Anthelminthic Activity of Alangium Salvifolium Wang Leaves

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Abstract
Helminthiasis is a common problem in many of the tropical countries due to poor management practices. Most diseases caused by helminthes are of chronic and deliberate in nature, and they probably cause more morbidity and greater social and economic deprivation than any other group of parasites. Chemical control of helminthes coupled with improved management practices has been an important worm control strategy throughout the world. Indiscriminate use of synthetic anthelmintics will lead to resistance of parasite and this opens the way for the screening of medicinal plants for their anthelmintic activity. Alangium salvifolium Wang of the family Alangiaceae was commonly known as Ankolam in Malayalam and it is a popular ayurvedic medicine with wide range of Ayurvedic properties. Traditionally various parts of the plant were used in the treatment of various disorders like rheumatism, treatment of inflammation, anti hypertensive, antidote for various poisoning, treatment of rabies, worm infestations in children etc. [2-3] The plants are known to provide a rich source of botanical anthelmintics [3]. A number of medicinal plants have been used to treat parasitic infections in man and animals [4]. Alangium salvifolium Wang of the family Alangiaceae was commonly known as Ankolam in Malayalam and it is a popular ayurvedic medicine with wide range of Ayurvedic properties. Traditionally various parts of the plant were used in the treatment of various disorders like rheumatism, treatment of inflammation, anti hypertensive, antidote for various poisoning, treatment of rabies, worm infestations in children etc. [5-6]

Key Words: Alangium salvifolium, anthelmintic activity, helminthiasis.

Introduction
Helminthiasis is among the most important animal diseases inflicting heavy production losses. The disease is highly prevalent particularly in third world countries due to poor management practices [1]. Chemical control of helminthes coupled with improved management has been the important worm control strategy throughout the world. However, increasing problems of development of resistance in helminthes against anthelmintics have led to the proposal of screening medicinal plants for their anthelmintic activity. [2] The plants are known to provide a rich source of botanical anthelmintics [3]. A number of medicinal plants have been used to treat parasitic infections in man and animals [4]. Alangium salvifolium Wang of the family Alangiaceae was commonly known as Ankolam in Malayalam and it is a popular ayurvedic medicine with wide range of Ayurvedic properties. Traditionally various parts of the plant were used in the treatment of various disorders like rheumatism, treatment of inflammation, anti hypertensive, antidote for various poisoning, treatment of rabies, worm infestations in children etc. [5-6]

Materials and Method
Preparation of extracts
Leaves of Alangium salvifolium were obtained from Ernad taluk of Malappuram district. The leaves were collected in the month of October after rain. The leaves were first dried in shade and then with the help of hot air oven at a temperature not exceeding 60°C. The size of the leaves were reduced with a blender and extraction was done with the help of continuous hot soxhlet extractor with different solvents as per their increasing order of polarity.

Preliminary phytochemical screening
Preliminary phytochemical screening were done on all the extracts for the detection of various active constituents.

Anthelminthic assay
Anthelminthic assay was done on adult Indian earth worm Pheretima posthuma and round worm Ascardia gallii. Indian Earth worm was selected due to its anatomical and physiological resemblance with the intestinal round worm parasite of human beings. The wide availability of earth worms made it useful in the evaluation of anthelmintic activity in vitro [7-9]. Round worms were obtained from the local slaughter house from the intestine of freshly slaughtered fowls. The average size of earth worm was found to be 6-9cm and that of round worm was 5-8cm. The ethanolic and aqueous extracts were taken for the study and these two extracts of different concentration were dissolved in minimum amount of dimethyl sulphoxide. The worms were identified by animal parasitology experts. Test samples of the extracts were prepared at a concentration of 50, 100,150,mg/ml usin Dimethyl sulphoxide. Six worms were placed in each 9cm petri dish containing 25ml of dimethyl sulphoxide. Six worms were placed in each 9cm petri dish containing 25ml of dimethyl sulphoxide.
the test solution of extracts. Piperazine Citrate (10mg/ml) was used as the reference standard and DMSO as control. This procedure was adopted for both type of worms. Two parameters of death and paralysis were noted. Time for paralysis was recorded when no movement is there for the worms except when they are shaken vigorously. Time for death of the worm were recorded after ascertaining that the worms does not show any movement when it is shaken vigourously or dipped in warm water (50°C) Also the colour of the worm gets faded on its death.

Table 1 Anthelmintic activity of the various extracts of the leaves of *Alangium salvifolium* Wang

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Drug treated</th>
<th>Pheritima posthuma</th>
<th>Ascardia galli</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time taken for paralysis</td>
<td>Time taken for death</td>
<td>Time taken for paralysis</td>
</tr>
<tr>
<td>1.</td>
<td>Control</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Standard (Piperazine citrate 10mg/ml)</td>
<td>25.7 ± 18</td>
<td>69.2 ± 26</td>
</tr>
<tr>
<td>4.</td>
<td>Aqueous- 50 mg/ml</td>
<td>27.4 ± 40</td>
<td>74.5 ± 42</td>
</tr>
<tr>
<td>5.</td>
<td>Aqueous- 100 mg/ml</td>
<td>26.0 ± 36</td>
<td>68.7 ± 18</td>
</tr>
<tr>
<td>6.</td>
<td>Aqueous- 150 mg/ml</td>
<td>22.1 ± 24</td>
<td>54.2 ± 22</td>
</tr>
<tr>
<td>8.</td>
<td>Ethanolic- 50 mg/ml</td>
<td>31.4 ± 33</td>
<td>78.8 ± 36</td>
</tr>
<tr>
<td>9.</td>
<td>Ethanolic- 100 mg/ml</td>
<td>30.9 ± 46</td>
<td>75.5 ± 28</td>
</tr>
<tr>
<td>10.</td>
<td>Ethanolic- 150 mg/ml</td>
<td>28.1 ± 28</td>
<td>71.9 ± 41</td>
</tr>
</tbody>
</table>

Values are expressed in Mean ± SEM, n=6

**Results**

Preliminary phytochemical screening
Preliminary phytochemical screening revealed the presence of saponins, glycosides, tannins, polyphenols, flavonoids and triterpenes on various extracts. Anthelmintic activity
The study revealed that all the concentrations of the extracts taken for the study showed significant anthelmintic activity. The study also confirms that higher concentrations of the extracts produced paralytic effect much earlier and the time to death was shorter in both type of worms. Aqueous extract shown more significant anthelmintic activity and this extract at a concentration of 150mg/ml shown more potent activity against both type of worms. Evaluation of anthelmintic activity was compared with reference standard piperazine citrate (10mg/ml). The Results were tabulated in table. 1.

**Discussion**

The present study concluded that *Alangium salvifolium* used traditionally in the treatment of worm infestations showed significant anthelmintic activity. This activity may be due to the presence of tannins and poly phenols. Some synthetic phenolic compounds are found to interfere with the energy generation in helminthes by uncoupling oxidative phosphorylation. The tannins contained in the extract may produced similar results. Another possible anthelmintic effect of tannin is that they can bind to free proteins in the gastro intestinal tract of the host animals or the glycoprotein on the cuticle of the parasite cause death.

**References**

14. Niezen JH, Waghorn GC, Charleston WAG. Growth and gastrointestinal nematode parasitism in lambs grazing either Lucerne (Medicago sativa) or Sulla (Hedysarum coronarium), which contains condensed
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