

RESEARCH ARTICLE

EFFECT OF AQUEOUS EXTRACT OF *ALOE VERA* AND *ALLIUM SATIVUM* ON THE LIPID PROFILE OF MALE ALBINO WISTAR RAT

Lilhare Minakshi U

Department of Zoology, Government Vidarbha Institute of Science and Humanities, Amravati, Maharashtra,
India- 444 604

Address for Correspondence Email: minakshimaskare@yahoo.in

ABSTRACT	KEYWORDS
<p>From the present study it has been clear that the Aloe vera extract and Allium sativum extract showed significant changes in total cholesterol level. The results of this study showed that the total body weight gain after 21 days of experimental period when animals fed with standard diet. Effects of both extract on plasma lipid profile which proved that the changes in total cholesterol level in group II were significant at 0.01 levels as well as in group III and group IV. The change in LDL and HDL were not significant in both the experimental groups. While the change in Triglyceride level was significant in the experimental Group III where aqueous Allium sativum extract was given.</p>	<p><i>Allium sativum</i> extract, <i>Aloe vera</i> extract, Cholesterol, LDL, HDL, Triglyceride.</p>
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INTRODUCTION

High density Lipoprotein cholesterol is beneficial in preventing risk of cardiovascular diseases. To lower the high cholesterol level we rely on allopathic medicines, homeopathic medicines but there are some medicinal herbs which also result in lowering of blood cholesterol level. Some of them are *Allium sativum* and *Aloe vera*. Consumption of raw *Allium sativum* has beneficial effect on plasma total cholesterol and LDL in rats fed on high cholesterol diet. (Ebsunum *et al.*, 2007) Commercially available *Allium sativum* is used for certain therapeutic purpose, including lowering blood pressure and antimutagenic. *Allium sativum* modulates lipid metabolism. It has been reported that *Allium sativum* increase resistance of low density lipoprotein to Oxidation (Gorinstein *et al.*, 2006). and may be one of the powerful anti-atherosclerotic properties of *Allium sativum*. *Aloe vera* is widely distributed Liliaceae plant in tropical regions. In the center of the *Aloe vera* there are mucilaginous tissue called *Aloe vera* gel which is used to make cosmetic & medicinal products. The pharmacological action of *Aloe vera* was studied in vitro or in vivo, which include

anti-inflammatory, anti-arthritis, antibacterial and hypoglycaemic effects (Yagi *et al.*, 2009). From the beginning of the last century, evidence of the lipid lowering properties of medicinal plants has accumulated. Many scientists have demonstrated the role of medicinal plants in the control of hyperlipidaemia. Ethnobotanical information indicates that more than 800 plants are used as traditional remedies for the treatment of diabetes, but only a few have received scientific scrutiny. Among these plants, *Aloe vera* has been used in herbal medicine in many cultures.

MATERIALS AND METHODS

Male albino Wistar rats weighing 120-160gm were purchased from Sudharkarrao Naik, Pharmacy College, Pusa. They were housed in clean cages 12 hr light/ 12 hr dark cycle. These were divided into four groups (Group-I, II, III, IV) and fed ad libitum for 21 days. They were given clean water and standard diets. 24 rats were divided into 4 groups. Group I- fed with standard diet. Group II- fed with high cholesterol diet (standard diet + 0.1% cholesterol/kg body weight). Group III fed with 0.1% cholesterol diet with *Allium sativum* extract

0.5gm/kg body weight. Group IV-fed with high cholesterol diet + *Aloe vera* extract 0.5 gm/kg body weight for 21 days.

Collection of blood sample

Animals were sacrificed under light chloroform anesthesia after 21 days of experimental period feeding and overnight fasting. Blood samples were collected from cardiac puncture into EDTA bottles for Biochemical estimation.

Biochemical estimation

Total cholesterol was estimated by an enzymatic reaction (Allain, *et al*, 1974). HDL cholesterol was estimated as for total cholesterol after precipitation of the other lipoproteins. Triglyceride was also estimated by enzymatic reaction, (Buccolo and David, 1973) and the LDL-cholesterol was calculated using the formula of (Friedwald *et al*, 1972).

$$\text{LDL-cholesterol (mg/dl)} = \text{Total cholesterol (mg/dl)} - (\text{HDL}(\text{mg/dl}) + \text{TG}/5)(\text{mg/dl})$$

Statistical analysis

All results were subjected to statistical analysis using Computer Software Package of Social Sciences (SPSS). The values were expressed as Mean ± standard error of mean (X ± S.E). Differences within groups were assessed using analysis of variance. Student “t” test was used to assess the differences between two groups and these were regarded as significant at p<0.05.

RESULTS

Observation from the table and figure 1 proved that there was body weight gain after 21 days of experiment. The body weight was not significantly different between all the groups. Table and figure 2 shows effect of extract on plasma lipid profile which proves that the change in total cholesterol level in Group II is significant at 0.01 level as well as the total cholesterol level in Group III and Group IV at 0.01 level. The change in LDL level is not significant while change in HDL level is also not significant. Change in Triglyceride level in Group I, II and IV is not significant while in Group III is significant at 0.01 level.

Table 1: Effects of *Allium sativum* and *Aloe vera* extract on initial and final body weights of rats.

Parameter	Group I	Group II	Group III	Group IV
Initial Body Weight(gm)	154.16±8.01	152.16±10.20	156.83±7.22	151.5±3.88
Final Body Weight(gm)	178.33±9.83	185.83±8.01	185±5.47	191.66±5.16

Fig 1: Effects of *Allium sativum* and *Aloe vera* extract on initial and final body weight of rats.

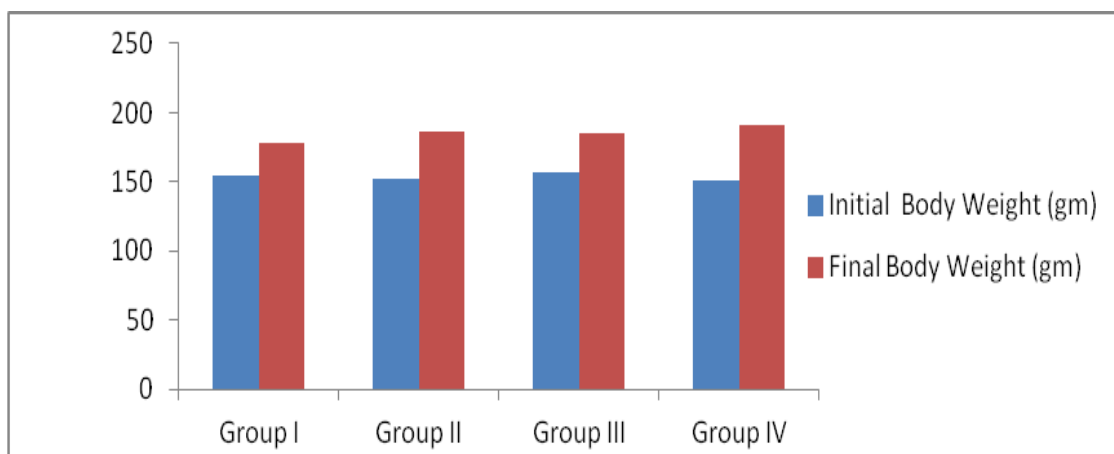
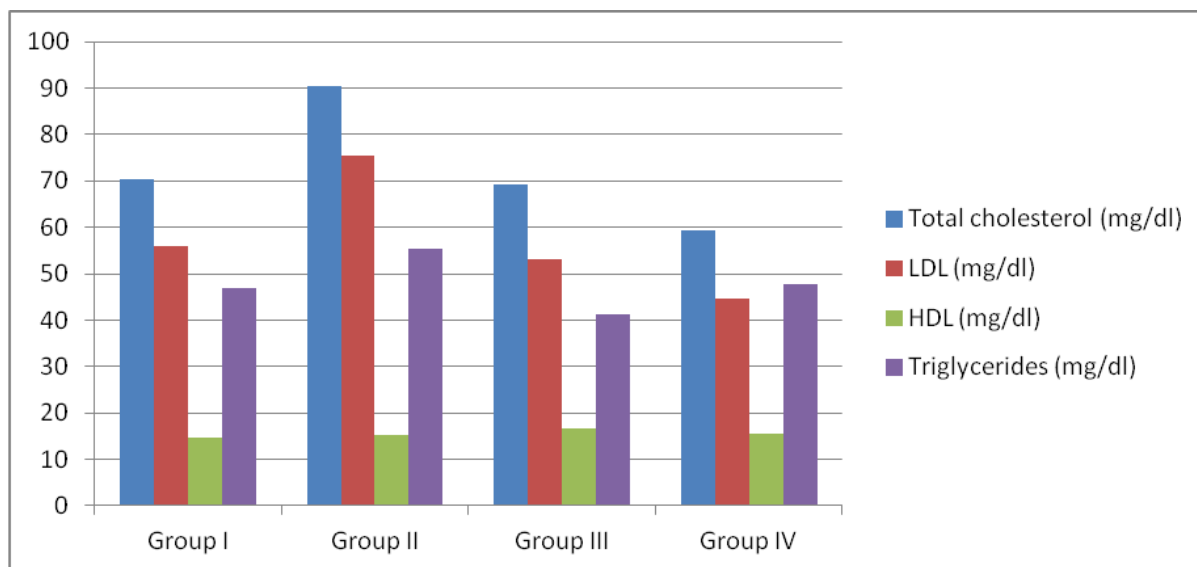


Table 2: Effects of *Allium sativum* and *Aloe vera* extract on plasma lipid profile of rats

Parameter	Group I	Group II	Group III	Group IV
Total cholesterol (mg/dl)	70.46±5.24	90.5±2.16	69.1±6.04	59.38±6.36
LDL (mg/dl)	55.9±4.43	75.33±2.75	53.21±2.76	44.56±2.26
HDL (mg/dl)	14.56±3.71	15.16±2.22	16.76±4.92	15.48±6.47
Triglycerides (mg/dl)	47±2.10	55.33±3.61	41.3±3.95	47.83±4.49

Values are expressed in mean± S.E, n= 6

Fig 2: Effect of *Allium sativum* and *Aloe vera* extract on plasma lipid profile of rat

DISCUSSIONS

After 21 days of experimental period the rat were anaesthetized and collected blood sample was studied for following parameter- Total cholesterol, HDL, LDL and Triglycerides with body weight. The body weight gain was not significantly changed between all the groups. Present study shows effect of extract on plasma lipid profile which proves that the change in total cholesterol level in group II is significant at 0.01 level as well as the total cholesterol level in Group III and IV is also significant at 0.01 level. The change in LDL level is not significant while change in HDL level is not significant. Change in Triglyceride level in Group I, II and IV is not significant while in Group III is significant at 0.01 level. From the present study it has been clear that the *Allium sativum* extract and *Aloe vera* extract shows beneficial effect on blood lipid profile. *Allium sativum* and *Aloe vera* has received special attention from ancient time as a natural remedies (Auer *et al.*, 1990). It has been well known for cardiovascular morbidity (Banerjee *et al.*, 2002). The current study has been conducted to assess the effect of extract on lipid profile of rats. In this experiment high cholesterol diets fed to rats have increased plasma TC, LDL, HDL and Triglyceride. These results were consistent with (Aouadi *et al.*, 2000). Oral administration of raw *Aloe vera* and *Allium sativum* extract in rats fed HCD has caused a significant reduction in plasma TC, HDL, LDL and TG. The hypolipidemic effects for *Allium sativum* has been reported by (Bordia *et al.*, 1981; Augusti, 1977; Banerjee *et al.*, 2002). The similar effect has been reported for *Aloe vera* by (Lim *et al.*, 2003). *Allium sativum* has been reported in some population to

possess hypolipidemic effect in particular on low density lipoprotein cholesterol, thus preventing cardiovascular disease risk. The consumption of raw *Allium sativum* has beneficial effect on plasma total cholesterol, and LDL in rats fed on high cholesterol diet (Maria *et al.*, 2007).

CONCLUSION

From the present study it has been clear that the *Allium sativum* extract and *Aloe vera* extract showed effect on lipid profile. Specially the significant change has been observed in total cholesterol level and triglyceride level is also maintained by the extract of *Allium sativum*. While no such significant change has been observed on LDL and HDL level.

ACKNOWLEDGEMENT

Author is very much thankful to Ms. K. R. Patil Lecturer, Department of Zoology, Govt. Vidarbha Institute of science and humanities Amravati for their kind cooperation during my research work.

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Cite this article as: Lihare Minakshi U. Effect of aqueous extract of *Aloe vera* and *Allium sativum* on the lipid profile of male albino Wistar Rat, *Int. Res. J. of Sci. & Engg.*, 2013; 1(3): 96-99.

Source of Support: Nil,

Conflict of Interest: None declared