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RESEARCH ARTICLE

Hypolipidemic Activity of Amaranthus Tristis Linn in Triton WR-1339 Induced Hyperlipidemic Rats.

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ABSTRACT:
Hyperlipidemia is the greatest risk factor of coronary heart disease. Currently available hypolipidemic drugs have been associated with number of side effects. Herbal treatment for hyperlipidemia has no side effects and is relatively low cost and locally available.plant has been selected for this study present study. The aim is to perform on anti-hyperlipidemic activity of ethanolic extract of leaves of *Amaranthus tristis* Linn against Triton wr-1339 induced hyperlipidemia in rats. *Amaranthus tristis* Linn administered a dose of 200mg/kg (p.o) to the triton induced hyperlipidemic rats. *Amaranthus tristis* Linn shows a significant decrease in the levels of serum cholesterol, phospholipids, triglyceride, LDL, VLDL and significant increase in the level of serum HDL level.

KEYWORDS: *Amaranthus tristis* Linn **,** Hyperlipidemia. LDL, VLDL, HDL.

1. INTRODUCTION:
The main aim of providing to treat the hyperlipidemic patients with hyperlipidemia is to reduce the risk of developing ischemic heart disease or the occurrence of cardiovascular or cerebrovascular disease. Currently available hypolipidemic drugs have been associated with number of side effects. Medicinal plants have long history to use for various health purposes due to presence of some phytoconstituents[1]. An herbal treatment for hypercholesterolemia has no side effects and is relatively less cost, readialy available. They are effective in control of lipid levels in the system[2]. *Amaranthus tristis* Linn is monoecious herb, and is around 100-300 cm height. It probably cultivated in India and China, and it is found throughout India in waste places. It is widely spread in tropical and subtropical regions of the world. Common name of this plant known as green amaranth in English.This plant is growing under a wide range of climatic conditions and they are able to produce leafy edible vegetables. Current industrial and public use of Amaranth plant has not only been linked to its recognized nutritional properties, but also to its potential beneficial use as therapeutic adjunct in diets for hypercholesterolemia susceptible individuals [3].

2. MATERIALS AND METHODS:
2.1 Collection of Medicinal Plant:
Fresh leaves of *Amaranthus tristis* Linn *were* collected from Gingee at Vilupuram district, Tamil nadu.India. The plant was authenticated by Dr.P.Jayaraman, Director, Plant Anatomy Research Centre (PARC) Tambaram,Chennai. A herbarium specimen of the plant (APCP-3/2015) was preserved in the Department of Pharmacognosy for further reference.

2.2 Preparation of Plant Extract:
The stem and leaves, are shade dried, and made course powder with help of dry mechanical grinder, and passed through the sieve number 60. The powdered stem and

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leaves were extracted by using soxhleation method. The powder defatted with petroleum ether (40-60°C) and extract with ethanol. Extracts were evaporated to dryness and perform preliminary phytochemical screenings was done using the standard procedure[4].

2.3 Animals:

Female Swiss albino mice weighing between 20-30gms were used for oral acute toxicity study because it shows greater sensitivity to treatment. Wistar albino adult rats were used for this pharmacological study[5]. The animals were allowed to acclimatize to the environment for 7 days and supplied with a standard pellet diet were collected from Hindustan Lever Ltd, Bangalore. The study has been approved by the Instituitional Animal Ethics Committee, Vels University XVI/CPCSEA/ VELS/IAEC/21.10.2000/14.

2.4 Pharmacological Evaluation:

The Wistar albino rats were divided into four groups of six rats each. First were given water and orally administered with 5% CMC. Second group were given a single dose of triton wr-1339 was administered 400 mg/kg. with 5% CMC. After 72 hours of triton injection received a daily dose of 5% CMC (p.o) for 7 days. According to OECD- 423 guidelines extract value third group was administered a daily dose of ethanolic extract of *Amaranthus tristis* Linn 200mg/kg suspended in 5% CMC (p.o) for 7 days, after inducing hyperlipidemia. Forth group were recived Fenofibrate 65mg/kg for 7 days[6].

2.5 Collection of Blood:

On the 8thday the blood was collected by aseptic retero orbital sinus puncture method, under mild ether anesthesia. The collected samples were centrifuged for 10 minutes[7-9] Then separate serum samples were collected and it is used for various biochemical parameters, Then animals were sacrificed and collected the liver[10]

2.6 Liver Lipid Extraction:

The liver was homogenized with 0.15M KCl in ice cold condision.and extract with $CHCl_3$: CH_3OH (2% *v/v*). This lipid extract was used for the estimation of lipid parameters[11].

2.7 Biochemical analysis:

The serum and liver were assayed total cholesterol, triglycerides, phospholipids, low-density lipoprotein (LDL), very low-density lipoprotein (VLDL), and high-density lipoprotein (HDL). The serum cholesterol levels were determined by Zak's method[12]. The triglyceride, phospholipids, , LDL and VLDLand serum HDL was evaluated by using standard methods[13]

3. RESULTS:

The prliminoryphytochemical tests of the etanolic extract of *Amaranthus tristis*Linn revealed that presence of phytosteroids, tannins, bioflavonoids, carbohydrates, saponins, and amino acids. In acute toxicity study the ethanolic extract of *Amaranthus tristis*Linn did not produce toxicity up to the dose level of 2000mg/kg.

Table 1. Effect of Ethanoic Extract of *Amaranthus tristis* Linn on HDL, LDL and VLDL in serum of control and experimental rats.

Groups	Parameters Mean ± SEM		
	HDL	LDL	VLDL
Control	23.22±2.31	24.67 ± 1.78	14.66 ± 2.51
Triton treated	17.70 ± 6.10a	154.52 ± 8.51 a	23.1 ± 2.01 a
Triton + Amaranthus tristis(200 mg/ kg)	24.10 ± 3.11b	30.33 ± 3.51b	15.32 ± 2.11 b
Triton + Fenofibrat (65mg/kg)	24.30 ± 3.10 b	25.71 ± 3.34 b	14.3 ± 2.10 b

Values are in mean ± SEM; Number of animals in each group = 5; a $p < 0.001$ Vs Group I; b $p < 0.001$ Vs Group II.

Table 2. Effect of Ethanoic Extract of *Amaranthus tristis* Linn on Cholesterol, Triglycerides, Phospholipids in serum of control and experimental rats

Groups	Parameters Mean ± SEM		
	Cholesterol	Triglyceride	Phospholipids
Control	62.57 ± 5.52	73.30 ± 5.57	156.25 ± 9.32
Triton treated	195.22 ± 10.58a	115.1 ± 5.57 a	208.27 ± 10.81 a
Triton + Amaranthus tristis(200 mg kg-1)	68.70 ± 5.53b	75.53 ± 5.96 b	176.70 ± 6.23 b
Triton + Fenofibrate (65mg/kg)	65.43 ± 2.51b	72.0 ± 11.01 b	159.54 ± 7.54 b

Values are in mean ± SD; Number of animals in each group = 5; a $p < 0.001$ Vs Group I; b $p < 0.001$ Vs Group II

Table 3. Effect of Ethanoic Extract of *Amaranthus tristis* Linn on Cholesterol, Triglycerides, Phospholipids in Liver of Control and Experimental Rats

GROUPS	Parameters Mean ± SEM		
	Cholesterol	Triglyceride	Phospholipids
control	63.81 ± 1.73	61.23 ± 0.67	85.42 ± 0.51
Triton treated	265.0 ± 3.55a	113.5 ± 0.86 a	144.2 ± 0.93 a
Triton + Amaranthus tristis (200 mg kg^{-1})	99 ± 1.31b	91.3 ± 1.07 b	90.5 ± 1.60 b
Triton + Fenofibrate (65mg/kg)	88.52 ± 2.33 b	81.5 ± 1.89 b	75.24 ± 2.55 b

Values are in mean ± SD; Number of animals in each group = 5; a $p < 0.001$ Vs Group I; b $p < 0.001$ Vs Group II.

The results were shown in Table 1, 2, 3 and 4. *Amaranthus tristis* Linn markedly lowers the levels of serum cholesterol and VLDL. The decrease in cholesterol level may indicate increased oxidation of mobilized fatty acids of lipolysis. The present study shows that all triton induced rats displayed hyperlipidemia as shown by their elevated serum and liver cholesterol, triglyceride, Phospholipids, VLDL, LDL and also the reduction in the HDL level. It can be concluded that Amaranthus tristis200 mg/ kg treatment was effective lowers in cholesterol, Phospholipids TG, VLDL, LDL and increases the HDL level.

This model is widely used for a number of different aims particularly, in rats it has been used for screening natural or chemical hypolipidemic drugs Interestingly, the results of the present study show that extract of *Amaranthus tristis* Linn produced a significant reduction in cholesterol level and also it reversed Triton induced hypolipidemic in rats.

Table 4. Effect of Ethanoic extract of *Amaranthus tristis* Linn on HDL, LDL and VLDL in Liver of Control and Experimental Rats.

GROUPS	Parameters Mean ± SEM		
	HDL	LDL	VLDL
Group-I control	24.99 ± 1.14	21.52 ± 0.38	12.21± 0.38
Group-II Triton treated	17.23 ± 0.67a	176.20 ± 0.51 a	21.51 ± 0.51 a
Group-III Triton + Amaranthus tristis (200 mg kg-1)	26.92 ± 2.01b	19.90 ± 3.06 b	18.09 ± 0.68 b
Group-IV Triton + Fenofibrate	36.46± 3. 9 b	20.91 ± 2.1 b	13.56 ± 1.5 b

Values are in mean ± SD; Number of animals in each group = 5; a $p < 0.001$ Vs Group I; b $p < 0.001$ Vs Group II.

4. CONCLUSION:

Amaranthus tristis Linn administered a dose of 200µg/kg (p.o) to the triton induced hyperlipidemic rats. *Amaranthus tristis* Linn shows a significant decrease in the levels of serum cholesterol, phospholipids, triglyceride, LDL, VLDL and significant increase in the level of serum HDL level. The antihyperlipidemic activity of *Amaranthus tristis* Linn (200 mg/ kg) against Triton Wr-1339 showed significant hypolipidemic activity when compared to hypolipidemic drug fenofibrate treated groups.

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