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ANALYSIS OF PROTEIN GLYCATION INHIBITORY POTENTIAL OF SOME PLANTS WITH HYPOGLYCAEMIC EFFECTS USING A NOVEL METHOD

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Protein glycation proceeds to the formation of advance glycation end products (AGEs). Elevation of AGE levels in the body is a major cause of chronic diabetic complications. Medicinal plants are being used to treat diabetes from ancient times with little or no known side effects. However, their protein glycation inhibitory potential which is beneficial to prevent or delay complications due to diabetes has not been studied. The objective of this study was to evaluate the protein glycation inhibitory potential of ten medicinal plants among which nine are well known for their hypoglycaemic effects.

Parts from ten plants were collected. They were *Coccinia grandis* ('Kowakka'), *Ficus racemosa* ('Attikka'), *Gymnema lactiferum* ('Kurinnan'), *Gymnema sylvestre* ('Masbedda'), *Musa paradisiaca* ('Alu kesel'), *Phyllanthus emblica* ('Nelli'), *Phyllanthus debilis* ('Pitawakka'), *Pterocarpus marsupium* ('Gammalu'), *Strychnos potatorum* ('Ingini') and *Tinospara cordifolia* ('Rasakinda'). Plants were authenticated and methanol extracts were prepared. Glycation inhibitory potential of the extracts was analyzed. Briefly, bovine serum albumin (BSA) was incubated with fructose in the presence of plant extracts at 37°C (pH 7.4) for 4 weeks. A BSA and fructose mixture in the absence of plant extract was used as a positive control. Corresponding test blanks were prepared in the absence of sugar. Standard inhibitor aminoguanidine (AG) was included. Aliquots were collected at intervals for further analysis. A novel native polyacrylamide gel electrophoresis (PAGE) method established by us was used to detect the effect of plant extracts on the BSA glycation.

Results revealed that, with different concentrations of plant extracts used (50 µg, 0.5, 2 and 5 mg/ ml), the most promising antiglycation effects were observed with *P. emblica* fruit, *P. debilis* (whole plant) and *P. marsupium* latex. *F. racemosa* (stem bark) showed the highest inhibition among the remaining extracts. *T. cordifolia* (leaf), *G. sylvestre* (leaf) and *M. paradisiaca* (yam) also showed promising inhibition. Inhibition with *C. grandis* (leaf) and *S. potatorum* (seed) was comparatively low. Lowest inhibition was observed with *G. lactiferum* (leaf).

All plants tested, other than *G. lactiferum* are being used to treat diabetes since ancient times and their hypoglycaemic properties have been proven experimentally. We were able to demonstrate the antiglycation potential of the plants tested, identifying an additional beneficial effect which is the potential to prevent or delay chronic diabetic complications. In conclusion, we have demonstrated the antiglycation potential of some medicinal plants with known hypoglycemic effects, using a novel method. Extracts of *P. emblica*, *P. debilis and P. marsupium* showed the highest protein glycation inhibitory potential.

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