ ) anti- $\alpha$ -amylase and anti- $\alpha$ -glucosidase activities when compared to the standard, Acarbose. Among the varieties, Oshadha showed the highest antiglycation and glycation reversing activities. Among the six extracts, methanolic extract of Oshadha indicated the highest antiglycation (IC<sub>50</sub> value:  $79.42 \pm 4.46$   $\mu$ g/ml) and glycation reversing (EC<sub>50</sub> value:  $411.76 \pm 5.91$   $\mu$ g/ml) activities. However, all extracts showed significantly low ( $p < 0.05$ ) antiglycation activity when compared to the standard, Rutin. The correlations between total phenolic contents and IC<sub>50</sub> values indicated the involvement of phenolic compounds, which are present in finger millet extracts, in inhibiting the catalytic actions of  $\alpha$ -amylase and  $\alpha$ -glucosidase enzymes as well as formation of advanced glycation end products (AGEs) and reversing the already formed AGEs.

**Keywords:**  $\alpha$ -Amylase, Diabetes mellitus, Finger millet,  $\alpha$ -Glucosidase, Glycation

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