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Research Article

HEPATOPROTECTIVE EFFECT OF METHANOLIC EXTRACT OF *CUCURBITA MAXIMA* AND *LEGENARIA SICERARIA* SEEDS

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ABSTRACT

The objective of the present study was to investigate the hepatoprotectiveactivity of methanol extract of *Cucurbita maxima* Duchesne (Cucurbitaceae) (MECM)and *Legenaria siceraria* seeds against Paracetamol induced hepatotoxicity. Hepatoprotective activity was evaluated by the biochemicalestimation of liver function parameters (SGPT, SGOT), antioxidant assays of liver homogenate . In MECM treated animals, the toxic effect of paracetamol was controlled significantly by restoration of the biochemical parameters, such as, SGPT, SGOT,status to/towards near normal values. Histology of the liver sections of the animals treated with the extracts showed the presence of normal hepatic cords, absence of necrosis and fatty infiltration, which further evidenced the hepatoprotective activity of *C. maxima* and *L.siceraria* methanol extract of the seeds aerial parts of *C. maxima* possesses significant hepatoprotective activity[1-3].

Key words: Antioxidant studies, *C. maxima*, cucurbitaceae, hepatoprotective.

INTRODUCTION

Liver is the largest organ in the vertebrate body andthe site for intense metabolism. Hepatic injury is associated with distortion of the metabolic functions.Because of the strategic placement in the body, liver is continuously exposed to various xenobiotics and this may result in a variety of liver ailments. Thus liver diseases remain one of the serious health problems[1]. In absence of reliable liver protective drugs in modern medicine, folk remedies from plant source are therefore evaluated for their potential hepatoprotective effects against different chemical induced liver damage in experimental animals .*Cucurbita maxima* Duchesne (commonly known as pumpkin)and *Legenaria siceraria* is widely cultivated throughout the world for use as vegetable[6]. Both, its fruits and the aerial parts are commonly consumed as vegetable. The plant has been used traditionally as medicine in many countries such as China, India, Yugoslavia, Brazil and America.[1-4]

MATERIALS AND METHODS

Preparation of plant extract

The seeds of planrs were air dried and then successively extracted with various solvents on basis of polarity,as methanolic extracts with refrence to review of literaturestudy has shown highest activity so selected for hepatoprotective study.

Animals

Swiss albino mice of either sex, weighing 30-35 g maintained under Individually ventilated cage system (temperature 23 ± 2 °C relative humidity 55 ± 10 % and 12 h light: 12 h dark cycle) were used for all experiments. The animals were fed with a commercial diet (Sanghli Feed: Pune) and

water ad libitum. The experimental protocols were approved by the Institutional animal ethics committee.[5-6]

Group 1-Received 0.5 ml p.o., for 14 days,
Group 2-Received only 2% Paracetamol (0.5ml/p.o),for 7 days ,after that no treatment was given.
Group 3-Received Methanolic extract of *Cucurbita maxima* fruit for 7 days and then paracetamol was administered 200mg/kg p.o. till 14th day.
Group 4- Received Methanolic extract of *Legenaria siceraria seed* for 7 days and then paracetamol was administered 200mg/kg p.o. till 14thday.

Group 5-Received paracetamol for 7 days and then Silymarin 10ml/kg p.o. till 14th day.

Collection of blood samples: The treatments were continued for 7 days and on the eighth day all animals were sacrificed under light ether anesthesia and blood collected without the use of anti-coagulant for serum preparation. The blood samples were collected by direct cardiac puncture and allowed to stand for 10 min before being centrifuged at 2,000 rpm for 10 min and the serum was collected.[8-10]
The parameter chosen for hepatoprotective activity are-SGOT and SGPT

Table 1: Table showing SGOT levels of Test1 and Test 2- treated animals

Animal	Normal control	paracetamol	Test 1	Test 2	Standard drug
1	0.31	0.84	0.58	0.62	0.44
2	0.33	0.82	0.57	0.54	0.40
3	0.35	0.74	0.62	0.56	0.37
4	0.28	0.87	0.53	0.54	0.35
5	0.26	0.72	0.65	0.46	0.33

Blank 0 Standard conc. 114 IU/LStandard abs 0.8,
Test 1 –Methanolic Extract of *legeraria siceraria* fruit .
Test2- Methanolic extract of *Cucurbita maxima* seed

Table 2: Table showing SGOT (ConcentrationI/L) levels Comparing test 1 and test 2 with paracetamol and normal control

Animal	Normal Control	Paracetamol	Test 1	Test 2	Standard Drug
1	44.18	119.70	82.65	88.35	62.70
2	47.03	116.85	81.23	76.95	57.00
3	49.88	105.45	88.35	79.80	52.73
4	39.90	102.60	75.53	76.95	49.88
5	37.05	123.98	92.63	65.55	47.03
Avg	43.61	113.72	84.08	77.52	53.87
STDEV	4.65	8.28	5.91	7.30	5.51
SEM	2.08	3.70	2.64	3.26	2.46

Test 1 –Methanolic Extract of *legeraria siceraria* fruit .
Test2- Methanolic extract of *Cucurbita maxima* fruit

Table 3: Table showing SGPT (ABS) levels of test1 and test 2 comparing with normal control and standard drug

Animal	Normal Control	Paracetamol	Test 1	Test 2	Standard Drug
1	0.14	0.49	0.46	0.36	0.33
2	0.15	0.51	0.40	0.43	0.29
3	0.16	0.52	0.44	0.40	0.31
4	0.11	0.46	0.39	0.42	0.33
5	0.16	0.54	0.34	0.39	0.30

Blank-0,Standard 150 IU/L
Standard abs 0.9, **Test 1** –Methanolic Extract of *legeraria siceraria* fruit
Test 2 -Methanolic extract of *Cucurbita maxima* fruit

Table 4: Average, standard deviation SGPT (ConcentrationIU/L) of treated

Animal	Normal Control	Paracetamol	Test 1	Test 2	Standard drug
1	23.33	81.67	76.67	60.00	55.00
2	25.00	85.00	66.67	71.67	48.33
3	26.67	86.67	73.33	66.67	51.67
4	18.33	76.67	65.00	70.00	55.00
5	26.67	90.00	56.67	65.00	50.00
Avg	24.00	84.00	67.67	66.67	52.00
STDEV	3.09	4.55	6.96	4.08	2.67
SEM	2.03	1.38	3.11	1.83	1.19

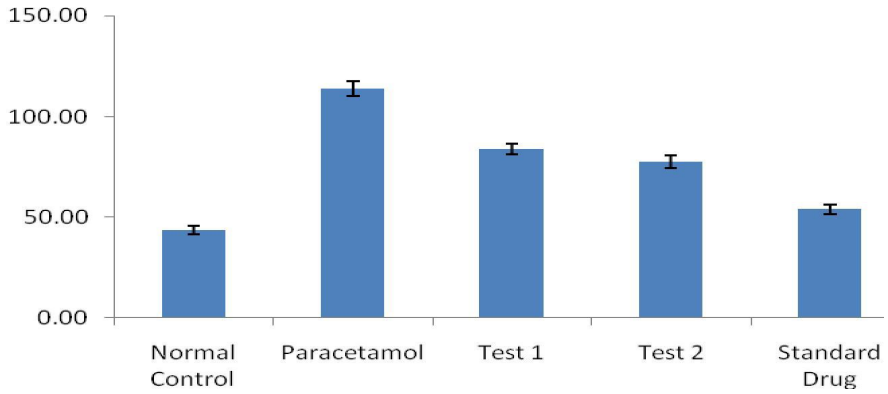
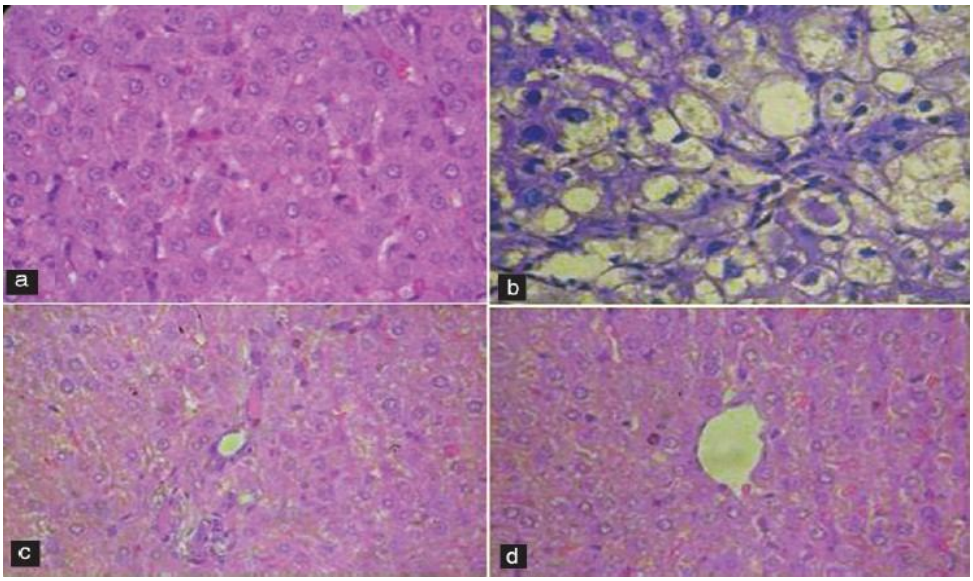


Fig. 1: Comparing SGOT levels of test drug 1 and test drug 2 with normal control and standard drug,
Test 1-Methanol Extract of *Legeraria siceraria* fruit
Test 2- Methanol extract of *Cucurbita maxima* fruit



(a) Histology of the liver sections of control animals (Group I) showed normal hepatic cells with well-preserved cytoplasm, prominent nucleus, nucleolus and visible central veins; (b) the liver sections of paracetamol-intoxicated rats exhibited intense centrilobular necrosis, vacuolization, macrovesicular fatty changes showing massive fatty accumulation in the hepatocytes, and broad infi ltration of the lymphocytes and the loss of cellular boundaries; (c) the histopathologic

observations of liver tissue section of silymarin treated group showed regeneration of cells with compact arrangement and lack of fatty lobulation; (d) the histological architecture of liver sections of the rats treated with methanol extract of Test 1-exhibited significant liver protection against Paracetamol induced toxicity as evident by the presence of normal hepatic cords, absence of necrosis, fatty infiltration.

RESULTS AND DISCUSSION

only methanolic extract of *Cucurbita maxima* and *Legenaria siceraria* extracts showed positive results for paracetamol induced hepatotoxicity. Serum enzymes including SGPT, SGOT are used in the evaluation of hepatic disorders. An increase in these enzyme activities reflects active liver damage or inflammatory hepatocellular disorders . In accordance with these findings, STZ induction has a significant role in the alteration of liver functions since the activities of SGPT, SGOT were significantly higher than normal values. On the other hand, treatment with Test 1 and Test 2, like that with paracetamol, caused significant reduction in the activities of these enzymes, showing the protective effect of the extract. .The results reveals that change in the biochemical parameters of the paracetamol intoxicated animals whereas no such change was observed in the control . Hence-significant activity were observed with methanolic extract of *Cucurbita maxima* and *legenaria siceraria* fruit intoxicanted by – Paracetamol showing moderate hepatoprotective activity . Combination with other herbal drugs might enhance the activity. Test 1 and Test2 merits preclinical toxicity studies to enter clinicals trial . The effects of Test 1 and Test 2 were comparable with that of standard reference drug Silymarin.[12-13]

Histopathological studies

Histopathological studies of rat liver tissue from Group I animals show normal hepatic cells with central vein ,and sinusoidal dilation . In paracetamol treated group (Group II), severe hepatotoxicity was observed by severe necrosis with disappearance of nuclei. Mild degree of necorsis with normal cells was observed in Group III and mild degree of necrosis (N) with areas of inflammation adjacent to necrosised area was observed in Group V animals, treated with Test 1 and Test 2 (200mg/kg/day) respectively normal hepatocytes with regenerating hepatocytes and mild inflammation in the portal area.[11]

CONCLUSION AND PERSPECTIVE

Test samples 1& 2 show moderate hepatoprotective activity.

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