Haematinic effect of *Hygrophila spinosa* T. Anderson on experimental rodents

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Ethanol extract of the aerial parts of *H. spinosa* a semiwoody herb was examined on male albino rats for certain haematological changes. The extract (100 & 200 mg/kg, po) significantly increased the haemoglobin, haematocrit, RBC and total WBC, as compared with vehicle treated control rat haemogram. In anemic male albino rats, the extract significantly increased haemoglobin, haematocrit and RBC count. Serum iron and serum total iron binding capacity were significantly decreased in *H. spinosa* extract treated anemic rats as compared with those in the vehicle treated anemic control rats. These findings demonstrated the haematinic effect of *H. spinosa* extract on experimental animals.

*Hygrophila spinosa* (common Bengali name “Kuliakhara”) is a semiwoody herb of Acanthacea family, an inhabitant of damp or swampy area is found throughout the planes of India. The aerial part is commonly consumed as vegetable food and used for its medicinal value. Medicinal use of different parts (leaves, roots, seeds) of the herb is in several pathophysiological condition such as jaundice, rheumatism, renal stone, gonorrhea, hepatic disorder, varicose vein, have been mentioned in the Indian traditional medicine. In the rural areas of West Bengal, pregnant woman takes the leaves as a cure for anemia. However, there is no information available about its effect on the blood profile. The present investigation was designed to explore the haematological profile on experimental rodents exposed to the aerial parts of *Hygrophila spinosa* extract.

Adult male albino Wistar rats (150±10 g body weight) were used in the present study. The animals were housed in standard condition of temperature 22±2°, relative humidity (60±5%) and 12hr light / dark cycle. They were fed with standard pellet diet soaked Bengal gram and tap water *ad libitum*.

Chemicals and solvents used were of analytical grade. The following chemical were used- Leishman stain (Qualigen, India), RBC and WBC diluting fluid (Qualigen, India), Haemoglobin kit (Boeringher Mannheim, India), Toad skin toxin was prepared after Das et al.

**Plant extract preparation**—The aerial part of *H. spinosa* was obtained commercially from the local market of Calcutta, during June- July. The plant was identified and a voucher specimen of the plant was kept at the Department of Physiology, University of Calcutta, for further reference. The plant material was dried under shed and material was kept in ethanol (50%) for 40 days. Supernatant was collected and evaporated to dryness by rotary evaporator. The black mass (yield 8.5±0.75 %) obtained was designated as Hs extract and was kept at room temperature (22°-28°C) in vacuum desiccator. Before experiment, the Hs extract was weighed and dissolved in 0.9%NaCl and kept at 8°C until further use.

**Animal treatment schedule I**—Twelve male albino Wistar rats (150±10g) were divided into control (group I) and experimental (group II & III). Group II rats received the Hs extract (100and 250mg/kg, po) for 15 days. On day 15th, all the animals were fasted overnight and on the day 16th, blood was collected in heparinised tube from all the animals by puncturing retro-orbital plexus, under light ether anesthesia. Haemoglobin, haematocrit, RBC, WBC and differential count was done. Mean cell haemoglobin (MCH), mean cell volume (MCV) and mean cell haemoglobin concentration (MCHC) were calculated.

**Animal treatment schedule II**—Sixteen male albino Wistar rats (150±10gm) were divided into saline treated control (group I), anemic control (group II) and Hs extract treated anemic rats (group III&IV). Anemia was developed in group II, III and IV rats, with a single injection of toad toxin at a dose of 5mg/100g,sc on day 10th. Rats of group III and IV

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Hygrophila spinoso extract on the haemogram of male albino rat. The table shows the effect of the extract on different hematological parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control (Group I)</th>
<th>Experimental (Group II)</th>
<th>Experimental (Group III)</th>
<th>Experimental (Group IV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total RBC count</td>
<td>6.8±0.4 (10^6 mm³)</td>
<td>12.9±0.2²</td>
<td>12.0±0.6¹</td>
<td>12.1±0.4</td>
</tr>
<tr>
<td>Total WBC count</td>
<td>4.5±0.3 (10^6 mm³)</td>
<td>7.3±0.3¹</td>
<td>12.6±0.6¹</td>
<td>12.6±0.6¹</td>
</tr>
<tr>
<td>MCH (10¹² g)</td>
<td>14.5±0.6</td>
<td>12.9±0.2²</td>
<td>12.2±0.17</td>
<td>12.2±0.17</td>
</tr>
<tr>
<td>MCHC (g/dl)</td>
<td>30±0.1</td>
<td>29.5±0.4</td>
<td>31.7±0.6¹</td>
<td>31.7±0.6¹</td>
</tr>
<tr>
<td>MCV (μm³)</td>
<td>44±2.6</td>
<td>45.5±0.9</td>
<td>40.6±1.6³</td>
<td>40.6±1.6³</td>
</tr>
</tbody>
</table>

**P** :<0.05; <0.02; <0.01; <0.001

We have confirmed here that, anemic rats fed with Hs extract can protect the decline of haemogram profile significantly.

As regards the mechanism of action of Hs extract on haemopoietic system, we have not done any experiments. It may be pointed out that growth factor like cytokines (p-11) takes part in haemopoietic stimulation, is probably involved in Hs extract induced haemopoietic stimulation in rodents. It is also necessary to identify the active principles of Hs extract involved in this process. Further studies in this area are warranted before one can recommended the use of Hs extract as haemopoietic modulator.

**References**

5. Das M, Dangupta S C & Gomes A, Toad (Bufo melanostictus, Schneider) skin extract induced haemato logical and biochemical changes in Rodents, Indian J. Pharmacol., 30 (1998) 68.