

The Anti-Glycation Effect of Sclerocarya birrea Stem-Bark Extracts and Their Ability to Break Existing Advanced Glycation End-Products Protein Cross-Links

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Abstract : Advanced glycation end-products (AGEs) have been implicated in the development and progression of vascular complications of diabetes mellitus and other age-related disease such as Alzheimer's disease, heart diseases, stroke and limb amputation. The aim of the study was to determine the anti-glycation activity and AGE-cross-linking breaking ability of Sclerocarya birrea stem-bark extracts (SBSBETs). Hexane, ethyl acetate, methanol and water extracts of Sclerocarya birrea stem-bark and standard inhibitor, aminoguanidine (AG) were incubated with bovine serum albumin (BSA)-fructose mixture for 20 and 40 days. The amounts of total immunogenic AGEs (TIAGEs), fluorescent AGEs (FAGEs) and carboxymethyl lysine (CML) formed were determined and the percentage anti-glycation activity of each plant extract calculated. The ability of SBSBETs to break fructose-derived BSA-AGE-collagen cross-links was also investigated. All SBSBETs under investigation demonstrated less anti-glycation activity against TIAGE, FAGEs and CML than AG after 20 days incubation. After 40 days incubation, ethyl acetate, methanol and water SBSBETs demonstrated lower anti-glycation activity against TIAGEs than AG but exerted higher anti-glycation activity than AG against FAGEs. All SBSBETs except water demonstrated lower anti-glycation activity than AG against CML. With regard to the ability of SBSBETs to breakdown fructose-derived AGEs cross-links, the polar SBSBETs demonstrated higher ability to break AGE-cross-links than the non-polar ones. The results of this study may lead to the isolation of bio-active phyto-chemicals from SBSBETs that may be used for the prevention of vascular complication of diabetes.

Keywords : advanced glycation end-products, anti-glycation, cross-link breaking, Sclerocarya birrea

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