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Research Paper

Hepatoprotective Activity of *Lantana Camera* Against Carbontetra Chloride Induced Hepatotoxicity in Wister Rat

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The root of *Lantana Camera* (*Verbenaceae*) is normally second-hand as a Antibacterial activity, Antifungal activity, Wound healing activity, Antiinflammatory activity and has also been widely employed in the management and prevention of disease. The aim of the present study is to estimate the protective effect of Lantana Camera extract against carbon tetrachloride (CCl4)-induced liver damage in male Wistar rats. Supervision with Lantana Camera extracts for 28 days significantly reduced the impact of CCl4 toxicity on the serum markers of liver damage, aspartate aminotransferase, alanine aminotransferase and alkaline phosphatase. In addition, management of Lantana Camera extract resulted in markedly increased the levels of superoxide dismutase and catalase enzymes in rats. The histopathological studies in the liver of rats also supported that Lantana Camera extract markedly reduced the toxicity of CCl4 and preserved the histoarchitecture of the liver tissue to near standard. Thus, the results suggest that Lantana Camera extract acts as a potent hepatoprotective agent against CCl4 induced hepatotoxicity in rats.

Keywords: *Lantana Camera*,Ccl4, Hepatotoxicity,

INTRODUCTION

Liver is the biggest reticulo-endothelial organ in the body as such has important immune function in maintaining body integrity. The liver plays an astonishing array of vital functions in the continuation, performance and adaptable homeostasis of the body. It is concerned with approximately all the biochemical pathway to enlargement, fight in opposition to disease, nutrient contribute, energy stipulation and reproduction[1]. The liver is the largest gland of the body enclosed within the right lower rib cage beneath the diaphragm. it is almost completely covered by visceral peritoneum and a dense irregular connective tissue layer that lies deep to the peritoneum. Liver is divided in two principle lobes, a large right lobe and a smaller left lobe separated by falciform ligament. The right lobe is considered by many anatomists to include an inferior quadrate lobe and a posterior caudate lobe. Liver has five surfaces as anterior, posterior, superior, inferior, and right[2]

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Hepatotoxicity

Hepatotoxicity implies chemical-driven liver injured convinced medicinal agent, when in use in overdoses and sometimes even when introduced within beneficial ranges, may possibly damage the organ. Additional chemical agent, such as those

used in laboratories (e.g. CCl_4, paracetamol, alcohol) and industries (e.g. lead, arsenic), natural chemicals (e.g., microcystins, aflatoxins) and herbal remedies (*Cascara sagrada*) can also induce hepatotoxicity. Chemical that effect liver injuries are known as hepatotoxins.. Chemicals that cause liver injury are called **hepatotoxins.** These agents be renovate in chemically immediate metabolities in liver, which have the ability to interconnect with cellular macromolecules such as protein, lipids and nucleic acids, leading to protein dysfunction, lipid per oxidation, DNA damage and oxidative stress. This damage of cellular function can dismiss in cell death and likely liver failure[3.] *Lantana Camara* is a tropical origin plant and native to Central and Northern South America and Caribbean. *Lantana Camara* is now spreaded to nearly 60 countries viz, New Zealand, Mexico, Currently *Lantana Camara* is distributed throughout India. *Lantana camara* is an important medicinal plant of the family Verbenaceae[4]. Used in Antibacterial activity[5] Antifungal activity[6] Wound healing activity[7] Antiinflammatory activity[8], Antifertility activity[9], (Embryo toxicityAntihyperglycemic activity[10], Antioxidant activity.[1]

MATERIAL AND METHOD

5.1 Animals

The study was carried out in rats of Wister strains of either sex weighing 150-200 gm. 2-3 months old. They were procured from animal house of the Jaipur College Of Pharmacy(A Unit Of Modern Society For Education And Research, Jaipur); and were kept individually under standard laboratory condition. Food pellets and tap water were provided and libitum. Ethical clearance for experimental studies was obtained from institutional animal Ethical Committee, National institute of the institute under reg. No. 931/PO/ac/06/CPCSEA.

5.2 Plant material

Lantana Camera **(***Verbenaceae***)**was purchased from local market and its indientity was confirmed . It was dried well to make powder. Coarse powder of the dried rind was prepared with the help of the grinder. Hydro alcoholic extract of the powereded drug was prepared by Soxhlet's apparatus.

5.3 Preparation of extract

The air-dried parts of the plants were powdered and extracted with 95% ethonal, chloroform per ether (40-60) and acqueous solvent systems by hot percolation method by using Soxhlet apparatus assembly at a controlled temperature. After complete extraction,

Table: Determination of SGPT, SGOT,Billiurubin

Treatment	SGPT	SGOT	Billurubin
Control	118	55	0.42
CCl_4 induced	158	75	0.77
Silimarin	146	65	0.67
Lantana camera	131	48	0.45

marc was pressed to collect the micelle, mixed with the contents of RBF, filtered and concentrated to get the extract. The color and consistency of the extract was noted.

Chemicals

Sulphuric acid, sodium hydroxide, fehling's solution (A and B), hydrochloric acid (HCl), Mayer's reagent, Dragendorff's reagent, ferric chloride, Ammonia solution, chloroform and dichloromethane were purchased & distilled water was prepared in the department of pharmacology, Maharishi Arvind Institute of Pharmacy Jaipur.

Determination of acute toxicity (LD50)

The acute toxicity of petroleum ether, mathanolic and aquiesous extract of plant *Emblica officinalis* were determined in wister rat. The animal were fasted overnight prior to the experiment , fixed dose method of OECD guideline no. 420; (Annexure-2d) of CPCSEA was adopted for this purpose.

Collection and Authentication of Plant:

Identification of the root of *ficus retusa* University of Rajasthan (Jaipur, Rajasthan).

Reference no. : **RUBL211421**

Plant is authenticated by Vinod kumar Sharma, Botanist, UOR, Jaipur. Material was shade dried at room temperature and powdered mechanically and passed through a sieve #40.

Group I- Vehicle Control (Untreated Normal animal)

Group II-CCl_4 was administered 2ml/Kg body weight s.c. on day 3rd.

Group III: : Siiymarin 50mg/Kg body weight orally from 1^{s1} to3rd day and administered with ccl_4 2ml/Kg body weight orally on day 3^{rd}

Group IV: This group was treated with aqueous extract of *Lantana Camera* 250mg /kg body weight orally from 1^{st} to 3^{rd} day and administered with CCl_4 2ml /kg body weight orally on 3^{rd} day.

SUMMARY AND DISCUSSION

The present studies were performed to assess the hepatoprotective activity in rats, against Carbontetrachloride as hepatotoxin to prove its claim in folklore practice against liver disorder. The changes associated with Carbontetra chloride induced liver damage of the present study appeared similar to the

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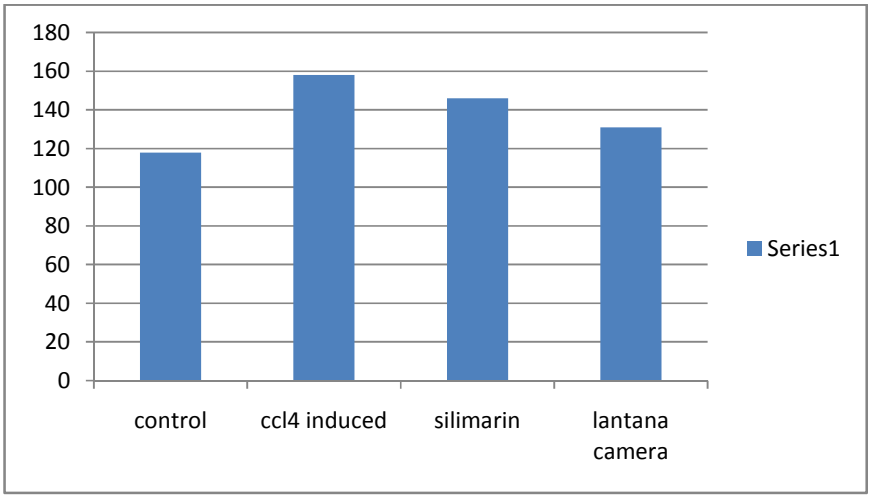

Fig. 1: Level of SGPT

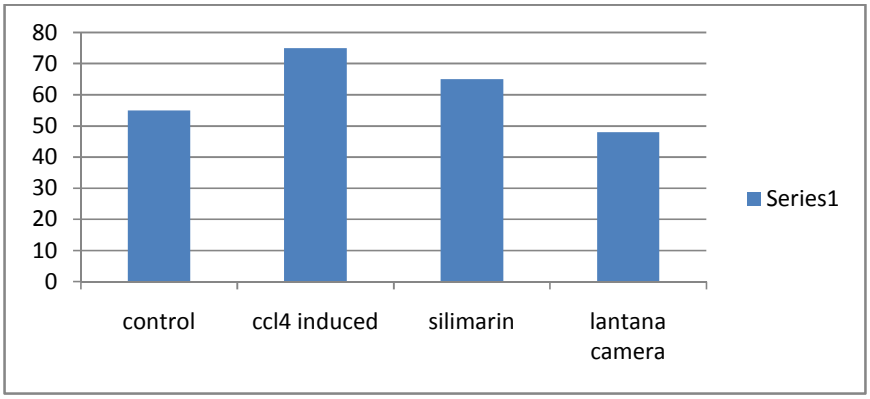

Fig. 2: Level of SGOT

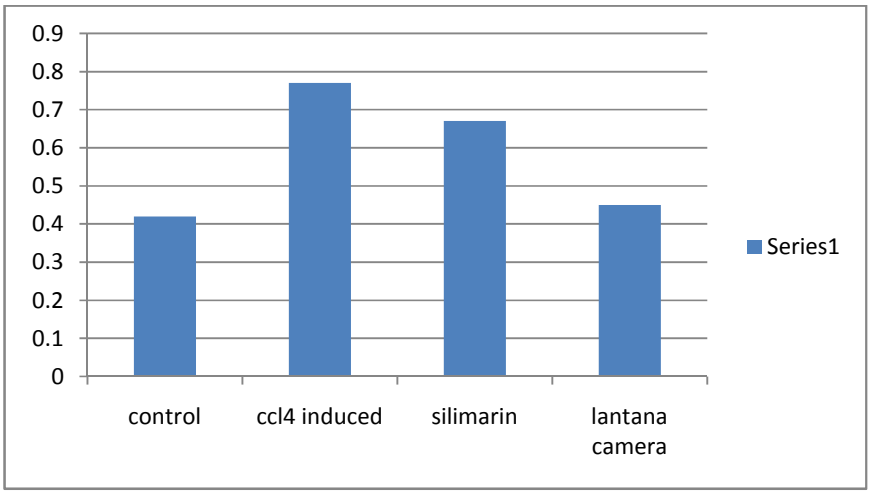

Fig. 3: Level of Billurubin

acute viral hepatitis. Carbontetrachloride is a widely used experimental hepatotoxicant, is biotransformed by the cytochrome P-450 system to produce the trichloromethyl free radical, which in turn covalently binds to cell membranes and organelles to elicit lipid peroxidation, disturb Ca 2+ haemostasis and finally result in cell death. Animals of Group II (received Carbontetrachloride) significantly lost their body weight and showed reduced food consumption as compared to control group. Animals of Group III and IV (received Carbontetrachloride plus 200mg/kg body weight of test extract and standard drug Silymarin 100mg/kg body weight) showed a significant increase in body weight and food consumption when compared to Carbontetrachloride group animals. These findings suggested the extract administered has significantly neutralized the toxic effects of Carbontetrachloride and helped in regeneration of hepatocytes. Estimating the activities of serum marker enzymes, like SGPT, SGOT, ALP can make the assessment of liver function when liver cell plasma membrane is damaged, a variety of enzyme normally located in the cytosol are released into the blood stream. Their estimation in the serum is a useful quantitative marker of the extent and type of hepato cellular damage. The tendency of these enzymes to return to near normally in extract administered group is a clear manifestation of antihepatotoxic effects of the extract. The levels of total protein and albumin were reduced due to the Carbontetrachloride-induced hepato-toxicity. The reduction is attributed to the initial damage produced and localized in the endoplasmic reticulam which result in the loss of P-450 leading to fatty liver. Inhibitin of bile acids synthesis from cholesterol which is synthesis in liver or derived from plasma lipids, leading to increase in cholesterol levels were also resulted due to Carbontetrachloride intoxication suppression of cholesterol levels by the extract suggest the bile acid synthesis inhibition was reversed. Reduction in the levels of SGPT and SGOT towards the normal value is an indication of regeneration process. Reduction in ALP levels with concurrent depletion of raised bilirubin levels suggests the stability of the biliary function during injury with Carbontetrachloride. The protein albumin levels were also raised suggesting the stabilization of endoplasmic reticulum leading to protein synthesis. This hepato protective effect exhibited by the ethanolic extract body weight was comparable with the standard drug, A

Silymarin. Histopathological liver sections also revealed that the normal liver architecture was disturbed by hepatotoxin in Carbontetrachloride group, whereas in the liver sections of the rat treated with the ethanolic extract and intoxicated with Carbontetrachloride the normal cellular architecture was retained and it in comparable with the standard Silymarin group, hence confirming the significant hepato protective effect of extract of *Lantana Camera*. In accordance with these results, it may be confirmed due to the presence of phytoconstituents such as flavonoids, alkaloids and glycosides which are present in the ethanolic extract could be considered as, responisible for the significant hepatoprotective activity. In conclusion, it can be said that the methanolic extract of *Lantana Camera* exhibited a hepato protective effect against Carbontetrachloride induced hepatotoxicity. Efforts are in progress to isolate and characterize the active principle, which is responsible for the hepatoprotective efficacy of this valuable medicinal plant.

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