RESEARCH ARTICLE

In vitro Anthelmintic activity of bark extracts of Pajanelia longifolia K.Schum.

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ABSTRACT

Development of anthelmintic resistance and high cost of conventional anthelmintic drugs led to the evaluation of medicinal plants having an alternative source of anthelmintics. In the current study, Pet-ether, chloroform and methanolic extracts of Pajanelia longifolia K.Schum. have been taken for anthelmintic activity against Indian earth worm Pheritima posthuma. Various concentrations of all the extracts were tested and results were expressed in terms of time for evoked response, paralysis and time for death of worms. Albendazole was used as a reference standard and normal saline as a control. The present study indicates the bark part of Pajanelia longifolia K.Schum. has a potent anthelmintic agent.

Keywords: Pajanelia longifolia K.Schum., Anthelmintic activity, Albendazole, Pheritima posthuma
INTRODUCTION

Helminthiasis is among the most important animal diseases inflicting heavy production losses. The disease is highly prevalent particularly in third world countries (Dhar DN et al., 1982) due to poor management practices. Chemical control of helminths coupled with improved management has been the important worm control strategy throughout the world. However, increasing problems of development of resistance in helminths (Geert S and P Dorny P, 1995) against anthelmintics have led to the proposal of screening medicinal plants for their anthelmintic activity. The plants are known to provide a rich source of anthelmints (Satyavathi GV et al., 1976). Number of medicinal plants has been used to treat parasitic infections in man and animals (Akhtar MS et al., 2000). Hence there is an increasing demand towards natural anthelmintics.

Pajanelia longifolia is a briefly deciduous or evergreen, small to medium sized tree belonging to the family Bignoniaceae. The plant locally known as Bondubale in Kannada, the bark is being used to treat skin diseases and mainly Eczema and wounds by ethnomedical practitioners of Agumbe range. The literature survey reveals that no reports were found on the anthelmintic activity of the bark extracts of Pajanelia longifolia.

MATERIALS AND METHODS

Collection of Plant material:
The bark part of Pajanelia longifolia plant material was collected in the month of May-June in Agumbe region, Shimoga district, Karnataka. The collected material was stored in a polyethylene bag until the time of use. The plant was authenticated by Prof. M.S. Pushpalatha, Department of Botany, Sahyadri Science College, Shimoga.

Worm collection:
Indian adult earthworms Pheritima posthuma were collected from Earth worm rearing center, Dummalli, Shimoga (Karnataka). The worms were maintained in the cages with moderate temperature. The worms were washed in water to remove dirt.

Preparation of Plant Extracts:
The collected plant material was then shade dried and coarsely powdered. The powdered plant material (3000g) was subjected to the hot method of extraction using Soxhlet extractor. The extraction process was carried out using various solvents viz., pet ether, chloroform and methanol according to their increasing polarity. The obtained extract was filtered and evaporated to dryness under reduced pressure in rotary vacuum evaporator.
Anthelmintic activity:
The anthelmintic activity was evaluated using the Indian adult earthworms *Pheritima posthuma*. The worms of length having 3-5cm and 0.1-0.2 mm in width were used for the experiment. The worms were washed with normal saline to remove all faecal matter before experimentation. Due to its anatomical and physiological resemblances with the human parasitic intestinal round worms (Vidyarthi et al., 1967; Thorn et al., 1977; Vigar et al., 1984; Chatterjee et al., 1967) and because of their easy availability, they have been used widely for the initial evaluation of anthelmintic compounds *in vitro* (Sollmann, 1918; Jain et al., 1972; Dash et al., 2002; Szewezuk et al., 2003). All the worms of equal size were divided into 11 groups and each group contains 3 worms. I group was treated with vehicle (1% Tween- 80 in normal saline) served as control, II group is treated with Albendazole (screened standard) 10 mg/ml and III – XI groups were treated with different concentrations (2, 4 and 6 mg/ml in normal saline containing 1% Tween-80) of all the three extracts. Observations were made for the time taken to paralysis and death of individual worm. Paralysis was said to occur when the normal group did not survive in the saline. Death was concluded when the worm lost their motility followed with fading of their body colour. The experiment was carried out in triplicate for each groups and data was statistically analyzed.

RESULTS
The time taken for mean paralysis and mean death of the earth worms are tabulated in Table-1. The results revealed that the pet-ether and methanol extracts of *Pajanelia longifolia* exhibited significant anthelmintic activity at a concentration of 6 mg/ml by causing the death of worms in lesser time. The chloroform extract at a concentration of 2 mg/ml was found to be insignificant. The anthelmintic activity of all the extracts was comparable to that of the standard drug Albendazole.

DISCUSSION
The predominant effect of Albendazole on the worm is to cause a flaccid paralysis that result in expulsion of the worm by peristalsis. The data of the current study revealed that all the tested extracts of *Pajanelia longifolia* possess anthelmintic activity in dose dependent manner giving shortest time of paralysis and death of worms.
Table-1: Anthelmintic activity of various extracts of *Pajania longifolia*

<table>
<thead>
<tr>
<th>Treatment Groups</th>
<th>Concentration(mg/ml)</th>
<th>Mean paralysis Time (min) ± SEM</th>
<th>Mean death Time (min) ± SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control/Vehicle</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Albendazole (Standard)</td>
<td>2</td>
<td>6±0.58</td>
<td>13±0.6</td>
</tr>
<tr>
<td>Pet-ether</td>
<td>2</td>
<td>13±0.6</td>
<td>16±0.29</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>11±0.46</td>
<td>16±0.29</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>9±0.44</td>
<td>15±0.44</td>
</tr>
<tr>
<td>Chloroform</td>
<td>2</td>
<td>17±0.44</td>
<td>21±0.36</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>17±0.44</td>
<td>20±0.52</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>13±0.6</td>
<td>16±0.29</td>
</tr>
<tr>
<td>Methanol</td>
<td>2</td>
<td>16±0.29</td>
<td>20±0.52</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>13±0.6</td>
<td>19±0.29</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>15±0.44</td>
<td>18±0.26</td>
</tr>
</tbody>
</table>

Results are expressed as mean ±Standard error mean for the above observations.

**CONCLUSION**

In this investigation, the extracts of *Pajania longifolia* were evaluated for anthelmintic activity by using the above model. The results revealed that the pet-ether and methanolic extracts exhibited considerable anthelmintic activity, may be due to the active phytoconstituents present in them. Current study gives the evidence that it may be a fruitful medicine in future. Further, the plant extracts will be explored for its phytochemical profile to recognize the active constituent, which is accountable for anthelmintic activity.

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**REFERENCES**


**Conflict of Interest statement**

The authors report no conflict of interest.