Parasitic diseases cause severe morbidity by affecting population in endemic areas with major economic and social consequences. More than half of the population of the world suffers from various types of infection and majority of cattle suffer from worm infections. So there is a need to find new drugs to treat parasitic diseases. Alcohol and aqueous extracts from the bark of *Nyctanthes arbor-tristis* Linn were investigated for their anthelmintic activity against *Pheretima posthuma*. Three concentrations (20, 40 and 60 mg/ml) of each extracts were studied, which involved the determination of time of paralysis and time of death of the worm. It was found that both the extracts exhibited significant anthelmintic activity. Albendazole in same concentration as that of extract was included as standard reference and distilled water as control. The anthelmintic activity of alcohol and aqueous extracts of *Nyctanthes arbor-tristis* Linn has therefore been compared and demonstrated for the first time.

Key words: Anthelmintic Activity, *Nyctanthes arbor-tristis* Linn, *Pheretima posthuma*, Albendazole.

INTRODUCTION

*Nyctanthes arbor-tristis* Linn (*Nyctantheaceae*) commonly called as night jasmine, a hardy large shrub or small tree widely distributed in outer Himalayan ranges from Chenab to Nepal, Assam, Burma, Bengal, Central India to Godavari, cultivated in many parts of India. [14,15] It grows upto 10m height, young branches have angular stem. Leaves are simple, opposite, ovate, rough and thin. Margins serrate, apex acute. The flowers are delightfully fragrant, sessile, bisexual, hypogynous, corolla tube orange coloured, lobes white, twisted. The seeds are orbicular, thin testa, brown coloured capsule 2cm long and compressed. [15-17] The bark was externally grey or brownish white in colour, rough deep and irregularly fissured. Internally yellowish white or sandal colour, externally granular in texture and internally smooth, 8.2mm thick, bitter taste, odourless, curved or quill in shape, short fracture in outer bark and fibrous fracture in inner bark. [18] The barks are intended for expectorant, anorexia, liver disorder, piles, worm infestation, blood disorder, oliguria, skin diseases fever and snake bite. [12,17-19,20]

Parasitic diseases cause severe morbidity by affecting population in endemic areas with major economic and social consequences. [4,9] A number of medicinal plants have been used to treat parasitic infections in man and animals (10,13-17). Anthelmintics are those agents that expel parasitic worms (helminthes) from the body, by either stunning or killing them. More than half of the population of the world suffers from various types of infection and majority of cattle suffer from worm infections [19]. Intestinal infections with worms can be more easily treated than those infections that occurs in other locations in the body, because the worms need to be killed by the drug and the drug need not be absorbed when given by oral route. However, increasing problems of development of resistance in helminths [10-13] against anthelmintics have led to the proposal of screening medicinal plants for their anthelmintic activity. The present study has been made to evaluate anthelmintic activity of barks of *Nyctanthes arbor-tristis* Linn on adult earthworm (*Pheretima posthuma*).

MATERIALS AND METHODS:

Collection of plant

The plant was widely cultivated in gardens almost throughout India for fragrant flowers. For the present work the plant was collected from sangameswarar temple near Bhavani (Erode District). The plant was identified by Dr. G. V. S. Murthy, Joint Director of Botanical Survey of India, Southern circle, TNAU Campus, 3. Coimbatore who authenticated the plant from available literature. The bark was collected by peeling method, where in trees cut at the base and bark as peeled out. The bark cuttings were collected and washed with water and dried in shade.

Extraction of Plant Material

The barks were shade dried and were ground to coarse powder. The coarsely powdered drug was then extracted successively with petroleum ether and ethanol for 24 hours. The extract was concentrated under reduced pressure. The dried extracts were stored under air tight containers. Aqueous extract was also obtained by decoction method with fresh bark powder by heating upto 1.5 hours.[21]

Experimental Procedure

Alcohol and aqueous extracts from the barks of *Nyctanthes arbor-tristis* Linn were investigated for their anthelmintic activity against *Pheretima posthuma*. Various concentrations (20, 40 and 60mg/ml) of each extract were tested by bioassay, which involved determination of time of paralysis and time of death of the worms. Albendazole was used as standard reference and distilled water as control. The anthelmintic assay was carried as per the method of C. D. Khadse and R.B. Kakde et., al. with minor modifications. [21] The assay was performed on adult Indian earthworm, *Pheretima posthuma* due to its anatomical and physiological resemblance with the intestinal roundworm parasite of human beings, it was selected for this assay. [23,24,25,26,27]. Because of easy availability, earthworms have been widely used for the initial evaluation of anthelmintic compounds in vitro. [29,30,31,32]. Indian adult earthworms (*Pheretima posthuma*) collected from moist soil near B.Komarapalayam, Namakkal district, Tamil nadu and washed with normal saline to remove all faecal matter and were used for the anthelmintic study. The earthworms of 3.5 cm in length and 0.1-0.2 cm in width were used for all the experimental protocol. Ten groups of six earthworms were released into 10 ml of Normal saline. Then albendazole, aqueous and alcoholic extracts of barks of *Nyctanthes arbor-tristis* Linn (20, 40 and 60 mg/ml each) in distilled water were added to their respective group. Observations were made for the time taken to paralysis and death of individual worms. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Death was concluded when the worms lost their motility when dipped in warm water (50°C) followed with fading away of their body colors.

RESULTS AND DISCUSSION:

Preliminary phytochemical screening of barks of *Nyctanthes arbor-tristis* Linn showed the presence of alkaloids, carbohydrate, glycosides, phytosterols, fixed oil, tannins, flavonoids, proteins and amino acids, gums and mucilage. It was found that ethanolic and aqueous extract exhibited anthelmintic activity in dose dependent manner giving shortest time of paralysis and death with 60 mg/ml concentration. The alcoholic extract of *Nyctanthes arbor-tristis* Linn caused paralysis in 8.53 min and time of death in 13.05 min while aqueous extract caused paralysis and death in 14.38 and 19.90 min respectively against the earthworm *Pheretima*...
The reference drug albendazole showed the same at 11.21 and 15.72 min, respectively. Albendazole by blocking glucose uptake and depletion of glycogen stores in the parasite exhibits anthelmintic activity. The alcoholic extract of *Nyctanthes arbor-tristis* Linn not only demonstrated paralysis, but also caused death of worms especially at higher concentration of 60 mg/ml in shorter time as compared to reference drug albendazole (Table No.1). Phytochemical screening of the extracts revealed the presence of tannins. Tannins were shown to produce anthelmintic activities [32] chemically tannins are polyphenolic compounds [11,12]. It is possible that tannins contained in the extracts of *Nyctanthes arbor-tristis* Linn produce similar effects. Reported anthelmintic effect of tannins, can bind to free proteins in the gastrointestinal tract of host animal [13] or glycoprotein on the cuticle of the parasite and may cause death. Further studies are under process to identify the possible phytoconstituents responsible for anthelmintic activity.

**CONCLUSION:**

In conclusion, the traditional use of the bark of *Nyctanthes arbor-tristis* Linn as anthelmintic has been confirmed using the different extracts and showed good anthelmintic activity. Further it would be interesting to isolate the possible phytoconstituents which are responsible for the anthelmintic activity and the mechanism of action.

**REFERENCES:**


**Source of support:** Nil, **Conflict of interest:** None Declared.