

ANTHELMINTIC ACTIVITY OF
JASMINUM GRANDIFLORUM LINN LEAVES

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Summary

The present study reports anthelmintic activity of various extracts obtained from the leaves of *Jasminum grandiflorum* Linn (Oleaceae) against adult earth worms *Pheretima posthuma*. Among all the extracts tested at 20 and 40 mg/ml concentration, methanol, chloroform and aqueous extracts showed better anthelmintic activity when compared with the standard drug albendazole.

Key words: *Jasminum grandiflorum* Linn; anthelmintic, *Pheretima posthuma*; methanol extract; albendazole.

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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 [1]. Though there is treatment by chemicals/ drugs in the developed countries but still in developing countries, it is due to the cost and other factors, there is need for better and cheaper treatments. Plants can be a better alternative as they have nutritive value as well as possess number of pharmacological activities with fewer side effects [2]. In this context, one such drug is *Jasminum grandiflorum* which has number of traditional uses yet its activities are not explored fully.

Jasminum grandiflorum Linn var *officinale* (Oleaceae) is a plant with fragrant flower, large scrambling sub erect twining evergreen shrub cultivated both in the plains and on the hills especially in Kashmir, Afghanistan, Persia, France, Italy, China, Japan, India, Morocco and Egypt [3]. In the traditional system of Medicine, the leaves are useful in odontalgia, fixing loose teeth, ulcerative stomatitis, leprosy, skin diseases, otorrhoea, otalgia, strangury, dysmenorrhoea, ulcers, wounds, ring worm and corns [4,5]. The phytoconstituents isolated so far from the leaves are Sambacein I-III [6]; 200-epifraxamoside, demthyl-200-epifraxamoside, Jasminanhydride [7]; indole oxygenase [8]; Kaempferol-3-O- α -L-rhamnopyranosyl(1-3) α -L-rhamnopyranosyl (1-6) β -D-galactopyranosyl, kaempferol-3-O-rutinoside, 7-ketologanin, oleoside-11-methyl ester, 7-glucosyl-11-methyl ester, ligstroside, oleuropein [9]. The plant is reported to possess spasmolytic, anti-inflammatory, antimicrobial, antioxidant, antiulcer, cytoprotective, chemo preventive, wound healing and antiacne activities [5].

In the present study, our aim was to evaluate the anthelmintic potential of the different extracts of the leaves of *Jasminum grandiflorum* against adult earthworm *Pheretima posthuma* to justify the traditional claim.

Materials and methods

Plant material

The leaves of *Jasminum grandiflorum* Linn. were collected in May 2008 from Bangalore and authenticated by Regional Research Institute (Ay.), Bangalore (no.2008-09/ 318). A voucher specimen was deposited in the herbarium of Department of Pharmacognosy, The Oxford College of Pharmacy, Bangalore.

Drugs and Chemicals

The following drugs and chemicals were used. Albendazole (Bandy Mankind Pharma Ltd., New Delhi). All organic solvents and chemicals were purchased from S D Fine Chemicals Ltd., Mumbai and were of analytical grade.

Preparation of extracts

Shade dried leaves were coarsely powdered and subjected to successive solvent extraction by soxhlation. The extraction was done with different solvents in their increasing order of polarity such as petroleum ether, chloroform, acetone, methanol and water. Each time the marc was dried and later extracted with other solvents. All the extract were concentrated by distilling the solvent in a rotary vacuum evaporator and evaporated to dryness. The yield was found to be 2.36, 1.26, 0.56, 4.67 and 9.26% w/w respectively with reference to the dried plant material.

Preliminary phytochemical screening

The coarse powder of leaves of *Jasminum grandiflorum* (25g) was subjected to successive extraction with different solvents in their increasing order of polarity from petroleum ether (60⁰-80⁰C), chloroform, acetone, methanol and water. The extracts were concentrated and subjected to various chemical tests to detect the presence of different phytoconstituents [10].

Earthworms

Indian adult earthworms (*Pheretima posthuma*; Annelida, Megascolecidae) collected from moist soil and washed with normal saline to remove all matters were used for all study. The earthworm of 3-5 cm in length and 0.1-0.2 cm in width were used for all the experimental protocol due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings [11, 12].

Anthelmintic activity

The anthelmintic activity was evaluated as per the method of Dash et al with slight modification [13]. The extracts were suspended in Tween 80 (0.1%) in normal saline. All the drugs and extracts were prepared freshly before starting the experiment. Eleven groups of six earthworms each were released into 10 ml of desired formulation as follows; vehicle (Tween 80 (0.1%) in normal saline, Albendazole (20 and 40 mg/ml), petroleum ether, acetone (20 mg/ml, each), chloroform, methanol and aqueous extract (20 and 40 mg/ml, each) in Tween 80 (0.1 %) in normal saline. Observation was made for the time taken to paralysis and death of individual worms up to 4 hrs of the test period. Paralysis was said to occur when the worms did not revive even in normal saline. Death was concluded when the worms lost their motility followed by fading away of their body colors [14].

Results and Conclusions

The results of the anthelmintic activity are given in the Table 1.

Table 1: Anthelmintic activity of different extract of *Jasminum grandiflorum* leaves

Drug tested	Concentration (mg/ml)	Paralysis time (min)	Death time (min)
Vehicle (Tween 80 (0.1%) in normal saline)	-----	-----	-----
Albendazole	20	188 ± 0.58	248 ± 0.91
	40	82 ± 0.55	127 ± 0.65
Methanol extract	20	34 ± 0.45	49 ± 0.35
	40	15 ± 0.35	34 ± 0.25
Aqueous extract	20	68 ± 0.75	150 ± 0.29
	40	30 ± 0.68	75 ± 0.30
Petroleum ether extract	20	57 ± 0.48	87 ± 0.42
Acetone extract	20	60 ± 0.69	81 ± 0.36
Chloroform extract	20	60 ± 0.78	101 ± 0.82
	40	25 ± 0.59	38 ± 0.42

Results are expressed as mean ± SD of six determinations; Vehicle worms were alive up to 24 hrs of observation.

From the Table, it is very clear that methanol, chloroform and aqueous extracts showed better anthelmintic activity when compared with standard drug at the same concentration. Methanol extract took the least time to cause paralysis and death of the worms followed by chloroform and aqueous extract respectively. Petroleum ether and acetone extract tested only at 20 mg/ml concentration also showed anthelmintic activity when compared with albendazole. Preliminary phytochemical screening of methanol extract showed the presence of alkaloids, tannins, saponin, flavonoids; chloroform extract contains alkaloids and steroids; aqueous extract contain alkaloids, tannins and flavonoids glycosides. This phytoconstituents may be responsible for the anthelmintic activity. These results may lend support for the traditional use of the plant. Further investigation is needed for the phytoconstituents responsible for anthelmintic activity.

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