

An executive summary of the final report of work done on the Minor Research Project of Mr. Santhosh Wilson Goveas entitled **“EVALUATION OF ANTI-DIABETIC ACTIVITY OF THE STEM EXTRACTS OF *COSCINIUM FENESTRATUM*”**, sanctioned by UGC, vide sanction letter No. **MRP(S)-0118/12-13/KAMA002/UGC-SWRO** Dated **28.5.2013**

The project work was carried out to investigate the effect of the stem extract of the plant *Cosciniun fenestratum* on the streptozotocin induced rats which were the model for type I diabetes. The methanolic plant extract was subjected for phytochemical screening and TLC to confirm the presence of berberine.

The experimental rats were categorised into 5 different groups and maintained for 21 days with its respective treatments and the blood glucose and the body weight were monitored. The oral glucose tolerance test was carried out to determine the hypoglycemic effect of the plant extract.

The rats were sacrificed on the 21st day and the serum and organs were collected and stored for further use. The diaphragm was aseptically isolated and subjected to *in vitro* peripheral glucose uptake studies. The serum was subjected to various biochemical test such as test for SGOT, SGPT, Total Cholesterol and Triglycerides. The pancreatic tissue sections were subject to histological staining using Hematoxylin-eosin staining procedure.

The oral glucose tolerance test showed hypoglycemic effect of the plant extract on the rats, this was further confirmed by the glucose uptake studies. The results from the tests on the biochemical parameters showed that the extract does not effect the body metabolism, inturn showed a positive effect on treated rats when compared to the diabetic rats. The histological studies show that there is pancreatic regeneration in diabetic rats treated with stem extracts. Management of diabetes with the agents devoid of any side effects is still a challenge to the medical system. This concern has led to an increase and demand for natural products with antihyperglycaemic activity having fewer side effects. Indian traditional medicine is one of the richest medicinal systems among those available around the world.

Plants may act on blood glucose through different mechanisms, some of them may have insulin-like substances, stimulation of β -cells to produce more insulin and others may increase β -cells

in the pancreas by activating regeneration of pancreatic cells . The fiber of plants may also interfere with carbohydrate absorption; thereby affecting blood glucose.

Berberine may act as an alphaglucosidase inhibitor, which is its main mechanism in diabetes treatment. The inhibitory effect of berberine on diabetes might be associated with its hypoglycemic effect, modulating lipids metabolic effects and its ability to scavenge free radical . However, the hypoglycemic effect could also be due to inhibition of intestinal glucose absorption or stimulation of peripheral glucose uptake.

The observed elevation in transaminase activity (SGOT and SGPT) in liver and kidney in diabetic rats. Increased gluconeogenesis and ketogenesis can be observed in diabetes and may be due to the high level in the activities of these transaminases.

The stem extract treatment showed signs of regeneration in damaged pancreatic islets. Berberine was known to restore the damage of pancreatic tissues in rats with diabetes mellitus.