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Antioxidant Activity Of Ethanolic Extract Of Canthium Parviflorum Lamk In Alloxan Induced Diabetic Rats.

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Medicinal plants used to treat diabetic conditions are of considerable interest and a number of plants have shown varying degrees of hypoglycaemic and antihyperglycaemic activity. The alcoholic extract {100mg, 200mg and 400mg / Kg body weight} of Canthium Parviflorum Lamk leaf produced a significant antidiabetic, antioxidant activities in animal models. The results support the traditional claims of Canthium parviflorum as a remedy of oxidative stress mediated diabetes.

KEY WORDS:

Canthium parviflorum; Antidiabetic; Antioxidant activities.

INTRODUCTION

In recent years, there has been renewed interest in the treatment against different diseases using herbal drugs as they are generally non-toxic and World Health Organization has also recommended the evaluation of the effectiveness of plants in condition where we lack safe modern drugs[1]. The term diabetes mellitus describes a metabolic disorder of multiple aetiology characterized by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action or both. The effects of diabetes mellitus include long term damage, dysfunction and failure of various organs. People with diabetes are at increased risk of cardiovascular, peripheral vascular and cerebrovascular disease[2]. *Canthium parviflorum* [convulaceae] Local name : Sakkarai kovaimaram a shrubby and woody plant found throughout the Western Ghats. Shade dried leaf powder is mixed with cup of water or goat's or cow's milk or boiled rice and taken orally[3]. In traditional system of medicine, it is claimed to be useful in treating diabetes, anthelmentic and diuretic[4,5]. There are no scientific studies in support of these traditional claims. Hence in the present study, an attempt has been made to investigate the antidiabetic and anti-oxidant effects of *Canthium parviflorum* in experimental animals.

Materials And Methods

Plant Material

Canthium parviflorum leaves were collected during the month January in the pattapi, Tambaram, Chennai, Tamil Nadu [India], and it was botanically identified and autheticated by Dr. Jayaraman, Plant anatomy research institute,Tambaram, Chennai[6].

Preparation Of Alcoholic Extract

Shade dried, coarsely powdered leaf 300gms were extracted with 95% ethyl alcohol {500ml } by soxhlet extractor. After exhaustive extraction nearly 80% of the solvent was removed by distillation over boiling water bath at atmospheric pressure and remaining 20% under reduced pressure. This extract [Yield 8.45%] was suspended in 0.5%w/v carboxy methyl cellulose and used for animal experiments[7].

Animals

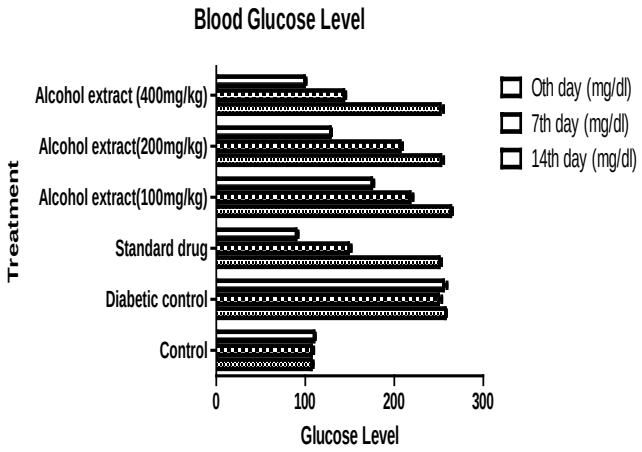
Wistar albino rats [150 – 200gm] of either sex, maintained in the animal experimental laboratory of C.L.Baid Metha College of Pharmacy at room temperature, relative humidity and 12 hours dark light cycle. Food and water were given ad libitum. Animal experiments were carried out based on the Institutional animal ethics committee(CPCSEA(IAEC/XXIX/10/2010)), IAEC-guidelines[8].

Preliminary Screening And Acute Toxicity Studies

Acute toxicity study was performed according to OECD guidelines 423.The method uses defined doses at 5,50,300,2000 mg/kg body weight. The six Wistar rats of female sex weighing 150-200gms were used. The starting dose of ethanolic extract 2000 mg/kg was administered. They were continuously observed for 3 days to detect changes in the skin, fur, eyes, mucous membrane, respiratory, circulatory, autonomic, central nervous system, somatic motor activity and behaviour pattern was observed[9]. A group of animals treated with the vehicle 0.5% w/w the carboxy methyl cellouse served as control. Based on the results of preliminary toxicity testing the dose upto 2000mg/kg was non toxic and dose of 100mg/kg, 200 mg and 400mg/kg of *Canthium parviflorum* were chosen for further experiments.

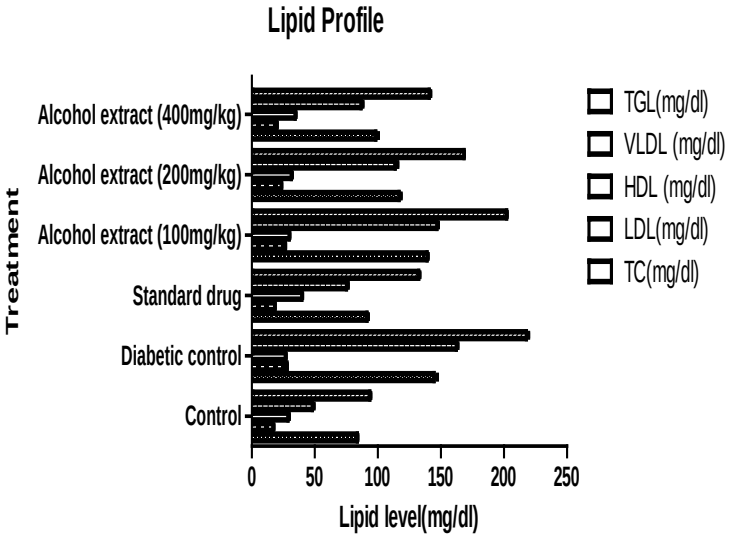
Antidiabetic Activity

This was investigated in diabetic rats induced by single Intra peritoneal injection of alloxan Monohydrate at the dose of 150mg/kg of body weight. Animals were divided in to six groups of six rats each. Group I treated as normal control (0.1 ml of 0.5% carboxy methyl cellose). Group II treated as diabetic control (alloxan induced); Group III treated with standard drug glibenclamide (5mg/kg), GroupIV, V & VI treated with test extract at the dose of 100mg, 200mg, 400mg,/kg body weight respectively. Treatment was



continued for 14 consecutive days.

At the end of the 14th day the animals were sacrificed by cervical dislocation under mild chloroform anaesthesia. The blood was collected by cardiac puncture and collected in the tube containing potassium oxalate and sodium fluoride was used for estimating blood glucose. The blood contain in the second tube was allowed to clot at room temperature and serum separated after centrifugation and from the serum the lipid profiles such as LDL, VLDL, TGL, HDL and total cholesterol was estimated[10]



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Antioxidant Activity

From group I to group VI the liver were dissected , blotted off blood, rinsed in the ice cold saline and weighed. Fat was freed from the tissues and then homogenised in buffer containing 20mM mannitol, 2mM tris HCl pH7 (10%) in a potter Elrehjem homogenizer fitted with a polyteflon plunger at high speed. The

homogenate thus obtained was used for the estimation of enzymatic parameters such as catalase and glutathione peroxidase[11].

Statistical Analysis

The results were presented as the mean ±SEM. Student paired t test and one way ANOVA was used to analyse statistical significance[12].

Results And Discusion

Preliminary Screening And Acute Toxicity Studies

Ethanolic extract of Canthium parviflorum lamk was non toxic and safety upto 2000mg/kg body weight.

Antidiabetic Activity

The blood glucose levels showeda reversal near to control values by treatment with Glibenclamide and ethanolic extract at the dose of 400mg/kg body weight. In lipid profiles the values or total cholesterol, LDL, VLDL, TGL and HDL returned to values nearing control which is having highly significant activity similar to the standard drug Glibenclamide.

Anti Oxidant Activity

The antioxidant enzymes catalase and Glutathione peroxidase were determined in the liver and its lowest activity was seen in the diabetic rats. The treatment with Glibenclamide, ethanolic extract 400mg/kg b.w. normalised the altered antioxidant enzyme levels of liver.

Conclusion

Among several traditional claims, the usefulness of *Canthium parviflorum.*,Lamk in oxidative stress induced diabetes have been emphasized more in literature. Hence it was considered that investigations for these medicinal properties may give scientific authentication to the traditional claims. Moreover, this plant has not been subjected to any systematic pharmacological screening so far.

The results of acute toxicity test indicated that *Canthium parviflorum* Lamk was non toxic upto 2000mg/kg. A significant reduction in the blood glucose level and the reversal of lipid profile to normal indicates the potent anti diabetic activity. A potent anti oxidant activity for *Canthium parviflorum* was evidenced by the significant reversal of enzymatic level to the normal value. The anti diabetic and anti oxidant property having highly significant activity similar to the standard drug Glibenclamide. Thus the result of the present study confirmed the traditional claims suggested for *Canthium parviflorum* and more over, the active compounds responsible for these pharmacological actions also remain to be identified.

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Reference

1. WHO, Defenition, diagnosis and classification of diabetes mellitus and its. Complication, *Report of a WHO consultation*, Department of non communicable disease
surveillance, Gneva.

2. Huizinga MM, Rothman RL. Addressing the diabetes pandemic: A comprehensive approach. *Indian J Med Res* 2006; 2: 481-4.

3. Anonyms, The Wealth of India, Raw materials, New Delhi, publication by CSIR, 1992, pp 210.

4. Mohideen S, Ilavarasan, R, Hemalatha, Anitha. N, sasikala E. Wound healing and diuretic activities of Canthium Parviflorum Lam. Korean society of pharmacognosy 2006; 5: 23-25.

5. Sathish Kumar T, Shanmugam S, Palvannan, Bharathikumar V M. Evaluation of antioxidant properties of Canthium parviflorum Lam. Leaves, Natural Product Radiance 2008; 7(2): 122-126.

6. Willey.R.L., Microtechnique : A laboratory guide, the macmillan company, New York, 1971.

7. Pulok K.Mukherjee, *Quality control of Herbal drugs*, Business horizons pharmaceutical publishers, 2008, 252-373.

8. OECD/OCDE, *OECD guidelines for the testing of chemicals, revised draft guidelines 423*, CPCSEA, Ministry of social justice and empowerment, Govt. of India, 2000.

9. Hans Vogel, *Drug discovery and evaluation: Pharmacological assay*, Springer publisher, 2007, 1334.

10. Annie Shirwaikar, Rajendran. K, Dinesh kumar C, Ramgopal Bodla, Antidiabetic activity of aqueous leaf extract of Annona squamosa in streptozotocin-nicotinamide type 2 diabetic rats, *Journal of ethnopharmacology*, 91, 2004, 171-175.

11. Ivorra MD, Paya M, Villar A. A review of natural products and plants as potential antidiabetic drugs. *Journal of Ethnopharmacology*, 1989; *27* : 243-75.

12. Kulkarni.S.K, *Handbook of experimental pharmacology*, Vallabh prakashan, 2007, 172-189.