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Research Article

Anti-Hyperlipidaemic Activity of Ethanol Extract of Whole Plant of *Corallocarpus Epigaeus* on Wistar rats

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ABSTRACT

The anti hyperlipidemic activity of *Corallocarpus epigaeus* (family Cucurbitaceae) whole plant extract was studied in triton and high fat diet (HFD) induced models in albino rats. The present study was designed to investigate the antihyperlipidemic activity of EECE extract in Triton X-100 and High fat diet induced hyperlipidemic rats. Treatment with plant extract (200 and 400 mg/kg, p.o body weight) was able to significantly decrease the levels of TC, TG and LDL. Also the extract was found to cause a significant increase in the HDL levels. Therefore it can be concluded that EECE extract is able to effectively suppress Triton and High fat diet induced Hyperlipidaemia in rats, suggesting the potential protective role in coronary heart disease. The hypolipidemic activity of whole plant extract of *Corallocarpus epigaeus* was compared with a standard drug simvastatin (20 mg/kg p.o body weight), a known lipid- lowering agent in both models. This result is considered as important for the treatment of Hyperlipidaemia induced atherosclerosis and apparently validates the folk medicinal use of hyperlipidemic patients in India.

Keywords: Anti-hyperlipidemic; Lipid profile; Triton; High fat; *Corallocarpus epigaeus;* Simvastatin.

1. INTRODUCTION

Health is freedom from bodily pain or disease especially, but true health is more than that including the joy of living, the power and ability to lead a satisfying and purposeful life. This concept is being dented in the present era as the metabolic syndrome, defined as a cluster of three among five criteria i.e insulin resistance and glucose intolerance, abdominal obesity, hypertension, low & high density lipoprotein, cholesterol and hypertriglyceridemia has become a global epidemic. The prevalence of metabolic syndrome in adults has been increasing rapidly in the past decades in most western countries, and the situation is even worse in people older than 60 years (Ford E *et al.,* 2002). It is an identified fact that people with metabolic syndrome are very likely to get atherosclerotic cardiovascular disease (ASVCD) and hence effective and feasible therapeutic strategies are immediately needed for the treatment of complications of metabolic syndrome(Ninomiya J K *et al.,* 2004). Hyperlipidaemia is a term used to describe several conditions in which high concentrations of lipids exist in the bloodstream and it results from abnormalities in lipid metabolism or plasma lipid transport or a disorder in the synthesis and degradation of plasma lipoproteins (Azezli A *et al.,* 2005). Hyperlipidaemia is a common disorder in developed countries and is the major cause of coronary heart disease that results from high levels of fats in the blood. These fats include cholesterol and triglycerides that are important for our body to function but when they are high, they can cause heart disease and stroke. Heart disease and stroke are usually due to atherosclerosis of large and medium sized arteries. Hyperlipidaemia is manifested as hypercholesterolemia and/or hypertriglyceridemia.

However, hypercholesterolemia is more common. The consequence of Hyperlipidaemia is that with time it can cause atherosclerosis, and thus the risk of coronary heart disease and stroke is increased. More people die annually from CVDs than from any other cause. Low and middle income countries are disproportionally affected. 82% of CVD deaths take place in low and middle income countries and occur almost equally in men and women (Gupta R *et al.,* 1996). Although there are a variety of treatments for patients with cardiac disease, Heart surgery is a major treatment in patients with advanced acquired or complex congenital heart diseases. Recognition that dyslipidemia is a risk factor has led to the development of drugs that reduce cholesterol levels. These drugs provide benefit in patients across the entire spectrum of cholesterol levels, primarily by reducing levels of low-density lipoprotein cholesterol (LDL). Since two-thirds of patients with CHD in the United States have low HDL levels (<40 mg/dl), it is important to include low-HDL patients in management guidelines for dyslipidemia, even if their LDL-C levels are in the normal range (Bersot T P *et al.,* 2003).

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Hyperlipidaemia is associated with risk factors like atherosclerosis, hypertension, type II Diabetes mellitus, obesity, myocardial infarction, congestive cardiac failure, angina pectoris, gall bladder diseases, degenerative joint diseases, sleep apnea, and infertility. Allopathic drugs are available for counteracting liver injury and Hyperlipidaemia, but the side effects and cost associated with these allopathic drugs necessities the search for alternative which are without side effects. It is crucial to maintain the normal body functions by reducing the elevated serum cholesterol to an adequate level. However, with the increasing concern about health promoting, the side effects of cholesterol-lowering drugs have been gradually uncovered. For example, studies reported that some patients were unable to tolerate statin treatments, due to musculoskeletal symptoms and other side effects (Rader *et al.,* 2001). Management of Hyperlipidaemia without any side effects is still a challenge to the medical system. Although many efficacious lipid lowering drugs exist, none is effective for all lipoprotein disorders, and all such agents are associated with some adverse effects (Mc Kenny JM, 2007) Plant products are frequently considered to be less toxic and more free from side effects than synthetic ones. Plants play a major role in the introduction of new therapeutic agents and have received much attention as sources of biologically active substances including antioxidants, hypoglycaemic, and hypolipidemics. India has a very long, safe and continuous usage of many herbal drugs in the officially recognized alternative systems of health viz. Ayurveda, Unani, Siddha, Homeopathy and Naturopathy. More than 70% of India's 1.1 billion populations still use these Non-allopathic Systems of Medicine. Currently, there is no separate category of herbal drugs or dietary sup.lements, as per the Indian Drugs Act (Ashok DB *et al.,* 2007).

Corallocarpus epigaeus L. **(**Family: Cucurbitaceae) is a prostrate climbing perennial plant. It is commonly called as Indian Bryonia. *Corallocarpus epigaeus* L. enriched with phenols has antidiabetic, anti-inflammatory, anti-venom and analgesic effects(A.N. Chandrakala *et al.,* 2013) and hence in our present study we aimed at investigating the antihyperlipidemic activity of ethanol extract of *Corallocarpus epigaeus* L. Whole plant (CE) in triton induced and high fat diet induced hyperlipidemic rats.

2. MATERIALS & METHODS

2.1 Collection, Identification & Authentication of plant material

The plant material was collected from the hills of Tirumala, A.P, India and was taxonomically authenticated by Prof.Dr.K.Madhava chetty, Department of Botany, SV University, Tirupati and a voucher specimen has been prepared.

2.2 Preparation of Plant Extract & Phytochemical screening

The collected plant materials were dried in shade for about 15 days, made in to coarse powder with the use of mixer grinder. Powdered plant material was extracted with Ethanol in soxhlet apparatus for 22 hours. The extracts were collected and concentrated under reduced pressure to a semisolid mass. The extracts obtained were dried in an autoclave. The solvent was recovered by distillation and the extracts were subjected to qualitative phytochemical tests (Movahedian A *et al.,* 2010).

2.3 Animal study

Adult Wistar rats of 150-250 g were obtained from the Albino lab for experimental purpose. The animals were maintained under controlled conditions of temperature (23 ± 2 C), humidity (50 ± 5%) and 12 h light-dark cycles. All the animals were acclimatized for seven days before the study. The animals were randomized into experimental and control groups and housed individually in sanitized polypropylene cages containing sterile husk as bedding. They had free access to standard pellets as basal diet and water *ad libitum*. Habituation period for animals prior to study was 48 hrs. All the studies conducted were approved by the Institutional Animal Ethical Committee (IAEC) of Albino Research and training institute, Hyderabad (REF-Albino/2013/Conf.Lett-0013) according to prescribed guidelines of Committee for the Purpose of Control and Supervision of Experiments on Animals (Reg No: CPCSEA/IAEC/EXP/25/50/2013/EXP-26), Govt. of India.

2.4 Determination of Acute Toxicity (LD_{50})

2.4.1 Animals

Albino rats weighing 150-250g were used for the study. They were nulliparous and non-pregnant. These were acclimatized to laboratory condition for one week prior to start of dosing.

2.4.2. Preparation of Dose

Ethanolic extract of *Corallocarpus epigaeus* L (CE) was dissolved in suitable solvent, to prepare a dose of 200 and 400 mg/kg. The doses were selected according to the OECD guideline no. 425.

2.4.3 Procedure

The procedure was divided into two phases. Phase I (observation made on day one) and Phase II (observed the animals for next 14 days of drug administration). Two sets of healthy female rats (each set of 3 rats) were used for this experiment. First set of animals were divided into three groups, each of one in a group. Animals were fasted overnight with water *ad libitum.* Animals received a single dose of 2000 mg/kg, p.o was selected for the test, as the test item was a source from herb. After administration of EECE, food was withheld for 3-4 hrs. If the animal dies, conduct the main test to determine the LD_{50}. If the animal survives, dose four additional animals sequentially so that a total of five animals are tested. However, if three animals

die, the limit test is terminated and the main test is performed. The LD_{50} is greater than 2000 mg/kg, if three or more animals survive. If an animal unexpectedly dies late in the study, and there are other survivors, it is ap.ropriate to stop dosing and observe all animals to see if other animals will also die during a similar observation period. Late deaths should be counted the same as other deaths. The same procedure was repeated with another set of animals to nullify the errors.

2.5 Evaluation of Antihyperlipidemic Activity

Preparation of Extract dose

Accurately 3 gm of the extract was weighed and suspended in 10 ml of distilled water using tween 80 and thus formed suspension is sonicated 10 min at medium vibration to obtain uniform suspension.

2.5.1 High fat induced Hyperlipidaemia

Experimental Animals & Treatment protocol

Albino wistar rats weighing 150-250g were divided into five groups of six in each group. Before the treatment Hyperlipidaemia is induced using high fat diet prepared by homogenously mixing dalda and coconut oil in the ratio of 3:2w/w. Except for Group-I all the other groups were fed on high fat diet (dalda and coconut oil) by gavaging at a dose of 10ml/kg body weight. Once the hyperlipidemia was induced between 0 to 2nd week of the experiment, treatment was started till twenty eight days (Hemanna Gowda K *et al.,* 2010).

Group-I: Distilled water was administered and served as negative control. Group-II: Distilled water was administered and served as positive control Group-III: Standard drug (Simvastatin 20mg/kg, p.o) was administered.

Group-IV: Ethanol extract of *Corallocarpus epigaeus* (EECE) was administered at a dose rate of 200mg/kg, p.o body weight.

Group-V: EECE was administered at a dose rate of 400mg/kg, p.o body weight.

After the completion of twenty eight days, blood was collected for the estimation of biochemical parameters like body weight, total cholesterol, HDL, LDL, VLDL, triglycerides .Before collection of blood the animals were kept overnight fasting.

2.5.2 Triton induced Hyperlipidaemia (Setty Seema K *et al.,* 2012)

Experimental Animals

Albino wistar rats weighing 150-250g were divided into five groups of six in each group.

Experimental Design

Group-I: Distilled water was administered and served as negative control.

Group-II: Distilled water was administered and served as positive control

Group-III: Standard drug (Simvastatin 20mg/kg, p.o) was administered

Group-IV: EECE was administered at a dose rate of 200mg/kg, p.o body weight

Group-V: EECE was administered at a dose rate of 400mg/kg, p.o body weight.

This treatment was continued from group II to V, Hyperlipidaemia was induced in Wistar albino rats by single Intraperitoneal injection of freshly prepared solution Triton -X-100(100mg/kg) in physiological saline solution after overnight fasting for18h.

Following that Group-II to V given a single dose of Triton administered at a dose of 100mg/kg, i.p. After 72hrs of Triton injection Group III received a daily dose of standard drug (20mg/kg, p.o) and group IV and V received a daily dose of 400mg/kg (p.o) for 7 days. The group-I served as normal control.

BIOCHEMICAL ANALYSIS

On 8th day after fasting for 18hrs the animals were anesthetised with ether and blood was withdrawn by retro orbital sinus puncture. Serum was separated by centrifugation of blood at 3000rpm per 10min for estimation of biochemical parameters such as TC, TG, HDL-C and LDL-C was calculated. TG and TC were measured with enzymatic kits. HDL-C was determined after precipitation of LDL with phosphotungstic acid and magnesium chloride. The LDL cholesterol concentrations were calculated from the fried wald's equation.

2.5.3 BIOCHEMICAL PARAMETERS

2.5.3.1 Estimation of Serum Triglycerides

Lipoprotein lipase is the enzyme which hydrolyses triglycerides to glycerol's and free fatty acids. The glycerol formed with ATP in the presence of glycerolkinase forms glycerol 3 phosphate which is oxidised by the enzyme glycerol phosphate oxidase to form hydrogen peroxide. The hydrogen peroxide further react with phenolic compound and 4-aminoantipyrene by the catalytic action of peroxidase to form red coloured quinoneimine dye complex. The colour formed is directly proportional to the amount of triglycerides present in the sample. Monitor the absorbance at 505 nm (Herbert K *et al.,* 1984).

$$\text{Triglycerides mg/dl} = \frac{\text{Absorbance of test}}{\text{Absorbance of standard}} \times 200$$

Table 1: Working procedure for estimation of Serum Triglycerides

Addition sequence	Blank (µl)	Standard (µl)	Test (µl)
Triglyceride mono reagent	1000	1000	1000
Triglyceride standard	-	10	-
Serum/Plasma	-	-	10

Mix well and incubate at 37 ^{0}C for 10 min. Measure the absorbance of the standard and test sample against the blank, within 60min.

Table 2: Working Procedure for estimation of serum cholesterol

Addition sequence	Blank (µl)	Standard (µl)	Test (µl)
Cholesterol reagent	1000	1000	1000
Cholesterol standard	-	10	-
Serum/Plasma	-	-	10

Mix well and incubate at 37^0 C for 10 min. Aspirate blank followed by standard and tests then measure the absorbance of the sample and standard against blank at 505 nm.

Table 3: Procedure of addition of reagents

Addition sequence	Blank (µl)	Standard (µl)	Test (µl)
Supernatant	--	--	100
Cholesterol reagent	1000	1000	1000
HDL-Cholesterol standard	--	100	--

Where*(2= dilution factor, as sample is diluted 1:1); Low density lipoprotein (LDL) and very low density lipo-protein (VLDL) values were calculated by using Friedewald's formula

Table 4: Percentage Yield of EECE

Sl. No	Extracts	Yield in gm	Percentage Yield
1	Ethanolic	102.35	23.9%

Table 5: Details of Qualitative Phytochemical Tests

Sl. No.	Test	Hydroalcoholic extract
1	Alkaloids	-
2	Carbohydrates	-
3	Flavonoids	+
4	Glycosides	-
5	Phenolic compounds	+
6	Proteins	-
7	Tannins	-
8	Saponins	+
9	Tri terpenoids	+

+ Indicates presence, **-** Indicates Absent

2.5.3.2 Estimation of Serum Cholesterol

In the presence of cholesterol esterase, cholesterol esters are dissociated in to cholesterol and fatty acids, cholesterol oxidase then converts the cholesterol in to hydrogen peroxide and cholesterone. In the presence of peroxidase, hydrogen- peroxide reacts with 4-amino antipyrine and phenol to form a quinoneimine dye. The absorbance of quinoneimine measured spectrometrically at 505nm was proportional to cholesterol concentration in the specimen (Nader R *et al.,* 1994).

$$\text{Cholesterol mg/dl} = \frac{\text{Absorbance of test}}{\text{Absorbance of standard}} \times 200$$

2.5.3.3 Estimation of Serum HDL-Cholesterol

Low Density Lipoprotein (LDL) Cholesterol, Very Low Density Lipoproteins (VLDL) Cholesterol and Chylomicron fractions are precipitated by addition of polyethylene Glycol 6000 (PEG). After centrifugation, the High Density lipoprotein (HDL) fraction remains in the supernatant and is determined with CHOD-PAP method (Siedel J *et al.,* 1983).

$$\text{HDL - Cholesterol mg/dl} = \frac{\text{Absorbance of test}}{\text{Absorbance of standard}} \times 50 \times 2$$

Procedure

Mix well and keep at room temperature (15-30^{0}C) for 10 min. Centrifuge for 15 min at 2000 rpm and separate clear supernatant. Use the supernatant for HDL-Cholesterol estimation.

2.6. Statistical Analysis

Table 6: Effect of EECE on Body Weights in HFD Induced Hyperlipidemic Rats

S.NO	Group	Body weights (gm)		
		Day 0	Day 14	Day 28
1	Normal Control	180.170±0.04	193.16±1.30	217.67±0.14***
2	Positive Control	214.52±0.175	272.86±1.081**	390.254±0.12
3	Simvastatin (20 mg/kg)	198.48±0.088**	240.94±1.48*	325.8±1.17***
4	Test-I (200 mg/kg CE)	176.79±0.230*	196.61±0.95*	254.946±1.08**
5	Test-II(400mg/kg CE)	189.26±0.37**	216.87±1.84*	292.33±1.79**

Values are expressed as Mean ± SEM (n=5) one way ANOVA followed by Tukey's multiple comparison test. Where, *** P<0.001, ** P<0.01 and * P<0.05.All values are compared with normal control. HFD: High Fat Diet, EECE: Ethanolic Extract of *Corallocarpus epigaeus*

Table 7: Effect of EECE on Lipid Profile in HFD Induced Hyperlipidemic Rats

S.NO	Group	Serum Lipid Profile mg/dl			
		TC	TG	HDL	LDL
1	Normal Control	122.1±0.7614	141.5±0.1633	39.95±0.05346	53.61±0.226
2	Positive Control	192.5±0.3936***	336.3±1.488***	22±0.3870***	100.1±0.1927**
3	Simvastatin (20 mg/kg)	128.1±0.7002**	162.5±0.719**	37.84±0.142**	84±0.5774**
4	Test-I (200 mg/kg CE)	185.0±0.1613*	321.2±0.8811*	23.88±0.143**	57.99±0.05594*
5	Test-II(400mg/kg CE)	176.35±0.217**	233.0±0.8208**	28.36±0.306**	71.42±0.536**

Values are Mean ± SEM (n=5) one way ANOVA followed by Tukey's multiple comparison test. Where, *** P<0.001, ** P<0.01 and * P<0.05. All values are compared with HFD control. HFD: High Fat Diet; EECE: Ethanolic Extract of *Corallocarpus epigaeus*

Table 8: Effect of EECE on Lipid Profile in Triton induced Hyperlipidemic Rats

Group	Serum Lipid Profile mg/dl			
	TC	HDL	LDL	TGs
Normal Control	19.32±0.0088	18.54±0.0379	4.737±0.0348	20.52±0.1804
Positive Control	52.21±0.22***	3.357±0.06***	35.22±0.071***	107.9±2.044***
Simvastatin (20 mg/kg)	32.70±0.273**	10.35±0.07***	24.60±0.2**	24.70±0.133***
Test-I (200 mg/kg CE)	19.84±0.321**	7.025±0.011*	18.33±0.2163**	40.21±0.0902*
Test -II(400 mg/kg CE)	23.40±0.074**	8.658±0.219**	20.64±0.1810**	32.39±0.1552**

Values are Mean ± SEM (n=5) one way ANOVA followed by Tukey's multiple comparison test. Where, *** P<0.001, ** P<0.01 and * P<0.05. All values are compared with positive control. EECE: Ethanolic Extract of *Corallocarpus epigaeus*

The values are expressed as Mean ± SEM. The data was analysed by using one way ANOVA followed by using Graph Pad Prism software 6.01 version. Statistical significance was set at $P \leq 0.05$.

3. RESULTS & DISCUSSION

3.1 Preparation & Phytochemical evaluation of extracts

The extracts were prepared, percentage yield was calculated and phytochemical investigations are carried out and tabulated.

3.2 Acute Toxicity Studies

In both the procedures, none of the animals have shown toxicity upon the single administration of EECE (200 mg/kg, p.o). Hence the procedure is repeated by increasing the dose of extracts (400 mg/kg, p.o). None of the animals had shown any toxicity. Thus, 200, 400 mg/kg body weights were selected as doses for the present study.

3.3 Effect of EECC on Physical Parameters of HFD induced hyperlipidemic rats

3.3.1 Body Weight

During 28 days of Hyperlipidaemia induction and treatment, the body weights of animals were monitored for every 14 days starting from day 0 and the results were tabulated.

In first 14 days i.e., from day 0 to day 14, animals in the Groups II to V increased their weights with extreme significance (217.67±0.14, 325.68±1.17, 254.94±1.08, 292.33±1.79) when compared to positive control group (390.25±0.127).

From day 14 to day 28 animals in all the groups decreased their weights. But animals treated with 200mg/kg, p.o EECE did not show significance in decrease in weights up to day 28. Animals treated with 400mg/kg, p.o showed significant decrease in weight from day 21 and on day 25, 28 it showed extreme significance in body weight reduction. P<0.001. Simvas-

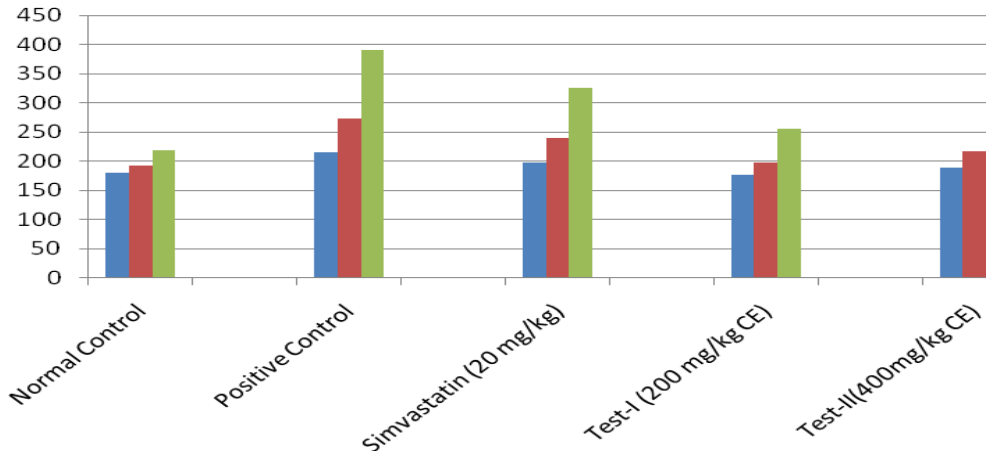

Figure 1: Effect of EECE on Body Weights in HFD Induced Hyperlipidemic Rat

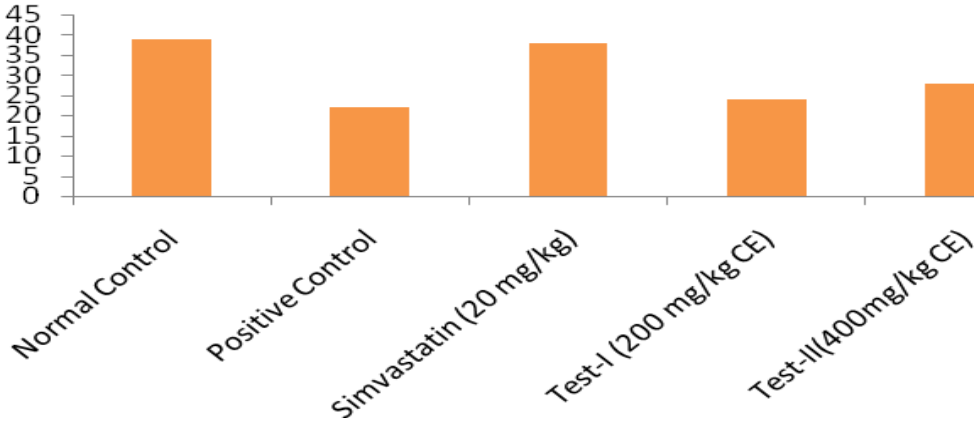

Figure 2: Effect of EECE on HDL in HFD Induced Hyperlipidemic Rats

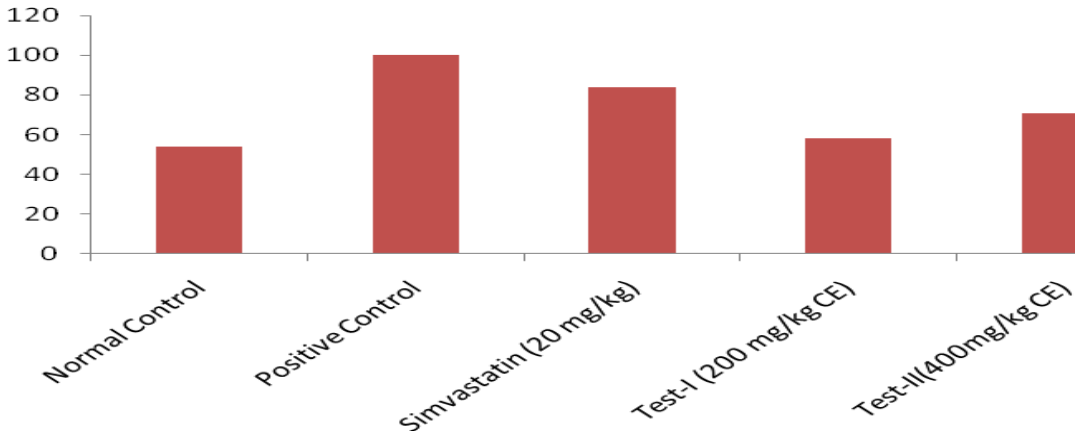

Figure 3: Effect of EECE on LDL in HFD Induced Hyperlipidemic Rats

tatin showed its antihyperlipidemic activity effectively on body weights and exhibited extreme significant reduction in weights from day 14 to day 28.

3.3.2 Serum Lipid Profile

The lipid profile was evaluated by estimating triglycerides (TG), total cholesterol (TC), HDL-Cholesterol (HDL-c), LDL-Cholesterol (LDL-c) and VLDL-Cholesterol (VLDL-c) in normal and hyperlipidemic animals.

High Density Lipoprotein (HDL)

Animals in HFD group exhibited very significant decrease in HDL levels (22±0.387 mg/dl) compared to normal control group (39.95±0.05 mg/dl).

Hyperlipidemic animals treated with 200mg/kg, p.o EECE did not show significant increase in HDL levels, animals treated with 400mg/kg, p.o EECE showed significant increase in HDL levels 28.36±0.306 mg/dl $P<0.001$.

Low Density Lipoprotein (LDL)

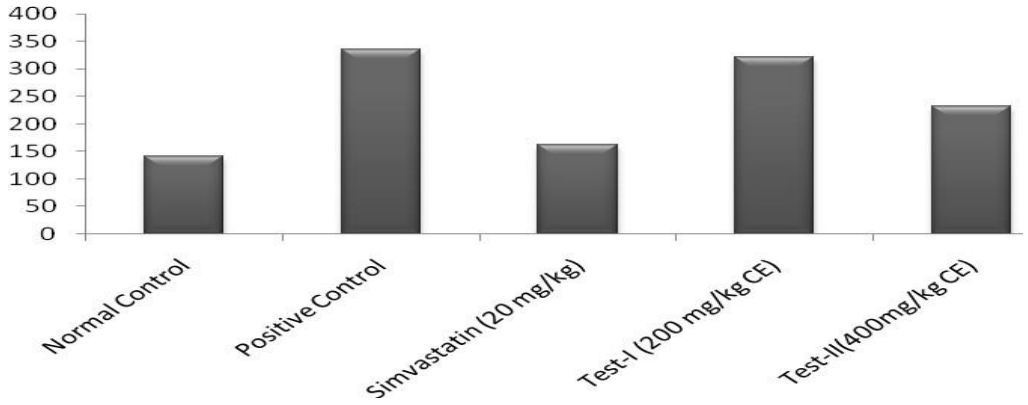

Figure 4: Effect of EECE on Total glycerides level in HFD Induced Hyperlipidemic Rats

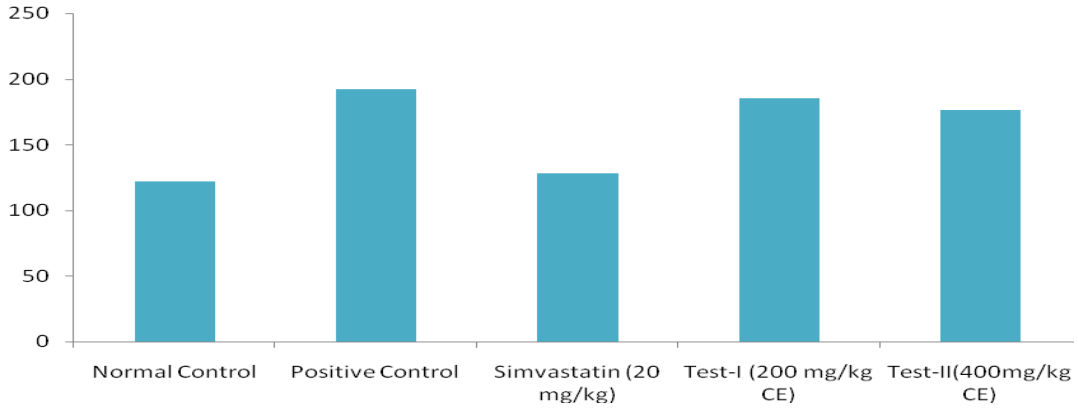

Figure 5: Effect of EECE on total cholesterol level in HFD Induced Hyperlipidemic Rats

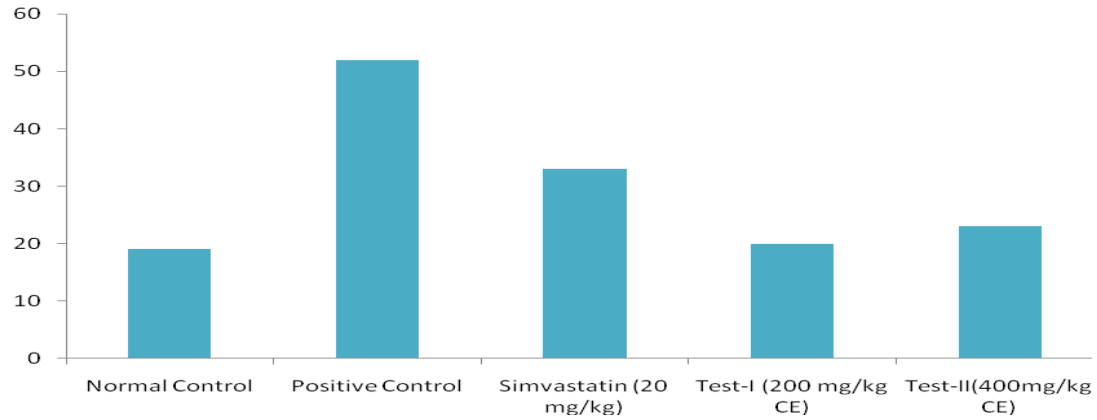

Figure 6: Effect of EECE on total cholesterol level in Triton Induced Hyperlipidemic Rats

Animals in HFD group exhibited very significant increase in LDL levels (100.1±0.1927 mg/dl) compared to normal control group (53.61±0.226 mg/dl).

Hyperlipidemic animals treated with 200mg/kg and 400mg/kg, p.o EECE did not show significant reduction in LDL levels P<0.001. The values were tabulated.

Total cholesterol (TC)

Animals in HFD group exhibited very significant increase in total cholesterol levels (192.5±0.3936 mg/dl) compared to normal control group (122.1±0.7614 mg/dl).

Hyperlipidemic animals treated with 200mg/kg, p.o EECE did not show significant reduction in total cholesterol levels, animals treated with 400mg/kg, p.o EECE showed very significant decrease in total cholesterol levels 176.35±0.217 mg/dl P<0.01.

Triglycerides (TG)

Animals in HFD group exhibited very significant increase in triglycerides levels (336.3±1.488 mg/dl) compared to normal control group (141.5±0.1633 mg/dl).

Hyperlipidemic animals treated with 200mg/kg, p.o EECE showed significant reduction in triglycerides levels 321.2±0.88 mg/dl P<0.05, animals treated with 400mg/kg, p.o EECE showed very significant decrease in triglycerides levels 233.0±0.82 mg/dl P<0.01.

3.4 Effect of EECC on Physical Parameters of Triton induced hyperlipidemic rats

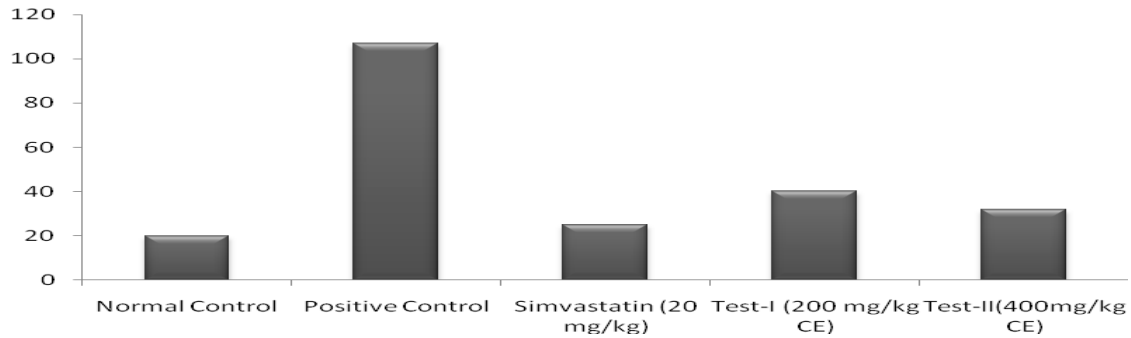

Figure 7: Effect of EECE on total triglyceride level in Triton Induced Hyperlipidemic Rats

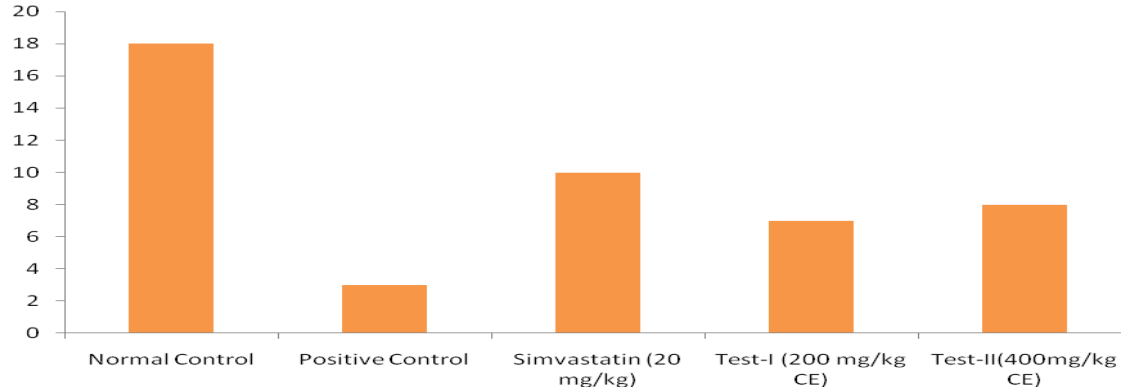

Figure 8: Effect of EECE on HDL level in Triton Induced Hyperlipidemic Rats

Effect of *Corallocarpus epigaeus* on total Cholesterol levels

Induction of Hyperlipidaemia resulted in significantly raised triglyceride levels (52.21±0.2228) compared to the normal (19.32±0.0088). Treatment with Triton-X-100 caused a significant rise in the levels of cholesterol 52.21±0.2228. Administration of various doses of the plant extract after the treatment with Titon-X-100 resulted in the lowering of Cholesterol levels in a dose dependant manner. The total cholesterol levels of groups treated with 200 and 400 mg/kg were 19.84±0.321, 23.40±0.0747 respectively. The reduction in cholesterol level produced by 400mg/kg extract was significant at ($p<0.05$).

Effect of *Corallocarpus epigaeus* on serum LDL levels

The LDL levels in normal rats were found to be 4.737±0.0348. Administration of Triton-X-100 resulted in a decrease in LDL levels (35.22±0.0713). In simvastatin group the LDL was reduced to 24.60±0.2, where as groups treated with 200 and 400 mg/kg of extract showed a dose dependant decrease in the LDL levels (18.33±0.112, 20.64±0.1810 respectively).

Effect of *Corallocarpus epigaeus* on serum HDL levels

The HDL levels in normal rats were found to be 18.54±0.03796. Administration of Triton-X-100 resulted in a fall in HDL levels (3.357±0.0605). In Simvastatin group the LDL was elevated to 10.35±0.0763, where as groups treated with 200 and 400 mg/kg of extract showed a dose dependant increase in the HDL levels (7.02±0.01, 6.858±0.2199 respectively).

Effect of *Corallocarpus epigaeus* on Triglyceride levels

Induction of Hyperlipidaemia resulted in significantly declined triglyceride levels (107.9±2.044) compared to the normal (20.52±0.1805). Administration of various doses of the plant extract was able to produce a dose dependant decrease in the triglyceride levels. The respective triglyceride values for rats treated with 200 and 400 mg/kg of extract were 40.21±0.0905 and 32.39±0.1552.

The present study was designed to investigate the antihyperlipidemic activity of EECE extract in Triton X-100 and High fat diet induced hyperlipidemic rats. Treatment with plant extract was able to significantly decrease the levels of TC, TG and LDL. Also the extract was found to cause a significant increase in the HDL levels. Therefore it can be concluded that EECE extract is able to effectively sup.ress Triton and High fat diet induced Hyperlipidaemia in rats, suggesting the potential protective role in coronary heart disease. This result is considered as important for the treatment of Hyperlipidaemia induced atherosclerosis and aparently validates the folk medicinal use of hyperlipidemic patients in India.

CONCLUSION

The present study indicated that administration of EECE at a dose of 400mg/kg, p.o produced significant antihyperlipidemic activity in HFD induced hyperlipidemic rats. EECE at a dose of 200mg/kg, p.o shows less effect than the 400mg/kg, p.o in reducing the lipid levels and body weights. The acute toxicity study indicated that the extracts are devoid of major toxic ef-

fects. The effect of EECE in normal rats, HFD rats and triton induced rats also indicated that it have better hypolipidemic activity compared with the normal control animals. Besides this, the drug administered to treat HFD induced hyperlipidemic rats showed a significant reduction in serum lipids such as TC, TG, LDL levels and also increases the HDL levels. The EECE also exhibited reduction in triglyceride levels in triton induced rats. These observations concluded that the ethanolic extract of the plant *Corallocarpus epigaeus* L possess antihyperlipidemic effects. The mechanism has point towards inhibiting cholesterol and triglyceride synthesis.

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CONFLICT OF INTEREST

NIL

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