ejpmr, 2022, 9(10), 497-501

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

EVALUATION OF ANTIDIABETIC ACTIVITY OF COCCINIA INDIA LEAVES EXTRACT ON EXPERIMENTAL ANIMALS

Mohammad abu Mobin Akhtar*, Dr. Nasiruddin Ahmad Farooqui, Dr. Shamim Ahmad Mr. Jiyaul Hak

Translam Institute of Pharmaceutical Education and Research Meerut, U.P.

***Corresponding Author: Mohammad abu Mobin Akhtar**

Translam Institute of Pharmaceutical Education and Research Meerut, U.P.

Article Received on 23/08/2022 **Article Revised on 12/09/2022** **Article Accepted on 02/10/2022**

ABSTRACT

Safety profile is essential for the drugs obtained from the plant origin. The level of toxicity can be evaluated by toxicological studies. From the results it was concluded that the ethanolic leaves extract of coccinia indica showed significant anti-diabetic activity in a dose dependent manner compared to the standard drug glibenclamide. The result also showed significant decrease in the liver Alkaline phosphatase(ALP), Aspartate amino transferase (AST), Alanine amino transferase (ALT), serum urea level, cholesterol, triglycerides, VLDL and LDL was in STZ induced diabetic animals when compared to control group. It is concluded that ethanolic leaves extract of coccinia indica showed significant effect in STZ induced diabetic rats. Further studies are necessary to examine the underlying mechanism of hypoglycemic effect and to isolate the active compound (s) responsible for anti-diabetic activities.

KEYWORDS: cholesterol, triglycerides, VLDL and LDL.

INTRODUCTION

Diabetes is a chronic metabolic disorder that causes high blood sugar levels above a long era of time. The word "meritas" or else "of honey" be located added through John-Rolle of England into the getting on 1700s near distinct the illness as of diabetes insipid us, which is too related through pollakiuria. Its a rapidly rising worldwide problem through substantial community, wellbeing and financial significances. In 2010, it was assessed that 285 billion persons worldwide (about 6.4 % of the grown-up people) suffered from this illness. This integer is assessed to rise to 430 billion if not controlled or better treated. There are two main reasons for the aging population and the increase in obesity. Furthermore, the true prevalence of diabetes worldwide must be astronomically high, as approximately 50% of diabetics are estimated to be undiagnosed up to 10 years after onset.

MATERIAL AND METHOD

Materials

Preparation of the plant material

The plant material is collected from botanical garden of our college. With the help of a botanist, it was identified as coccina indica the plants material (drug sample) was authentication from CH. CHARAN SINGH UNIVERSITY MEERUT by Prof. Vijai Malik. It was identified as coccina indica Sample is been preserved and documented in the herbarium.

Preparation of Extract

Small pieces of plant root were washed. Then it will be dried in room temperature. By the use of electric mixer these roots are converted into the powder form. Experiment is carryout to study the effects of ethanolic roots extract of coccina indica. Around 60g of powder is been weighed and soaked into 600ml of 90% ethanol solution at room temperature. For occasionally shaking this preparation is leave for overnight. Whatman filter paper is use for filtration of extraction. By using Soxhlet evaporation method for the filtration and it should be done until drying and dried to obtain 5g of dried extract.

ACUTE TOXICITY STUDY

Research has been done to investigate the toxic effects of the release. Guidelines for the Organization for Cooperation and Development (OECD) no. According to 425 the study was conducted. Mice are used intended for this resolution. Animals not eat overnight, single water is assumed, later that the discharge was controlled with a gauge with a body weight of 2000 mg / kg in appropriate groups and groups were given continuously 24 h for behavioral, neuro-logical and anatomical side view and 24 h for some a bad situation. 72 h. Animals were tested for toxicity for fourteen days. On the bases of guidelines, if death was detected in two or three animals, the dosage to be given is determined as a poisonous dosage. When death is detected in an mice, the similar dosage is frequent to check the toxicity. Ifs death is not detected at wholly; shrub extraction was well thought-out nontoxic. Otherwise, the poisonousness examination can be in progress through 100mg / kg body weight and repeated

in other doses such as 250, 500, 1000, 2000 and 5000mg / kg body mass.

Estimation of blood glucose level

The blood is collected from tip the tail vein of rats with syringe and the fasting blood glucose level is determine by a commercial glucometer and glucose oxidase strips (one touch glucometers).

Biochemical Analysis

At the end of the study, blood samples were collected using the micro capillary method from all groups of rats with retro-orbital reticular hemorrhage, serum was separated and biochemically analysed for liver parameters (AST, ALP, ALT), kidney parameters, etc. parameters of functional tests (serum creatinine and blood urea) and lipid profile (total cholesterol, triglyceride, HDL, LDL, VLDL).

RESULTS AND DISCUSSION

Pharmacological studies

Blood glucose levels in STZ and nicotinamide treated groups increased significantly compared to the control group. Rats induced with STZ and nicotinamide were treated with ethanolic root extract of Premna corymbosa rottl 200mg/kg/p.o and 400mg/kg/p.o for 21 days. Administration of ethanolic extract of Premna corymbosa rottl root at a dose of 200 mg/kg/p.o. slightly lowers blood glucose level in the second week. Treat with ethanolic root extract of Premna corymbosa rottl at a dose of 400mg/kg/p.o. It showed a significant decrease in blood glucose level in the first week ($p<0.01$), with a further decrease in weeks 2, 3 and 4 ($p<0.001$). Treatment with glibenclamide (0.5mg/kg b.w/p.o) resulted in a significant ($p<0.001$) reduction in blood glucose levels from week 1 to week 4.

Tables 1: effect of ethanolic extract of coccinia indica root extract on streptozotocin induce diabetic rats

Groups	Treatment/ dose	0 days (mg/dl)	After 7 days mg/dl)	After 14 days (mg/dl)	After 21 days (mg/dl)
Group- I	Normal control	97.45±2.31	96.82±0.99	97.12±1.69	99.94±0.98
Group- II	Diabetic control	265.19±2.75	283.21±2.01	272.23±2.66	210.45±1.99
Group- III	Coccinia indica root extract(150mg/kg b.w.)	264.11±2.88	248.88±2.45	210.12±3.03	131.47±2.98
Group-IV	Coccinia indica root extract (300mg/kg b.w.)	262.56±2.99	222.89±3.64	161.85±2.69	111.79±3.08
Group-V	Standard Glibenclamide (5 mg/kg b.w.)	255.23±3.39	199..23±3.12	153.45±2.94	99.27±3.06

The values were expressed such as ± SEM (n = 6) *p < 0.05, **p < 0.01 ***p <0.001 Vs control statistical significant examination for comparison is done through one way ANOVA following through dunnets "t" examination.

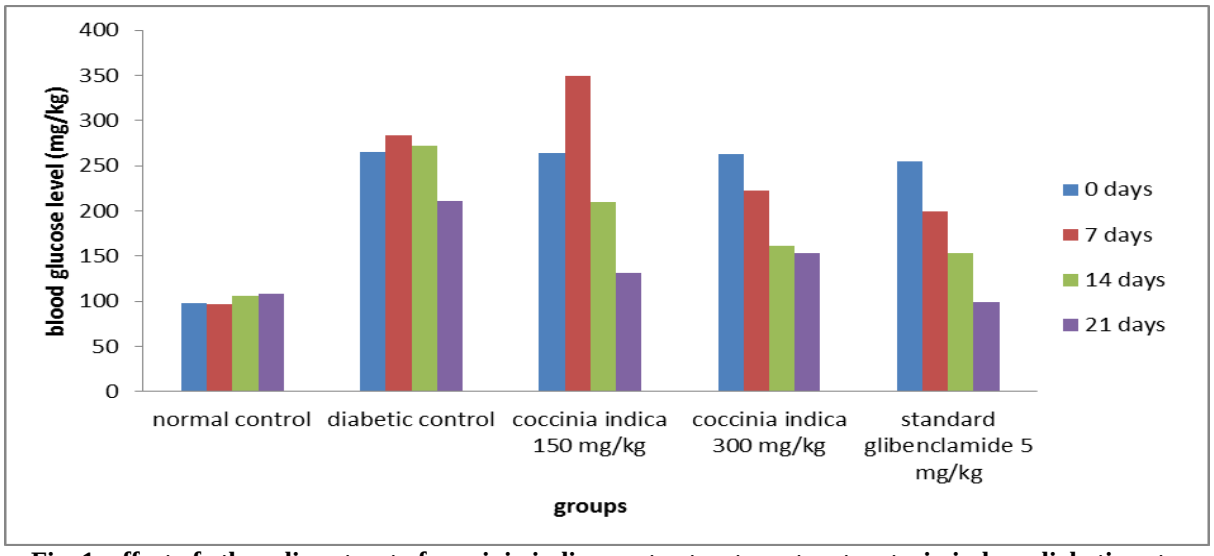

Fig. 1: effect of ethanolic extract of coccinia indica root extract on streptozotocin induce diabetic rats.

Estimation of liver enzyme

Table no. 2: effect of ethanolic root extract cooccinia indica on liver profile on streptozotocin induce diabetic rats.

Groups	Treatment/ dose	ALP (IU/L)	AST (IU/L)	ALT (IU/L)
Group- I	Normal control	90.45±8.14	84.96±8.46	26.58±2.96
Group- II	Diabetic control	168.96±10.02	162.94±8.98	129.48±8.69
Group- III	Coccinia indica root extract(150mg/kg b.w.)	122.88±9.23	88.52±8.32	45.93±3.36
Group-IV	Coccinia indica root extract (300mg/kg b.w.)	101.98±8.98	90.20±7.25	35.69±4.25
Group-V	Standard Glibenclamide (5 mg/kg b.w.)	86.99±7.08	90.89±7.95	29.86±2.88

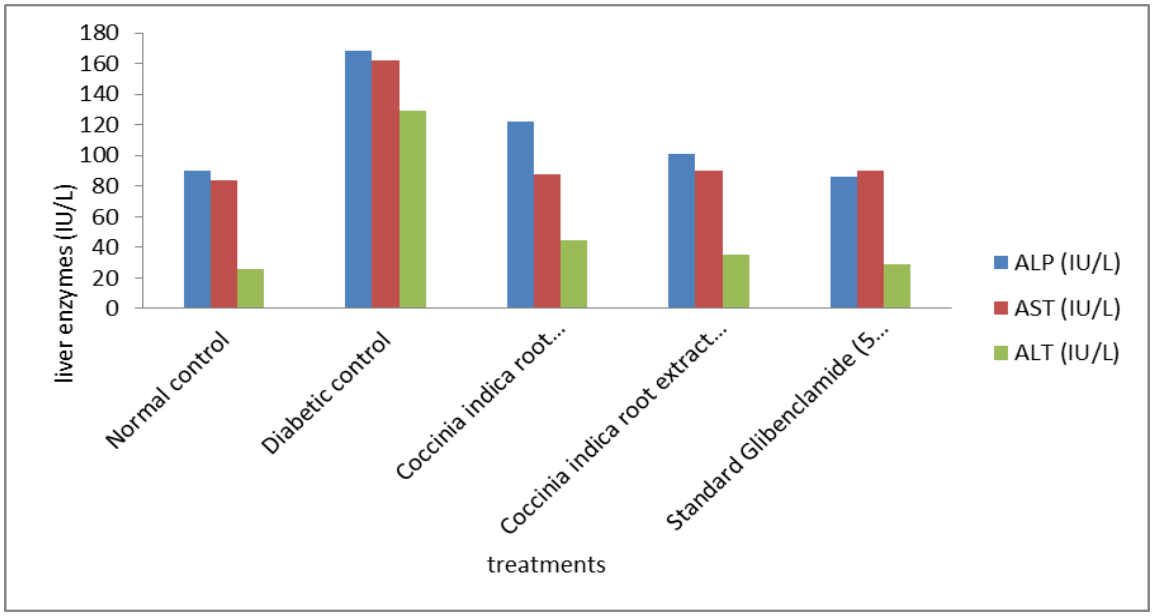

Fig. 2: Effects of ethanolic root extract cooccinia indica on liver profile on streptozotocin induce diabetic rats.

Estimation of renal profile

The serum level of urea increased significantly ($p<0.001$) in STZ nicotinamide-induced diabetic rats compared to control rats. The serum level of urea in diabetic rats treated with EEPC 200 mg/kg and 400 mg/kg decreased significantly ($p<0.001$), ($p<0.001$) and ($p<0.001$). Glybenclamide treatment (0.5 mg/kg body weight/food) showed a significant decrease ($p<0.001$) in serum urea compared to STZ-nicotinamide-induced diabetic animals.

Table 3: Effects of ethanolic root extract cooccinia indica on serum creatinine and blood urea on streptozotocin induce diabetic rats.

Groups	Treatment/ dose	Serum creatinine (mg/dl)	Blood urea (mg/dl)
Group- I	Normal control	1.38±0.09	26.89±2.63
Group- II	Diabetic control	2.93±0.26	42.25±3.72
Group- III	Coccinia indica root extract(150mg/kg b.w.)	1.46±0.29	31.72±3.56
Group-IV	Coccinia indica root extract (300mg/kg b.w.)	1.38±0.10	28.87±3.26
Group-V	Standard Glibenclamide (5 mg/kg b.w.)	1.34±0.12	24.96±2.10

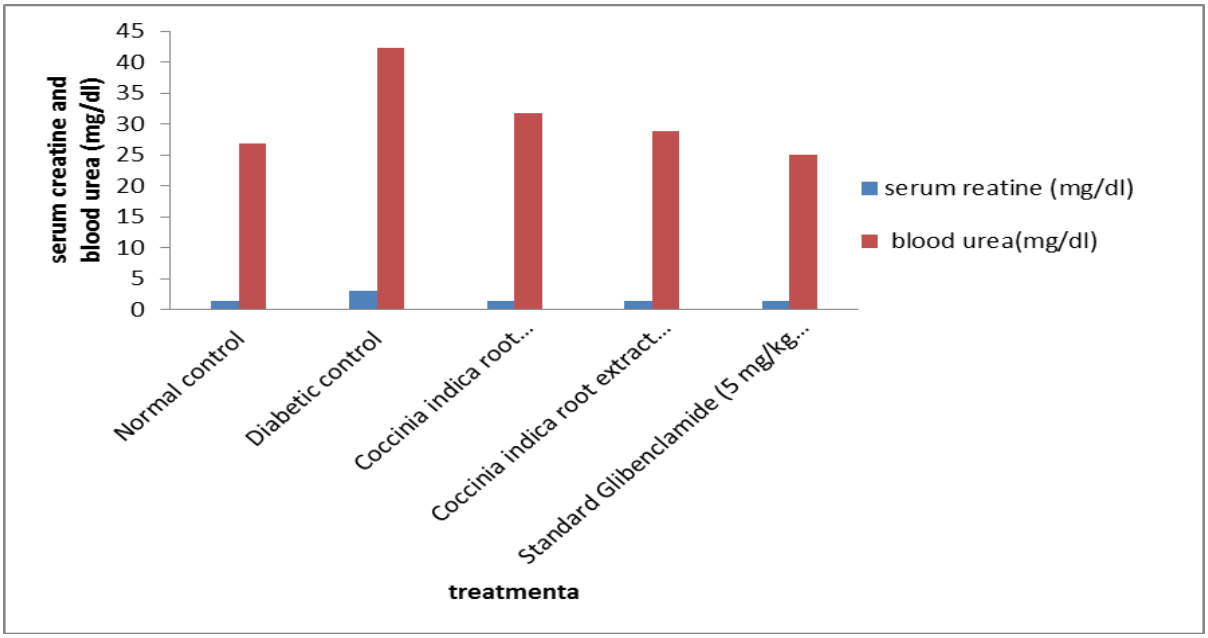

Fig. 3: Effects of ethanolic root extract cooccinia indica on serum creatinine and blood urea on streptozotocin induce diabetic rats.

Estimation of lipid profile

Serum total cholesterol, triglyceride, LDL, and VLDL levels were significantly increased compared to control rats, while HDL was significantly decreased in STZ-nicotinamide-induced diabetic rats. Serum levels of total cholesterol, triglycerides, LDL and VLDL in diabetic animals treated with EEPC 200 mg/kg and 400 mg/kg/p.o showed a significant decrease ($p<0.001$), and HDL levels in diabetic animals treated Shown with EEPC. a showed a significant increase ($p<0.01$) compared to STZ-nicotinamide-induced diabetic animals. Glibenclamide (0.5 mg/kg/food) showed a significant decrease ($p<0.001$) in serum total cholesterol, triglyceride, LDL and VLDL levels and HDL compared to STZ-nicotinamide-induced diabetic rats. increased significantly.

Table 4: effect of ethanolic extract of coccinia indica on lipid profile in streptozotocin induce diabetic rats.

Groups	Treatment/ dose	Total cholesterol (mg/dl)	triglycerides (mg/dl)	HLD (mg/dl)	LDL (mg/dl)	VLDL(mg/dl)
Group- I	Normal control	67.45±2.31	35.82±0.99	13.12±0.69	60.94±2.98	7.94±0.33
Group- II	Diabetic control	77.19±2.75	45.21±2.01	13.23±0.66	75.45±1.99	10.45±0.35
Group- III	Coccinia indica root extract(150mg/kg b.w.)	72.11±2.88	37.88±2.45	16.12±3.03	65.47±2.98	8.47±2.98
Group-IV	Coccinia indica root extract (300mg/kg b.w.)	69.56±1.99	36.89±2.64	15.12±0.69	64.79±3.08	8.79±0.9
Group-V	Standard Glibenclamide (5 mg/kg b.w.)	68.23±3.39	36.23±3.12	15.45±0.56	64.27±3.06	8.27±0.29

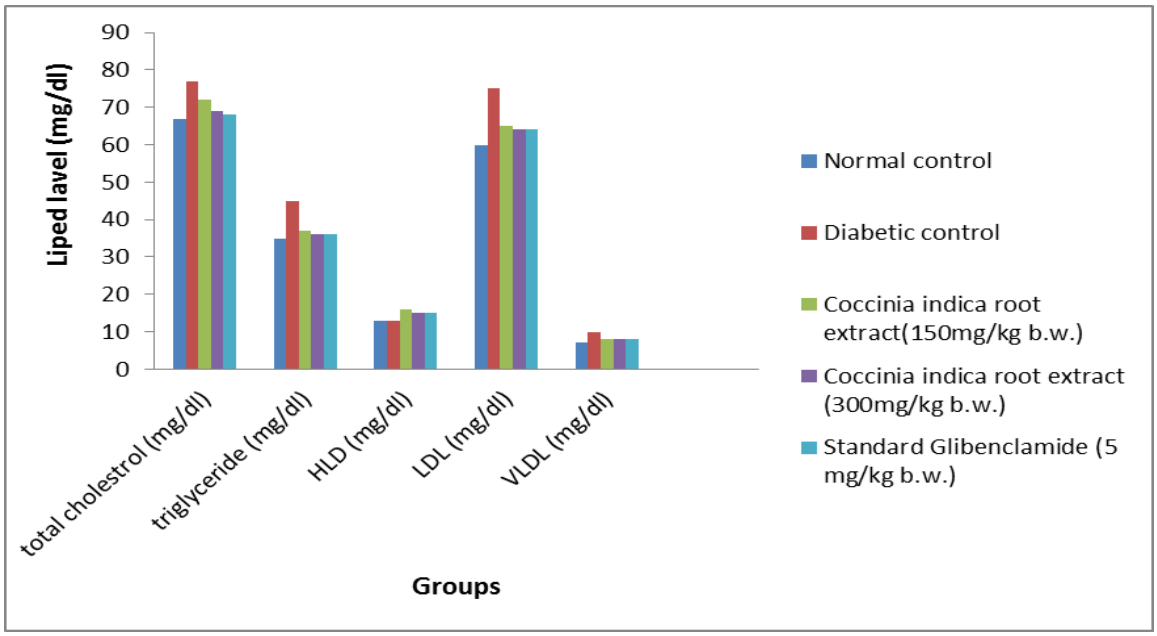

Fig. effect of ethanolic extract of coccinia indica on lipid profile in streptozotocin induce diabetic rats.

DISCUSSION

Medicinal plants of natural origin play a major role in the treatment of diabetes, especially in cases where resources are limited. According to ethnobotanical reports, about 800 medicinal plants have antidiabetic activity (I-4) and their phytochemical compounds include alkaloids, glycosides, terpenoids, flavonoids, etc., and preclinical studies have also been conducted, which are very effective in clinical and clinical studies. Is. I-5,6). The present study showed that the ethanolic extract of Premna corymbosa was not toxic to Wistar rats up to 2000 mg/kg body weight.

Literature review and phytochemical evaluation showed the presence of flavonoids, alkaloids, glycosides and sterols. The antidiabetic properties of Premna corymbosa ethanol extract may be mediated by the synergistic effects of these phytochemicals. STZ-induced diabetes models show that streptozotocin is an alkylating agent that causes DNA damage and leads to the activation of poly(ADP-ribose) synthetase, which leads to the depletion of NAD and ATP. This causes necrosis, which leads to decreased insulin secretion there. A decrease in plasma insulin concentration leads to a persistent hyperglycemic state. STZ is the most commonly used chemical to induce experimental diabetes in IDDM and NIDDM.

The present study was conducted to investigate the antidiabetic potential of Premna corymbosa in healthy and STZ-induced diabetic rats. This study showed that the ethanolic extract of Premna corymbosa has hypoglycemic properties in STZ-nicotinamide-induced diabetic rats. Oral administration of Premna corymbosa ethanolic extract protects against STZ-nicotinamide-induced diabetes.

Normal levels of blood urea and serum creatinine indicate that Premna corymbosa ethanolic extract does not interfere with kidney function, maintains kidney integrity, and is free of significant abnormalities. The ethanolic extract of Premna corymbosa does not affect the normal vagina.

CONCLUSION

Several factors contribute to the increasing popularity of herbal medicines for various chronic diseases. Interestingly, people who use alternative therapies are not always uniform. Many people who use herbal medicines find their health care alternatives consistent with their values, beliefs, and philosophical orientations toward health and life.

Coccinia indica leaves extract was selected to evaluate its anti-diabetic potential in a STZ induced diabetic mouse model. Leaves extracts of coccinia indica were extracted by thermal infiltration using ethanol as a solvent in a Soxhlet apparatus for primary phytochemical screening. The ethanolic leaves extract of coccinia indica contains alkaloids, glycosides, flavonoids and tannins.

Safety profile is essential for herbal medicines. The level of toxicity can be assessed by toxicological studies. From the results, it was concluded that the ethanolic leaves extract of coccinia indica showed a significant dose-dependent anti-diabetic activity compared to the standard drug glibenclamide.

The results also showed a significant decrease in liver alkaline phosphatase (ALP), aspartate aminotransferase (AST), alanine aminotransferase (ALT), serum levels of urea, cholesterol, triglycerides, VLDL and LDL in the control group. It is concluded that the ethanolic extract of coccinia indica leaves showed significant effects in ST - induced diabetic rats. Further studies are needed to investigate the underlying mechanisms of the hypoglycemic effect and to isolate the active compounds responsible for the anti-diabetic activity.

REFERENCES

1. Grover JK, Yadav S, Vats V. Medicinal plants of India with Antidiabetic potential. *Journal of Ethnopharmacology*, 2002; 81:81-100.
2. The Expert Committee on the Diagnosis and Classification of diabetes mellitus: follow up report on the diagnosis of diabetes mellitus. *Diabetes Care*, 2003; 26: 3160-3167.
3. SATOSKAR RS, Bhandarkar S D. Pharmacology and Pharmacotherapeutics, 9th edition, Popular Prakasham, New Delhi, 2005; 871-920.
4. Muhammed M and Lakshmi P, Diabetes Management: The Therapeutic Role of Ayurvedic herbs. *Journal of Ethanopharmacology*, 2004; 23: 56-62.
5. Muhammed M and Lakshmi P, Diabetes Management: The Therapeutic Role of Ayurvedic herbs. *Journal of Ethanopharmacology*, 2004; 23: 56-62.
6. Allison D B., Fontaine K R., Manson J E., Stevens J., Vanitallie T B.,1999. Annual deaths in the United States from diabetes, Journal of Ethnopharmacology, 16: 1530-1538.
7. GoldfineA.,Type II diabetes:new drugs, new perspectives, Journal of Clinical Endocrinology and Metabolism, 86, 280.
8. Narayan. KM., Boyle JP., Thompson T J., Sorensen SW., Williamson D F ., 2003. Lifetime risk for diabetes mellitus in the United States, JAMA, 14, 1884-1890.
9. Rang HP, dale MM, Ritter JM., 2006. Pharmacology 5th edition, New Delhi, Churchil living stone, 380-393.

„