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## Hepato-Protective Activity of The Ethyl Acetate Extract of Aerial Parts of *Launaea Intybacea* (Jacq) Beauv



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### A B S T R A C T

The present study was conducted to evaluate the hepato-protective activity of ethyl acetate extract of aerial parts of *Launaea intybacea* in  $CCl_4$ -induced hepatotoxicity in albino rats. Silymarin (200mg/kg) was given as reference standard. The ethyl acetate extract of aerial parts of *Launaea intybacea* have shown very significant hepatoprotection against  $CCl_4$ -induced hepatotoxicity in albino rats in reducing serum total bilirubin, SALP, SGPT, SGOT levels and liver homogenates LPO, SOD, CAT, GPX, GST and GSH levels.

**Key words:** *Launaea intybacea*, hepatotoxicity,  $CCl_4$  and Silymarin

### INTRODUCTION

*Launaea intybacea* belongs to family Asteraceae is a herb found in though out India and common in costal areas. (kirtikar, 1999, *et al*) The plant is used in folk medicine, ethnobotanical used of the plant related to its hepatoprotective, alkaloids, steroids, triterpenids, saponins, flavonoids, xanthones, phenolic acid tannic acid and gallic acid were isolated from the plant many such compounds have protective effects due to there pharmacological activities Liver disease remains one of the serious health problems. (Christian, 2008, *et al*) Herbs play a major role in the management of various liver disorders. A number of plants possess hepatoprotective property. (Recknagel, 1967, *et al*) Due to excessive exposure to hazardous chemicals, the

free radicals generated will be so high such that they overpower the natural defensive system leading to hepatic damage and cause jaundice, cirrhosis and fatty liver, which remain one of the serious health problems. Carbontetrachloride ( $CCl_4$ ) is one such hazardous chemical which induces hepatopathy through membrane lipid peroxidation by its free radical derivative. Excessive production of the reactive species manifests in tissuethiol depletion, lipid peroxidation, plasma membrane damage etc., culminating into severe hepatic injury. (Wargovich, 2001, *et al*) With this scientific information, the present study was designed with an aim to assess the hepatoprotective activity of the ethyl acetate extract of aerial parts of *Launaea intybacea*, against  $CCl_4$  induced liver damage.

## MATERIALS AND METHODS

### Plant material

The plant material used in this study was collected during month of January in Akole Dist-Ahmednagar (MH), India and authenticated from Department of Botanical Survey of India, Pune (India).

### Preparation of the Extract

The shade dried aerial part of *Launaea intybacea* was extracted with ethyl acetate successively by soxhlation method and concentrated over water bath and evaporated under reduced pressure. The yield of extract was calculated.

### Animals

Albino rats (either sex) of Sprague dawley strain, weighing 150-200g were used. The animals were acclimatized to laboratory conditions (RT-25°C) for 4 days and given pelleted animal feed (Hindustan Lever) and drinking water, Diagnostic reagent kits (Enzopak) were used for the estimation of serum SALP, SGPT and SGOT levels and assay procedure was used for the estimation of liver homogenates LPO, SOD, CAT, GPX, GST and GSH. (Handa, 1986, *et al* )

### Toxicity studies

Acute toxicity study was performed for ethyl acetate extract according to the acute toxic classic method as per OECD guidelines, (Ashok, 2001, *et al* ) albino rats were used for acute toxicity study. The animals were kept fasting for overnight providing only water, after which the extract was administered orally at the dose of 100, 200 and 400 mg/kg and observed for 16 days. If mortality was observed in 2 out of 3 animals, then the dose administered was assigned as toxic dose. If the mortality was observed in 1 animal, then the same dose was repeated again to confirm the toxic dose. If mortality was not observed, the procedure was repeated for further higher dose i.e., 400 mg/kg.

### Hepatoprotective Activity

The animals were divided into four groups comprising of six albino rats in each group using randomization technique and treated with the extract for seven days to assess the hepato-

protective potential of the plant. The first group (vehicle control) received vehicle for all the seven days. The second group was kept as toxin control and given only the CCl<sub>4</sub> treatment. The third group received ethyl acetate extract in the dose of 200mg/kg p.o. and the fourth group received the Silymarin in the dose of 200mg/kg p.o. as a reference material for the study. All the animals except the vehicle control received CCl<sub>4</sub> on 16<sup>th</sup> day of the treatment. The blood samples were collected by cardiac puncture in heparinized microfuge tubes. The blood samples thus collected were immediately centrifuged at 2200rpm for 15 minutes. When serum clearly separated out, the serum was analyzed for SGPT and SGOT levels using enzopak reagent kits. The animals were sacrificed by cervical dislocation after 48 hours of CCl<sub>4</sub> administration. The livers were dissected out immediately, washed with ice cold saline and 10% homogenates in 1.15%(w/v) KCl were prepared. The homogenates were centrifuged at 7000xg for 10 min at 4°C and the supernatants were used for the assays of LPO, SOD, CAT, GPX, GST and GSH. The results thus obtained were subjected to statistical analysis using *student t-test* and analysis of variance (Ashok 1999 and Heba 2006, *et al* )

(Table: 1 and Table: 2 )

## RESULTS AND DISCUSSION

The present studies were performed to assess the hepatoprotective activity in rats against carbon tetrachloride as hepatotoxin to prove its claims in folklore practice against liver disorders. Carbon tetrachloride-induced hepatic injury is commonly used as an experimental method for the study of hepatoprotective effects of medicinal plant extracts and drugs. The extent of hepatic damage is assessed by histological evaluation and the level of various biochemical parameters in circulation. Highly reactive trichloro free radical formation, which attacks polyunsaturated fatty acids of the endoplasmic reticulum, is responsible for the hepatotoxicity of CCl<sub>4</sub>. It produces hepatotoxicity by altering liver microsomal membranes in

experimental animals. From the Table 1 it was evident that the extract was able to reduce all the elevated biochemical parameters due to the hepatotoxin intoxication. The levels of total proteins and albumin were reduced due to the CCl<sub>4</sub> induced hepatotoxicity. The reduction is attributed to the initial damage produced and localised in the endoplasmic reticulum which results in the loss of P450 leading to its functional failure with a decrease in protein synthesis and accumulation of triglycerides leading to fatty liver. Reduction in the levels of SALP, SGOT and SGPT towards the normal value is an indication of regeneration

process. The ethyl acetate of aerial parts of *Launaea intybacea* (Jacq) Beauv has shown very significant hepatoprotection against CCl<sub>4</sub>-induced hepatotoxicity in albino rats in reducing serum total bilirubin, SALP, SGPT and SGOT levels. It is also found that treatment with ethyl acetate extract of plant has brought down the elevated level of LPO and also significantly enhanced the reduced levels of SOD, CAT, GPX, GST and GSH. Liver section of *Launaea intybacea* treated animal group clearly showed normal hepatic cells and central vein thereby confirming hepatoprotective activity.

**Table: 1 Effect of ethyl acetate extract of *Launaea Intybacea* aerial parts on CCl<sub>4</sub>-induced hepatotoxicity ( Serum parameters).**

Sr. No.	Groups	Total Bilirubin <sup>a</sup> (mg/dl)	SALP (Units/ml) <sup>a</sup>	SGPT (Units/ml) <sup>a</sup>	SGOT (Units/ml) <sup>a</sup>
1.	Control	0.74 ± 0.06	233.12 ± 1.21	79.21 ± 1.12	193.22 ± 1.20
2.	CCl <sub>4</sub>	2.30 ± 0.05	426.13 ± 1.32	354.50 ± 1.10	330.24 ± 1.39
3.	Ethyl acetate Extract (200mg/kg)	0.76 ± 0.06	231.16 ± 1.28	81.64 ± 6.10	197.16 ± 2.29
4.	Silymarin (200mg/kg)	0.79 ± 0.04	230.05 ± 14.30	79.31 ± 3.43	193.35 ± 11.01

<sup>a</sup> Values of mean ± S.E.M. (n=6)

**Table: 2 Effect of ethyl acetate extract of *Launaea intybacea* aerial parts on CCl<sub>4</sub>-induced hepatotoxicity ( Liver homogenates)**

Sr. No.	Groups	LPO nmoles/mg of protein	SOD Units/mg of protein	CAT Units/mg of protein	GPX (µg/mg)	GST µg/mg of protein	GSH µg/mg of protein
1.	Control	0.42 ± 0.5	0.74 ± 0.06	79.21 ± 1.12	193.22 ± 1.20	2.06 ± 0.12	0.45 ± 0.07
2.	CCl <sub>4</sub>	5.05 ± 1.53	5.05 ± 1.53	354.50 ± 1.10	330.24 ± 1.39	0.23 ± 0.02	0.12 ± 0.32
3.	Ethyl acetate Extract (200mg/kg)	0.44 ± 1.21	0.44 ± 1.21	81.64 ± 6.10	197.16 ± 2.29	2.01 ± 0.07	0.43 ± 0.02
4.	Silymarin (200mg/kg)	0.44 ± 0.01	0.44 ± 0.01	79.31 ± 33.43	193.35 ± 11.01	2.01 ± 0.11	0.45 ± 0.01

<sup>a</sup> Values of mean ± S.E.M. (n=6)