

Effect of Madecassoside on the Antioxidant Status of Streptozotocin-Nicotinamide Induced Diabetes in Sprague-Dawley Rats

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Abstract : Diabetes Mellitus (DM) is one of the most common non-communicable diseases globally. Although significant advances have led to better understanding of the condition and the development of effective therapies and preventive strategies, the pathway to cure remains elusive and DM prevails as a serious medical challenge in the 21st century. Oxidative stress has been suggested to contribute to the progression and pathophysiological conditions of diabetes. Madecassoside (MA) a major pentacyclic triterpenoid, has been demonstrated to possess various biological activities. However, no attempt has been made to study the antioxidant activity in diabetic rats. Therefore, the present study is aimed to evaluate the antioxidant effect of MA on streptozotocin-nicotinamide induced type-2 diabetes in Sprague-Dawley rats. The study protocol was approved by the institutional ethical committee prior to the conduct of research. Adult male Sprague-Dawley rats weighing 250-300 g were used in the study. The animals were rendered diabetic with a single intraperitoneal dose of streptozotocin (65 mg/kg) and nicotinamide (110 mg/kg). The diabetic animals after a stabilisation period of 14 days received various treatments (Madecassoside 50 mg/kg; Glimpiride 2.5 mg/kg) suspended in 0.5% carboxymethyl cellulose orally, for a period of 28 days. The animals fasted overnight after the last treatment were sacrificed and the pancreas, liver and kidneys were isolated. The weighted quantity of the samples of various treatments were homogenised in ice-cold condition and were subjected to lipid peroxidation, catalase and superoxide dismutase assay. The data's obtained were subjected to statistical analysis. Diabetic rats showed significant increase in lipid peroxidation and decrease in enzymatic antioxidant levels. All the treated groups had significantly higher SOD, CAT and reduced LPO activity in the pancreas, liver and kidney. Results suggest madecassoside to have potential antioxidant effect against the diabetic model. However further investigations are necessary to study the mechanism at the cellular level.

Keywords : antioxidant, diabetes, madecassoside, nicotinamide, streptozotocin

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