

Antidiabetic Potential of Some Indian Medicinal Plants on Albino Rats

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Abstract: The Study was carried out to Evaluation of antidiabetic activity of some folklore ethnomedicinal plants on female Albino Rats. Ethnomedicinal field work was carried out in tribal hamlets, forest areas and different villages of Melghat region of Amravati district of Maharashtra, India. Ethanomedicinal plants was identified and authenticated by botanist Taxonomy experts. The rats were observed continuously for 2 hrs. For behavioral, neurological and autonomic profile and for next 24 and 72 hrs for lethality or death. In this model diabetes was induced by single intravenous injection of STZ after 13 days of STZ administration animal showing blood glucose concentration more than 300mg/dl considered as diabetic and used for experimentation. Diabetic animals received suitable dose of plants extract dose. Analysis was done by students t test ethnomedicinal plants shows protective effects in diabetic complication in (streptozotocin) STZ induced diabetic rats.

Keywords: Diabetes, Antidiabetis, *Clitoria terneta*, *Achyranthus aspera*.

1. Introduction

Diabetes mellitus is one of the most common metabolic diseases in the world. It is group of disorder that are associated with high blood sugar level which often leads to complication such as blindness, kidney failure, coronary heart disease, circulatory problem and premature death [2,3].

Clitoria terneta belonging from family *fabaceae*, perennial twine Sherb, stems, terete, more or less pubescent. *c. terneta* have been reported to have tranquilizing property, anti-inflammatory, analgesic activity, antipyretic and immune modulatory activities [5]. *C. terneta* has been reported to have anti-inflammatory, hepatoprotective [10], antihyperlipidemic [11]. *C. terneta* useful for the development of new tools as antimicrobial agents for the control of infectious diseases [6]. *Achyranthus aspera* belong to *Amaranthaceae* family. It is a common plant of the study area abundantly found in wastelands. The plant is used in indigenous, system of medicine as emenagogue, antiarthritic, antifertility, laxative, anti helminthic, aphrodisiac, antihypertensive, anticoagulant [1]. It is reported to contain alkaloids, flavonoids saponins, steroids and terpenoids [3].

2. Literature Survey

The literature survey are carried out by Methodology, database, PMC, Medline.

3. Material and Methods

During the present work the ethnomedicinal field work was carried out in Tribal hamlets, forest areas and different villages of melghat region of Amravati district of Maharashtra, India plants was identified and authenticated by botanist.

The leaves of above mentioned plants were collected, shade dried, powdered and subjected to soxhlet extraction with ethanol for anti diabetic study. The extract was evaporated to near dryness and kept at 4°C. All procedures with animal

were conducted strictly in accordance with approved guidelines of committee for the purpose of control and supervision of experiments on Animals. It Healthy wistar strain female albino rats of about two month old and weighing 150-300 gm were procured. The rats were allowed to acclimatize to laboratory environment for 15 days before experimentation.

They were divided into 5 groups of 6 animals each and kept singly in separate cages during the experiment. For next 24 and 72 hrs any lethality or death.

In this model diabetes was induced by single intravenous injection of streptozotocin (STZ) induced Diabetes. (55mg/kg) dissolved in 0.1 M cold sodium citrate buffer, PH 4.5 After 13 days of STZ administration the survived animals showing blood glucose concentration more than 300 mg/dl will be considered as diabetics and will be used for experimentation. 13 days after streptozotocin control and survival diabetic rats will be randomly divided in five groups. Groups- 2-5 diabetic animals received suitable dose of extract dose *clitoridterneta*, *Achyranthus aspera* that was decide after carried out the dose fixation of all plant extract respectively. After 15 days of above treatments schedule animal's blood withdrawal by retro- orbital plexus fasted animal for determination of insulin level, glucose, triglyceride and cholesterol, HDL, VLDL, LDL [7].

All the data are expressed as mean +S.E. Statistical analysis was done by student's t test.

4. Result

The highest dose 4000 mg/kg body weight of *clitoria terneta* leaves and alcohol extract of leaves at the highest dose of 2000 mg/kg body weight were used for acute toxicity activity such as respiratory distress, salivation, weight loss one tenth of highest dose were selected for present investigation. Table 2 Showed the blood glucose levels of normal control, diabetic control, ethanolic leaves extracts of different experimental plants treated and glibenclamide

treated rats. In diabetic control rats the increased in blood glucose concentration was observed after inducing of STZ.

Table 2: Effect of ethanolic leaves extract of different plants in streptozotocin induced diabetic rats.

Treatment w. group mg/kg	Blood sugar	Serum cholesterol	Serum triglycerides	HDL cholesterol	LDL cholesterol	VLDL cholesterol
Group -1 Normal control	115±6.55	144.78±20.4	66.31±12.33	43.9±3.19	87.5 ± 15.5	13.26± 2.39
Group-2 Diabetic control	368.6± 12.66	212.9±8.10 ^b	85.52± 5.84	44.15± 2.39 ^a	89.± 2.66 ^b	17.10±1.16 ^a
Group-3 Standard glibenclamide (10mg/kg)	112±2.16 ^b	82.5±0.67 ^a	80.6±0.80 ^a	44.13±2.22 ^c	77±1.61 ^c	18.32±1.74 ^{ns}
Group-4 clitoria terneta (400mg/kg)	44.16±0.59 ^c	71.5±0.76 ^c	945±0.88 ^{ns}	21.5±0.16 ^b	30.5±0.33 ^a	19.16±0.12 ^c
Group-5 Achyranthus aspera 200mg/kg	59.5±77 ^b	43.5±0.90 ^c	60.16±0.42 ^c	15.5±0.55 ^c	16.3±0.14 ^{ns}	11.03±0.48 ^a

The result of the present study demonstrated the antidiabetic activity of ethanolic extracts of *clitoria terneta* and *achyranthus aspera* leaves the higher dose of *clitoria terneta* at 400mg/kg body and *Achyranthus aspera* at 200 mg/kg body weight leaves as well as glibenclamide treated were found to significantly decrease the plasma blood glucose after 15 days of treatment as compared to control.

Clitoria terneta and *Achyranthus aspera* leaves extract plays important role in diabetic, table 2 showed the value for the HDL for control, diabetic control standard glibenclamide and ethanolic extract treated groups.

The higher groups showed the significant increase in the HDL value compared to diabetic control animal groups in also decreases total cholesterol levels in experimental groups.

5. Discussion

Present study showed the similar results as in studies by other investigators and focuses on effect of ethanomedicinal plants on albino rats. The present aim of study was to evaluate the protective effect of ethanolic extracts of *A.excelsa*, *clitoria terneta* and *Achyranthus aspera* leaves. Diabetic is due to the excess glucose present in the blood reaching with hemoglobin to form glycosylated hemoglobin. The rate of glycation is proportion to the concentration of blood glucose [8]. There is evidence that glycation itself may induce the formation of oxygen derived free radicals in diabetic condition [4]. The ethanolic extract of the leaves has antihyperglycemic activity probably due to increased up take of glucose by enhanced glycogenesis in the liver and also due to increase in insulin sensitivity [7].

The study of the glucose lowering of the ethanol extract and fractions of *B.indellensis* stem bark in STZ (Streptozotocin) type I and II diabetes rats at different prandial states was performed and significant lowering in blood glucose level was observed. The extract act by stimulation of islets cell and requires functional cells for its action [9]. *C. esculenta* has been a remedy which is popular for diabetes mellitus [1]. *C. esculenta* has been a remedy which is popular for diabetes mellitus [2,11]. It has been reported that plant contains hypoglycemic effect [4]. The higher dose of *clitoria terneta* at 400mg/kg body weight and *Achyranthus aspera* at 200mg/kg body weight levels was found to significantly decrease the plasma blood glucose after 15 days of treatment [6,9].

6. Conclusion

The ethanolic plant extract shows protective effects in diabetic complication in STZ induced diabetic rats also this study may prove to be an effective and safe alternative remedy in diabetic complication.

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