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Research Article

**ANTHELMINTIC ACTIVITY OF ETHANOLIC EXTRACT OF
JATROPHA CURCAS ROOT**N. Dhanushiya¹, V. Dillibabu¹, M. Dinesh Kumar¹, M. Perumal¹, Dr. J. Karthi²¹ Bachelor of Pharmacy, Pallavan Pharmacy College, Kanchipuram² M. pharm, Ph.D., Department of Pharmacognosy^{1,2} Pallavan Pharmacy College, Kanchipuram.**Abstract:**

Despite the availability of several allopathic medicines, a large number of people continue to rely on nature, which has bestowed upon humans an abundance of medicinal plants for both illness prevention and treatment. The mechanism of action of anthelmintic medications is to either kill or immobilize the parasite so that the host's immune system can eradicate it. Since the currently available anthelmintics, like albendazole and mebendazole, show several negative effects, including elevated liver enzyme and hematological effects, etc., the current study looked into the plant *Jatropha curcas*, which is claimed to be useful as an anthelmintic but hasn't been scientifically validated. The phytochemical studies on the root of *Jatropha curcas* were carried out to demonstrate its importance as a valuable medicinal plant. The extract was subjected to preliminary phytochemical analysis. The preliminary screening reveals the presence of alkaloids, flavonoids, saponins, steroids, tannins, and triterpenoids. Studies involving the ethanolic root extract of *Jatropha curcas* were conducted in vitro in pharmacology. Worm paralysis time was used to measure anthelmintic activity. As a result, the study's findings indicate that *Jatropha curcas* roots have strong anthelmintic action.

Keywords: *Jatropha curcas*, Anthelmintic activity, Euphorbiaceae.

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1. INTRODUCTION:

Jatropha curcas is a succulent, deciduous shrub that grows year-round and has therapeutic qualities. It can grow to a height of 6 meters and tolerate rainfall between 250 and 1,200 mm annually. Round and black, jatropha seeds have a golden yellow oil.⁽¹⁾ In addition to having macro- and micro-mineral elements, the plant's seeds carry the hazardous toxalbumin curcin, also referred to as jatropha. The terms "physic nut" and "hedge castor oil plant" are most commonly used to refer to it. Its latex has been used in traditional medicine to treat burns, dermatitis, syphilis, inflammation, rash, rheumatism, scabies, and ulcers due to its well-known wound-healing qualities.⁽²⁾ Despite being native to North and South

America, the species is currently found in more than 52 countries. widely grown for commercial purposes, such as biodiesel in bi-products, in India, central Africa, Spain, South Asia, Thailand, and Indonesia. In Madagascar, the herb is used to treat asthma, dental issues, and pneumonia, and to help remove the placenta.^(3,4) Jatropha leaves (*Jatropha curcas* linn) contain secondary metabolites such as alkaloids, saponins, tannins, phenolics, flavonoids, triterpenoids, steroids, and glycosides and can be used as an alternative anthelmintic. The study's goal is to see if Jatropha root extract has any anthelmintic efficacy against *Pheretima Posthuma*.⁽⁵⁾



2. MATERIALS AND METHODS:

2.1 Collection of plant material

The fresh plant root of *Jatropha curcas* Linn (Euphorbiaceae) was collected from Vellore District, Tamil Nadu, India during August 2023 and taxonomically identified by **Dr.P.Elankani** research officer of Siddha Central Research Institute, Tamil Nadu-600 106.

Plant Authentication no: 603.27092302

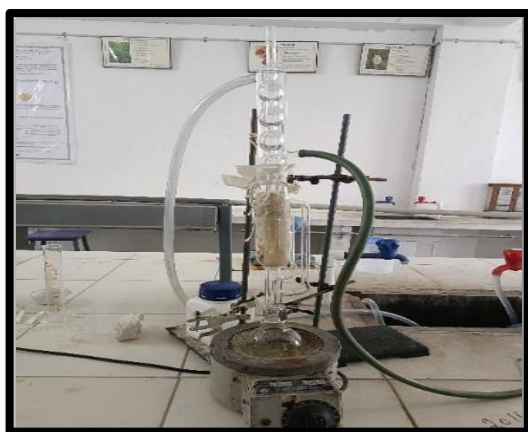
2.2 Extraction preparation

The Fresh and matured roots of *J. curcas* Linn were thoroughly dried at room temperature under shade and coarsely powdered. The plant root of dried *Jatropha curcas* powder weighed around 120g. There were two steps involved in the extraction process.

- ❖ Soxhlet apparatus extraction process
- ❖ Cold maceration process

2.2.1 Soxhlet apparatus extraction process

A root of dried *Jatropha curcas* powdered that weighed around 20g was put into the Soxhlet apparatus by using a muslin cloth. This was thoroughly extracted with ethanolic solvent in a Soxhlet apparatus for 6 hours. The temperature was maintained at 40– 50°. To get the extract, the solvents were eliminated using a hot plate. The dried extract was stored in the desiccator until the actual experiment.⁽⁵⁾



2.2.2 Cold maceration process

The matured roots of *J. curcas* Linn were collected in fresh condition. The dried and coarse powder (100 g) was extracted with ethanolic solvent by using a cold maceration for 48 hours. Then filter with Whatmann filter paper No. 1. The filtrates were combined, and the alcohol was allowed to evaporate in a water bath. The dried extract was stored in the desiccator until the actual experiment. (7,8)



2.3 Selection of worm

The experiment was carried out on adult *Pheretima Posthuma* earthworms, which share anatomical and physiological characteristics with the human intestinal roundworm parasite. (9) Because they are easily accessible, earthworms are a popular option for the initial in vitro evaluation of anthelmintic compounds. (10) Adult earthworms (*P. posthuma*)

Table 1: Phytochemical composition of ethanol extract of *J. curcas* root.

Phytochemical	Interference
Alkaloids	+
Flavonoids	+
Phenols	+
Saponins	+
Steroids	+
Tannins	-
Amino acids	-
Glycosides	+

(+): Presence; (-): Absence

were used in an anthelmintic study after being taken out of the moist soil of the saver area of Kanchipuram, Tamil Nadu. After that, they were thoroughly cleaned with regular saline to remove all feces.

2.4 Chemicals

All chemicals and drugs were obtained commercially and were of analytical grade. Albendazole, normal saline, and carboxy methyl cellulose were purchased from Ganapathy Chemicals, Kanchipuram.

2.5 Phytochemical screening

The preliminary phytochemical group test was carried out by following standard procedure.

2.6 Anthelmintic activity

The adult Indian earthworm *Pheretima posthuma* resembles human intestinal roundworm parasites in terms of anatomy and physiology. (11) The preliminary assay was performed on the adult earthworm *Pheretima posthuma* belonging to class Oligochaeta. A Petri dish with a concentration of *Jatropha Curcas* ethanolic extract (100mg/ml) was filled with *Pheretima posthuma*. Six worms were inserted in each Petri dish, and their paralysis or demise was tracked. After determining that worms did not move when shaken or when given external stimuli, the mean time for paralysis was observed when the time of death of a worm (min) was forcefully recorded. The test findings were compared to samples treated with the reference chemical albendazole (20 mg/ml). The study will last for four hours. (12)

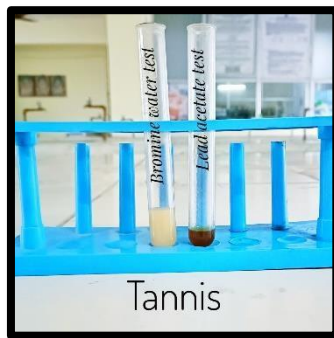
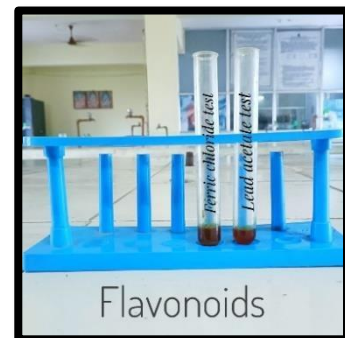
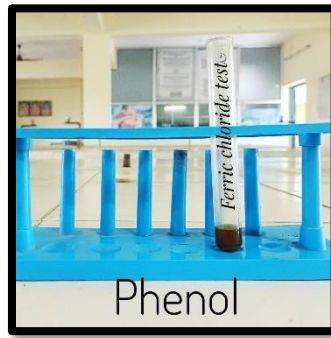
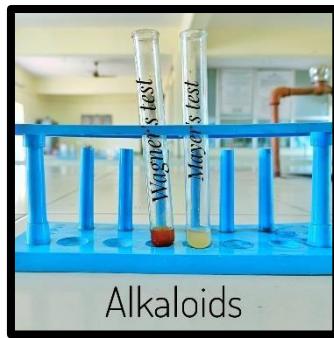
2.7 Statistical analysis

The expressed results are Mean \pm SEM (n=6) two-way ANOVA using Graph pad PRISM software version. $P < 0.001$, $P < 0.01$ and $P < 0.05$ were considered as statistically significant. n=6 Values are expressed as \pm S.E.M. Values are Mean \pm SEM (n=6) two-way ANOVA.

3. RESULTS AND DISCUSSION:

3.1 Phytochemical screening

The phytochemical screening test showed the presence of various compounds in the root of *J. curcas* below.



3.2 Anthelmintic activity

The effect of ethanolic extract of *J.curcas* root (100mg/ml) on paralysis and death of earthworm (*P.posthuma*) to evaluate in vitro anthelmintic activity was observed as follows as shown below.

Table 2: Effect of in vitro anthelmintic activity of ethanolic extract of *J.curcas* root in *P.posthuma*.

S.No	Group	Concentration (mg/ml)	Pheretima posthuma	
			Paralysis (min)	Death (min)
1	Control (1% CMC in 10ml of normal saline)	10ml Of 1% CMC	180.30 ± 0.25	240.50 ± 0.10
2	Standard (Albendazole + 1% CMC in 10ml of normal saline)	20mg/10ml	24.15 ± 0.29	66.45 ± 0.14
3	Test (ethanolic extract + 1% CMC in 10ml of normal saline)	100mg/10ml	20.00 ± 0.15	49.30 ± 0.24

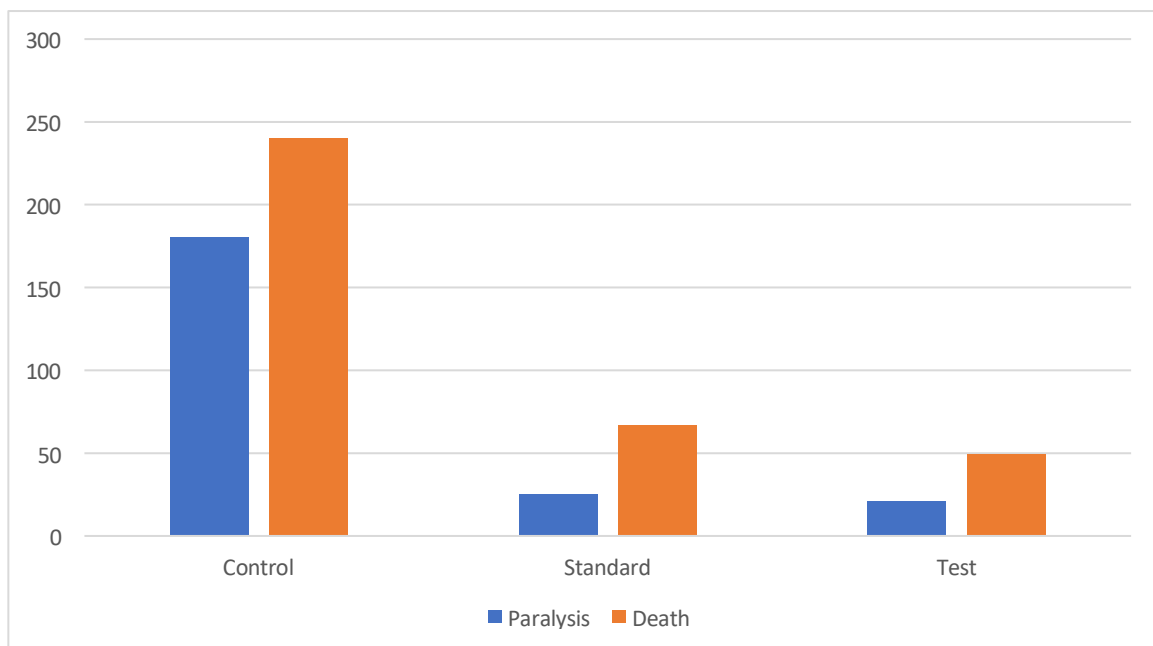
The expressed results are Mean \pm SEM (n=6) two-way ANOVA using Graph pad PRISM software version. $P < 0.001$, $P < 0.01$ and $P < 0.05$ were considered as statistically significant. n=6 Values are expressed as \pm S.E.M. Values are Mean \pm SEM (n=6) two-way ANOVA



Control – 1% of
CMC in 10ml of

Albendazole – 1%
of CMC in 10ml of

Ethanollic extract of
J. curcas – 1% of
CMC in 10ml of



Anthelmintic activity of ethanolic extract of J. curcas against Pheretima Posthuma

4. CONCLUSION:

Primary and secondary metabolites, such as alkaloids, phenols, steroids, flavonoids, and glycosides, were discovered in the ethanolic extract of *J. curcas* by the study "Pharmacological Evaluation of Plant Root Extract from "*J.curcas*" Linn". Future studies might examine the mechanism of action and anthelmintic effect.

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