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Comparative study on Anthelmintic property of Medicinal Plants

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Abstract:
For the present study *Acacia catechu, Euphorbia heterophylla, Corallocarpus epigaeus* and *Caesalpinia bonducella* plant parts were chosen to evaluate the comparative analysis on anthelmintic activity. Different concentrations (20, 40, 60, 80, 100mg/ml) of methanolic extracts of these plant parts were used. The evaluation parameters involved the determination of time of paralysis and time of death of the worms. Piperazine citrate was used as standard drug at 10 mg/ml concentration and saline as control. The results obtained showed that *Corallocarpus epigaeus* showed the highest anthelmintic activity with death time of 9 minutes at 100 mg/ml concentration.

Keywords: Anthelmintic activity , *Euphorbia heterophylla, Corallocarpus epigaeus , Caesalpinia bonducella, Acacia cathechu*, Piperazine citrate.

Introduction

One of the most common problems faced by developing countries is helminthes infections, which poses a major threat to human well being. It is an infection in which human intestinal parasitic worms are vectored through air, water and food which causes secretion of toxins and uses the vital nutrients from the host bodies ultimately leading to the manifestation of the disease [1]. According to the WHO, the present treatments for these diseases have limitations as these drugs are mainly microfilaricidal, with little effects on adult worms, so only few drugs are used in the treatment of helminthes in humans. It is seen that natural sources such as traditional medicinal plants, help in the treatment of infection from parasite.

The plant parts chosen for the study were roots of *Euphorbia heterophylla* (Figure 1), *Corallocarpus epigaeus* (Figure 2), bark of *Acacia catechu* (Figure 3), *and* seeds of *Caesalpinia bonducella* (Figure 4). *Euphorbia heterophylla* belongs to the family of *Euphorbiaceae* commonly called as "Atividayam" in Tamil Nadu. *Euphorbia heterophylla* leaves and roots are used in traditional medical practices as laxative, antigonorrheal, migraine and wart cures and the plant lattices have been used as fish poison, ordeal poisons, insecticide, anticonvulsant, cough remedy, skin irritant, anti-cancer and recently anti-HIV activities of *Euphorbia* species have also been reported[2]. *Corallocarpus epigaeus* belongs to the family of *Cucurbitaceae* commonly called as "Akashagarudan" in Tamil Nadu. It is a prostrate or climbing monoecious plant whose roots and rhizomes has benefit in cases of chronic mucous eneteritis and also used as anthelmintic. It is especially useful in syphilitic cases, old venereal complaints and chronic dysentery, effective remedy for rheumatism and snake bite[3]. *Acacia*

catechu belongs to the family of *Leguminosae* commonly known as "Karungali" in Tamil Nadu. It has long been used for the treatment of skin, sexual, stomach problems, malaria, sore throat (aerial part) and toothache (bark). It has anti-plasmodial activity, effective against hepatitis-C virus and HIV[4]. *Caesalpinia bonducella* belongs to the family of *Caesalpiniaceae* commonly known as "Kalarchi" in Tamil Nadu. Almost all parts of this plant are being used in traditional medicine to treat various diseases. The leaves of *Caesalpinia bonducella* have been utilized as an anti-pyretic, anti-inflammatory [5]. In our study the anthelmintic activity of these four medicinal plants were evaluated on adult Indian earthworms *Pheretima posthuma* due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human being [6].

Material and Methods

The plants materials were collected from Horticulture research center, Yerkaud, Tamil Nadu. The different plant parts such as the heartwood (bark) of *Acacia catechu,* roots of *Euphorbia heterophylla* and *Corallocarpus epigaeus* and the seeds of *Caesalpinia bonducella* were collected and washed thoroughly in distilled water. A known quantity of the roots, bark and the seeds (100g) were dried in oven at 40º C to constant weight.

The dried roots bark and seeds were powdered in a mixer-grinder and used for the study. A known amount of the powdered contents of the roots, bark and seeds was extracted with methanol for 24 h. Extracts thus obtained were filtered through 0.45-µm filter. The residue was extracted twice with solvents as mentioned. The combined methanol extracts were concentrated at 40ºC, weighed, and stored at 4ºC. Three groups of approximately equal size (800 mg) earthworms consisting of three earthworms in each group were used for the study. Group one was treated with normal saline and used as control. Group two was treated with standard drug Piperazine citrate (10 mg/ml). Group three was treated with different concentration (20 to 100 mg/ml) of *Euphorbia heterophylla* root extract. The same procedure was followed for *Corallocarpus epigaeus* **(**root), *Acacia catechu* (bark) *and Caesalpinia bonducella* seed extracts. After treatment observations were made for the time taken to paralysis and death in individual worms.

Fig 1: Euphor bia heterophylla (roots)

Fig 2: *Corallocarpus epigaeus* (roots)

Fig 3*: Acacia catechu (bark)*

Fig 4: *Caesalpinia bonducella* (seeds)

Results and Discussion

The time of paralysis and death of the *Pheritema postuma* (Indian earthworm) of various extract treatment were given in the table 1-4. Paralysis was said to occur when the worms do not revive even in normal saline. Death was concluded when the worms lost their motility followed with fading away of their body colour.

Table 1: *In vitro* anthelmintic activity of *Acacia catechu* on *Pheretima posthuma*

Treatment	Concentration (mg/ml)	Time of paralysis (mins)	Time of death (mins)
Piperazin citrate	10	26.5±1.04	66.5±1.37
Normal saline	-	-	-
Acacia catechu methanolic bark extract	20	57.5±4	87.5±0.2
	40	63.5±6	87±0.3
	60	21±1.15	37±0.7
	80	12.5±0.2	34±1.0
	100	10±1.0	16±4

- No paralysis and death; Each value represent mean ± SEM (n =3)

Table 2: *In vitro* anthelmintic activity of *Euphorbia heterophylla* on *Pheretima posthuma*

Treatment	Concentration (mg/ml)	Time of paralysis (mins)	Time of death (mins)
Piperazin citrate	10	26.5±1.04	66.5±1.37
Normal saline	-	-	-
Euphorbia heterophylla methanolic root extract	20	18.5±0.3	26.5±2
	40	16±0.5	24.5±0.3
	60	13.5±0.7	21±0.5
	80	13.5±0.5	20±0.7
	100	9±0.1	14±0.1

- No paralysis and death; Each value represent mean ± SEM (n =3)

Table 3 : *In vitro* anthelmintic activity of *Corallocarpus epigaeus* on *Pheretima posthuma*.

Treatment	Concentration (mg/ml)	Time of paralysis (mins)	Time of death (mins)
Piperazin citrate	10	26.5±1.04	66.5±1.37
Normal saline	-	-	-
Corallocarpus epigaeus methanolic root extract	20	22±1.05	118±1.15
	40	7±1.0	31±1.7
	60	5±0	22±2.0
	80	5±1.0	15±0.2
	100	4±1.0	9±1.3

- No paralysis and death; Each value represent mean ± SEM (n =3)

Table 4: *In vitro* anthelmintic activity of *Caesalpinia bonducella* on *Pheretima posthuma*

Treatment	Concentration (mg/ml)	Time of paralysis (mins)	Time of death (mins)
Piperazin citrate	10	26.5±1.04	66.5±1.37
Normal saline	-	-	-
Caesalpinia bonducella methanolic seed extract	20	23.8±1.18	30.8±1.38
	40	21.6±1.2	26.8±2.2
	60	17.4±1.4	23.1±1.15
	80	14±1.7	20±1.2
	100	9±1.5	18±1.5

- No paralysis and death; Each value represent mean ± SEM (n =3)

The results were dose dependent, on comparing the methanolic extracts of the medicinal plants given above it was found that *Corallocarpus epigaeus* showed the highest anthelminthic activity with death time of 9 mins at 100 mg/ml concentration, followed by *Euphorbia heterophylla* 14 mins, *Acacia catechu* 16 mins and *Caesalpinia bonducella* 18 mins at 100 mg/ml concentration. These plants have significant anthelmintic activity and potential to develop as useful and safe alternative to the anthelmintic drugs present in markets having problems concern with side effects and development of resistance. These plants also can be further explored for its phytochemical profile to identify the active constituents responsible for the anthelmintic activity.

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References

1) Murugamani V, Raju L and Girija Shankar G. The new method developed for evaluation of Anthelmintic activity of housefly worms and compared with conventional earthworm method. ISNR pharmacology 2012: 2012:1-6
2) Aditya MP, Pandharkar TM, Yerawar PP and Patawar VA. Evaluation of *In-Vitro* Antihelminthic Activity of *Euphorbia Heterophyllum*. Journal of Chemical Biological and Physical Sciences 2012; 2: 2401-2407.
3) Shri VijayaKirubha T, Senthamarai R, Vasuki K, Venkateswara Rao A, Selvadurai S. Anthelmintic activity of roots and rhizomes of *Corallocarpus Epigaeus*. J. Nat. Prod. Plant Resource 2011; 1: 81-84.
4) Patil, Suyog H, Deshmukh, Pooja V, Sreenivas S. A, Sangameshwar K, Vijapur, Laxman S. *In vitro* Anthelmintic activity of *Acacia catechu*. International Journal of Green Pharmacy 2013; 7:34-36.
5) Karthi J, Thamizhmozhi M, Saravanan C, Ayas Ahamed K, NirubanChakravarthy K. Invitroanthelmintic activity of leaves extracts of *Caesalpinia bonducella*. Der Pharmacia Lettre 2011; 3: 317-319.
6) Asha Devi S, Ganjewala Deepak and Subramanian Babu . Anthelmintic activity of rhizome extract of *Acorus calamus* L. In comparison with beta and alpha asarone. Research Journal of Biotechnology 2012; 7:112-113.

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