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Research Article

ANTIHYPER LIPIDEMIC ACTIVITY OF ETHANOLIC EXTRACT OF *TRIDAX PROCUMBENS L*

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ABSTRACT

The potential antihyperlipidemic activity of ethanolic extract of *Tridaxprocumbens* whole plant was evaluated using animal model. The high cholesterol diet was used to induce hyper lipidemia in rats. Atorvastatin (10mg/kg) was used to as a standard. The extract was tested at two doses (250mg/kg and 500mg/kg). This study showed that the ethanolic extract of *Tridaxprocumbens* possess antihyperlipidemic activity.

Keywords: *Tridaxprocumbens*, antihyperlipidemic, high cholesterol diet, atorvastatin.

INTRODUCTION

Hyperlipidemia is the condition of abnormally elevated levels of any or all lipids and/or lipoproteins in the blood.[1] Atherosclerosisis the most common cause of mortality and morbidity worldwide.[2] Diet high in saturated fats and cholesterol, age, family history, hypertension and high levels of cholesterol particularly TC, TG and LDL are mainly responsible for Coronary Heart Diseases. HMG CoAreductase inhibitorhas been used in the treatment of hyperlipidemia[3]and Atorvastatin is one of the most prevalently used HMG CoA reductase inhibitors.

*Tridaxprocumbens*is a flowering weed belonging to the family Asteraceae, distributed in tropics and subtropics throughout the world. The plant bears daisy like yellow–centered white or yellow flowers with three toothed ray florets[4].

The plant consists of Alkaloids, Carotenoids, Flavonoids, Saponins and Tannins.[5] The plant is used in folk medicine to treat bronchial catarrh, dysentery, diarrhoea, and conjunctivitis.

The plant is reported to have antioxidant and hepatoprotective[6], antibacterial[7], anti inflammatory and analgesic[8], anti coagulant and antihypertensive[9], immunomodulatory[10], and antidiabetic activities [11].

The ethanolic extract of *Tridaxprocumbens* has not been investigated for antihyperlipidemic activity so far. The present study was therefore aimed at investigating the antihyperlipidemic activity of the ethanolic extract of whole plant.

MATERIALS AND METHODS

Plant material

Tridaxprocumbens plant was collected and dried under shade for few days. After complete drying the plant was milled and the size was reduced.

Preparation of the ethanolic extract of the plant

The milled plant was kept for maceration in a glass jar with 1000ml of ethanol (99% alcohol) for one week with regular shaking. Then the mother liquor was filtered by simple filtration in order to separate the particles, then extract was separated and processed for distillation, this process of maceration and filtration is repeated for three times for complete removal of the extract. The liquid extract was collected and evaporated in order to obtain a soft mass. The extract was thoroughly evaporated in order to remove the traces of the solvent. Then, the obtained mass is stored in a well closed container in a cool and dark place.

Chemicals
Cholesterol -50gm, Cholic acid -25gm (OXFORD Chemicals; Mumbai), Atorvostatin(10mg/kg) , Sodium Carboxy methyl cellulose.

Requirements
Capillary tubes, rat feeding tube of 21 gauge, rat pellets, distilled water, coconut oil and eggs.

Animals
20 male Wistaralbino rats weighing 100 – 150 gm were used for the study. The experimental animals were housed in polypropylene cages and maintained under standard conditions (12 h light and dark cycles, at 25±3◦ C and 35-60% humidity).Standard pelletized feed and distilled water were provided. All the experimental procedures were approved by institutional animal ethical committee.

Preparation of High cholesterol diet (HCD)[12]
High Cholesterol diet was prepared by mixing cholesterol 2%, cholic acid 1% and coconut oil 2% and an eggwith powdered standard animal food.

Preparation of Sodium CMC
1 % of sodium CMC was prepared by dissolving 200 mg of Sodium CMC in 20 ml of distilled water.

Acute oral toxicity study[13]
Acute Toxicity Study was carried out for the determination of LD_{50} value of ethanolic extract of *Tridaxprocumbens*in experimental animals. The study was performed as per OECD guidelines 423. By this procedure LD_{50} of ethanolic extract of *Tridaxprocumbens* was found to be 2000mg/kg.

Induction of hyperlipidemia
The diet which was prepared as pellets was placed in the cage carefully and was administered for 10days.

Grouping and treatment
The animals received treatments as given in table no 1.

Biochemical assays for lipids[14]
At the end of treatment period, all the animals were tested for biochemical lipid markers. Blood was collected by cardiac puncture method under ether anaesthesia. Serum total cholesterol (TC), triglycerides (TG) was estimated by method of CHOD-PAP and high-density lipoprotein-cholesterol (HDL-c) by the method of GPO-PAP using span diagnostic kits. Serum LDL-c, VLDL-c level and atherogenic index was determined by calculation.

Statistical Analysis
Allthe results were expressed as mean ± SEM and subjected to one way analysis of variance followed by Dunnet's t-test for comparison between the groups.

RESULTS AND DISCUSSION
Chemical tests carried out on the ethanolic extract of *Tridaxprocumbens* have revealed the presence of Alkaloids, Flavonoids, Saponins, Glycosides and Carbohydrates. Rats fed with high cholesterol diet,for10 days displayed an increaseinbodyweight ascomparedtonormalrats. Treatment with Ethanolic extract of plant (250mg/kg/day & 500mg/kg/day) showed only slight increase in body weight to6.0% and 3.5% respectively, as compared to control group (12.5%).The hyperlipidemic animals when treated with plant extract showed only slight increase in body weight(3.5%),which was comparable to Atorvastatin treatment(4.0%). The results suggest the potential of Ethanolic extract of *T. Procumbens* extracts against hyperlipidemia.
There was significant increase in the levels of serum TC, TG, LDL-c and VLDL-c in high cholesterol diet induced rats and also there wasa significantreduction in HDL- c levelsin these animals.Treatmentwith plant extractshowedasignificantreductionin TC, TG andLDL-clevels.Therewasasignificant riseinHDL-clevels inallthegroups.Atorvastatin alsoproducedsignificantreductionin serum TC,TG, LDL-clevelsandariseinHDL-clevels (figure 1, table 2).
There was a significant reduction in Atherogenic index after the treatment of hyperlipidemic rats with 250mg/kg and 500mg/kg of plant extract (figure 2). Atherogenic index is an important indicator of Coronary Heart Diseases risks at both low and high serum Cholesterol levels.

CONCLUSION
Ethanolic extract of *Tridaxprocumbens* showed significant lipid lowering activity. The activity may be due to the presence of Flavonoids and Tannins in the Ethanolic extract, which reduce oxidation of LDL-c. This needs further study. The significant weight reduction property of the plant extract was comparable to that of the standard drug Atorvastatin.

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Table 1: Grouping and Treatment

1	GROUP A	Received 1% Sodium CMC, served as control
2	GROUP B	Received standard drug Atorvostatin at a dose 10mg/kg
3	GROUP C	Received Atherogenicdiet
4	GROUP D	Received ethanolic extract of *Tridaxprocumbens* 250mg/kg
5	Group E	Received ethanolic extract of *Tridaxprocumbens* 500mg/kg

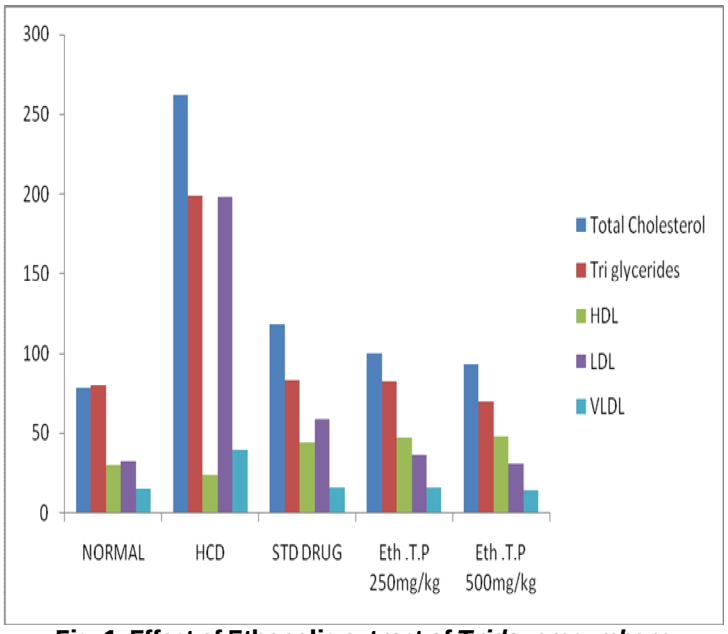
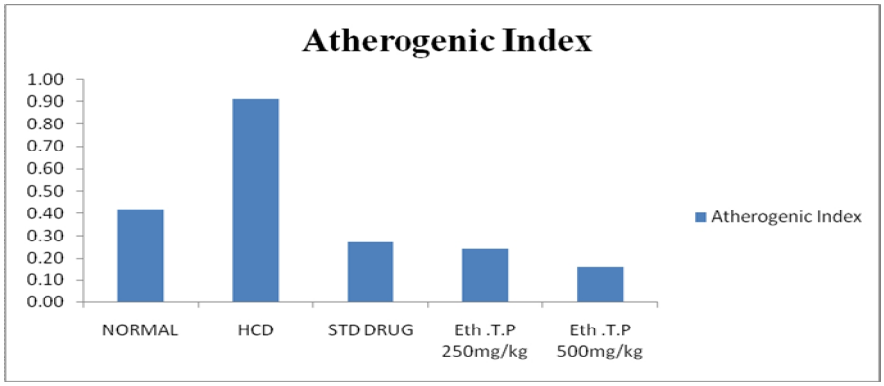


Fig. 1: Effect of Ethanolic extract of *Tridaxprocumbens* on lipid profile in rats

Table 2: Effect of Ethanolic extract of *Tridaxprocumbens* on high cholesterol diet induced hyperlipidemia in rats

	NORMAL	HCD	STD DRUG	Eth .T.P 250mg/kg	Eth .T.P 500mg/kg
Total Cholesterol	78.52	262.43	118.32	100.55	93.61
Tri glycerides	80.08	198.84	83.36	83.08	70.07
HDL	30.35	24.46	44.44	47.54	48.54
LDL	32.16	198.18	59.22	36.4	31.06
VLDL	16.01	39.79	16.67	16.61	14.01
Atherogenic Index	0.42	0.91	0.27	0.24	0.16



Eth. T.P= Ethanolic extract of *Tridaxprocumbens*

Fig. 2: Effect of Ethanolicextract of *Tridaxprocumbens* on Atherogenic Index

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