INTRODUCTION

_Eclipta alba_ (L.) Hassk has been widely used in India for the traditional treatment of liver disorders (Chopra et al., 1966; Mehra and Handa, 1968). An Ayurvedic drug from _Eclipta alba_ has been found to be quite beneficial for the treatment of jaundice in children (Dixit and Achar, 1981). Its effect on Na+/K+ ATPase in hepatic injury has also been studied (Mogre et al., 1981). In vitro immuno-inactivation of surface antigen of hepatitis B virus (HBsAg) by _Eclipta alba_ has been reported (Thyagarajan et al., 1982). In guinea pigs, hepatoprotective properties of liquid extract from fresh _Eclipta alba_ leaves against acute carbon tetrachloride (CCl4) liver damage have been demonstrated (Khin et al., 1978). _Eclipta alba_ powder has been found to contaract an increase in liver weight hepatic lipid peroxidation liver glutamyl transpeptidase, serum alanine transferase, serum alkaline phosphatase and serum albumin to globulin ratio induced in rats in vivo by CCl4 (Chandra et al., 1987). This plant showed antihepatotoxic activity in assays using CCl4 galactosamine and phalloidin – induced cytotoxicity in cultured rat hepatocytes (Wagner et al., 1986).

MATERIAL AND METHODS

Plant material

Fresh Plant of _Eclipta alba_ were collected in August 2006 from the local surround of Vidisha, Madhya Pradesh, India. Dr. P.N. Shrivastava performed taxonomic identification and the voucher specimen was deposited in the herbarium of our laboratory for future reference (vide access no. 32).

Preparation of extracts

The plants were washed thoroughly with tap water and air dried in shade at room temperature. They were then mechanically powdered and sieved. 1000gm of powdered plant material was extracted with ethanolic soxhlation and dried in a rotary evaporator at 40°C. Another 500gm of the powdered plant material was decocted in a 1000 ml of water. The liquid aqueous extract obtained was concentrated in vaccume at 40°C. The extractive yield were found to be 12.5 % and 17.36% for ethanolic and aqueous extract of _Eclipta alba_, respectively.

Preliminary phytochemical screening:

A preliminary phytochemical screening was carried out for the extracts employing the...
standard procedure to reveal the presence of alkaloids, steroids, terpenes, flavonoid, saponins, tannins, glycosides, carbohydrates and proteins.

**Animals:**
Twenty-four albino rats of Wistar albino rats weighing 100-200 gm were obtained from the laboratory of college. The animals were housed in polypropylene cages and maintained in controlled temperature (27±2°C) and light cycle (12 h light and 12 h dark). They were fed with pellets of Golden feed, New Delhi. Water was supplied libitum. They were given a week to get acclimatized with the laboratory conditions. Approval for the study was obtained from the institutional animal ethical committee (IAEC) Reg. No. 804/03/CA/CPCSEA.

**Acute toxicity studies**
Liver damage was induced in rats by administering carbon tetrachloride subcutaneously in the lower abdomen in a suspension of liquid paraffin in the ratio 1:2 v/v at the dose of 1 ml CCl4 was administered twice a week, on every first and fourth day of all the 13 weeks.

**Treatment schedule**
Rats were divided into six groups of 6 rats each as follows. Group I animals served as control, group II animals constituted hepatotoxic rats which received liquid paraffin+ CCl4 twice a week for 13 week period. Group III, IV and V were the treated group which received liquid paraffin+ CCl4+Eclipta alba at 50 mg, 100 mg and 200 mg/kg body weight. Group VI received the CCl4 and Silymerin a standard hepatoprotective drug at 100 mg/kg body weight. The rats were received 1 ml water at the dose of 70 mg/kg body weight for 3 months period. All the group were given fresh food daily at 10:30 am and then measuring the food in take by recording the body weight of rats in each group. Animals were kept starved over night on 90th day. On the next day the blood was collected by making an incision by jugular vein to collect the blood. The liver tissue was dissected by blotting of the blood washed in saline.

**Biochemical estimation**
Serum was prepared from the collected blood and subjected to biochemical estimation of different parameters like aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline phosphatase (ALP), total lipid, triglyceride, phosphatase and cholesterol. Liver homogenates were also subjected to various biochemical estimation.

**Histopathology:**
A portion of liver tissue in each group was fixed in 10% formalin (formalin diluted to 10% with normal saline) and proceed for histopathology. After paraffin embedding block, were stained with Haemotoxylin and Eosin and examined under microscope. A few photomicrographs of representative types were also taken. (Fig.1).

**Statistical analysis**
One way analysis of variance (ANOVA) followed by Scheffes test was applied for determining the statistical significance of difference in enzymes, protein and lipids levels between different group. The level of significance was set at 0.05.

**RESULTS**
Total biochemical parameters was recorded in the present study. These include AST, ALT, ALP, TP, triglyceride, cholesterol and phospholipids regarding AST in the blood serum the control value were 22.87±0.02 were achieved when higher dose of Eclipta alba 200 mg was given to the hepatotoxic rats. Values were little less as compare to the Silymerin. Regarding ALT the, higher doges of Eclipta alba showed a significant increase as compare to the controlled group. Regarding ALP the value remained to be a bit higher as compared to the control group and Silymerin treatment. As regards the total proteins the 200 mg dose of Eclipta alba brings the protein value at most equal to the normal rats. As regards the total lipid the value got increased in 50 mg dose but at higher dose, it got decreased which is still much higher then the total lipid values in the control rats. Regarding triglycerides the value was a little higher in 200 mg/kg body weight dose as compared to the control group. Cholesterol value came to be nearer to the control group of animals. There was a considerable increase in the phospholipids of the plant extract treated group VIth serum as compared to the group 1 which recorded only LP (liquid paraffin). Thus, it is quite clear that, total lipid, cholesterol and phospholipids were found to be increased against...
Table 1: Protective effect of Eclipta alba whole plant extract and Silymerin on different biochemical parameters in the serum of rats

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group - I (LP only)</th>
<th>Group - II (LP ± CCl4)</th>
<th>Group - III (LP ± CCl4 ± EA) 50 mg/kg b.w.</th>
<th>Group - IV (LP ± CCl4 ± EA) 100 mg/kg b.w.</th>
<th>Group - V (LP ± CCl4 ± EA) 200 mg/kg b.w.</th>
<th>Group - VI (CCl4 ± Silymerin) 100 mg/kg b.w.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspartate transaminase%</td>
<td>22.87±0.02</td>
<td>34.78±1.34</td>
<td>34.10±1.06</td>
<td>28.26±1.08</td>
<td>24.72±1.08</td>
<td>25.8±1.02</td>
</tr>
<tr>
<td>Alanine transaminase%</td>
<td>27.62±1.02</td>
<td>72.12±4.11</td>
<td>69.02±2.14</td>
<td>40.12±2.12</td>
<td>35.21±1.16</td>
<td>26.82±1.16</td>
</tr>
<tr>
<td>Alkaline phosphatase%</td>
<td>74.42±3.14</td>
<td>139.12±5.0</td>
<td>120.12±4.0</td>
<td>99.20±3.57</td>
<td>79.02±3.24</td>
<td>75.12±3.52</td>
</tr>
<tr>
<td>Total protein (g/100ml)</td>
<td>6.74±0.74</td>
<td>4.32±0.19</td>
<td>4.30±0.18</td>
<td>5.14±0.15</td>
<td>6.41±0.21</td>
<td>6.68±0.42</td>
</tr>
<tr>
<td>Total lipid (g/100ml)</td>
<td>198.65±5.62</td>
<td>302.66±8.73</td>
<td>282.22±8.73</td>
<td>246.89±8.73</td>
<td>215.98±8.12</td>
<td>9.41±0.84</td>
</tr>
<tr>
<td>Tryglycrides (g/100ml)</td>
<td>8.21±0.82</td>
<td>14.84±1.34</td>
<td>13.46±1.24</td>
<td>11.24±1.02</td>
<td>10.12±0.89</td>
<td>9.41±0.84</td>
</tr>
<tr>
<td>Cholesterol (g/100ml)</td>
<td>64.86±3.36</td>
<td>99.61±4.46</td>
<td>82.16±4.26</td>
<td>75.42±3.87</td>
<td>69.15±3.57</td>
<td>65.75±3.57</td>
</tr>
<tr>
<td>Phospholipid (g/100ml)</td>
<td>122.65±8.91</td>
<td>240.76±12.88</td>
<td>240.62±12.88</td>
<td>192.26±11.46</td>
<td>180.62±11.02</td>
<td>199.56±10.02</td>
</tr>
</tbody>
</table>

* P<0.50 as compared to group - I  ** P<0.10 as compared to group - II Value are mean ± SE from 6 animals of each group.

Table 2: Effect of Eclipta alba on different biochemical parameters in the liver of rats.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group - I (LP only)</th>
<th>Group - II (LP ± CCl4)</th>
<th>Group - III (LP ± CCl4 ± EA) 50 mg/kg b.w.</th>
<th>Group - IV (LP ± CCl4 ± EA) 100 mg/kg b.w.</th>
<th>Group - V (LP ± CCl4 ± EA) 200 mg/kg b.w.</th>
<th>Group - VI (CCl4 ± Silymerin) 100 mg/kg b.w.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Protein (g/100ml)</td>
<td>8.14±0.28</td>
<td>5.04±0.21</td>
<td>5.86±0.38</td>
<td>6.96±0.22</td>
<td>7.99±0.22</td>
<td>7.42±0.24</td>
</tr>
<tr>
<td>Total Lipid (g/100ml)</td>
<td>7268±618</td>
<td>9982±436</td>
<td>9012±402</td>
<td>8124±492</td>
<td>7608±514</td>
<td>7204±346</td>
</tr>
<tr>
<td>Tryglycrides (g/100ml)</td>
<td>2238±84.3</td>
<td>3329±78.6</td>
<td>29.92±68.2</td>
<td>2546±88.6</td>
<td>2278±64.6</td>
<td>2256±78.3</td>
</tr>
<tr>
<td>Cholesterol (g/100ml)</td>
<td>1289±63.2</td>
<td>2438±74.8</td>
<td>2183±81.2</td>
<td>1496±88.6</td>
<td>1316±91.2</td>
<td>1396±68.6</td>
</tr>
<tr>
<td>Phospholipid (g/100ml)</td>
<td>3680±461</td>
<td>3721±354</td>
<td>3720±354</td>
<td>3718±486</td>
<td>3714±496</td>
<td>3718±485</td>
</tr>
</tbody>
</table>

* P<0.50 as compared to group - I  
Value are mean ± SE from 6 animals of each group.
the control group 1st. Rest parameters were found to be all most normal level when three different doges of the compound of the Eclipta alba were given to the CCl₄ induced hepatotoxic rat.

**DISCUSSION**

The results in the present study indicate that 200 mg/kg body weight doge of the plant extract was able to reduce major elevated biochemical parameters due to the changes associated with CCl₄ induced liver damage in the experimental rats. The level of total protein was found to be at normal level after the treatment. Similar results have been observed by Pattanayak and Priyashree (2008) which have noticed such changes in the hepatotoxic animal when treated with the extract from Dendrophoe falanta. Similarly, level of triglyceride, total lipid and cholesterol was found to be decreased after the treatment. Vanukumar and Latha (2002) have also reported that when liver cell plasma membrane is damaged, a variety of enzymes normally located in the cytosol which are released in blood stream which causes hepatocellular changes. Treatment of CCl₄ increases the level of total protein, cholesterol in the liver. But it was noticed that the recovery beginning as soon as the plant extract was given. The phospholipids content in serum registered a significant like that of liver showed a deamination in CCl₄ administered group. A histopathological study of the liver further suggest the hepatoprotective efficacy of *Eclipta alba* extracts Fig. 1). Kumar & Mishra (2008) have also reported hepatoprotective effect of *Pergularia demia* ethanol extract.

The observations of these dose, clearly indicat the involvement of hepatoprotective active principles in *Eclipta alba*. The detail phytochemistry of the active hepatoprotective principles is still awaited.

**ACKNOWLEDGEMENTS**

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**REFERENCES**