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Anthelmintic activity of *Pongamia pinnata* L. leaves on *Pheretima posthuma*

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Abstract
The anthelmintic property of fresh aqueous+ acetone extract of *Pongamia pinnata L.* belonging to family Fabaceae was studied for anthelmintic activity against *Pheretima Posthuma* (Indian earthworm). Four concentrations (25, 50, 75 and 100 mg/ml)of leaves extract were studied in a bioassay, which involve the determination of time of paralysis and time of death of the worms. 100 mg/ml conc. of aqueous + acetone extract of leaves of *Pongamia pinnata L.* reveal considerable anthelmintic activity as compared to other three conc. and Albendazole (10mg/ml).Albendazole and saline water were including in the assay as standard reference drug and control respectively.

Keywords: *Pongamia pinnata L,* pheretima posthuma, anthelmintic activity

Introduction
Karanja is botanically Pongamia pinnata L. belongs to family Fabaceae. Pongamia pinnata is a fast-growing tree which reaches 40 feet in height and spread forming a broad, spreading canopy casting moderate shade mostly found near the river side. Medicines from herbal sources have got a spontaneous importance while considering the side effects of the synthetic and chemical drugs. Plant based medicaments, for centuries; man's prime therapeutic weapons are still in the front line for treating a large number of diseases [1, 2, 3, 4].

All parts of this plant have medicinal properties and traditionally used as medicinal plants. They have been used as crude drug for the treatment of tumors, piles, skin diseases, wounds and ulcers [5]. Besides this, the plant possess antiflammatory, anti plasmodial, antinociceptive, anti-lipidperoxidative, antidiarrheal, antiulcer, antihyperammonic and anti-oxidant activity [6] Particularly, leaves have anthelmintic, digestive and laxative used for inflammations, piles and wounds [7] and juice of the leaves is taken for cold, cough, diarrhoea, dyspepsia, flatulence, gonorrhea and leprosy [8].

Therefore in the present study an attempt was made to find out the anthelmintic activity of leaves of Pongamia pinnata L.

Scientific classification [9]

Kingdom	:	Plantae
Order	:	Fabales
Family	:	Fabaceae
Genus	:	Pongamia
Species	:	*P. pinnata*

Image of *Pongamia pinnata* L. leaves

Fig 1: Leaves of Pongamia pinnata

Materials and Methods
Plant Material
The fresh leaves of *Pongamia pinnata L.*have been collected from the local area at Shahada and authentified by Dr. Santosh K Tayade, HOD of Botany, Art's Science and Commerce College, Lonkheda, Shahada, Dist-Nandurbar (MS).

Worms
Indian earthworms *(Pheretima Posthuma)* were used to study anthelmintic activity. The earthworms were collected from moist soil at local area at Taloda, Dist-Nandurbar.Theaveragesizeofearthwormwas6-8cm.Earth worm. All worms were washed with normals a line, and kept in beakers containing normals aline separately.

Preparation of Extracts

Collected fresh leaves of *Pongamia pinnata L.*were dried and crushed to coarse powder and pass it through sieve no 40 to get fine powder and subject it to maceration with Acetone + water, then dried it by using evaporator and then extract was subjected to preliminary phytochemical testing [10, 11, 12].

Drugs and chemicals

1. Albendazole.
2. Saline solution.

Anthelmintic Activity

The anthelmintic assay was carried as per the method of Ajaiyeoba et.al, with necessary modification [13]. The assay was performed on adult Indian earthworm Pheretima Posthuma, due to its anatomical and physiological resemble with the intestinal round worm parasite of human being [14, 15]. Because of easy availability, earthworm has been used widely for initial evaluation of anthelmintic compound in vitro [16]. 25ml of formulation containing different concentration of crude drug aqueous + acetone extract(25,50,75,100 mg/ml in distilled water)were prepared and 3 worms of same type were placed in it.Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Time for death of worms were recorded after ascertaining that worms neither move when shaken vigorously nor when dipped in warm water (50°C). Albendazole(10mg/ml) was used as reference standard while saline water as control.

Table 1: Anthelmintic activity of *Pongamia pinnata L.*leaves extracts on Indian earthworm (*Pheretima Posthuma)*

Sr. No	Extracts	Conc. (mg/ml)	Indian Earthworms (Pheretima Posthuma)	
			Time of Paralysisin min(P)	Time of Deathin min(D)
1.	Aqueous + Acetone	25	35.45 ± 1.45	150± 3.14
		50	16.25± 1.25	70.82±2.40
		75	7.20± 1.13	53.45±1.54
		100	4.15± 0.45	25.75±1.11
2.	Standard (Albendazole)	10	5.25± 0.55	28.17± 1.26
3.	Control (Saline solution)	-	-	-

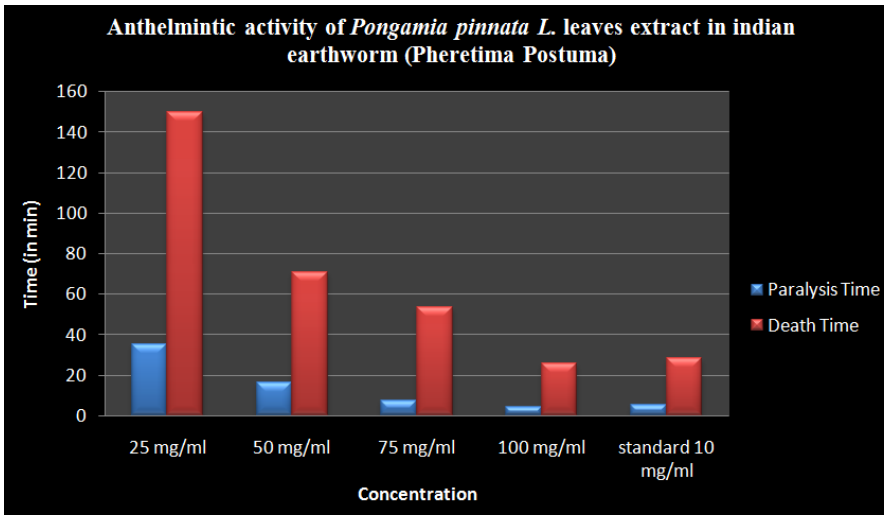

Fig 2: Anthelmintic activity of *Pongamia pinnata L.* leaves extracts on Indian earthworm (*Pheretima Posthuma)*

Statistical Analysis

The data presented as mean + SEM. The activities of extract where compared with the control. The extract showed significantly higher duration of paralysis and death value of $P<0.001$ were considered statistically significant [17, 18].

Results and Discussion

From the observations made, higher concentration of leaves extract produced paralytic effect much earlier and the time to death was shorter for all worms. The aqueous+acetone extract showed anthelmintic activity in dose-dependent manner giving shortest time of paralysis (P) and death (D) with 100 mg/ml concentration, for worms. Evaluation of anthelmintic activity was compared with reference standard Albendazole. From the above results, it is concluded that *Pongamia pinnata L.*leaves extract showed significant anthelmintic activity. 100 mg/ml aqueous + acetone extract exert paralytic effect in 4.15 ± 0.45 minutes and death in 25.75 ± 1.11 minutes which requires less time for paralysis and death of worms as compared to effect produced by the standard drug Albendazole. The experimental evidence obtained in the laboratory model could provide a rationale for the traditional use of this plant as anthelmintic. The plant may be further explored for its phytochemical profile to recognize the active constituent accountable for anthelmintic activity.

Conclusion

From the above results, it is concluded that the aqueous+ acetone leaves extract of Pongamia pinnata L.shows potent anthelmintic activity than standard anthelmintic drug. Further studies using in vivo models are required to carry out and establish the effectiveness and pharmacological rationale for the use of *Pongamia pinnata L.* leaves as an

anthelmintic drug. The drug can be further explored for the isolation and characterization of the active constituents responsible for anthelmintic activity.

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