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ANTIHYPERLIPIDEMIC EFFECT OF LEAVES OF *ATYLOSIA BARBATA BAKER* LINN. IN DEXAMETHASONE INDUCED RATS

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ABSTRACT

Atylosia barbata Baker. (family Fabaceae) is considered in system of folklore medicine in the treatment of diabetes, antioxidant, anti-inflammatory and anti-rheumatism. The present experimental investigation established the lipid lowering properties of ethanolic extract of leaves of *Atylosia barbata* Baker. on experimentally Dexamethasone induced rats. The lipid parameters studied are Total cholesterol (TC), low density lipoprotein cholesterol (LDL-C), High density lipoprotein cholesterol (HDL-C), very low density lipoprotein cholesterol (VLD-C), Triglycerides and atherogenic index. Extract was administered orally for eight days at a dose of 600 and 1200 mg/kg in Dexamethasone induced rats. The level of TC, LDL-C, VLDL-C and triglycerides were reduced significantly. ($p<0.001$) while HDL-C level was significantly increased when compared to control groups of rats. In conclusion these suggested that ethanolic extract of leaves of *Atylosia barbata* Baker. can reduce the lipid levels significantly.

Keywords: *Atylosia barbata*, Dexamethasone, leaves, Hyperlipidemia

INTRODUCTION

Hyperlipidemia is an elevation of lipids (fats) in the bloodstream. These lipids include cholesterol, cholesterol esters (compounds), phospholipids, and triglycerides in the blood as part of large molecules called lipoproteins. The majority of risk factors involved in the causation of atherothrombotic diseases are directly or indirectly due to disturbances in

the lipid and lipoprotein metabolism. In order to understand the pathophysiology of atherosclerosis and myocardial infarction, it is imperative to understand the normal lipids and lipoproteins, their functions and metabolism in patients of hyperlipoproteinemias of particular interest has been the elucidation of the role of apolipoproteins, lipoprotein receptors, transfer factors and lipolytic enzymes in the metabolism of the lipoproteins **[1, 2]**.

It is important to know about the normal levels of lipids before management. The normal level of total serum cholesterol is < 200 mg/dl above 30 years of age and for every decade less the normal cut off level is 10mg/dl lesser i.e. Between 20-30 years it is 190mg/dl and between 10-20 years it is 180mg/dl. The normal levels of LDL cholesterol is < 130mg/dl above 30 years of age and similarly for every decade less the normal cut off level is 10mg/dl lesser.

The normal level of serum triglyceride is < 150mg/dl. The normal level of HDL cholesterol is >35mg/dl, for apoprotein B < 130mg/dl and for apoprotein A1 >120mg/dl **[3, 4]**.

A polymorphic, much branched, sub erect, perennial herb, 30-60 cm high found throughout India, ascending to an altitude of 1,850 m in the Himalayas. Leaves imparipinnate, 5-15 cm long, leaflets 9-21, narrow, oblanceolate, glabrous above, obscurely silky below, flowers red or purple, in leaf opposed racemes. Pods slightly recurved, 3.7-5.0 cm, seeds 5-10 greenish grey, smooth **[5, 6]**.

Plant description

Atylosia barbata Baker known Peruvidukol (Tamil), kattuzhunnu (Mal) and Mashaparni (Sanskrit).The plants is woody climber with densely pubescent branches, pinnately 3-foliolate leaves having roundish, 7-10cm broad and long leaflets. purple and streaked flowers, in long-peduncled racemes and straight, rather inflated, densely pilose, 5-6 seeded pods (**Figure 1)**. The plant found in the sub-Himalayan tract of Assam, and sparsely or rarely in western and southern Maharashtra and in Karala, up to 1,050m. A decoction or powder of the roots is reported to be rheumatism **[7]**.

Figure 1: *Atylosia barbata* Baker Plant

MATERIALS AND METHODS

Plant material

The plant *Atylosia barbata Baker*. is widely found throughout India. For my work the plant was collected from in the deep forest of Satpuda hills with the help of forest officers of Chopda Tahsil, Dist. Jalgaon, Maharashtra (India) and authenticated by Prof. (Dr.) C. R. Jadhav, scientist, BSI (Botanical Survey of India), Pune (M.S.). (Specimen no. 01). The leaves of the plant were dried under shade and then coarsely powdered with help of mechanical grinder. The powder was passed through sieve no. 40 and stored in an airtight container for further studies. Extraction was carried out by continuous soxhlet extraction process for 72 hr.

Animals

Male wistar rats weighing about 150-180 gm were procured from listed suppliers of Venkataswara Enterprises, Bangalore, India selected. The animals were kept under a conventional light regimen at room temperature (about 25^0 C) and humidity.

Animals were housed in polypropylene cages and were allowed free access to standard laboratory feed and water. All the animals have been divided into five groups and placed in separate cages, each consisting of six animals. The animals were acclimatized to the laboratory condition for one week before the onset of experiment.

Preparation of extract

The collected, cleaned and powdered leaves of *Atylosia barbata* was used for the extraction purposes. 200 gm of powdered leaves material was evenly packed in the soxhlet apparatus. It was then extracted with ethanol. The solvent used was purified before use. The extraction was carried out with ethanol by hot continuous extraction for about 24 hrs. After extraction, the extract was filtered while hot through whatmann filter paper to remove any impurities if present. The extract was concentrated by vacuum distillation to reduce the volume to 1/10; the concentrated extract was transferred to 100ml beaker and the remaining solvent was evaporated on a water bath. Then it was cooled and placed in a dessicator to remove the excess moisture. The dried extract was packed in airtight containers and used for pharmacological screening.

Preliminary phytochemical screening

Preliminary phytochemical screening was done and found the presence of steroids, terpenoids, flavonoids, alkaloids, phenolic compounds, saponins, tanins and carbohydrates. The results were given below in Table 1**[8 -11]**.

ANTIHYPERLIPIDEMIC ACTIVITY

Animals were divided into five groups each consisting of six animals. Hyperlipidemia was induced in group II, III, IV and V by

subcutaneous injection of Dexamethasone (10mg/kg/day S.C.) for 8 days. The rats in normal and hyperlipidemic control group received normal saline while III group received Gemfibrozil (10mg/kg/day P.O.) [suspended in gum acacia in water] and IV and V group, received extract by oral route in dose of 600mg/kg/day and 1200mg/kg/day respectively throughout the 8 days experiment. After the experimental period, the overnight fasted experimental rats were sacrificed by decapitation under light ether anesthesia and blood was collected **[12-13]**.

Serum was separated from blood and analyzed for biochemical parameters (lipid profile). The lipid profile of Dexamethasone induced hyperlipidemia is summarized in **(Table 2)**.

RESULTS AND DISCUSSION

Preliminary phytochemical screening

Preliminary phytochemical screening was done and found the presence of steroids, terpenoids, flavonoids, alkaloids, phenolic compounds, saponins, tanins and carbohydrates. The results were given below in **(Table 1)**.

Table 1: Preliminary phytochemical screening of ethanol extracts of leaves of *Atylosia barbata*

Sr. No.	Constituents	Tests	Ethanol
1.	Alkaloids	Mayer's test	-
		Dragordraff's tes	-
		Hager's test	-
		Wagner's test	-
2.	Sterols	Libermann's Burchard test	-
		Salkowski's	-
3.	Carbohydrates and Glycoisdes	Molisch's test	+
		Fehling's test	+
		Benedict's test	+
		Borntrager's test	+
4.	Fixed oils and fats	Spot test	-
		Saponification test	-
5.	Phenolic compound	$FeCl_3$ test	+
6.	Protein and aminoacids	Biuret test	-
		Ninhydrin test	-
		Xanthoprotein test	-
		Millon's test	-
7.	Triterpinoid and saponins	Foam test	+
		Haemolysis test	+
8.	Tannins	Gelatin test	+
		$FeCl_3$ test	+
9.	Gums and mucilage	Precipitation with 90% alcohol	-
10.	Flavonoids	Aqueous NaOH	+
		Conc. H_2SO_4	+

ANTIHYPERLIPIDEMIC ACTIVITY

Total cholesterol levels in Dexamethasone induced group have significantly increased as compared to normal rats. The values have risen to (141.00±3.924) as compared to normal rat group, in which values lie in the

range (86.167±2.151. This indicates hypercholesteremia. In the test group treated with EELTP (600mg/kg and 1200mg/kg), the values were reduced to (117.33±2.261 and 102.50±1.607) **.** There is a significant reduction in total cholesterol values in test treatment groups. On the other hand Gemfibrozil also have significantly reduced total serum cholesterol levels to **(**91.833±1.195)**.**

HDL-cholesterol in Dexamethasone induced rats have significantly decreased as compared to normal rats. The values have reduced to (24.833±1.014) as compared to normal rats (39.333±0.881)**.** In the test group treated with EELTP (600mg/kg and 1200mg/kg) the values were (30.500±0.670 and 32.107±1.138) respectively. In Gemfibrozil treated group, the values were (35.333±0.760).

LDL-cholesterol in Dexamethasone induced group have significantly increased to (113.50±3.128 mg/dl) as compared to normal group (46.667±1.944mg/dl). In test group treated with EELTP (600mg/kg and 1200mg/kg), the values were reduced to (91.833±1.046mg/dl & 80.667±1.116) respectively. Gemfibrozil has significantly reduced in LDL-cholesterol levels to (64.833±1.990).

VLDL-cholesterol in Dexamethasone induced group have significantly increased to (30.667±0.667mg/dl) as compared to normal rat group (19.333±1.229mg/dl).

In test group treated with EELTP (600mg/kg and 1200mg/kg), the values were reduced to (27.500±0.763 and 24.167±1.076mg/dl) respectively. There is significant reduction in EELTPL treated group. Gemfibrozil has significantly reduced. VLDL- cholesterol level to (22.500±0.562 mg/dl)

Atherogenic Index (Total cholesterol/HDL-cholesterol)

Atherogenic index in Dexamethasone induced hyperlipidemia control was increased to (5.6069) as compared to normal rat group (2.196). In test group with EELTP (600mg/kg and 1200mg/kg), the values were significantly reduced to (3.8366 and 3.131) respectively. Gemfibrozil has significantly reduced the values to (2.715) **(Table 2)**.

Table 2: Effect of ethanolic extract of leaves of *Atylosia barbata* on lipid profile against Dexamethasone induced hyperlipidemia model

Group No	Groups	Dose/ Route	Total Cholesterol (mg/dl)	Total Triglycerides (mg/dl)	HDl-cholesterol (mg/dl)	LDL-cholesterol (mg/dl)	VLDL-Cholesterol (mg/dl)	Atherogenic Index
I	Normal Control	-	86.167± 2.151**	76.333± 1.308**	39.333± 0.881**	46.667± 1.944**	19.333± 0.229**	2.196
II	Dexamethason Control	10mg/kg SC	141.00± 3.924**	113.50± 1.628**	24.833± 1.014**	113.50± 3.128**	30.667± 0.667**	5.606
III	Dexamethasone+ Gemfibrzil	10mg/kg SC+10mg/kg P.O.	91.833± 1.195**	78.333± 0.861**	35.333± 0.760**	64.833± 1.990**	22.500± 0.562**	2.613
IV	Dexamethasone+ EELTP	10mg/kg SC+600mg/kg P.O.	117.-33± 2.261**	101.33± 0.954**	30.500± 0.670**	91.833± 1.046**	27.500± 0.763**	3.836
V	Dexamethasone+ EELTP	10mg/kg SC+1200mg/kg P.O.	102.50± 1.607**	85.167± 1.493**	32.107± 1.138**	80.667± 1.116**	24.167± 1.076**	3.131

EELAB= Ethanol extract of leaves of *Atylosia barbata.*
***P < 0.001, ** P < 0.01 Vs control**
The data were statistically analyzed by Student's t-test and all values were expressed as mean SEM. The data were also analyzed by one way ANOVA followed by Dunnet's t- test and values P<0.05 were considered significant.

CONCLUSION

These results suggested that ethanolic extract of leaves of *Atylosia barbata* possess significant anti-hyperlipidemic activity.

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