HYPOLIPIDEMIC ACTIVITY OF ETHANOLIC EXTRACT OF *DAUCUS CAROTA* SEEDS IN NORMAL RATS.

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Abstract

**Objective:** Hypolipidemic activity of ethanolic extract of *Daucus carota* seeds in Normal rats.

**Method:** Rats were divided in to 4 groups. First control group, treated with vehicle only for 7 days. Second group was standard, treated with lovastatin (7.2mg/kg) for 7 days. Third and fourth group were test, treated with *Daucus carota* seeds extract (200mg/kg and 400mg/kg) for 7 days. 8th day blood sample was collected by retro orbital route and lipid profiles were estimated in serum.

**Result and Conclusions:** Standard and test (400mg/kg DCSE) groups were showed significant (P <0.001) reduction in the total cholesterol, triglyceride HDL and VLDL as compared control group. Test group (200mg/kg) was showed significant (P <0.05) reduction as compared control group. The antioxidant potential of *Daucus carota* seeds has contributed to the reduction of oxidative stress and Lipid levels in experimental rats.

**Keywords:** *Daucus carota* seeds extract, Lovastatin, antioxidant, Hypolipidemic activity.

Introduction

Hyperlipidemia is one of the greatest risk factors contributing to prevalence and severity of cardiovascular diseases. [1] It is also reported that almost 12 million people die of cardiovascular diseases and cerebral apoplexy each year all over the world. Therefore, it is very important to pay attention to early stage prevention and control of hyperlipidemia in a comprehensive way. However, the risk of hyperlipidemia would be reduced by consumption of flavonoids and their glycosides, supported by abundant studies [2-5]. For instance, the flavonoids extracted from gingko, soybean, and some other plants have been reported as the antioxidants and could be beneficial to hyperlipidemia patients. During the past decade the interest in polyphenols, including isoflavonoids has increased considerably because of beneficial effects proposed by epidemiologists, nutritionists and food manufacturers [6, 7].

*Daucus carota* Linn., commonly known as “Carrot” belongs to the family (Apiaceae, Umbelliferae) and is cultivated almost all over the world as a useful vegetable. Carrot is widely consumed as an aphrodisiac and nervine tonic and its scraped root is used as a local stimulant for indolent ulcers. The plant has undergone extensive phytochemical studies and a large number of active ingredients have been isolated. These include volatile oils, steroids, triterpenes, carbohydrates, glycerides, tannins, flavonoids, amino acid, carotene and hydrocarotene. [8–10] Pharmacological studies showed that...
**Daucus carota** seeds (DCE) exhibit antifertility properties.\(^{11,12}\) The crude extract of root of the plant has been found to be hypoglycemic\(^{13}\) and hepatoprotective.\(^{14}\) Different parts of this plant are used in Indian systems of medicine for the treatment of a broad spectrum of ailments including kidney dysfunction, asthma, dropsy, inflammation, leprosy and worm troubles.\(^{15, 16}\) The current study discusses the Hypolipidemic activity of ethanolic extract of *Daucus carota* seeds in Normal rats.

**Materials and Methods**

**Plant Material**

The Carrot seeds were collected from Ooty, Tamilnadu. The plant was identified by a botanist, and voucher specimen (Specimen No. BBU 2821) was deposited in the department of Botany, Bharathiya University, Coimbatore. After authentication, seeds were cleaned and milled into coarse powder by a mechanical grinder.

**Preparation of seeds extract**

Collected seeds were powdered in hand grinder. Powdered seeds (2 kg) were extracted with 95 % ethanol using a soxhlet apparatus. The ethanolic extract was filtered and concentrated by distillation process. A brownish green colored residue was obtained (yield 6.79 % w/w), which was kept in a desiccators. This ethanolic extract of DCSE (*daucus carota seeds extract*) was used for further experiments.

**Animals**

Healthy, adult male rats of Wister strain, weighing 180 ± 5gm was obtained from animal house, IRT Perundurai medical college, Erode, Tamilnadu, India. The animals were kept in a well-ventilated room and they were exposed to 12 hours day and 12 hours night cycle with a temperature between 20 ± 2°C. The animals were housed in large spacious, hygienic polypropylene cages during the course of the experimental cages period. The animals were fed with water and mice pellet feed *ad libitum*, supplied by M/s.Hindustan Lever Ltd., Mumbai. All the experimental procedures and protocols used in this study were reviewed by institutional animal ethics committee (NCP/IAEC/PG-05/2009) and were in accordance with the guidelines of the CPCSEA.

**Chemicals**

Lovastatin : (Lostatin 10) Dr. Reddys Laboratories limited, Hyderabad.

**PROCEDURE:**

**Hypolipidemic activity**

**Procedure**

**Animal's treatment:** Rats were randomly divided into four groups of six animals. Each group was kept in a separate cage.\(^{17}\)

**Group I** : Served as control and treated with vehicle only.

**Group II** : Served as standard and treated with lovastatin 7.2 mg/kg body weight.

**Group III** : Treated with *Daucus carota* seeds ethanolic extracts 200mg/kg body weight by suspending in 0.5 % Carboxyl methyl cellulose

**Group IV** : Treated with *Daucus carota* seeds ethanolic extracts 400 mg/kg body weight by suspending in 0.5 % Carboxyl methyl cellulose.

Dose was given by oral route. After end of the 7th day, the animals were anaesthetized by light anesthesia. The blood samples were withdrawn through sinus puncture and serum was separated by centrifugation at 4000 rpm for 20 min.

Biochemical parameters like total cholesterol, triglycerides, LDL, VLDL and
HDL were estimated by using biochemical kits (Asritha, *in vitro* diagnostic reagents).

**Statistical Analysis**
The collected data were subjected to appropriate statistical test like one-way ANOVA (Analysis of variance), followed by a turkey test. P values of less than 0.01 were considered as significant. The analysis was carried out using Graph pad prism software of version 4.

**Results and Discussion**
The results of Hypolipidemic activity of *Daucus carota* seeds extract (DCSE) on Normal rats are shown in Table 1

**Estimation of Triglycerides**
In the triglyceride concentration from the serum in the normal animal, which received only the solvent, had the value of 284.59 ± 15.49. The animals treated with standard showed the value of 178.03 (P < 0.001). Whereas animals treated with *Daucus carota seeds* extract at a dose of 200 mg/kg and 400 mg/ kg had showed the value of 222.08 ± 6.14 (P < 0.05) and 189.61 ± 7.79 (P < 0.01) correspondingly. The above values showed that *Daucus carota seeds* extract treatment lowered the normal triglyceride level in experimental rats.

**Estimation of Total Cholesterol**
In the total cholesterol concentration from the serum in the normal animal, which received only the solvent, had the value of 316.40 ± 7.98. The animals treated with standard showed the value of 137.75 ± 13.83 (P < 0.001). whereas animals treated with *Daucus carota seeds* extract at a dose of 200 mg/kg and 400 mg/ kg had showed the value of 253.12 ± 6.50 (p < 0.01) and 191.66 ± 10.42 (P < 0.001) correspondingly. The above values showed that *Daucus carota seeds* extract treatment lowered the normal total cholesterol level in experimental rats.

**Estimation of LDL cholesterol**
In the LDL cholesterol concentration from the serum in the normal animal, which received only the solvent, had the value of 118.46 ± 15.96. The animals treated with standard showed the value of 108.15 ± 11.59. Whereas animals treated with *Daucus carota seeds* extract at a dose of 200 mg/kg and 400 mg/ kg had showed the value of 111.35 ± 16.18 and 123.30 ± 10.96 correspondingly. The above values showed that *Daucus carota seeds* extract treatment lowered the normal LDL cholesterol level in experimental rats.

**Estimation of HDL cholesterol**
In the HDL cholesterol concentration from the serum in the normal animal, which received only the solvent, had the value of 254.79 ± 16.80. The animals treated with standard showed the value of 66.82 ± 5.86 (P < 0.001). whereas animals treated with *Daucus carota seeds* extract at a dose of 200 mg/kg and 400 mg/ kg had showed the value of 186.19 ± 15.40 (P < 0.05) and 106.24 ± 17.77 (P < 0.001) correspondingly. The above values showed that *Daucus carota seeds* extract treatment lowered the normal HDL cholesterol level in experimental rats.

**Estimation of VLDL cholesterol**
In the VLDL cholesterol concentration from the serum in the normal animal, which received only the solvent, had the value of 56.85 ± 3.16. The animals treated with standard showed the value of 35.60 ± 2.62 (P < 0.001). whereas animals treated with *Daucus carota seeds* extract at a dose of 200 mg/kg and 400 mg/ kg had showed the value of 44.41 ±1.22 (P < 0.05) and 37.92 ± 0.90 (P < 0.001) correspondingly. The above values showed that *Daucus carota seeds* extract treatment lowered the normal VLDL cholesterol level in experimental rats.
showed that *Daucus carota seeds* extract treatment did not produce any significant activity in LDL cholesterol level in experimental rats.

**Discussion:**
There was a significant decrease in serum cholesterol levels in all the *Daucus carota* seeds extract treated groups. However, the fall in serum Total cholesterol was less compared to that of the group treated with lovastatin. As the dose of *Daucus carota* seeds extract increased there was an increase in the fall in serum cholesterol values. The lovastatin reduced triglyceride levels significantly; similar effect was observed in the animals treated with *Daucus carota* seeds extract. There was significant increase in HDL-cholesterol and VLDL-cholesterol levels in either the *Daucus carota* seeds extract treated group or the group fed lovastatin. There was no significant decrease LDL-cholesterol in *Daucus carota* seeds extract treated group as compared to that recorded in control. The results of this study showed significant lowering of serum total cholesterol, triglycerides, HDL- and VLDL cholesterol in *Daucus carota* seeds extract treated animals, almost comparable to that of lovastatin.

**Conclusion:**
In conclusion, the plasma level triglyceride (TG), total cholesterol (TC), LDL-cholesterol decreased after 7 days supplementation of *Daucus carota* seeds extract in normal rats. Decreased total cholesterol and TG levels in blood indicate the production of oxygen free radical was effectively inhibited by *Daucus carota* seeds ethanolic extract 400mg/kg shows more significant hypolipidemic activity.

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TABLE 1– Hypolipidemic activity of ethanolic extract of *Daucus Carota* seeds extract on normal rats:

| Group               | Triglyceride | Total cholesterol | HDL Cholesterol | VLDL Cholesterol | LDL Cholesterol |
|---------------------|--------------|-------------------|-----------------|------------------|-----------------|
| Control             | 284.59 ± 15.41 | 316.40 ± 7.98    | 254.79 ± 16.80  | 56.85 ± 3.16     | 118.46 ± 15.96  |
| Standard Lovastatin (7.2 mg/kg) | 178.03 ± 13.14*** | 137.75 ± 13.14*** | 66.14 ± 5.86*** | 35.60 ± 2.62*** | 108.15 ± 11.59ns |
| 200mg/kg (DCSE)     | 222.08 ± 6.14*  | 253.23 ± 6.50**   | 186.19 ± 15.40* | 44.41 ± 1.22*   | 111.35 ± 10.18ns |
| 400mg/kg (DCSE)     | 189.61 ± 7.70** | 191.40 ± 10.42*** | 106.24 ± 17.77*** | 37.92 ± 0.90*** | 123.30 ± 10.96ns |

Results are expressed as mean ± SEM.
A tressed group animals compared with control (n=6, P < 0.001).

**Fig -1 Estimation of total cholesterol from the blood serum of the normal rats:**

Standard (Lovastatin 7.2 mg/kg), 200mg/kg (DCSE), 400mg/kg (DCSE)
Fig. 2 Estimation of HDL cholesterol from the blood serum of the normal rats:

Standard (Lovastatin 7.2 mg/kg), 200mg/kg (DCSE), 400mg/kg (DCSE)

Fig. 3 Estimation of triglyceride from the blood serum of the normal rats:
Standard (Lovastatin 7.2 mg/kg), 200mg/kg (DCSE), 400mg/kg (DCSE)

**Fig -4 Estimation of VLDL cholesterol from the blood serum of the normal rats:**

Standard (Lovastatin 7.2 mg/kg), 200mg/kg(DCSE), 400mg/kg (DCSE)

**Fig -5 Estimation of LDL cholesterol from the blood serum of the normal rats:**

Standard (Lovastatin 7.2 mg/kg), 200mg/kg (DCSE), 400mg/kg (DCSE)