Hepatoprotective Activity of Caralluma umbellata in Chicken

N. Punniamurthy, V. Ranganathan¹, D. Basheer Ahamad and S. Sathesh Kumar
Veterinary University Training and Research Centre, Tamil Nadu Veterinary and Animal Sciences University, Thanjavur-613403.

(Received : 18-09-2013; Accepted : 24-02-2014)

Abstract
Hepatoprotective activity of Caralluma umbellata on paracetamol induced hepatotoxicity was evaluated in white leghorn male cockerels. They were divided into five groups of six birds each. Birds in group I served as untreated control. Group II was administered with paracetamol @ 2 g/kg body weight orally from seventeenth day and till the end of the experiment. Group III was given silyamin @ 100mg/kg for 16 days followed by paracetamol @ 2 g/kg body weight till the end of the experiment. Group IV and V were administered with Caralluma umbellata @ 500mg and 2500 mg/kg body weight for 16 days followed by paracetamol @ 2 g/kg body weight. Hemato-biochemical observations were made. The cytopathology of the liver was also recorded in all the groups treated. Hemato-biochemical observations and cytopathology showed the reversal of paracetamol induced toxicity by Caralluma umbellata.

Key words: Caralluma umbellata, Paracetamol, Chicken, Liver toxicity

Liver is the main metabolizing organ which gets exposure to the various xenobiotics because of the highly specialized functions of the hepatic parenchymal cells and dual blood circulation (Gupta, 1989). Caralluma umbellata is a perennial herb that possesses many therapeutic effects including anti-inflammatory activity (Ray et al., 2012). The anti-inflammatory effects of Caralluma umbellata may relate to an influence of plant compounds on injured liver cells because of the protection against inflammation. The present study was undertaken to find out the effect of Caralluma umbellata leaves on the paracetamol induced hepatic injury in chicken model.

Materials and Methods
Thirty numbers of four weeks old male White LegHorn cockerels, weighing between 500-600 g were purchased from District Livestock Farm, Orathanadu, Thanjavur District, Tamil Nadu, India. The birds were housed in cages and maintained at 30-35° C under 12 h light/dark. They were fed with SKM Animal Feed, manufactured by SKM feeds, Erode District, Tamil Nadu. Clean water was provided ad libitum. The birds were acclimatized for one week under laboratory conditions. The experimental protocol was approved by Institutional Animal Ethical Committee of Tamil Nadu Veterinary and Animal Sciences University. Birds were divided into five groups of six birds each. In the 23 day trial, birds in group I served as untreated control and was given distilled water for 23 days. Group II was administered with paracetamol @ 2 g/kg body weight orally from seventeenth day and till the end of the experiment. Birds in group III were given silyamin @ 100mg/kg for 16 days followed by paracetamol @ 2 g/kg body weight till the end of the experiment. Birds in group IV and V were administered with Caralluma umbellata @ 500mg and 2500 mg/kg body weight for 16 days followed by paracetamol @ 2 g/kg body weight till the end of the experiment. Initial and final body weights were measured. Blood samples were collected by cardiac puncture at the end of the experiment for haemato-biochemical studies to assess the potential of medicinal plant in reversal of paracetamol induced toxicity. Blood samples were analyzed as per the method of reference of Schalm et al (1975). The levels of alanine aminotransferase (ALT) and aspartate aminotransferase (AST), gamma glutamyl transpeptidase (GGT) were assayed by absorbance methods using Systronics colorimetry (Totan et al., 2006). Impression smear was made

¹Corresponding author: Email : varanganathan@gmail.com
with liver sample, collected from all groups after sacrificing birds for cytopathology. The results were analysed by ANOVA (Snedecor and Cochran, 1994).

Results and Discussion

The results of the haemato-biochemical studies are depicted in Table I. The ALT, AST and GGT levels in paracetamol treated group were significantly higher (32.83%, 90.86%, 119.50%) than the control group. These enzyme levels were reversed in paracetamol intoxicated birds pre-treated with silymarin by 22.80%, 36.90%, 32.42%. Caralluma umbellata @500 mg/kg could reverse the levels by 15.80%, 23.90%, 26.15% and @ 2500 mg/kg by 11.51%, 29%, 35.05%, respectively (Table I). Lower levels of ALT, AST and GGT activity in pre-treated groups indicated that Caralluma umbellata and silymarin have the potential to reverse paracetamol intoxication. The enzyme ALT is abundant in liver cells in the body and is primarily used as a specific module for hepatic damage mainly in small animals and primates (Cornelius, 1989). The levels of these enzymes in liver damage may be the result of excessive release of enzyme into serum by disruptive hepatic parenchymal cell membrane (Hoe and Wilkinson, 1973). The results apparently indicated that the degree of hepatic cell damage was of lesser magnitude in Caralluma umbellata pre-treated birds. Similar observations have been reported by Chattopadhyay et al., (1992) with Azadirachta indica (neem) in rats in reversing the levels of ALT, AST and GGT during paracetamol intoxication.

There was significant decrease in Hb level in paracetamol intoxicated birds (34.60%) as compared to control group where as significant reversal of Hb was found in the groups pre-treated with Caralluma umbellata with lower and higher dose by 40.53% and 46.12%, respectively and silymarin could reverse the Hb level by 33.57% (Table I). There were no significant changes in total RBC levels in all the groups studied where as significant decrease was noticed in paracetamol treated birds and the level was reversed in groups pre-treated with Caralluma umbellata and silymarin. Many plants have been observed to stimulate the levels of leukocytes (Jafarian et al., 2012, Raphael and Kuttam, 2003). The observed effect may be attributed to the effect of Caralluma umbellata as an anti-inflammatory agent (Ray et al., loc. cit). The impression smears from the control birds and birds treated with Caralluma umbellata and silymarin revealed normal cytopathology where as birds treated with paracetamol revealed hepatocytes with vacuolated cytoplasm along with mononuclear cell infiltration indicative of paracetamol induced liver toxicity. Paracetamol intoxicated birds were observed to have liver with pale, cooked appearance indicative of pathomorphology and the absence of these lesions in intoxicated birds pre-treated with Caralluma umbellata indicates the potential of this plant as a hepatoprotective agent.

Table I. Effect of different concentrations of Caralluma umbellata on hematobiochemical observations and body weight gain in birds

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
<th>Group IV</th>
<th>Group V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body wt gain (%)</td>
<td>93.40</td>
<td>82.00</td>
<td>89.20</td>
<td>85.90</td>
<td>93.25</td>
</tr>
<tr>
<td>ALT (IU/ml)</td>
<td>6.67±0.03</td>
<td>8.86±0.21</td>
<td>6.84±0.34</td>
<td>7.46±0.51</td>
<td>7.84±0.34</td>
</tr>
<tr>
<td>AST (IU/ml)</td>
<td>24.18±2.12</td>
<td>46.15±6.02</td>
<td>29.12±2.34</td>
<td>35.12±2.15</td>
<td>32.76±8.40</td>
</tr>
<tr>
<td>GGT (U/L)</td>
<td>66.15±7.12</td>
<td>145.20±12.64</td>
<td>98.12±8.65</td>
<td>107.22±10.70</td>
<td>94.30±18.41</td>
</tr>
<tr>
<td>Hb (g%)</td>
<td>19.13±0.78</td>
<td>12.51±1.39</td>
<td>16.71±1.70</td>
<td>17.58±0.37</td>
<td>18.28±0.35</td>
</tr>
<tr>
<td>RBC m(Cumm)</td>
<td>04.05±0.10</td>
<td>4.01±0.12</td>
<td>4.09±0.43</td>
<td>4.12±0.08</td>
<td>4.11±0.20</td>
</tr>
<tr>
<td>WBC thou(Cumm)</td>
<td>2.75±0.17</td>
<td>2.99±0.02</td>
<td>4.67±0.27</td>
<td>3.17±0.44</td>
<td>3.00±0.13</td>
</tr>
</tbody>
</table>

a, b, c, d values (mean ± S.E.M., n=6) in the same row bearing no common superscript vary significantly (P≤0.05)
Summary
Hepatotoxicity was induced in birds using Paracetamol to evaluate the hepatoprotective activity of *Caralluma umbellata*. Hematobiochemical observations and cytopathology showed the reversal of paracetamol induced toxicity by *Caralluma umbellata* in both doses studied.

Acknowledgement
The authors are thankful for Indian Council of Agricultural Research, New Delhi for funding the study.

References


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Investigation on Bacterial Flora in Upper Respiratory Tract of Yak


Department of Microbiology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati-781022, Assam, INDIA.

(Received : 06-09-2013; Accepted : 13-01-2014)

Abstract
Out of the total 196 nasal swab samples collected from clinically affected (75) and apparently healthy (121) yaks, 189 (96.43%) were found to be bacteriologically positive yielding a total of 238 numbers of bacterial isolates. The most predominant bacterial isolate was coagulase-negative *Staphylococcus* (23.10%), followed by *Pneumococcus* spp., *Streptococcus* spp., *Klebsiella pneumoniae*, *Bacillus* spp., *Mannheimia haemolytica*, *Citrobacter* spp., *Staphylococcus aureus*, *Enterobacter aerogenes*, *Proteus vulgaris* and *Escherichia coli*. All the three strains of *E. coli* of serogroup O96 were pathogenic for mice. Pathogenicity was also observed among all the selected *M. haemolytica* for the inoculated mice. All the four *S. aureus* was recorded to be dermo-necrotic. However, none of the coagulase-negative staphylococci was positive for dermo-necrotocin production.

Key words: Yak (*Poephagus grunniens* L.), upper respiratory tract and bacterial flora.

Yak (*Poephagus grunniens* L.) is treated

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1Corresponding author; Email: luitbarkalita@gmail.com

The Indian Veterinary Journal (December, 2014)