

Plausible Influence of Hydroxycitric Acid and Garcinol in *Garcinia indica* Fruit Extract in High Fat Diet Induced Type 2 Diabetes Mellitus

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Abstract : *Garcinia indica* (G. indica) fruit rind extract commonly used in South Indian culinary and Indian System of medicines is reported to exhibit various biological activities. The present study envisages the influence of the phytoconstituents in G. indica extract (Vrikshamla capsules- a herbal supplement) on diabetic condition. The condition of type 2 diabetes was triggered in experimental animals by feeding high fat diet for 8 weeks followed by a sub-diabetogenic dose of 35mg/kg bw of streptozotocin intraperitoneally. Oral supplementation of the extract at two doses (100 and 200 mg/kg body weight) for 14 days reduced hyperglycemia, hypercholesterolemia and dyslipidemia ($p < 0.001$). Pathophysiological changes of obesity and diabetes associated complications majorly mediated by oxidative stress were analyzed by measuring the markers of oxidative stress such as lipid peroxidation, enzymatic (SOD, Catalase, GPx) and non-enzymatic markers (GSH). Conspicuous changes markers were noticed in diabetic condition which was reverted by the G. indica extract. Screening the extract by AccuTOF-DART (MS) revealed the presence of hydroxycitric acid and garcinol in abundant quantity which probably has influenced the biological activity. This was also corroborated through docking studies of hydroxycitric acid and garcinol both individually and synergistically with the antioxidant proteins. Altogether, hydroxycitric acid and garcinol present in G. indica fruit extract alleviates the pathophysiological conditions such as hyperglycemia, dyslipidemia, insulin resistance and oxidative stress mediated by diabetes.

Keywords : antioxidants , diabetes, hydroxycitric acid, garcinol, *Garcinia indica*, streptozotocin

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