

Anthelmintic activity of latex of *Jatropha curcas* (ratanjot)

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ABSTRACT

A multitude of plants have been used for the treatment of helmenthiasis throughout the world. One such plant is *Jatropha curcas*. It is known as ratanjot or biodiesel plant, which belongs to the family Euphorbiaceae. It possesses many uses like antidiabetic, antimicrobial and antioxidant. The phytochemical prospection of the fresh and dried latex showed the presence of different classes of secondary metabolites that have demonstrated antimicrobial action. The present research work investigated the Anthelmintic activity of latex of leaves of *Jatropha curcas*. The major finding of the present work illustrates that aqueous latex of *Jatropha curcas* has shown better Anthelmintic activity than control *Jatropha* latex and standard drug, piperazine citrate.

Key words: *Jatropha curcas*, phytochemical screening, Anthelmintic activity.

INTRODUCTION

A number of plants have been tested for their anthelmintic efficacy ^[1-10]. *Jatropha curcas* is a species of flowering plant in the genus *Jatropha* in spurge family, Euphorbiacea that is native to the American tropics, most likely Mexico and Central America.

It is cultivated in tropical and subtropical regions around the world, becoming naturalized in some areas. The specific epithet, "*curcas*", was first used by Portuguese doctor Garchia de orta more than 400 years ago and is of uncertain origin.^[2] Common names include **Barbados Nut, Purging Nut, Physic Nut, or JCL** (abbreviation of *Jatropha curcas* Linn.).

J. curcas is a poisonous, semi-evergreen shrub or small tree, reaching a height of 6 m (20 ft).^[3] It is resistant to a high degree of aridity, allowing it to be grown in deserts.^{[4][5]}

The seeds contain 27-40% oil ^[8] (average: 34.4%) that can be processed to produce a high-quality biodiesel fuel, usable in a standard diesel engine. The seeds are also a source of the highly poisonous to albumin curcin.

MATERIALS AND METHOD

Plant material

The fresh plant's latex are collected from omkareshwer national park and the latex are collected in to a sterile vial and packed by the close rubber cap and stored into refrigerator.

Worm collection and Authentication

Adult earthworms (*Pheretima posthuma*), were used to evaluate anthelmintic activity in vitro. The Indian earthworm *Pheritima posthuma* was collected. The average size of earthworm was 8- 10 cm.

Drugs and chemicals

Piperazine citrate suspension manufactured by Glaxo Smithkline pharma was used as standard drug during the experimental protocol.

Sample and Standard Preparation

Standard preparation

Piperazine citrate solution having strength of 15 mg/ml was prepared and used as standard.

Sample preparation

The *Jatropha curcas* is prepared as 15mg/ml, 10 mg/ml and 20 mg/ml by dissolving the powder of latex of *Jatropha curcas* into the dil. water. Same procedure follow for latex of *Thevetia*.

Anthelmintic Activity

The assay was performed in vitro using adult earthworm (*Pheretima posthuma*) owing to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings for preliminary evaluation of anthelmintic activity. Test samples of the latex was prepared at the concentrations, 15 mg/ml in distilled water and 2 worms of *Pheretima posthuma* of 8- 10 cm were placed in petri dish containing 25 ml of above test solution of extracts. Piperazine citrate (15mg/ml) was used as reference standard and Normal saline (0.9% NaCl) as control. This procedure was adopted for two different types of worms. All the test solution and standard drug solution were prepared freshly before starting the experiments. Observations were made for the

time taken for paralysis was noted when no movement or loss of movement (Not revive even in normal saline). Time for death of worms were recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water and fading away the colour of worm. All the results are shown in Table, and expressed as a mean of the selected worms in each group.

RESULT AND DISCUSSION

The latex of *Jatropha curcas* displayed a significant anthelmic activity in dose dependent manner as shown in Table. The predominant effect of Piperazine citrate on the worm is to cause a flaccid paralysis that result in expulsion of the worm by peristalsis. Piperazine citrate by increasing chloride ion conductance of worm muscle membrane produces hyperpolarisation and reduced excitability that leads to muscle relaxation and flaccid paralysis. Another possible anthelmic effect of tannins is that they can bind to free protein in the gastrointestinal tract of host animal or glycoprotein on the cuticle of the parasite and cause death.

| Treatment | Concentration of extract in (mg/ml) | Time taken for paralysis (min) | Time taken for death (min) |
|---------------------------------|-------------------------------------|--------------------------------|----------------------------|
| Control 0.9% NaCl | - | - | - |
| Standard (Piperazine citrate) | 15mg/ml | 8:10 ±0.12 | 12:35± 0.46 |
| Jatropha+dil. H ₂ O | 15mg/ml | 32±2 | 58±5 |
| Jatropha + control 0.9% NaCl | 15mg/ml | 32±1 | 64±3 |
| Thevetia +dil. H ₂ O | 15mg/ml | 246±25 | 297±25 |
| Jatropha+dil. H ₂ O | 10mg/ml | 40±2 | 84±5 |
| Jatropha+dil. H ₂ O | 20mg/ml | 22±2 | 41±5 |

Conclusions

The *Thevetia* mild or/and does not cause the anthelmic activity with respect to the *Jatropha* and the *Jatropha* is show the incremented activity with respect to increasing the concentration of drug.

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