

Research Article**ASSESSMENT OF ANTHELMINTIC ACTIVITY OF *CROSSANDRA INFUNDIBULIFORMIS* LEAF EXTRACT**T. Panduraju <sup>1\*</sup>, B. Raja Narender <sup>1</sup>, Kotte Mahendar <sup>2</sup><sup>1</sup> Sree Chaitanya Institute of Pharmaceutical Sciences, LMD Colony, Karimnagar (T.S) – 505527, INDIA.<sup>2</sup> Jyothishmati Institute of Pharmaceutical Sciences, Thimmapur, Karimnagar (T.S) – 505527, INDIA.

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**ABSTRACT**

*Helminthic infections are a major cause of morbidity and mortality worldwide and are prominent among the so called Neglected tropical diseases (NTDs). The NTDs include 'Schistosomiasis and the soil transmitted helminthes' (STH), a group of parasite whose life cycle usually depends on a period of development outside the human host, typically in moist, worm soil. An anthelmintic drug can act by causing paralysis of the worm, or by harmful its cuticle, which lead to partial absorption or rejection by immune mechanisms. Most of the existing synthetic anthelmintic drugs produce serious side effects. In order to reduce the harmful side effects of these synthetic anthelmintic drugs, it is significant for us to promote the studies of traditionally used anthelmintic plant based drugs. The methanol leaf extract of Crossandra infundibuliformis was prepared with distilled water by soxhlation method. The methanol leaf extract is used to evaluate the presence of phytoconstituents and anthelmintic activity. The anthelmintic activity was investigated on Pheritima posthuma (Indian earth worm). Anthelmintic activity was performed in three different concentrations such as 20 mg/ml, 50 mg/ml and 100 mg/ml. Albendazole (10 mg/ml) was used as reference standard drug whereas distilled water as control. Determination of paralysis time and death time of the worms were recorded. Methanol extract exhibited more noteworthy anthelmintic activity at the concentration of 100 mg/ml. The results reported in the present work shows evidence that the leaf extract of Crossandra infundibuliformis possess anthelmintic activity.*

**KEYWORDS:** Anthelmintic activity, Pheritima posthuma, Albendazole, Crossandra infundibuliformis.

**INTRODUCTION**

Helminthic infections are a mojour cause of morbidity and mortality worldwide and are prominent among the so called Neglected tropical diseases (NTDs). The NTDs include 'Schistosomiasis and the soil transmitted helminthes' (STH), a group of parasite whose life cycle usually depends on a period of development outside the human host, typically in moist, worm soil. Helminthes infections are the mainly common infections in humans, and overstated worldwide population. Anthelmintic drugs that act either locally to expel worms from the gastrointestinal tract or systemically to eliminate adult helminthes or developmental forms that attack organs and tissues. An anthelmintic drug can act by causing paralysis of the worm, or by destructive its cuticle, which lead to partial digestion or rejection by immune mechanisms [1-3].

Most of the existing anthelmintic drugs produce side effects such as abdominal pain, loss of appetite, nausea, vomiting, headache and diarrhea. In order to eliminate the harmful side effects of these synthetic anthelmintic drugs, it is significant for us to promote the studies of traditionally used anthelmintic plants which will lead to the development of new anthelmintic substances with ease of availability and lesser side-effects. As per World Health Organization, 80% world's population relies on traditional medicines to meet their primary health care needs, most types of which use remedies from plants [4, 5].

*Crossandra infundibuliformis* is a species of leafing plant in the family Acanthaceae, native to southern India and Srilanka. The flowers of *C. infundibuliformis* are sometimes referred as 'Tropical flame' or 'Fire cracker' has been used used as hairdo by the South Indian women and Puliya's tribal women. *Crossandra infundibuliformis* is used as an Anthelmintic, Antibacterial, Antioxidant, Antiulcer, Aphrodisiac, Antimicrobial, Anti-inflammatory, Wound healing, etc. Leaf extract of *Crossandra infundibuliformis* is used in various conditions like fever, headache, pain etc. Leaf extract has been used as Antioxidant, Antibacterial, Hepatoprotective, Antifungal, Larvicidal, Anti cancer, Aphrodisiac, Analgesic, Anti inflammatory, Wound healing activity. It is often used in ayurvedic medicine as a remedy for diabetes, ulcers, leprosy, conjunctivitis, skin problems etc [6-8].

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Different parts of *Crossandra infundibuliformis* have different medicinal values such as:

1. Leafs ground with pepper and the paste applied to wounds.
2. It is more attractive to insect pollinators such as butterflies and dragonflies.
3. In China some leafs have been eaten since ancient times, and some leafs have been used in traditional Chinese medicine.
4. Leaf paste is used as toothache.
5. Stem Bark ground with turmeric and the paste applied to skin diseases of children.
6. Crushed fruits made into a paste for brushing teeth to cure pyorrhoea
7. Root paste applied around vagina to cure venereal diseases, syphilis.
8. The fresh methanol extract of leafs exhibited better anti-solar activity than the dry leaf extract.
9. Leafs can be used in various sunscreen formulations [8-10].



Fig. 1: *Crossandra infundibuliformis* plant leaves

## MATERIAL AND METHODS

### Plant Materials:

The fresh leaves of *Crossandra infundibuliformis* (Family: Acanthaceae) was collected from local areas of LMD Colony, Karimnagar District, Telangana, India and the fresh leaves were washed and shade dried and powdered in a pulverizer. It was passed through 60 mesh to get the powder of desired coarseness.

### Preparation of extract:

#### Methanol extracts (Soxhlation method):

The air dried powdered plant material (*Crossandra infundibuliformis* leaf) was extracted with methanol in a Soxhlet apparatus. After complete extraction, the extracts were cooled at room temperature, filtered and evaporated to dryness under reduced pressure in a rotary vacuum flask evaporator. A greenish semi-solid extract was obtained and preserved in desiccator as labelled C.I.L.E (*Crossandra infundibuliformis* Leaf Extract).

### Experimental Animals:

The Anthelmintic activity was evaluated on Indian earth worm (*Pheretima posthuma*) were collected from the water logged soil areas of LMD colony, Karimnagar, the average size of adult earthworm being 8-10 cm. The Adult earth worms were washed with normal saline solution to remove all the faecal matter were study for the anthelmintic activity.

### Drugs & Chemicals:

Albendazole (ZENTEL, Glaxo Smithkline) was used as standard anthelmintic during the experimental protocol.

### Anthelmintic activity:

The anthelmintic activity was carried as per the method of Ajayieoba *et al*<sup>11</sup> with minor modifications. The anthelmintic study was performed on adult Indian earthworm *Pheretima posthuma*, due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings. *Pheretima posthuma* worms are easily available and used as a suitable model for screening of anthelmintic drug. Test samples of the extract was prepared at the concentrations 20, 50 and 100 mg/ml in normal saline, Albendazole (10 mg /ml) was used as reference standard and normal saline as control and two earth worms i.e. *Pheretima posthuma* of approximately equal size were placed in each Petri dish containing 25 ml of above test solution of extracts, standard drug and control respectively. All the test sample solution and standard drug solution were prepared freshly before the experiments<sup>12,13</sup>. Observations were made for the time taken for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Time for death of worms were recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50°C). All the results were shown in Table.1 and expressed as a mean  $\pm$  SEM of two earth worms in each group.

## RESULTS AND DISCUSSION

From the study of anthelmintic activity of methanol leaf extract of *Crossandra infundibuliformis* (C.I.L.E) produced paralysis as well as death of worms. Methanol leaf extract exhibited anthelmintic activity in dose-dependent manner showing maximum efficacy at 100 mg/ ml concentration as compared to reference standard drug Albendazole (Table 1).

Table No. 1: Anthelmintic activity of methanol leaf extract of *Crossandra infundibuliformis* (CIFE)

| S. No. | Groups                                                      | Concentrations (mg/ml) | <i>Pheritima posthuma</i> (Earthworms)     |                                        |
|--------|-------------------------------------------------------------|------------------------|--------------------------------------------|----------------------------------------|
|        |                                                             |                        | Time taken for paralysis in min (mean±SEM) | Time taken for death in min (mean±SEM) |
| 1      | Control (Normal saline)                                     | -                      | -                                          | -                                      |
| 2      | <i>Crossandra infundibuliformis</i> (methanol leaf extract) | 20                     | 65 ± 3.12                                  | 92 ± 1.28                              |
|        |                                                             | 50                     | 43 ± 5.56                                  | 84 ± 2.29                              |
|        |                                                             | 100                    | 39 ± 3.11                                  | 61 ± 2.01                              |
| 3      | Albendazole (standard)                                      | 10                     | 29 ± 2.94                                  | 52 ± 3.74                              |



Control (Water)



Standard (Albendazole)



C.I.L.E 100mg/ml



C.I.L.E 50mg/ml



C.I.L.E 20mg/ml

Fig. 2: Anthelmintic activity of C.I.L.E

## CONCLUSION

From the above results, we can conclude that *Crossandra infundibuliformis* (C.I.L.E), which is used traditionally to treat intestinal worm infections, exhibited more important anthelmintic activity. This study can be further carried out in the direction that can lead to know the role of secondary metabolites of the plant extracts in the anthelmintic activity.

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