



Phytochemical and Anthelmintic studies on the whole plant of *Merremia emarginata* Burm. F

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ABSTRACT

In the present study ethanol and aqueous extracts of the whole plant of *Merremia emarginata* Burm. F were investigated for their anthelmintic activity against *Ecinia foetida* and *Pheretima posthuma*. Four concentrations (100, 150, 200, 250 mg/ml) of each extract were subjected for evaluation. The study is mainly concerned with the determination of time of paralysis and time of death of the parasites. The gradual increase in the dose showed a gradual increase in the anthelmintic activity. The ethanolic extract of the whole plant showed a significant anthelmintic activity at highest concentration of 250 mg/ml.

Keywords: *Merremia emarginata* Burm. F, *Ecinia foetida* and *Pheretima posthuma*, Piperazine citrate, Anthelmintic activity

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INTRODUCTION

Plants are used as a source of medicine since ancient times. *Merremia emarginata* Burm. F (Convolvulaceae) is a perennial, much branched creeper. Stems rooting at nodes, leaf blade reniform to broadly ovate, Inflorescences sub sessile, Seeds are greyish brown, Leaves are small, kidney-shaped to somewhat heart-shaped. It is widely distributed all over the India, especially in Gujarat, Bihar, West Bengal, Western- Ghats, Goa Kerala and Karnataka. It is an uncultivated food crop used as a green leaf vegetable by poor people in India and a creeping perennial herb rooting at the nodes. The plant is used in rheumatism, neuralgia, coughs and headache. Methanol extract of this plant has been reported for antioxidant and antiobesity activities¹¹. The plant is also traditionally used to treat diabetes in Srilanka and India.¹² *Merremia emarginata* is also known as *ipomoea reniformis* chois. In India it is known by various names in different regions like mooshakarni in Sanskrit, Underakani in Gujarat, Toinnuatali in Telugu, Mushkani in Hindi, Goromusha in Persian, Paerattae-kirae in Tamil, Yellikkadukirai in Madras.¹³⁻¹⁷

MATERIAL AND METHODS

Plant Material

The whole plant of *Merremia emarginata* Burm. F .were collected from Thirunelli Hills of Wayanad District, Kerala State, South India in the month of September 2013 . It was then shade dried after confirming the botanical identity from the Botany department of Iqbal College, Palode, Trivandrum and a vouches specimen (MEMER-WP) has been deposited in the Department of Pharmacognosy and Phytochemistry, Pariyaram Medical College, Kannur, Kerala.

Preparation of Extracts

The Whole plant materials were shade dried, powdered and there after subjected to the extraction process. Extracts were prepared by using solvents like ethanol, and water and they were vacuum dried and used for the anthelmintic evaluation.

Phytochemical screening

Phytochemical screening of the whole plant revealed the presence of Flavonoids, Tannins, and Saponins in the alcoholic as well as aqueous fraction⁷.

Organisms Selected

Indian earthworm *Pheretima posthuma* and *Eicinia fetida* were collected from the water logged areas of soil in Kadannappalli village of Kannur district, Kerala, South India. The authenticity of the parasites collected were confirmed before the study. The average size of *Pheretima posthuma*

and *Eicinia fetida* were 5-8 cm. Parasites were washed with water to remove the adhering sand and the unwanted materials. Saline treatment with the parasites has also been carried out before conducting the study.

Experimental

The anthelmintic study was carried out as per the method of Ajayieoba E. O. et al. with minor modifications⁶. The experiments were done on adult Indian earth worm *Pheretima posthuma* and *Eicinia fetida* since both are from the same annelida group. The earth worms of approximately equal size were released in to 20 ml solutions of four different concentrations (100, 150, 200, 250 mg/ml) in petri dishes containing alcoholic and aqueous extracts. Piperazine citrate was used as reference standard and saline as control. Determination of time of paralysis and time of death of the worms were evaluated. 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 moved when shaken vigorously nor when dipped in warm water (40-50)⁰C followed by observable changes in the body of the parasites including colour.

Statistical Analysis

The statistical analysis were done by using Dunnett's test.

RESULTS AND DISCUSSION

Table I Anthelmintic Activity of *Merremia emarginata* Burm. F Extracts.

Extracts	Conc. (mg/ml)	<i>Ecinia foetida</i>		<i>Pheretima posthuma</i>	
		Paralysis time in minutes	Death time in minutes	Paralysis time in minutes	Death time in minutes
Control	-----	-----	----	-----	-----
Aqueous	100	91±0.171	190±0.070	90±0.019	197±0.037
	150	76±0.031	107±0.034	78±0.027	99±0.010
	200	51±0.050	85±0.075	44±0.039	67±0.023
	250	37±0.023	69±0.043	27±0.015	51±0.056
Ethanol	100	97±0.011	149±0.095	89±0.025	177±0.016
	150	69±0.060	68±0.049	61±0.046	87±0.034
	200	57±0.039	45±0.015	35±0.057	60±0.027
	250	39±0.012	25±0.031	14±0.029	41±0.034
Piperazine citrate (CONTROL)	100	199±0.012	260±0.041	201±0.034	287±0.034
	150	167±0.011	184±0.034	156±0.098	194±0.019
	200	105±0.089	136±0.057	110±0.045	127±0.026
	250	61±0.010	97±0.029	65±0.019	82±0.014

Values are mean ± S.E.M, N=3*P<0.01 with the standard

An anthelmintic drug can act by causing paralysis of the parasite or by damaging its cuticle and there by leading to partial digestion or rejection by immune mechanisms⁹. The detailed literature survey of the plant reveals its usage among the tribals in treating intestinal worm infections. The data obtained in the study could provide a rationale for the traditional use of this plant as an anthelmintic. The phytochemical screening of the whole plant reveals the presence of several constituents including tannins. Literature surveys showed that tannins were capable to produce anthelmintic activity¹⁰. The alcoholic and aqueous extract of the plant displays a significant anthelmintic activity in dose dependent manner. The anthelmintic activity of these extracts were comparable with that of standard drug. The probable mechanism of action of the whole plant of *Merremia emarginata* Burm. F. as an anthelmintic could be due to its poly phenolic content.

CONCLUSION

It is concluded based on the findings of the present study that the anthelmintic activity of the extracts are dose dependent. The aqueous and ethanolic extracts exhibited significant anthelmintic activity in *Merremia emarginata* at highest concentration of 250 mg/ml. This study strongly supports the traditional use of the plant as an anthelmintic.

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