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ANTI-OBESITY EFFECT OF *TRIDAX PROCUMBENS* IN ATHEROGENIC DIET-INDUCED
OBESE RATS

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ABSTRACT

We evaluated the effect of *Tridax procumbens* on total cholesterol, triglycerides, total protein, free fatty acids and HDL cholesterol in atherogenic diet induced obesity rats. In atherogenic diet induced obesity model, the rat receiving treatment with *Tridax procumbens* showed significant reduction in total cholesterol, triglycerides total protein, free fatty acids and elevation of high density lipoprotein cholesterol. *Tridax procumbens* was found to possess significant antiobesity activity.

Keywords: Triglycerides, Atherogenic, Cholesterol etc.

INTRODUCTION

Tridax procumbens Linn or the Mexican daisy belongs to the family Compositae. It is common grass found all over the world, growing primarily during raining season. It is a small hair straggling perennial herb which can be easily located among the weeds along the road or in wastelands. The leaves are placed opposite to each other and are ovate-elliptic in shape with deeply dentate leaf margins. The pale yellow composite flowers which may be found all the year round are solitary hairy heads found on all stalks. The matured and dry seeds, each of which are covered with dense silky hairs or pappus are released from the dry flowering heads and dispersed by wind to distant places [1]. The extracts of *Tridax procumbens* have been reported to have various pharmacological effects like mosquito repellent activity, leishmanicidal, hepatoprotective, effect on liver antioxidant system, immunomodulatory effect, wound healing activity and antiprotozoal effects [2,3,4,5].

The present study has been undertaken to establish the antiobesity effect of *Tridax procumbens* on normal and atherogenic diet induced obesity rats.

MATERIALS AND METHODS

Chemicals

Diagnostic Kits for estimation of Total Cholesterol, Triglycerides, Total protein, Free Fatty Acids and HDL were purchased from Madras scientific company Trichy, Tamilnadu, India. Atherogenic diet was purchased from local market.

Collection and Preparation of Extracts

The plant *Tridax procumbens* was collected from the areas near Lalgudi, Trichy Dt. The plant was identified at St.Joseph College, Trichy. The plant was dried under shade for 8-10 days. The dried plant was then crushed into powder using an electronic blender.

Methanolic extraction Powdered sample of 100gm was weighed and subjected to soxhlet extraction using methanol as solvent. The plant extract was then collected and filtered through Whatman No.1 filter paper. The extract was concentrated at 50°C using a rotatory evaporator and then air dried. The dried powder was stored at 40°C in an airtight bottle.

Experimental Design:

Albino rats were divided into four feeding groups (A, B, C and D) of six rats per group. Group I served as normal control and received standard diet throughout experimental period. Group II, III and IV received atherogenic diet throughout the treatment period. Group III and IV received *Tridax procumbens* (100 mg/kg body weight). Treatment periods for all these groups were 14 days.

At the end of treatment period to all these groups, the animals were used for various biochemical parameters. The animals were deprived of food overnight, anesthetized using light ether and sacrificed by cervical decapitation Blood was collected and centrifuged by using table top centrifuge at 2000 rpm for 30 minute to get serum.

Measurement of serum lipid profile: Total cholesterol (TC), total triglycerides (TG), total protein (TP), Free Fatty Acids were estimated by the method of CHOD-PAP using standard kits and total high density lipoprotein (HDL) were estimated by the method of GPO-PAP using standard kits.

Statistical analysis

Data, expressed as mean \pm S.D, were analyzed by analysis of variance (ANOVA). Statistical significance of the difference of the means was evaluated by Student's t-test. Differences were considered statistically significant if the p value was < 0.05 .

RESULT.

The results reveal that feeding of atherogenic diet increased serum total cholesterol, free fatty acids, triglyceride and total protein and decreased serum HDL-cholesterol levels when compared to normal group at over a period of 14 days. Administration of *Tridax procumbens* showed statistically significant decreased in total cholesterol ($p < 0.05$), free fatty acids ($p < 0.001$), triglyceride ($p < 0.001$) and total protein ($p < 0.001$) level as compared to hyperlipidemic animals (Table-1). At this time an increase of HDL-cholesterol level was also observed.

Table-1: Effect of treatment for 14 days with *Tridax procumbens* on plasma lipid profile of normal and atherogenic diet induced by obesity rats.

Groups	Total cholesterol (mg/100ml)	Total triglycerides (mg/100ml)	Total protein (mg/100ml)	Total HDL (mg/100ml)	Free Fatty Acids (mg/100ml)
Group I (Normal)	83.0 \pm 0.6	18.5 \pm 2.9	4.31 \pm 0.05	40.31 \pm 1.84	20.6 \pm 4.0
Group II (Atherogenic diet only)	156.1 \pm 0.4	22.06 \pm	10.31 \pm 0.08	55.70 \pm 0.34	17.66 \pm 4.0
Group III Atherogenic diet + <i>Tridax procumben</i>	116.1 \pm 0.4	18.7 \pm 0.2**	4.32 \pm 0.07	62.61 \pm 0.87	18.6 \pm 3.0**
Group IV <i>Tridax procumbens</i> Plant extract only.	84.3 \pm 1.6	20.05 \pm 0.7*	5.67 \pm 0.04	35.35 \pm 0.55	19.6 \pm 4.0

Tridax procumbens extract at 100 mg/Kg of body weight dose orally, showed reduction in serum cholesterol content in rat, which were mainly due to decrease in VLDL and LDL levels. It thus reduced the obesity, which was 70%, as compared to respective control group I. These findings are quite similar with the reports of Ae-son et al, 2007.

DISCUSSION

Treatment with *Tridax procumbens* produced a significant decrease in the serum level of lipids in atherogenic diet induced Obesity rats. Atherogenic diet induced Obesity model has been successfully employed for the evaluation of Hypocholesterolemic effect of protein [7, 8] and S-allyl cystein sulphoxide of *Allium sativum* [9] in albino rats. Ahluwlaia and Amma [10] found that feeding of oleoresin of gum guggal (*Commiphora mukul*) lowered the total cholesterol and its fractions in lipoproteins. Sudheesh et al. [12] reported that condensed tannins of *Solanum melongena* are reduced in hyperlipidemia and hyperglycemia.

In the present study an increase in plasma HDL-cholesterol with a concomitant percentage decrease from other lipid was observed (Table 1). It can be concluded from the present data that the levels of total serum cholesterol, triglyceride and total protein which are actually raised in atherogenic diet, can be lowered significantly with *Tridax procumbens*. *Tridax procumbens* can be utilized for providing dietary management in the prevention of atherosclerosis in hyperlipidemic Patients.

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