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SCREENING OF ANTI-HYPERLIPIDEMIC ACTIVITY OF METHANOLIC EXTRACT OF *LAGERSTROEMIA SPECIOSA* (LINN.) PERS. LEAVES

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ABSTRACT: The present study was designed to investigate the hypolipidemic activity of the methanolic leaf extract of *Lagerstroemia speciosa* Linn. Plant extract was tested in fat diet induced hyperlipidemic rat models. Methanolic extracts of leaves of *Lagerstroemia speciosa* Linn. were administered in doses of 250mg/kg and 500mg/kg/day for one week. The obtained results reveal that methanolic leaf extract (LMLS & HMLS) of *Lagerstroemia speciosa* Linn. showed significant antihyperlipidemic activity.


INTRODUCTION: Hyperlipidemia¹ is a major risk factor for the atherosclerosis and other complications like obesity, coronary heart disease, ischemic cerebro vascular disease, and hypertension. In addition hyperlipidemia is induced by secondary effect of diabetes. Although many of the synthetic drugs are available, but, none is effective for all lipoprotein disorders and are associated with some adverse effects. Natural products are the best agents used for centuries to cure various ailments and are less toxic, low cost and which can provide better safety and efficacy on long term usage. *Lagerstroemia Speciosa* Linn. belongs to the Lythraceae²⁻⁵ family. It is a medicinal tree traditionally used to lower high blood sugar^{3,5}.

Commonly called as Sogasula chettu in Telugu. *Lagerstroemia Speciosa* has been evaluated for anti-diabetic³, antibacterial, antiviral^{2,4}, anti-inflammatory^{2,4}, antinociceptive, anti-diarrhoea, cytotoxic^{2,4}, anti-obesity^{2,4,6}, anti-fibrotic⁴ and Xanthine oxidase inhibition activities^{2,4}. The present study was designed to investigate the antihyperlipidemic activity of the methanolic leaf extract of the *Lagerstroemia Speciosa* Linn.

MATERIALS AND METHODS:

Plant Materials and Chemicals: The fresh leaves of the *Lagerstroemia Speciosa* Linn. collected at our college premises, Vadlamudi, Guntur and was authenticated by botanist of Acharya Nagarjuna University, Guntur. Atorvastatin was obtained as gift sample from Cipla Kurkumbh, Pune. Diagnostic kits for estimation of cholesterol (Excel Diagnostics) and triglycerides (Excel Diagnostics) were used. High cholesterol diet^{7,9,10} was prepared in the college laboratory.

Preparation of Extracts: The leaves of the plant were dried in shade at room temperature and then

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coarse powder was prepared. Methanolic extract prepared by hot continuous extraction method. The powdered material of plant of *Lagerstroemia Speciosa* was evenly packed in Soxhlet extractor for extraction for 6 hours with methanol and the temperature was maintained on the electric heating mantle with thermostat control. The extract was concentrated by distillation and percentage yield was calculated.

Preliminary Phytochemical Screening: The conventional chemical tests were carried for the methanolic extract of *Lagerstroemia Speciosa* to identify the presence of various phyto-constituents.

In vivo Studies:

Experimental of Animals: Either sex of the Wistar Albino rats weighing between 150- 200gm was procured from the Mahaveer Enterprises, Hyderabad, India. The animals were kept under standard environmental conditions of room temperature and 12 h light and dark cycles. The animals were housed in the colony cages (three rats per cage) and provided feed and water *ad libitum*. Research study was carried out in accordance with the guidelines of Institutional Animal Committee. The study was conducted after obtaining Ethical committee clearance from the Institutional Animal Ethical Committee. The protocol number is 005/IAEC/VPC/2017.

Preparation of Doses: In the present study, two doses of the *Lagerstroemia Speciosa* leaf extract was prepared as 250 mg (LMLS) and 500 mg/kg (HMLS) suspended in 1% CMC and given by oral gavage.

Preparation of High Fat Diet: Animal food pellets were crushed with the help of motor and pestle and grinded into fine powder in mixer grinder. To the fine powder 3% of cholesterol, 1% of cholic acid, 30% of sucrose and 10% of coconut oil were added and mixed well.

Anti-Hyperlipidemic Activity: The animals were fed with a high fat diet for 30 days¹⁰. After inducing the hyperlipidemia, then the rats were divided into 5 groups of 6 animals and are treated with different doses of plant extract orally for one week. Group-1 was administered with LMLS (250mg/kg) and fed with high fat diet, group-2 was administered with HMLS (500mg/kg) and high fat diet, group-3 received the Atorvastatin (10mg/kg) and high fat diet, group-4 was administered with vehicle and fed with normal diet, served as normal control and group-5 was fed with fat diet and kept as hyperlipidemic control.

Biochemical Assay: Under mild ether anaesthesia, blood samples were collected by retro-orbital puncture at the end of the experiment. The collected samples were centrifuged for 15 minutes at 2000rpm to get the serum. Then the serum samples were analysed by using diagnostic kits for serum Total Cholesterol, Triglycerides, HDL-C, LDL- C and VLDL-C.

Statistical Analysis: Results were analysed by one way ANOVA, followed by Dunnett's t-test and 'P' value less than 0.05 were taken as significant.

RESULTS: Dried and powdered leaves of *Lagerstroemia Speciosa* was subjected to soxhlet extraction with 95% methanol and yielded 8% w/w. Terpenoids, tannins and saponins were identified in preliminary phytochemical tests (**Table 1**).

TABLE 1: PRELIMINARY PHYTOCHEMICAL SCREENING OF THE METHANOLIC LEAF EXTRACT OF LAGERSTROEMIA SPECIOSA

S. no	Name of the constituent	Methanolic extract
1	Tannins	++
2	Saponins	+
3	Terpenoids	+++
4	Flavonoids	++
5	Glycosides	-
6	Alkaloids	+
7	Phytosterols	+

Note: Absence (-), Presence: Mild (+), Moderate (++), Potent (+++)

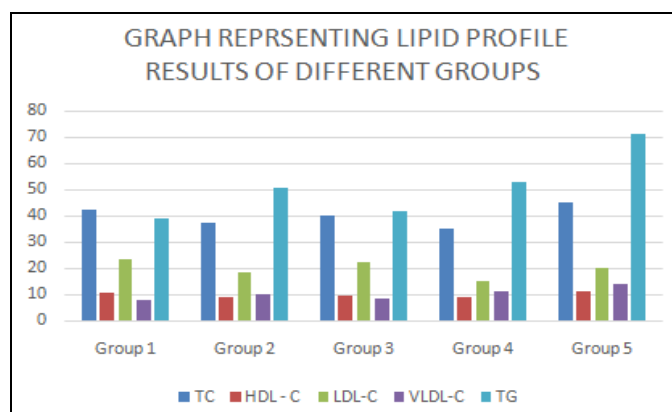
TABLE 2: EFFECT OF LAGERSTROEMIA SPECIOSA LEAF EXTRACT ON LIPID PARAMETER LEVELS IN FAT DIET INDUCED HYPERLIPIDEMIC RATS

S. no	Groups	Serum lipid Parameter (%)				
		Total Cholesterol	Total Triglycerides	HDL-C	LDL-C	VLDL-C
I	LMLS (250mg/kg)	42	39	11	24	08
II	HMLS (500mg/kg)	37	50	09	18	10

III	Atorvastatin (10mg/kg)	40	42	10	22	08
IV	Normal Control	45	71	11	20	14
V	Hyperlipidemic Control	35	53	09	15	11

Values are statistically significant at *P < 0.05 using one way ANOVA by t-test

Treatment with LMLS (250mg/kg) and HMLS (500mg/kg) for one week successfully reduced the animal body weights and also prevented the elevated serum cholesterol, triglycerides, LDL-C, VLDL-C in fat diet model (**Table 2**) and (**Graph 1**).



GRAPH 1: LIPID PROFILE RESULTS OF EXPERIMENTAL ANIMALS

DISCUSSION: Hyperlipidemia is a major risk factor for atherosclerotic coronary artery disease. It has been well established that nutrition plays an important role in aetiology of hyperlipidemias. High fat diet has been often used to elevate serum cholesterol to assess hypercholesterolemia in various animals. Based on this information, the present study was done on animal models fed with high fat diet to screen the antihyperlipidemic activity. From the obtained results (**Table 2**), it was observed that maximum activity was reported by the HMLS (500mg/kg) and considerable activity was found with the LMLS (250mg/kg) when compared with that of the standard drug (Atorvastatin). Animals treated with Atorvastatin (10mg/kg) showed marked reduction in all serum lipoproteins.

CONCLUSION: Present study reveals that methanolic leaf extract of *Lagerstroemia Speciosa* (HMLS) effectively reduced the serum cholesterol, triglycerides, LDL-C and VLDL-C than that of the standard drug Atorvastatin.

Whereas, LMLS showed the similar or equal antihyperlipidemic activity to that of the standard drug. These results proving the antihyperlipidemic activity of the methanolic extract of the *Lagerstroemia Speciosa* leaves.

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CONFLICTS OF INTEREST: Nil

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