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Anthelmintic activity of ethanolic leaf extract of *Jasminum mesnyi*

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PEER REVIEW

ABSTRACT

Peer reviewer

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Comments

This is a good study in which the authors evaluated the anthelmintic activity of ethanolic extract of leaves of *Jasminum mesnyi*. The extract of 40 mg/mL concentration showed more significant activity than the 20 mg/mL concentration of the extract. It took 24 min to paralyse the worm in case of drug extract 40 mg/mL and 92 min to paralyse the worm in case of drug extract of 20 mg/mL concentration.

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Objective: To evaluate the anthelmintic activity of ethanolic extract of leaves of *Jasminum mesnyi*.

Methods: Anthelmintic activity was carried out on adult Indian earthworm *Eisenia fetida*. In this study, 20 mg/mL and 40 mg/mL concentrations of plant extract were tested which involved the time of paralysis and time of death of worm. Albendazole (10 mg/mL) was taken as reference standard drug whereas distilled water was used as control.

Results: The extract exhibited significant anthelmintic activity which was more in higher concentration extract.

Conclusions: It was concluded from the present study that the plant exhibited significant anthelmintic activity.

KEYWORDS

Anthelmintic, *Jasminum mesnyi*, Albendazole, *Eisenia fetida*

1. Introduction

Anthelmintics are the drugs which either kill or expel infesting worms. These helminths harm the host by food deprivation, cause blood loss, cause injury to organs, intestinal or lymphatic obstruction and also by secreting toxins[1]. Helminthic infections are increasing day by day and in developing countries these pose a large threat to public health and lead to diseases like anaemia, malnutrition, eosinophilia and pneumonia[2]. Many potent anthelmintics are available today and by using different type of drugs treatment is done[3]. *Jasminum mesnyi* belongs to family Oleaceae and is commonly found in Himalayan region. *Jasminum mesnyi* is also known as Primrose

Jasmine or Japanese Jasmine. It is an evergreen, rambling shrub in which leaves are opposite and trifoliate attached to base of branchlets. Flowers are yellow coloured, usually solitary, axillary or rarely terminal, having 6–10 petals arranged in a semidouble whorl[4]. *Jasminum mesnyi* leaves contains secoiridoids glucosides 9''-hydroxyjasmesoside, 9''-hydroxyjasmesosidic acid, jasminin 10''-O-β-d-glucoside, 2''-hydroxyjasminin, jasmoside and jasmesoside. Hydroxyjasminin, isojasminin, jasminin, 4''-hydroxyisojasminin, jasmosidic acid. It also contains syringin and rutin[5]. In the genus *Jasminum* iridoids were first reported in *Jasminum mesnyi*[6]. The leaves also contain three caffeic glycoside esters poliumoside, forsythoside B and echinacoside[7].

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Studies have shown that other plants belonging to *Jasminum* species like *Jasminum grandiflorum* Linn[8] and *Jasminum arborescens* Roxb[9] also showed anthelmintic activity and this formed the base for the conduction of anthelmintic activity on *Jasminum mesnyi*.

Figure 1 shows the photograph of *Jasminum mesnyi* plant.



Figure 1. Photograph of *Jasminum mesnyi* plant.

2. Materials and methods

2.1. Collection of plant material

The leaves of plant *Jasminum mesnyi* were collected from Saproon area of Solan in Himachal Pradesh. The plant was taxonomically identified and authenticated as *Jasminum mesnyi* by the Department of Forest Products, Dr. Y. S. Parmar University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh, India. The Herbarium sample was linked to UHF– Herbarium with field book No. 12559.

2.2. Extraction process

The plant leaves were shade dried and 25 g of this plant material was extracted with 250 mL of ethanol in a soxhlet apparatus. The extraction process continued till the extraction was exhausted. The extract was then combined, filtered and evaporated to dryness on a hot water bath to yield a crude extract of leaves of *Jasminum mesnyi*.

2.3. Experimental animals

The assay was performed *in vitro* using healthy adult earthworms *Eisenia fetida* belonging to Family Lumbricidae. The healthy earthworms were obtained from moist soil and were washed with normal saline to remove any foreign

matter. The earthworms taken were almost of equal sizes.

2.4. Drugs

Albendazole (Ranbaxy, New Delhi) was used as standard drug. The solvents and other chemicals used were of analytical grade.

2.5. Experimental design

The assay was performed *in vitro* using adult earthworm *Eisenia fetida* (Family Lumbricidae) as it is having anatomical and physiological resemblance with the intestinal roundworm parasites of human beings for preliminary evaluation of anthelmintic activity. Test samples of the extract were prepared at the concentrations 20 mg/mL and 40 mg/mL in distilled water and six worms of approximately equal size (same type) were placed in each Petri dish containing 30 mL of above test solution of extracts. Albendazole (10 mg/mL) was used as reference standard. Distilled water was used as control. All the solutions (test and standard) were freshly prepared before starting the experiment. Observations were made for the time taken to paralysis and death of individual worm. Paralysis was said to occur when the worms were not able to move even in normal saline. Death was concluded when the worms lost their motility followed with fading away of their body colours. The mortality of parasite was assumed to have occurred when all signs of movement had ceased[10].

3. Results

Table 1 showed significant results of anthelmintic activity. Both of the extracts showed significant anthelmintic activity. The extract of 40 mg/mL concentration showed more significant activity than the 20 mg/mL concentration of the extract. It took 24 min to paralyse the worm in case of drug extract 40 mg/mL and 92 min to paralyse the worm in case of drug extract of 20 mg/mL concentration.

Table 1

Anthelmintic activity of leaves of *Jasminum mesnyi*.

Time	Concentration (mg/mL)	Paralysis time (min)	Death time (min)
Control	–	–	–
Albendazol	10	26.00±0.73	48.00±0.48
Ethanollic extract	20	92.00±0.56	123.00±0.42
Ethanollic extract	40	24.00±0.32	51.00±0.46

Values are expressed as mean±SD (n=6); Control worms were alive up to 24 h of the experiment. ANOVA followed by Dunnett's *t* test, ***P*<0.01, **P*<0.05 when compared to control.

Hence it was found that higher concentration of extract produced paralytic effect and death of the worms much earlier than lower concentration (Figure 2).

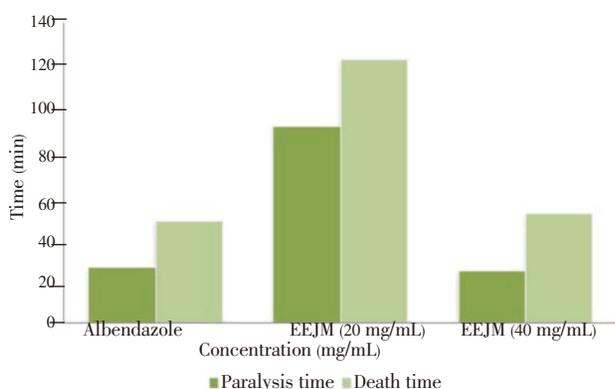


Figure 2. Graph of anthelmintic activity of ethanolic extract of *Jasminum mesnyi* leaves.

*EEJM: Ethanolic Extract of *Jasminum mesnyi*.

4. Discussion

Helminth infections affects the large proportion of the world's population and are amongst the most common infections in man. The present study shows promising results for anthelmintic activity of ethanolic extract of *Jasminum mesnyi* leaves. The anthelmintic activity of two different concentrations of *Jasminum mesnyi* extract was compared and standard drug used was Albendazole. Both the concentrations of the extract showed anthelmintic activity however the more concentration showed better activity and paralysed and killed the worm in lesser time than the low concentration extract.

Conflict of interest statement

We declare that we have no conflict of interest.

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Comments

Background

Helminths can cause many serious diseases in man. Modern synthetic medicines however cure the disease but cause many side effects so attempt has been made to evaluate the anthelmintic activity of a natural herb. Natural herbs are having less side effects and are cost effective.

Research frontiers

This research was carried out as other *Jasminum* species have shown anthelmintic activity. The constituents responsible for its anthelmintic activity are further to be evaluated.

Related reports

Anthelmintic activity of *Jasminum grandiflorum* Linn leaves. had already been reported by Sandeep *et al.* (2009) and *in-vitro* antioxidant and anthelmintic activity of extracts of *Jasminum arborescens* Roxb. had been reported by Bhagath *et al.* (2010). In both the studies the species were different but results showed promising results.

Innovations & breakthroughs

In this paper an attempt has been done to highlight the Anthelmintic activity of *Jasminum mesnyi* and is showing promising results so and since it is of natural origin it will be having lesser side effects.

Applications

The present study shows promising results for anthelmintic activity of ethanolic extract of *Jasminum mesnyi* leaves. Further *in-vivo* studies can be done so that the herb can be used as an effective medicine by humans.

Peer review

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