Inhibitory Effects of *Andrographis paniculata* Water Extracts against Glycation-Induced Cross-Linking

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Diabetes mellitus is a metabolic disorder that causes an increase in blood glucose level, which can lead to the acceleration of glycation-induced protein cross-linking and associated complications. It has been a major health issue worldwide affecting over 400 million people. In Sri Lanka, one in twelve adults suffers from diabetes. Past studies have shown that Ayurvedic medicine can be used for the treatment of diabetes. A study was designed to investigate the anti-glycation effects of water extracts of *Andrographis paniculata* (AP). Sonicated (APS) and boiled (APB) samples of AP leaves were prepared by sonicating for 1 hr and boiling for 1 hr respectively. Extracts at concentrations of 0.02%, 0.1% and 0.2% (w/v) were incubated with lysozyme and fructose at 37°C and pH 7.4 for 7 days. Incubation was also done with standard glycation inhibitor aminoguanidine (AG) as a positive control and other controls in replace of extracts. After 7 days, products of protein cross-linking in the incubation mixtures were detected using Sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE). High molecular weight products representing dimer, trimer, and tetramer were observed in the negative control containing fructose but no AG and extract, indicating the occurrence of protein cross-linking. Such products were not observed in the positive control (AG), confirming the inhibition of glycation. Similarly, APS and APB showed dose-dependent inhibition of protein cross-linking at all three concentrations, with a complete protein cross-linking inhibition observed at a concentration of 0.2%. Despite being to a slightly lesser degree than APS, the presence of glycation inhibition in APB indicates good thermal stability of AP. In conclusion, AP water extracts can be used to prevent diabetic complications and due to its thermal stability, can be used as a home remedy.

Keywords: Glycation, Cross-linking, Antidiabetic, *Andrographis paniculata*