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# Dyslipidemia treatment with *Ocimum sanctum* oil on cigarette smoke induced Albino mice

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**ABSTRACT**

*The whole parts of the plant Ocimum sanctum have been traditionally used for curing many diseases like arthritis, asthma, bronchitis, common cold, diabetes, fever etc. Numbers of active constituents from this plant are also represented. Our present study is to carry out the Dyslipidemia of the leaf extract of Ocimum sanctum oil. Cigarette smoking is a major risk factor for cardiovascular disease, including coronary heart disease, atherosclerosis (hardening of arteries) and stroke. Starting to smoke at an early age is an even greater health risk than being heavy smoker smoking induces itself causes elevation of plasma cholesterol, Triglycerides or a low HDL levels that contributes to the development of atherosclerosis, cause may be primary (genetic) or secondary. Dyslipidemia itself causes no symptoms but can lead to symptomatic vascular diseases i.e. coronary artery disease and peripheral arterial disease. The Phytochemical studies of the leaf extracts revealed the presence of carbohydrates, tannins, alkaloids, flavonoids, steroids and glycosides in Ocimum sanctum plant. Normal mice (G-I) showed no change in lipid metabolism but experimental mice that in cigarette smoke induced (G-II & G-IV) and oil administered (G-III) mice showed changes in their lipid metabolism. Based on these results present study clearly demonstrated that Ocimum sanctum oil exerts anti lipidemic effect, for prevention of dyslipidemia it may be suggested as cardio tonic.*

**Key words:** Dyslipidemia, *Ocimum sanctum* oil, lipid profiles, phytochemical analysis.

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## INTRODUCTION

There has been resurgence in the consumption and treatment and demand for medicinal plants. These plants are finding use as pharmaceuticals, neutraceuticals, cosmetics and food supplements **[1]**. Even as a traditional source of medicine and they continue to play pivotal role **[2]**. *Ocimum sanctum* (OS) is also known as holy basil in English or tulsi in Hindi, belongs to family lamiaceae. The protective nature of the *Ocimum sanctum* on the brain tissues against the detrimental effect of noise stress was reported by Sembulingam et al (2005) **[3]**. It contains a major component, Eugenol which has an inhibitory effect of on the Japanese encephalitis virus. The *Ocimum sanctum* has significant anti diabetic effect in rats **[4]**. The extract has an anti ulcer and antioxidant activity. The oil contains a major component Eugenol which has anti helmentic activity.

Cigarette smoking is a major risk factor for cardiovascular disease, including coronary heart disease, atherosclerosis (hardening of arteries) and stroke. Starting to smoke at an early age is an even greater health risk than being heavy smoker **[5]**. Smoking induces itself causes include elevation of plasma cholesterol and or TGs or a low HDL level that contributes to the development of atherosclerosis **[6]**.

Tobacco smoke contains 4,000 different chemicals. More than 200 of these chemicals are known to be toxic **[7]**. Tobacco smoking is a major preventable factor leading to death. Nonsmokers who are exposed to tobacco smoke also inhaling these toxic chemicals. These chemicals include nicotine, carbon monoxide, and tars **[8]**. Nicotine is a drug that stimulates the central nervous system and enhances arousal. Nicotine affects blood pressure and heart rate directly, increasing the risk to smokers of coronary heart disease. It also affects hormone production. For example cigarette smoking lowers blood estrogen levels and therefore reduces bone mineralization **[9]**.

Dyslipidemia itself causes no symptoms but can lead to symptomatic vascular disease including coronary artery disease and peripheral arterial disease. High TGs (>1000 mg/dl [>11.3 mmol/L] can cause acute pancreatic disease. High levels of LDL can cause eyelid xanthelasma, arcus corneae; and tendinious xanthomas **[10]**.

## MATERIALS AND METHODS

**Preparation of Plant Extracts**:
We have selected the healthy, disease free and mature plants were collected in the fields of Buddayapalli, Kadapa district, Andhra Pradesh during the month of January 2012. The leaves of *Ocimum sanctum* were dried for 20 days under the shade. The powder was extracted with hydro-alcoholic mixture by maceration. The hydro-alcoholic mixture was prepared by ethanol 70% and water in the ratio of 7:3. The extract was concentrated under a stream distillation of dry nitrogen or argon for quantitative determination of the oil content.

**Phytochemical screening:**
Plant extracts collected were characterized biochemically by qualitative analysis.

**1. Detection of alkaloids**
The extracts were stirred with 5 ml of 1% aqueous hydrochloric acid on a steam bath for 10 minutes. Then treated with a few drops of Mayer's reagent; precipitation with these reagents was seen as evidence for the presence of alkaloids **[11]**.

**2. Detection of carbohydrates**
Filtrates were treated with 2 drops of alcoholic α-naphthol solution in a test tube. Formation of the violet ring at the junction indicates the presence of carbohydrates **[12]**.

**3. Detection of glycosides**
Extracts were treated with sodium nitropruside in pyridine and sodium hydroxide. Formation of pink to blood red colour indicates the presence of cardiac glycosides **[12]**.

**4. Detection of phenols**
Extracts were treated with 3-4 drops of ferric chloride solution. Formation of bluish black colour Indicates the presence of phenols **[12]**.

**5. Detection of tannins**
The methanolic extracts were separately boiled for ten minutes in 10 ml of water in a test tube. A few drops of 0.1% ferric chloride were added to each test tube and observed for 10 minutes for a brownish green or a blue black coloration **[13]**.

**6. Detection of Flavonoids**
Extracts were treated with few drops of sodium hydroxide solution. Formation of intense yellow colour, which becomes colorless on addition of dilute acid, indicates the presence of flavonoids **[14]**.

**7. Detection of proteins and amino acids**
To the extract 0.25% w/v ninhydrin reagent was added and boiled for few minutes. Formation of blue colour indicates the presence of amino acid **[14]**.

**8. Detection of Diterpenes**
Extracts were dissolved in water and treated with 3-4 drops of copper acetate solution. Formation of emerald green colour indicates the presence of Diterpenes **[14]**.

**9. Detection of steroids**
The extract was dissolved in 2 ml of chloroform. A few drops of concentrated sulphuric acid were carefully added to form a lower layer. A reddish colour formed at the interphase indicates the presence of a steroid ring **[15]**.

**Animals:**
Male albino mice (25-30gm) were chosen as the experimental model for the present study. The animals were fed with gold mohur commercial pellet diet (Hindustan lever ltd., Bangalore) and water. Were obtained, housed and divided into four groups containing six animals each. All the experimental procedures and protocols used in this study were reviewed and approved by Institutional Animal Ethical Committee Regd. No: -19/a/IAEC/2012.

**Oral Administration of the *Ocimum sanctum* oil:**
Animals were divided into four groups, each consists of six mices. Group-I normal group, did not receive any treatment for period of 20 days. Group-II exposed to cigarette smoke (scissors brand, nicotine content 2.5 mg/cigarette), Group-III mice administered with *Ocimum sanctum* oil orally (dosage of 0.05 ml) for 20days, Group-IV mice co treated with oil and smoke. Group-II and Group-IV animals were exposed to cigarette smoke at the bottom of polypropylene box by slow suction. Group-III and Group-IV animals were exposed to smoke (Figure 2). The duration of each exposure was 2-3 cigarette/day. At the end of 20 days mice were sacrificed after overnight fasting. Blood was collected by cutting the jugular vein and serum was separated by centrifugation. The extracted lipids were used for the estimation of various lipid components.

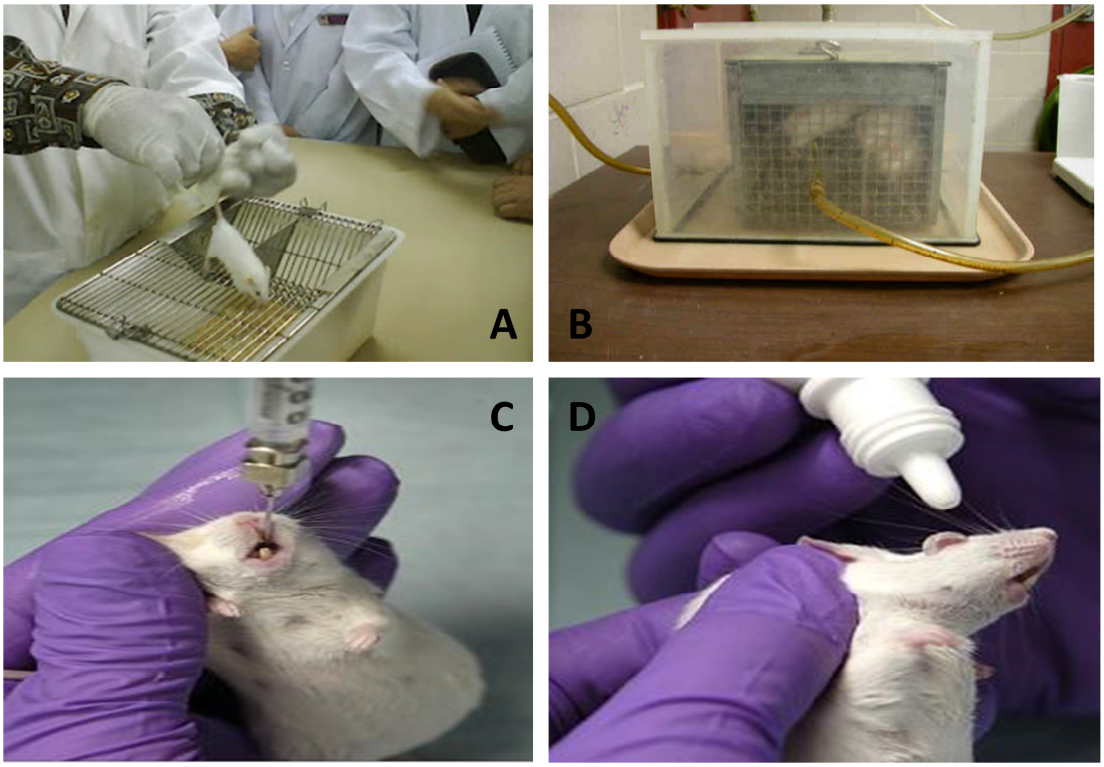



**Figure 2: Experimental set up with albino mice groups (G-I, G-II, G-III&G-IV)**

**A:** Collection and preparation of albino mice for experiment
**B:** Cigarette smoke induction
**C:** Oral administration with osmium sanctum oil
**D:** Collection of blood samples for lipid profile

**Biochemical estimations:**
Biochemical estimations such as Total Cholesterol, HDL, LDL, VLDL, Triglycerides levels were estimated by standard procedures with commercially available kits (Span diagnostics pvt. Ltd., India) **[16].** Serum Cholesterol

was estimated by the method of Zak and Boyle (1952). HDL cholesterol was estimated by method of Gidez et al., (1982). Triglycerides were estimated by the method of Buccolo, David et al., (1981).

**LDL** = Total Cholesterol – (HDL) – (VLDL)
**VLDL** = Triglycerides ÷ 5

**Statistical analysis:**
All values were expressed as mean ± standard deviation (SD); the analysis of variance (ANOVA) was performed with Duncan's test using SPSS version 20.0, $P<0.05$ was considered to be statistically significant.

## RESULTS AND DISCUSSION

Preliminary Phytochemical screening of hydro alcoholic *Ocimum sanctum* extract revealed the presence of alkaloids, carbohydrates, tannins, steroids, proteins, glycosides (Table 1). Lipoproteins includes total cholesterol, lipoproteins (HDL, VDL, VLDL) and triglycerides level were significantly increased when the experiment albino mice exposed to cigarette smoke rapidly for 20 days (G-II & G-IV) (Figure 1). Co treated with *Ocimum sanctum* oil showed mild changes in lipid levels and continuously when treated with *Ocimum sanctum* oil it showed decreased level in lipid profile (G-III) , $P<0.05$ data are statistically significant.

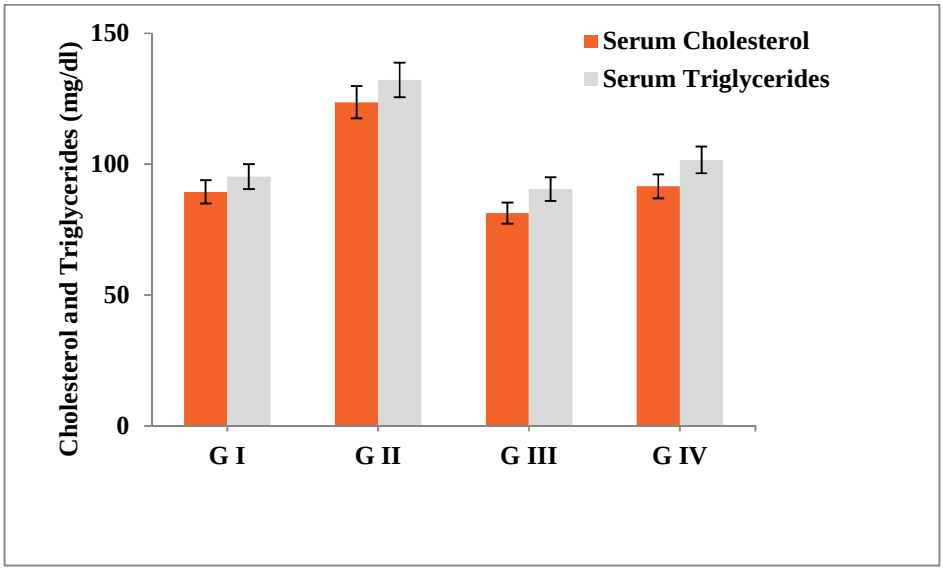
Normal mice (G-I) showed no change in lipid metabolism but experimental mice that in cigarette smoke induced one showed low levels of serum and tissue cholesterol and triglycerides along with rapid change in lipoproteins also *Ocimum sanctum* oil proved to have reducing properties of lipid level that we scientifically called it as in case of cholesterol i.e. hypo cholestremia, in case of triglycerides hypo triacyl glycerolinic effect in cigarette smoked organisms.

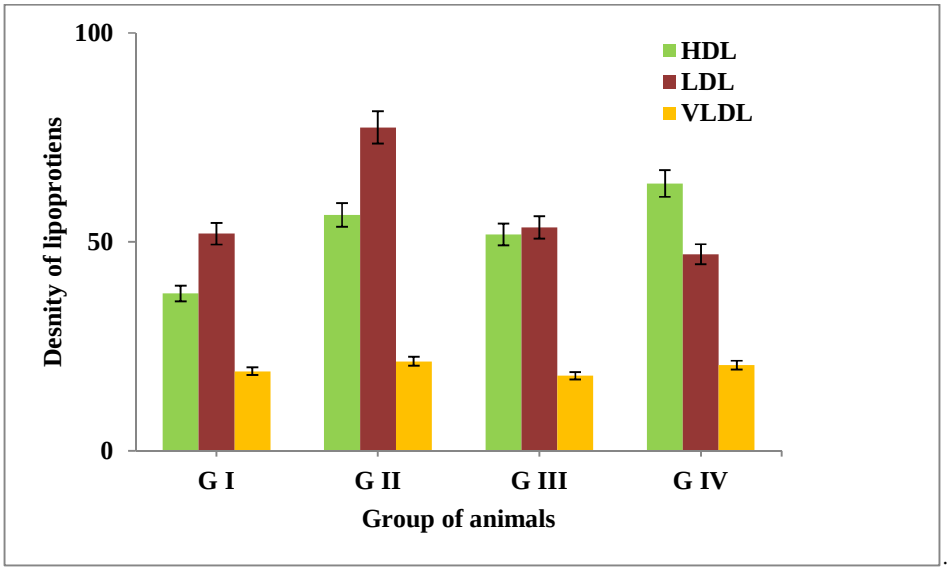
**Table 1: Phytochemical analysis of leaf extracts of *Ocimum sanctum***

| Phytochemical analysis of *Ocimum sanctum* | | | | | | |
|---|---|---|---|---|---|---|
| **Alkaloids** | **carbohydrates** | **Tannins** | **Flavonoids** | **Steroids** | **Proteins** | **Glycosides** |
| + | + | + | - | + | + | + |

*+ = Present - = Negative*

**Figure 1: Effect of cigarette smoke on cholesterol, tri glycerides and lipoproteins (HDL, LDL, VLDL) four groups of Albino mice**






## CONCLUSION

The experimental and graphical represents revealed that *Ocimum sanctum* oil having reduced properties in lipid levels i.e. Dyslipidemia in albino mice. These *Ocimum sanctum* oil may have decreases lipid levels in humans also.

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## REFERENCES

[1] Maruti Venkata Prasad P, Sai Sudha G, Habeeb Khadri C, Riazunnisa k, *World J. Pharma Sci*. **(2015)** 6: 506-513.
[2] Riazunnisa K, Chandra obulu Y, Sai Sudha G, Habeeb khadri C, *Int. J. Pharm. Sci. Rev. Res*., **(2013)** 14: 77-80
[3] Chopra RN, Nayar SL, Chopra IC, Asolkar LV, Kakkar KK, *Council of Scientific and Industrial Research*, **(1956)** 2:902-912.
[4] Craig R, Lee Kan E, North Molly S, Bray, Christyz, Avery, *Pharacogenomics* **(2006)** 5: 891 - 899.
[5] Krishna swami S, Richard J, prasad NK, Association between cigarette smoking and corony artery disease in patients in India **(1991)** 1:215-216 **.**
[6] Kumari, Veena, Peggy postma, Nicotine use in schizopherenia, *The self medication hypothesis* **(2008)** 8:314-322.
[7] Thamolwan Suanarunsawat, Watcharaporn Devakul Na Ayutthaya, Thanapat Songsak, Jittraporn Rattan mahaphoom **(2012)** 1:215-220.
[8] Kothari, S K, Bhattacharya et al, *Journal of Essential Oil Research* **(2005)** 4: 415-424.
[9] Saiprasanna Behera, Vijay Kumar Dolai, Chayan Banerjee, *International Journal of Universal Pharmacy and Life Sciences* **(2012)** 2(3): 350-360.
[10] Asha MK, prashanthh D, Murali B, Padmaja R, Amul, *Filoterpia* **(2001)** 72(6), 669-670.
[11] Sourov Kuri, Mustahsan Billah, Masud Rana, Zannatul Naim, Mahmodul Islam, Md. Hasanuzzaman, Ramjan Ali, Rana Banik, *Asian Pac J Trop Biomed* **(2014)** 4(4): 299-305.
[12] Manoharan N, Geegi PG, Anitha P, Anu M, Lalithambigai S, *International Journal of Advanced Research* **(2013)** 1(9):13-20.
[13] Okwu DE, Morah FNI, Anam EM, *J. Med. Aromatic Plant Sci* **(2005)** 27(5): 496 – 498.
[14] Nageswara Rao V, Kaladar DK, *Middle-East Journal of Scientific Research*, **(2014)** 3(1): 2277 – 8179.
[15] Friedwald WT, Levy RI, fredrickson DS, *Clin chem* **(1972)** 18:499-502.
[16] Mandhania, Mandan, Sawhney: *India. Biol. Plant*, **(2006)** 50: 227-231.