ISSN: 2231-6078

INTERNATIONAL JOURNAL OF DRUG DISCOVERY AND HERBAL RESEARCH (IJDDHR)
1(2): April-June: (2011), 104-105

Research Article

Anthelmintic Potential of *Praecitrullus fistulosus* (fruits)

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Abstract

The present investigation was undertaken to evaluate petroleum ether and methanol extract of *Praecitrullus fistulosus* for anthelmintic activity against Pheretima posthuma. Two concentrations (50 and 100 mg/ml) of each extract were assessed, which involved the determination of time of paralysis and time of death of the worms. Distilled water and Albendazole were used as control and standard respectively. The results stated that tested extracts of the *Praecitrullus fistulosus* exhibited significant anthelmintic activity at highest concentration of 100 mg/ml.

Keywords:*Praecitrullus fistulosus*, Anthelmintic, Pheretima posthuma..

Introduction

Helminthiasis or worm infestation is one of the most widespread and severe public health problem in the world. Infections with parasitic worms are pathogenic for human beings and a large proportion of the world's population is affected by helminthes. In developing countries they pose a major threat to public health and contribute to prevalence of malnutrition, anaemia, eosinophilia and pneumonia. Existing drugs have adverse effects and their indiscriminate use is leading to resistance of parasites[1]. The plant kingdom is known to provide a rich source of botanical anthelmintics, antibacterials and insecticides [2]. In the series of medicinal plants, *Praecitrullus fistulosus* is one of the excellent plant, gifted by the nature having composition of all the essential constituents that are required for normal and good human health. *Praecitrullus fistulosus* is commonly known as Tendu in Punjabi, Tinda kaaya in Telugu, Kovaikkaai in Tamil and Indian round gourd in English. Leaves are alternate and usually palmately 5-lobed or divided, stipules are absent. Flowers are actinomorphic and nearly always unisexual. The perianth has a short to prolonged epigenous zone that bears a calyx of 3-6 segments or lobes and 3-6 petals or more frequently a 3-6-lobed sympetalous corolla. The fruit is a type of berry called a pepo by Gerald Carr. The fruits are approximately spherical, and 5–8 cm in diameter [3]. *Praecitrullus fistulosus* may be a useful source of resistance to whiteflies for the improvement of watermelons [4]. The seeds of tinda are roasted and consumed in the same way as watermelon or egusi seeds. In India, tinda is used as fodder and in medicine [5]. Thus, the present investigation was designed to assess petroleum ether and methanol extract of *Praecitrullus fistulosus* for anthelmintic activity against Pheretima posthuma.

Material and Methods

Plant material

The fresh fruits of *Praecitrullus fistulosus* were procured from the local market of Bhopal (M.P.). Plant specimens were identified and authenticated at Department of Pharmacognosy, RKDF College of Pharmacy, Bhopal (M.P.), where the voucher specimen has been preserved for future reference. The fruits were washed under running water to remove adhering dirt, shade dried and converted into moderately coarse powder by mechanical grinder.

Preparation of plant extracts

The powdered plant material was defatted with petroleum ether (60-80°C) and then extracted with methanol in a soxhlet apparatus. The solvent was removed under reduced pressure, which obtained a dark greenish and blackish sticky residue (yield: 2.6% w/w and 4.7% w/w with respect to dried plant material). The dried extracts were stored in a desicator till further study.

Testing animals

Indian adult earthworms (Pheretima posthuma) were used to assess anthelmintic activity of plant extracts. Pheretima posthuma were collected from the water logged area of Bhopal and washed with normal saline to remove all faecal matter. The earthworms of 3-5cm in length and 0.1- 0.2 cm in width were used for all the experimental protocol.

Grouping of animals

Group 1 Control (normal saline)
Group 2 Standard (Albendazole)
Group 3 Petroleum ether (1%, 2% concentration)
Group 4 Methanol (1%, 2% concentration)

Evaluation of anthelmintic activity

The anthelmintic activity was evaluated on adult Indian earthworm known as pheretima posthuma due to its anatomical and physiological resemblance with the intestinal round worm parasites of human beings. Four adult earthworms of approximately equal size were placed in petridish containg different concentrations (1%, 2%) each of crude extract of *Praecitrullus fistulosus* (petroleum ether and methanol) solutions. Observations were made for the time taken to paralysis and death of individual worms. Paralysis was said to occur when the worms do not revive even in normal saline water. Death was concluded when the worms lose their motility followed with fading away of their body color [6].

Statistical analysis

The data obtained were expressed as mean ± SEM. Statistical analysis were performed by one way analysis of variance (ANOVA) followed by student's t test. *P* values < 0.001 were considered significant.

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Table 1 Anthelmintic activity of *Praecitrullus fistulosus*

S.N.	Groups	Concentrations (%)	Time taken for paralysis (min)	Time taken for death (min)
1	Control	1%	---------	---------
2	Albendazole (Standard)	1%	21.75± 1.652	38.75±0.478
3	Pet-ether extract	1%	142.5± 5.204	366.25±30.915
4	Pet-ether extract	2%	123.75± 6.884	370±15.138
5	Methanol extract	1%	117±10.870	393.75±25.769
6	Methanol extract	2%	112.5±3.227	398.75±29.324

Results and discussion

In the present work, the extracts of *Praecitrullus fistulosus* produced a significant anthelmintic activity. Both the extracts of *Praecitrullus fistulosus* not only produced paralysis but also cause death of all species of worms as shown in Table 1. The anthelmintic activity of both pet-ether and methanol extract was comparable with standard drug Albendazole. Pet-ether extract showed better anthelmintic activity in comparison to the methanolic extract of *Praecitrullus fistulosus* The predominant effect of Albendazole on the worm is to cause a flaccid paralysis that result in expulsion of the worm by peristalsis. Albendazole, by increasing chloride ion conductance of worm muscle membrane, produces hyperpolarisation and reduced excitability that leads to muscle relaxation and flaccid paralysis[7]. Phytochemical screening of crude extract of *Praecitrullus fistulosus* revealed presence of tannins as one of the phytoconstituent. Reported literature indicated that, tannins are polyphenolic compounds, which showed potent anthelmintic activity[8-10]. The anthelmintic effect of plants depends upon the content and type of tannins [11]. Both the extracts (Petroleum ether and methanol extract) showed anthelmintic activity but petroleum ether extract showed more potent activity than methanolic extract.

Conclusion

Obtained results concluded that *Praecitrullus fistulosus* fruits possess significant anthelmintic activity. The plant may be further explored for isolation of the active constituents accountable for anthelmintic activity.

Acknowledgement

Mr. Yogesh Shivhare and Sweta Gautam would like to express their heartfelt thanks to Mr. Rakesh Punekar, Vice-principal, RKDF College of Pharmacy, Bhopal (M.P.) for constant support during this work.

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