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# Effect of Antihyperlipidemic Activity of Tephrosia Purpurea Plant On Wister Albino Rat.

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**THE BEGINNING:**

Logical term for fats in the blood is lipid. lipids carry out fundamental roles in your body at ordinary level, yet can cause medical issues assuming they are in abundancehyperlipidemia implies high lipid levels . Because of their impact on atherosclerosis, lipo proteins and protein abnormalities are spread widely in the general population and are thought to be risk factors for cardiovascular disease.

**Categories of Lipoprotein**

Since water is present in blood and other bodily fluids, lipids require a transport system to transport throughout the body. Lipoproteins are the transport system.

**Chylomicrons:** Chylomicrons, which are essentially fatty oils, transport lipids exogeneously to the adipose, liver and cardiac,skeletal muscles.

**Very Low density lipoprotein:** The liver and digestive system produce lipoproteins to transport fats throughout the body. VLDL contains endogenous fatty acids and, to a lesser extentcholesterol.

**Low density lipo protein:** Lipoproteins of low thickness are made by the liver to transport cholesterol to the body tissue and body cells. LDL might frame stores on the walls of conduits and veins.

**High-density lipo protein:** (HDL): High lipid levels can speed up atherosclerosis or solidifying the passages.Veins are typically smooth and unhampered within, as age expands, a tacky substance called plaque settle in the walls of your conduitsand different materials coursing the blood. As more plaque advance, supply routes can limit and harden. Ultimately, enough plaque might develop to decrease blood course through all the supplies. Cardiovascular illnesses are the main source of death in industrialized and emerging countries.. Desirable lipid levels to score as minimal risk of heart disease are40 mg/dL and more for men and for women is 50 mg/dL not greater than 200 mg/dL of total cholesterol.

**AIM AND OBJECTIVE:**

★ Study for anti hyperlipidemic activity on wister rats using Tephrosia purpurea METP and PETP,raised by Triton X and evaluation against standard Atorvastatin.

**TEPHROSIA PURPUREA VEGETATIONAL PROFILE**

Alkaloids, saponins, glycosides, tannins, flavonoids, and other substances are the active components of TEPHROSIA PURPUREA. 2.5% of rutin is present in the roots and leaves. Isolonchocarpin, pongamol, a novel B-hydroxychalcopurpurnone, Lanceolatin a.lanceolatin B,Karanjin,kanjone, and B.sitosterol are isolated from roots.

**USES OF TEPHROSIA PURPUREA:**The herb is anthelmintic, alexiteric, alternative, and antipyretic,Leprosy, ulcers, asthma, tumours, as well as illnesses of the liver, spleen, heart, and blood are all treated with it. In cases of dyspepsia, diarrhoea, rheumatism, asthma, and urinary problems, the roots are brewed into a decoction.

**METHOD AND MATERIALS**

★ Plant material is collected and authorised for aerial parts.Using the proper grinder, the plant is reduced to a coarse powder.
★ In this study, methanol was used to carry out the cold extraction procedure. using a Rotary evaporator the filtrates (extract of methanol)were evaporated stored in a porcelain dish. They rendered a gummy concentrate of greenish black.The extract was kept in a vacuum dissector for 7 days.
★ Purpurea plant powder used for extraction yielded the following.
★ 200gm of methanol extract as its percentage.

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- ★ 53.70 grammes weighs the empty china bowl.
- ★ China bowl weight with the extract-t
- ★ Extract weight obtained (103.24-53.70) gm 103.24gm extraction) x 100
- ★ percent yield of methanol extract (Weight of Extract)/powder -50.54 gm - 50.54/200 100 - 25,7%

**Phenolic Constituents Extracts of Tephrosia purpurea in parts**

(Homogenize in MeOH-HO (4-1) (10-val. or wt), titer, for 5 min.)1. Residue (Discarded.)2. FilterateTo 1/10th Val (-40°C), evaporate. 2 m 150 of acidification and CHCL extraction is first (Dry, evaporate)and Aqueous Acid layer (Discarded.).

**PROFILE OF EXPERIMENTAL SPECIES**

5 weeks old healthy Adult Male albino rat was selected and weighed .An average weight of 30 to 40 grams were chosen. Four animals are housed in a cage in a temperature-controlled (27 °C, 13 °C) environment where a 12:12 hr light/dark cycle is to be maintained. The male animals are given a conventional feed and water at will as they adjust to their surroundings for seven days,following the rules of IAEC AND CPSCEA,acute toxicity studies and OECD Guideline No 423

**METHOD OF INDUCTION**

When Triton X-100 is administered systemically to rats, plasma cholesterol and triglycerides are biphasically elevated. A single intraperitoneal injection of Triton-X-100 (100 mg/kg) in physiological saline solution was used to cause hyperlipidemia in Wistar albino rats following an overnight fast of 18 hours.

**PROTOCOL OF EXPERIMENTAL ANIMAL:.**

six groups of four animals were labelled

Batch-1: . (Normal saline 10ml/kg orally for seven day) as control

Batch 11:Hyperlipidemic control, (Triton x100,)

Batch III: Hyperlipidemic rats with a dosage of METP 500mg for 7days

Batch -IV: Hyperlipidemic rats with a dosage of PETP 400mg/kg for 7days.

Batch -V: Hyperlipidemic rats with a dosage of PETP 500mg/kg for 7 days

Batch- VI: Hyperlipidemic rats with a dosage of Atorvastatin 10 mg/kg for 7 days.

All the batches receive a single i.p. injection of Triton X-100 at a dose of 100mg/kg, followed with batch- II, and batch - III. Batch-IV, batch- V.batch- VI, except batch-1 (Normal control). After 72 hours of Triton X 100 injection. Batch - VI receives Atorvastatin at a dose of 10 mg/kg, prepared by suspending bulk Atorvastatin in aqueous 0.5% methylcellulose for 2 for 7 days. Batch- III receive METP, a daily dose of 500mg/kg orally for seven days and batch - IV, and batch - V receives PETP at a daily dose of 400mg/kg and 500mg/kg respectively by oral route for seven days.

**COLLECTION AND ANALYSIS OF BLOOD SAMPLE**

The rats were anaesthetized by ether, and then Blood samples were collected on Oth and 8th day13 from the retro-orbital plexus of rats using microcapillary technique from rats of all the batch - 3, and centrifuged at 3000 rpm for 15 min to get the serum. The serum is analyzed for total cholesterol triglycerides and HDL levels using biochemical kits (diagnostic kit) using the formula LDL-Cholesterol-Total Cholesterol - (HDL-Cholesterol +TG/5)VLDL-C TG/5

**BIOCHEMICAL ASSAYS FOR LIPIDS**

**Procedure for the** measurement of triglycerides is (GPO/PAP) and measurement of cholesterol (Total cholesterol) is CHOD/POD Approach.

**ACUTE TOXIC STUDIES:**

Tephrosia purpurea was administered to male albino rats in accordance with the (OECD) draught guidelines 423, and doses were chosen in the order of 1.75–5000 using the default dose progression factor for toxicity studies. For a total of 14 days, individual animals are observed at least once during the first 30 minutes after dosing, as well as on occasion for the following 24 hours and for7days. In every case,no death was noticed within that time frame. . Results in the aggregate pointed to an LDso value of 5000 mg/kg. Thus, the therapeutic dose (400 mg/kg and 500 mg/kg) for antihyperlipidemic studies was determined from the lethal dose.

**ANALYTICAL STATISTICS**

The results are given as Mean S.D. Using the Graph Pad Prism Software 6 version, the one-way Analysis of Variance (ANOVA) of all the results was compared to those of the control subject. For statistical analysis, P values under 0.05 were taken into consideration

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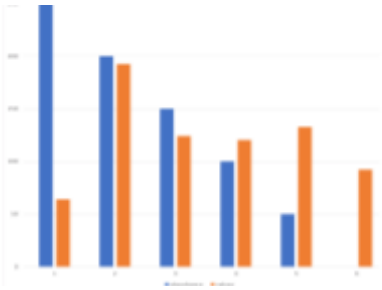
**TEPHROSIA PURPUREA EXTRACTS AND THE LEVELS OF SERUM TOTAL CHOLESTEROL:**

It was found that the total cholesterol levels in normal rats were 64.03, 1.45 - nth day, respectively. The levels of total cholesterol in batches ll,III, IV, V, and VI (i.e., hyperlipidemic control, METP 500 mg/kg, PETP400 mg/kg,and 500 mg/kg, and standard (atorvastatin) 10mg/kg) considerably dropped after treatment TEPHROSIA PURPUREA . The total cholesterol levels in all batches b treated with METP at a dose of 500 mg/kg were 4.199.5, while the levels in the all batches treated with PETP at doses of 400 mg/kg and 500 mg/kg were respectively 120.4 9.4 and 132.7 19.25. The lowering of cholesterol was accomplished by PETP in a dose-dependent manner. The reduction in total cholesterol in the Standard Atorvastatin) batch was reduced to 92.29+_63.(fig.1)

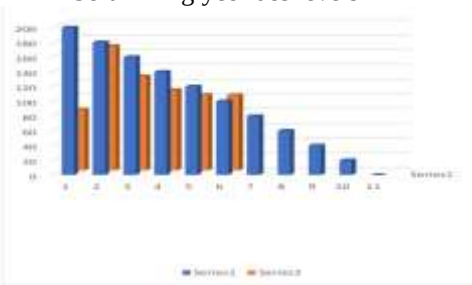
**FIG-1 :EFFECT ON SERUM CHOLESTEROL LEVELS BY TEPHROSIA EXTRACTS**



**EFFECT ON SERUM ABSORBANCES AND TRIGLYCERIDE LEVELS BY TEPHROSIA PURPUREA EXTRACTS**

The normal rats had Triglycerides levels of 82.66 2.46 on day one. The induction of hyperlipidemia significantly increased the triglyceride levels in batch-II, III, lV, V, and VI (i.e., the hyperlipidemic control, METP 500 mg/kg, and PETP 400 mg/kg) and 500mg/kg)10 mg/kg of standard atorvastatin were administered to hyperlipidemic rats, and the triglyceride readings were found to be 109.3 mg/kg and 102.5 mg/kg, respectively. After providing various doses of PETP, triglyceride levels were reduced in a dose-dependent manner triglycerides dropped to 192.26+-7.68 in the Standard (Atorvastatin) batch(fig-2)

.Fig 2: Effect of Tephrosia purpurea Extracts on Serum Triglycerides levels



**EFFECT ON SERUM ABSORBANCES AND LDL-LEVELS.BY TEPHROSIA PURPUREA EXTRACTS.**

On day zero, it was discovered that the LDL-C levels in the rats were 8.45 3.43. The levels of LDL-C significantly increased after Triton-X-100 treatment in batches II, III, IV, V, and VI (Le Hyperlipidemic Control, METP 500 mg/kg, PETP 400 mg/kg, PETP 500 mg/kg, and Standard Atorvastatin 10 mg/kg).LDL-C values decreased as a result of administering different doses of the METP & PETP following the induction. The LDL-C levels of the groups given METP at a dose of 500 mg/kg were 86.8 6.6, while the levels of the batches given PETP at doses of 400 mg/kg and 500 mg/kg were 70.1 10.5 and -.1 5.9, respectively. Furthermore, PETP dose-dependent LDL-C dropped to 32.9+-1.61 in the Standard (Atorvastatin) group. The decrease in LDL -C LEVEL by METP and PETP WAS significant at 0.01)(fig -3)

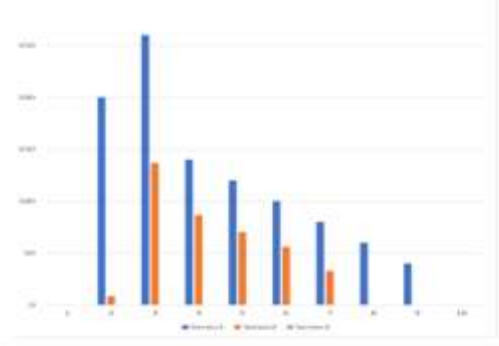


Fig.3**EFFECTONSERUMLDL-CLEVELSBYTEPHROSIA PURPUREAEXTRACT**

**EFFECT ON SERUM VLDL-C by TEPHROSIA PURPUREA EXTRACTS.**

In normal rats, the VLDL-C levels were 16.5 and 10.5. VLDL-C levels increased after Triton-X-100

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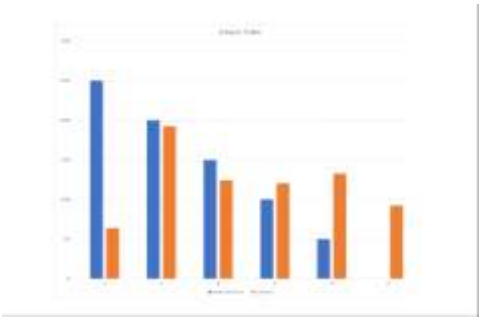
administration. The amount of VLDL-C increased significantly after Triton-X-100 treatment in batches II, III, IV, V, and VI, i.e. Control of hyperlipidemia, METP 500 mg/kg, PETP 400 mg/kg. PETP 500 mg/kg and Standard Atorvastatin 10 mg/kg.

Following Titon-X-100 induction, different dosages of the METP and PETP were administered, which reduced VLDL-C levels. VLDL-C levels were 25.5 2.05 in groups treated with METP at a dose of 500 mg/kg, and were 22.5 2.3 and 22.1 1.4 in batches treated with PETP at doses of 400 mg/kg and 500 mg/kg, respectively. Lowering VLDL-C was a dose-dependent effect of PETP. Against compare the Standard (Atorvastatin)group ,the VLDL-C was reduced to 20.44+-1.53.The reduction in cholesterol levels by METP And PETP wassignificant at ,($p < 0.05$)( fig-4)

Fig-4EffectONSERUMVLDL-CBYTEPHROSIAPURPUREAEXTRACT



**EFFECT ON SERUM HDL-C LEVELS by TEPHROSIA PURPUREA EXTRACTS.**

Typical rodents at O hrs had HDL-C upsides of 38.91 2.33. In batch Triton X-100 treatment brought about an undeniable diminishing in HDL-C levels. Batch ll,III, IV, V, and VI (Hyperlipidemic Control, METP 500 mg/kg, PETP 400 mg/kg, PETP 500 mg/kg, and Standard Atorvastatin 10 mg/kg) all contain these medications.While the degrees of HDL-C in the gatherings treated with METP at a portion of 500 mg/kg were 30.44 1.53 and 30.0 3.3separately, the levels in the gatherings treated with PETP at a portion of 400 mg/kg and 500 mg/kg displayed a portion subordinate ascent. The HDL-C level in the atorvastatin batch expanded to 39.18 3.14.Normal rats at O hrs had HDL-C values of 38.91 2.33. In Group II, Triton X-100 treatment resulted in a marked decrease in HDL-C levels. batch- III, IV, V, VI (Hyperlipidemic Control, METP 500 mg/kg, PETP 400 mg/kg, PETP 500 mg/kg, and Standard Atorvastatin 10 mg/kg) all contain these medications.

While the levels of HDL-C in the groups treated with METP at a dose of 500 mg/kg were 30.44 1.53 and 30.0 3.3 and 30.0 3.3 respectively, the levels in the groups treated with PETP at a dose of 400 mg/kg and 500 mg/kg exhibited a dose-dependent rise. The HDL-C level in the atorvastatin group increased to 39.18 3.14.(fig-5)

Fig-5 EFFECT ON SERUM HDL-C LEVELS BY TEPHROSIA PURPUREA EXTRACTS.

## DISCUSSION

Tephrosia purpurea's methanolic extract contains alkaloids, tannins, saponins, and phenol, whereas the phenolic extract only contains phenol, according to a phytochemical investigation.Methanolic extract from Tephrosia purpurea's aerial parts had a yield value of 25.7%, and phenolic extract from the same parts had a yield value of 12.6%.

All of the fasting rats received Triton-X-100 (100 mg/kg), which increased T.C., T.G., VLDL, and LDL levels while lowering HDL levels. Triton X-100 induces hyperlipidemia after 72 hours, which is compared to the normal control group and causes noticeably higher serum lipid levels in the hyperlipidemic group.Batch- III to VI's changes in lipid levels were equivalent to those of the hyperlipidemic control group (i.e. Triton X-100 batch- II). The serum lipid level is markedly reduced in the Standard Group (also known as the Atorvostatin group) (P 0.001).

According to the study's findings, METP Extract and PETP Extract significantly reduced blood lipid levels at doses of 500 mg/kg and 400 mg/kg, respectively (P 0.01). PETP Extract significantly reduced serum lipid levels (P 0.001) at a dose of 500 mg/kg, demonstrating antihyperlipidemic activity, which was found to be more effective at higher PETP doses compared to METP and lower doses.Flavonoids have demonstrated a variety of pharmacological actions, such as antioxidant and antiatherogenic properties. The current finding so strongly implies that the presence of tannins, phenols, and flavonoids in the extracts may be responsible for this medicinal plant's hypolipidemic effect.

## CONCLUSION:

According to the findings, PETP (500 mg/kg) is equally potent to batches treated with atorvastatin as it exhibits same antihyperlipidemic effect in the Triton X-100 model of hyperlipidemia.

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Additional research on TEPHROSIA PURPUREA may reveal its potential mode of action and isolate its active ingredient.

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