
Title : Effect of Natural extracts against Diabetes mellitus - A Life Style Disorder**Author(s) :** Dr. Rupali Sengupta and Dr. A.M Bhagwat**Institution :** Dr BMN College of Home Science, 338 R.A. Kidwai Road , Matunga, Mumbai 400019, India.

Introduction:

The present work was undertaken to evaluate the antihyperglycemic potential of plant extracts of *Psidium guajava*, *Syzygium cumini*, *Albizia lebbek*, *Piper betel* and *Trigonella foenum-graecum* on alloxan induced hyperglycemic mice and on the antidiabetic activity in streptozotocin induced diabetic mouse model. The study was extended to assess the liver and muscle glycogen content along with the level of cMDH (Cytosolic Malate Dehydrogenase Enzyme) activity in both alloxan and streptozotocin models of mice. In addition, a comparison between the effect of the leaf extract of *P.guajava* with that of standard drug, Rosiglitazone, on glucose levels in normal glucose loaded mice was also attempted and their mechanism of action was studied by comparing with the standard drug, Rosiglitazone.

Methodology:

Based on information sourced from ethnobotanical studies undertaken by earlier workers, five plants were selected for the present study, namely, *P.guajava*, *S.cumini*, *A.lebbeck*, *P.betel* and *T. foenum-graecum*. Screening of the plants for their phytochemical constituents revealed the presence of alkaloids, flavonoids, tannins, saponins, cardiac glycosides and carotene as the principal biomolecules responsible for their antidiabetic effect. When the plant extracts were tested for their stability it was observed that the extracts remain stable over a period of six months.

Using the Swiss albino glucose loaded mice model, a glucose tolerance test was conducted wherein the effect of the leaf extracts of the five noted plant species was studied over a period of 40 minutes. This study established the antidiabetic potential of these leaf extracts. Among the five leaf extracts the best results were obtained with the leaf extracts of *P.guajava*, *A.lebbeck* and *T. foenum-graecum*.

The main work was on the Extraction of all drugs, Biochemical analysis, Physiology of drugs, Enzymatic studies, Phytochemistry, Mode of Action of alloxan & streptozotocin which is used to induce diabetes and also on standard drug, Rosiglitazone and to check the stability of drugs using UV spectrophotometer, Infrspectrophotometry, Qualitative Test of the drugs taken for studies.

Results and Conclusion:

The antihyperglycemic effects of plant extracts on alloxan treated hyperglycaemic mice was *P.guajava* > *A.lebbeck* > *T.foenum graecum* at 240 minutes in response to a dose of 250 mg/kg b. wt. When the above plant extracts were further assessed for antidiabetic activity in the streptozotocin diabetic mice, the results obtained were opposite, thus *T.foenum-graecum* > *A.lebbeck* > *P.guajava* was the order of effectiveness in streptozotocin induced diabetic mice.

The glycogen content and cMDH levels in the liver and muscles were simultaneously studied after administration of the herbal drug dose. There was a marked increase in the glycogen levels and cMDH activity in both the liver and the muscle tissues thereby indicating that the plant extracts were efficient in mobilising the glucose in to the tissues, probably due to the activation of the glucose channel of the plasma membrane.

A comparison of efficacy of the leaf extract of *P.guajava* and Rosiglitazone, a PPAR γ agonist, indicated a parallel mode of functioning. This suggests that the leaf extract of *P.guajava* extract may be functioning as a ligand, like Rosiglitazone, to activate the PPAR γ in hyperglycaemic and diabetic mice model, which in turn, improves the insulin sensitivity.