OP 10

Effect of Metal Ions and Detergents on *In vitro* Protease Inhibitory Activity of Black Gram Cultivated in Sri Lanka

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Background: Black gram or Undu (*Vigna mungo*) is a commonly consumed pulse in Sri Lanka which exhibited high protease inhibitory activity.

Objectives: To assess the effect of metal ions and detergents on the activity of protease inhibitors present in back gram cultivated in Sri Lanka.

Methods: Whole seed samples of the local cultivar, Anuradha which is bred in Sri Lanka were collected from Field Crops Research and Development Institute at Mahailluppallama. The crude protein extract of the seed sample (20%) was prepared using distilled water and subjected to trypsin inhibitory assay using Hammerstein casein as the substrate. Three different metal ions (1 mM) and four detergents (1% w/v) were added to separate portions of the crude protein extract and after 30 minutes, trypsin inhibitor activity (TIA) of each sample was measured.

Results: The TIA of 20% black gram extract was 73.21±0.29%. The TIA of the samples mixed with ferric chloride, mercuric chloride and barium chloride were 67.77±0.8%, 62.99±0.89% and 72.58±0.97%, respectively. The TIA of the samples treated with detergents, Triton X100, Tween-80, Tween-20 and sodium dodecyl sulphate (SDS) were 65.14±0.95%, 66.24±0.30%, 70.50±0.88% and 74.10±0.22%, respectively. Of the metal ions, ferric chloride and mercuric chloride showed a considerable reduction in the inhibitory activity, while barium chloride did not exert a considerable impact. Among the detergents added, Triton X100, Tween-80 and Tween-20 exerted a decline in the activity of trypsin inhibitors, while SDS indicated a slight increase in the inhibitory activity.

Conclusions: The result of the current study revealed that that ferric chloride, mercuric chloride, Triton X100, Tween-80 and Tween-20 exert a negative effect on the activity of protease inhibitors present in black grams cultivated in Sri Lanka.

Keywords: *Black gram, Detergents, Metal ions, Protease inhibitory activity*