HEPATOPROTECTIVE ACTIVITY OF THE LEAVES OF ABUTILON CRISPUM (LINN) MEDICUS

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ABSTRACT

Natural products serve as lead molecules for development for the many popular drugs. Herbal drugs are having fewer side effects than the other class of drugs which are coming from the synthetic source. Abutilon crispum (Linn) Medicust, belonging to family Malvaceae. The present study deals with the hepatoprotective potential of Abutilon crispum in view to give scientific evidence to the folklore claim on the hepatoprotective activity of the leaves. The leaves were collected and extracted using decoction method in water. Sylimarin was used as standard. The serum of each animal of all groups were analyzed the biochemical parameters Serum glutamic-oxaloacetic transaminase (SGOT), Serum glutamic-pyruvate transaminase (SGPT), alkaline phosphatase (ALP) and total bilirubin content. The above findings indicated that the leaf extract of A. crispum possess significant hepatoprotective activity.

KEY WORDS: Abutilon crispum, Sylimarin, SGOT, SGPT, Alkaline phosphatases, Carbon tetrachloride.

INTRODUCTON

Abutilon crispum(Linn) belonging to family Malvaceae is trailing perennial, weak, shrub. The plant common distribution in the shady forest undergrowth on hilly slopes. Found in throught India, It is known as Nelabenda in local area [¹]. The plant finds its application in the traditional system of medicine. In India the Plant is used in the treatment of asthma, piles,
ulcers, cough, jaundice and diabetics by tribal people of Andhra Pradesh and fruits are used in the treatment of piles in Tamilnadu [2-5].

Since the plant is reported to have many medicinal uses, the author has taken up the plant A. crispum to give scientific evidence and so was evaluated for hepatoprotective activates.

MATERIALS AND METHODS

Plant Material
The fresh leaves (1 kg) of *Abutilon crispum* were collected from Pakala, Narsampet of Warangal district and authenticated by Prof. V. S. Raju, Department of Botany, Kakatiya University, Warangal. A voucher specimen (MRM/03/2012) was deposited in the College of Pharmaceutical Sciences, Andhra University, Visakhapatnam. The collected plant material was dried under shade and coarsely powdered.

Preparation of the Extract
The aqueous extract of *Abutilon crispum* leaves was obtained by decoction process for 30 min from 500 g of the dried leaves in 1 Liter of water. The filtrate was evaporated in vacuum yielded a brown coloured sticky residue (15.82% w/w). The extract so obtained was suspended in 0.5% w/v sodium carboxy methyl cellulose and used for further studies.

Test Animals for Hepatoprotective Activity
Adult Wistar albino rats of either sex, weighing between 180 to 220 g were used for the study. The animals were divided into 5 groups of 6 animals each and were fed standard pellet diet and supplied water *ad libitum*. All the experimental procedures were approved by Institutional animal ethical committee of Talla Padmavathi College of Pharmacy, Warangal, Telangana, India vide approval No. 1505/po/a/11/CPCSEA.

Acute toxicity studies of the aqueous extract of *A. Crispum*
Acute toxicity of *A. crispum* was evaluated using standard laboratory model suggested by Seth *et al* [6]. Adult albino mice of either sex, weighing between 25-33 g were divided into eight groups of six animals each. The control group received 2 ml /kg distilled water orally. The other groups received the extract, at dose levels of 100, 200, 400, 800, 1000, 2000 and 3000 mg/kg in distilled water through oral route. After administration of the dose the animals were observed continuously for first four hours for behavioral changes and for mortality if any at the end of 72 h. However, no mortality was observed.
Hepatoprotective activity of aqueous leaf extract of A. Crispum

Hepatoprotective activity of the aqueous extract of A. crispum was evaluated as per the method suggested by Srinivas et al. The animals were allowed to acclimatize to the laboratory environment for 7 days. The vehicles used for the study was 0.5% w/v sodium carboxy methyl cellulose in distilled water. Group-I served as control, which received only vehicle (0.2 ml / 100 g) through oral route. All other groups of animals received one of the following treatments. Sylimarin (20 mg/kg) and aqueous extract (100 mg/kg, 200 mg/kg) respectively in a similar manner. Carbon tetrachloride (1.25 ml/kg) was administered intra peritoneally 30 min after the first dose of test samples.

Estimation of Biochemical Parameters

The serum of each animal of all groups were analyzed the biochemical parameters serum glutamic-oxaloacetic transaminase (SGOT), Serum glutamic pyruvate transaminase (SGPT), alkaline phosphatase (ALP) and total bilirubin content[9-11]. All the tests were carried out with serum diagnostic kits supplied by Span Diagnostic Ltd., Mumbai. The results were presented in Table- 1 as Mean ± S.E.M. Significance of differences between control and treated groups was determined using Student’s t-test.

- Section of liver tissue of animal treated with
- Section of liver tissue of Silymarin groups
  Showed a normal cellular structure

- Section of liver tissue of AEAC 200mg/kg showing
  Showing slight necrosis
- Section of liver tissue of AEAC 100 mg/kg
  Showing normal structure with lesser vacuole necrosis

Fig. No.1 Effect of A.crispum aqueous extract and standard drug on rat liver tissue
Table-1: Hepatoprotective activity of leaf aqueous extract of A. crispum on serum enzyme and bilirubin levels

<table>
<thead>
<tr>
<th>Groups</th>
<th>SGPT   (U/L)</th>
<th>SGOT   (U/L)</th>
<th>Alkaline phosphatase (KAU)</th>
<th>Total Bilirubin (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group-I(CCl4)</td>
<td>676.2±19.20</td>
<td>890.4±36.24</td>
<td>476.2±15.54</td>
<td>3.01±0.13</td>
</tr>
<tr>
<td>Group-II(Sylimarin 20mg/kg)</td>
<td>56.6±3.12*</td>
<td>138.6±6.54*</td>
<td>134.2±4.72*</td>
<td>0.64±0.038*</td>
</tr>
<tr>
<td>Group-III (Aq.extract of A.crispum 100 mg/kg)</td>
<td>122.2±2.64*</td>
<td>213.4±4.40*</td>
<td>110.2±10.8*</td>
<td>0.48±0.030</td>
</tr>
<tr>
<td>Group-IV(Aq.extract of A.crispum 200 mg/kg)</td>
<td>109.2±2.12*</td>
<td>160.2±3.34*</td>
<td>74.2±1.62*</td>
<td>0.32±0.028*</td>
</tr>
</tbody>
</table>

Results expressed as Mean±S.E.M from six observations

Significant reduction compared to: Carbon tertachloride = *p< 0.05

RESULTS AND DISCUSSIONS

From the acute toxicity studies, it was observed that the aqueous extract at tested dose levels produced increased urination and marked analgesia. No mortality was observed with the animals even after observation for a period of 72 h.

The results showed that the serum enzyme levels were very high in rats with CCl4 (Group-I). When compared with Group-I, the values of enzyme level were found to be significantly (p< 0.05) lower. The extract at all tested dose levels showed comparable hepatoprotective activity as that of the Sylimarin treated rats. When the dose of the extract was doubled, the hepatoprotective activity was significantly increased in a dose dependent manner though not proportionately. In histopathological studies, liver tissue from the CCl4 treated group shown necrosis and fatty changes where as liver cells from standard group showing normal cellular structure and AEAC at 100 mg/kg shown slight necrosis and in 200 mg/kg shown lesser vacuole formation (Fig. no. 1). The above findings indicated that the leaf extract of A. crispum possess significant hepatoprotective activity.

CONCLUSION

The CCl4 has been used as a tool to induce hepato toxicity in experimental animals. This toxic chemical caused per oxidative degradation in the adipose tissue resulting in fatty infiltration of the hepatocytes. The increase in the levels of serum bilirubin reflected the depth of jaundice and the increase in bilirubin and alkaline phosphatases was the clear indications of cellular leakage and loss of functional integrity of the cell membrane. The above proceedings are clearly demonstrating that the aqueous extract is a good herbal hepatoprotective agent. The possible reason for this activity may be the presence of flavonoid
and phenolic compounds as secondary metabolites in the leaf extract. If this data is validated in clinical trials, *A. cripsum* may offer an effective herbal hepato protective agent.

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**REFERENCES**
