In vitro antiglycation and protein cross-link breakage effects of *Murraya koenigii* leaf extracts and their phytochemical composition

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*Murraya koenigii* (curry leaf) is a well-known spice and herb with several pharmacological benefits. Information regarding its ability to break cross-links formed between advanced glycation end products (AGEs) or prevent formation of advanced glycation end-products are limited. These AGEs are linked to vascular complications of diabetes and other age-related diseases.

Mixture of glucose and bovine serum albumin (BSA) were incubated with and without plant extracts (*Murraya koenigii* leaf n-hexane, ethyl acetate, methanol and water) or control (aminoguanidine) at 37°C for 40 days. AGEs inhibition and protein cross-link breakage effects of *Murraya koenigii* (*M. koenigii*) were assessed using enzyme-linked immunosorbent assay (ELISA) and spectrofluorometry. Their phytochemical compositions were determined using gas chromatography mass spectrometry (GC-MS) and standard chemical tests. Cell viability test of the leaf extracts were investigated using H-4-II-E liver cells.

All *M. koenigii* leaf extracts significantly inhibited the formation of BSA-glucose derived total immunogenic AGEs (TIAGEs) than aminoguanidine used as positive control (p < 0.0001). Methanol and water extracts of the plant showed significantly higher antiglycation effect (p < 0.001) against carboxymethyl lysine formation than the control, aminoguanidine. Of the extracts, the highest anti-glycation effect against fluorescent AGEs was demonstrated by the methanol extract. Only the n-hexane, ethyl acetate and water extracts showed cross-link breakage ability. Methanol leaf extract of *M. koenigii* displayed 100% cell viability for concentrations ranging from 7.8 – 1000 μg/mL.

The results of the study suggest that *Murraya koenigii* leaf extracts have both antiglycative and protein cross-link breakage effects. Phytochemical screening of the extracts gave an indication of secondary metabolites and compounds which may be responsible for the observed effects. Demonstration of the anti-glycation and AGEs-protein cross-link breaking effects of these extracts may lead to the identification and isolation of novel antiglycation phytochemicals and eventual new drug discovery and synthesis.

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