Section D

401/D

Methylglyoxal mediated protein glycation inhibitory activity of Ceylon cinnamon (*Cinnamomumzeylanicum* Blume)

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In living organisms, proteins are susceptible to modification by glucose and other reducing sugars through a process of non-enzymatic glycation. It is a series of complex reactions and finally produces Advanced Glycation End products (AGEs). Accumulation of AGEs in the body contributes to pathogenesis of diabetes complications and very few AGEs which play important roles in developing diabetes complications have been characterized to date. One of these is methylglyoxal which is a highly reactive dicarbonyl compound. Therefore, the discovery of inhibitorswhich can trap or inhibit the methylglyoxal induced AGE formation would offer a potential therapeutic approach for the prevention of diabetes complications. Ceylon cinnamon (CC) (*Cinnamomumzeylanicum* Blume) known as 'true cinnamon' in the world is used as a spice in Sri Lanka for centuries. Although many biological activities have been reported worldwide, methylglyoxal mediated protein glycation inhibitory activity of CC is not investigated to date. The present study evaluates themethylglyoxal mediated protein glycation inhibitory activity of bark and leaf of CC.

Freeze dried ethanolic and dichloromethane: methanol (DCM:M) bark and leaf extracts of CC were used in this study. Methylglyoxal mediated protein glycation inhibitory activity was evaluated using *in vitro* Methylglyoxal/Bovine serum albumin assay (MGO/BSA assay) with some modifications (rutin, ethanolic and DCM:M bark & leaf extracts, n = 6). Both bark and leaf of CC showed dose dependent and moderate methylglyoxal mediated protein glycation inhibitory activity compared to the standard drug rutin ($p < 0.05$). The IC_{50} values of ethanol bark, DCM:M bark, ethanol leaf, DCM:M leaf and rutin were 392.59 ± 20.88, 357.38 ± 3.08, 349.28 ± 8.21, 278.29 ± 8.55 and 63.35 ± 0.29 µg/ml respectively. However, methylglyoxal mediated protein glycation inhibitory activity among bark extracts and leaf extracts were statistically significant ($p < 0.05$). Further, among the studied extracts DCM:M leaf showed the highest activity whereas ethanol bark had the lowest activity. This is the first study to report the methylglyoxal mediated protein glycation inhibitory activity of bark and leaf of CC worldwide. The findings of this study indicate the potential of using Ceylon cinnamon bark and leaf in the management of diabetes and related complications.

Keywords: Ceylon cinnamon, anti-glycation, bark and leaf extracts

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