INTRODUCTION
Diabetes mellitus (DM) is a metabolic disorder characterized by hyperglycemia arising as a consequence of a relative or absolute deficiency of insulin secretion, resistance to insulin action or both. This is a major and growing public health problem throughout the world and India leads the world with largest number of diabetic subjects thus earning the dubious distinction of being termed the “Diabetes Capital of the World”. The basis of abnormalities in carbohydrate, fat and protein metabolism in diabetes is deficient action of insulin on its target tissues, resulting from inadequate insulin secretion and/or diminished tissue responses to insulin at one or more points in the complex pathways of hormone action. Although the prevalence of diabetes is consistently increasing, an effective treatment is still lacking. Current pharmacotherapeutics insufficiently reverse hyperglycemia, have limited tolerability, and induce side effects. Hence the identification of new pharmacological approaches to effectively prevent, treat and cure this metabolic disorder is of crucial importance.

Barleria montana, (Synonym Barleria purpurea) commonly known as “Mountain barleria” is one of the species in the genus Barleria belonging to the family Acanthaceae (Ruellia family). Mountain barleria is an erect herb found in the mountains of Western Ghats. Traditionally it has been used for centuries for treating wounds, diabetes and for its hepatoprotective activity.

Barleria cristata, commonly known as “Crested purple Nail dye” is also one among the genus Barleria belonging to the family Acanthaceae, is an attractive plant with blue flowers commonly grown on forest grounds of Tikauli (Nepal) and Tirupati hills (Andhra Pradesh). Traditionally, the decoction of roots is been used for years for treating inflammation, cough, diabetes and in conditions of anaemia. The whole plant is been used as a stimulant and demulcent.

In experimental diabetes, enzymes of glucose metabolism are markedly altered and produce hyperglycaemia, which leads to pathogenesis of diabetic complications. There is an urgent need to identify indigenous natural resources in order to procure them.

However, to our knowledge, there are no available reports on the antidiabetic effects of these plants. Hence, the present study was carried out to determine the anti-hyperglycaemic potentials of methanolic extracts of BM and BC plants.

MATERIALS AND METHOD
The first step in standardization of herbal drugs is the correct identification of plants. The plants were authenticated by Dr. Madhavachetty, Prof of Botany, Tirupati, Andhra Pradesh. Voucher specimens have been deposited at the laboratory for future reference.

Preparation Of Plant Extract
Fresh leaves of BM were collected, washed under running tap water and blotted dry for further study. The leaves were air dried, ground into coarse powder, defatted with petroleum ether, extracted with methanol and evaporated to dryness and then subjected for the antidiabetic activity.

Fresh roots of BC were collected, washed to remove the sand and adhering impurities. The roots were dried in shade, ground into coarse powder, defatted with petroleum ether, extracted with methanol and evaporated to dryness and then subjected for the antidiabetic activity.

Animals Used
Male Albino Wistar rats weighing 200-300 g each were used. Animals maintained under standard environmental conditions (approved by Animal Ethical Committee, RGUIHS University, Bangalore, India), were fed with a standard diet (Hindustan Lever, Mumbai, India) and water ad libitum. The animals were acclimatized to laboratory condition for one week prior to the experiment. The animals were fasted for 16 h before experimentation but were allowed for free access to water.

Induction Of Diabetes In Rats
The animals were injected by STZ at the dose of 60 mg/kg b.w. i.p. STZ induces diabetes within 3 days by destroying the beta cells of pancreas. After 3 days, fasting blood glucose...
levels (FBG) were measured and the animals showing blood glucose level more than 180 mg/dl were used for the study.

**Treatment Schedule**

The rats were divided into seven groups of 6 rats each \( n = 6 \). Except for group I, which served as normal non diabetic control, all other groups were comprised of diabetic rats. Group II served as diabetic (STZ) control, Group III received the reference drug glipizide \((20 \text{ mg/kg b.w. p.o.})\), Groups IV and V received BM \((250 \text{mg/kg and 500mg/kg b.w. p.o.})\) respectively and group VI and VII received BC \((250 \text{mg/kg and 500mg/kg b.w. p.o.})\) daily for 12 days.

**Estimation Of Fasting Blood Glucose (FBG) Level**

The effect of methanolic extract of BM and BC on blood weight and on blood glucose levels of normal and STZ-diabetic rats were observed. FBG was measured before STZ treatment and on days 0, 5 and 12 by using a one touch glucometer (Accucheck). After 24h of the last dose, blood was collected from overnight fasted rats from each group. Then the rats were sacrificed and their pancreas were studied for histopathological changes.

**RESULTS AND DISCUSSION**

The methanolic extract of BM\((250 \text{ and 500mg/kg b.w})\) induced a significant reduction of 185.21 & 161.64 and the methanolic extract of BC \((250 \text{ and 500mg/kg b.w})\) induced a significant reduction of 183.23 and 152.22 respectively in serum glucose levels in diabetic rats, on 5th day of administration. After 12 days treatment, glucose levels of BM \((250 \text{ and 500mg/kg b.w})\) treated animals was 156.4 and 115.6 and methanolic extract of BC \((250 \text{ and 500mg/kg b.w})\) treated animals showed 142.50 and 107.91 respectively which were quiet similar to those of normal controls \((95.58)\). The graphical representation of these results are shown in Fig VIII.

Body weight of the animals in all groups was recorded on 0 day and 12th day. Normal control group was found to be stable in their body weight but all the other group rats showed significant reduction in body weight. STZ induced reduction in body weight was significantly reversed in BM\(500\text{mg/kg}) and BC treated \((500\text{mg/kg})\) and standard treated groups. These results are shown in Table.1 and the histopathological observation of pancreas of the various groups of animals is shown in Figure I-VII.
DISCUSSION
The fundamental mechanism underlying hyperglycemia involves over-production (excessive hepatic glycogenolysis and gluconeogenesis) and decreased utilization of glucose by the tissues. Persistent hyperglycemia, the common characteristic feature of diabetes can cause most of the diabetic complications. In all the patients, treatment should aim to lower the blood glucose to near-normal levels. In our investigation, Glibipide is the standard antidiabetic drug used for the study. Glibipide is an oral rapid, short acting antidiabetic drug from the second generation sulfonylurea class. It undergoes enterohepatic circulation, having more potent and shorter half-lives than the first generation sulfonylureas. Its action is produced by blocking potassium channels in the beta cells of the islet of langerhans. By partially blocking the potassium channels, the cell remains depolarized, increasing the time, the cell spends in the calcium release stage of cell, which results in signalling leading to calcium influx. The increase in calcium will initiate more insulin release from each beta cell. Sulfonylureas may also cause the decrease of serum glucagon and potentiate the action of insulin at the extrapancreatic tissues. The present investigation discusses about the hypoglycaemic and antidiabetic effects of methanolic extract of Barleria montana leaves and Barleria cristata roots on normal and streptozotocin-induced diabetic rats. The results of the study have shown that the methanolic extract of BM leaves at a dose of 500mg/kg body weight and methanolic extract of BC roots at a dose of 250 and 500mg/kg body weight has a marked hypoglycaemic activity by lowering the blood glucose levels. The results of the study have shown a significant (P<0.001) difference between the initial and final fasting plasma glucose levels of methanolic extract of BM leaves and BC roots and were comparable with that of the standard drug glipizide (Table 1).

In conclusion, it can be stated that the methanolic extract of Barleria montana leaves (500mg/kg b.w) and Barleria cristata roots (250mg and 500mg/kg b.w) has beneficial effects, in reducing the elevated blood glucose level and the body weight of STZ induced diabetic rats but no effect on normal rats. Thus, justifying the claim made by Ayurvedic classics.

ACKNOWLEDGEMENTS
The authors sincerely thank the management and Dr.V.Murugan, Principal, Dayananda Sagar College of Pharmacy for providing the necessary facilities for this work.

REFERENCES
4. Annie Shirwaikar K, Rajendra I.S.R, Punitha. Antidiabetic activity of alcoholic stem extract of Coccinum fenestratum in streptozotocin-


Source of support: Nil, Conflict of interest: None Declared