INTRODUCTION

Helminth infections are among the most common infections in man, affecting a large proportion of the world's population. In developing countries they pose a large threat to public health and contribute to the prevalence of malnutrition, anemia, eosinophilia, and pneumonia. Although the majority of infections due to worms are generally limited to tropical regions, they can occur to travelers who have visited those areas and some of them can develop in temperate climates. Parasitic diseases cause severe morbidity, including lymphatic filariasis (a cause of elephantiasis), onchocerciasis (river blindness), and schistosomiasis. These infections can affect most populations in endemic areas with major economic and social consequences.

The use of herbs and medicinal plant as the first medicines is a universal phenomenon. Every culture on the earth, through written or oral tradition, has relied on the vast variety of natural chemistries found in plants for their therapeutic properties. All drugs from the plant are substances with a particular therapeutic action extracted from plants. Butea monosperma (L) is a deciduous tree, belongs to family fabaceae, which grows up to 15 m in height and 1.5-1.8m in girth, with a crooked trunk. Bark is light-brown or bluish grey, yielding a ruby-red crooked gum. Wood white or yellowish-brown, often becoming grey or grayish-brown, leaves 3-foliate, large, unequal, 10.2-20.4cm. Flowers are borne in racemes, brilliant orange-red, 3.8-5.1cm long, lower calyx-teeth deltoid, pods silvery-white, broad dehiscing by one suture. Seeds are flat, elliptic, reddish-grey, 3.2cm².

MATERIALS AND METHODS

Plant Material

Bark of Butea monosperma plant was collected from local region of Narsapur, District of Medak, and Andhra Pradesh, India in the month of June, 2010. The botanical identity was confirmed by a botanist of the Mohana Department of Botany, Government Mehbubia Junior College, Gunfoundry, Hyderabad. (Reference No: 3/2010)

Preparation of Extracts

5 Kg of bark was crushed to coarse powder and passed through sieve # 44. The sieved powder was stored in air tight, high density polyethylene containers before extraction. Extraction was performed by using soxhlet apparatus (12 hours), carried out first with petroleum ether (60-80°C) to defat the material. The defatted material was then extracted with ethanol to get ethanolic extract and finally with water and small quantity of Chloroform (as 6.5ml/litre) as preservative to get aqueous extract. The aqueous and ethanolic extracts were concentrated for further studies at reduced pressure and temperature in a rotary evaporator and tested for presence of secondary metabolites by different phytochemical tests.

Preliminary Phytochemical Analysis

The plant extract was screened for the phytochemical components using the standard Method. The phytochemical components analyzed were alkaloids, steroids, starch, proteins, anthraquinone glycosides, saponins, flavonoids, tannins, and cardiac glycosides (Table1).

Evaluation of anthelmintic activity

Pheretima posthuma is commonly known as earthworms were collected (due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human being) from water logged area near Narsapur, Medak Dist, and Andhra Pradesh. Anthelmintic activity was carried out on adult earthworm, Pheretima posthuma. Ten groups were made, each containing six adult earthworms of approximately equal size. The solutions of alcoholic extract, aqueous extract and albendazole were made in the concentrations of 20, 40, 60 mg/ml in normal saline as vehicle. Groups of earthworms were released into 10 ml of desired formulations as made above, and one group was treating as control in normal saline. The observation was made for the time taken to cause paralysis and death of individual worms. Paralysis was said to occur when the worms did not move even in normal saline (Figure1). Death was concluded when the worms lost their motility followed with fading away of their body colours (Figure2).

Statistical analysis

Data collected in the study are expressed as the mean ± standard error of mean (S.E.M.) and statistical analysis was carried out by using one-way analysis of variance (ANOVA) method followed by Dunnet’s test. P value of less than 0.05 was considered to be statistically significant.

RESULTS

Both ethanolic and aqueous extracts of Butea monosperma (L) has shown significant effect on Pheretima posthuma in concentration dependent manner. Ethanol extract 40mg/ml has shown significant effect by taking less time to paralyze as well as death (P<0.05), similarly concentration of 60mg/ml has shown significant effect on time of paralysis 12±0.683 (P<0.01) and time of death 13±0.577 (P<0.05) when compared with standard group.

DISCUSSION

The earthworm Pheretima posthuma is one of the most important soil invertebrates in promoting soil fertility. These earthworms are important components of the diets of many higher animals.
Helmintic infections of the gastrointestinal tract of human beings and animals have been recognized to have adverse effects on health standards with a consequent lowering of resistance to other diseases. In search of compounds with anthelmintic activity, a number of substances were screened using different species of worms, for example, earthworms, Ascaris, Nippostrongylus, and Heterakis. Of all these species, earthworms have been used widely for the initial evaluation of anthelmintic compounds in vitro because they resemble intestinal "worms" in their reaction to anthelmintics and are easily available. It has been demonstrated that all anthelmintics are toxic to earthworms and a substance toxic to earthworms is worthy for investigation as an anthelmintic.

CONCLUSION

In conclusion ethanolic and aqueous extract of Butea monosperma (L) bark was assessed for anthelmintic activity. The paralysis and death of test organisms justifies the continued use of these plants in folk and traditional medical practice. Studies should therefore be done in order to identify the active phytochemical constituents and evaluate their effectiveness in vitro so that they can be synthesized and commercial production begins in earnest.

ACKNOWLEDGMENT

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REFERENCES

9) Sollmann T. Anthelmintics: Their efficiency as tested on earthworms. J Pharm Exp Ther 1918; 12:129-70

Table 1: Phytochemical screening of Butea monosperma leaves extracts

<table>
<thead>
<tr>
<th>Constituents</th>
<th>Ethanolic Extract</th>
<th>Aqueous Extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaloids</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Sterols</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Glycosides</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Proteins</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cardiac Glycosides</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Saponins</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tannins &amp; Phenolic Compounds</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Starch</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Flavonoids</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Table 2: Effect of Butea monosperma bark ethanolic and aqueous extract on Pheretima posthuma (Earth worm)

<table>
<thead>
<tr>
<th>Treatment groups</th>
<th>Concentration in mg/ml</th>
<th>Pheretima posthuma</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time of paralysis (min)</td>
<td>Time of death (min)</td>
</tr>
<tr>
<td>Standard</td>
<td>20 mg/ml</td>
<td>12.5 ± 0.9916</td>
</tr>
<tr>
<td></td>
<td>40 mg/ml</td>
<td>11 ± 0.6831</td>
</tr>
<tr>
<td></td>
<td>60 mg/ml</td>
<td>6.5 ± 1.176</td>
</tr>
<tr>
<td>Ethanolic extract</td>
<td>20 mg/ml</td>
<td>13.67 ± 1.383</td>
</tr>
<tr>
<td></td>
<td>40 mg/ml</td>
<td>16.5 ± 2.012*</td>
</tr>
<tr>
<td></td>
<td>60 mg/ml</td>
<td>9.33 ± 1.358</td>
</tr>
<tr>
<td>Aqueous extract</td>
<td>20 mg/ml</td>
<td>17.67 ± 1.82</td>
</tr>
<tr>
<td></td>
<td>40 mg/ml</td>
<td>12.00 ± 0.7303</td>
</tr>
<tr>
<td></td>
<td>60 mg/ml</td>
<td>12.00 ± 0.683**</td>
</tr>
<tr>
<td>Control</td>
<td>20 mg/ml</td>
<td>12.5 ± 0.9916</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SEM, analyzed by One way Analysis of variance (ANOVA) followed by Dunnett’s t test a=8, *P<0.05, **P<0.01, ***P<0.001.

Figure 1: Anthelmentic activity of Butea monosperma (L) paralysis time

Figure 2: Anthelmentic activity of Butea monosperma (L) death time

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