



***In-vitro* Anthelmintic Activity of Methanolic Extract of *Muntingia calabura* Leaves**

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ABSTRACT

To investigate the in-vitro anthelmintic activity of methanolic extract of *Muntingia calabura* leaves. We select the Indian adult earthworms (*Pheretima posthuma*) were used for this experiment, in this work dried extract was suspended in 1% w/v Carboxy Methyl Cellulose, prepared in normal saline water in three different conc. (25, 50, 100 mg/ml). Albendazole suspension of same conc. was taken as standard and normal saline water with 1% CMC was taken as a control. Worms were placed in Petri dish containing 15 ml of sample (drug) solution. Time for paralysis (Vermifuge), was noted either when any movement could not be observed except when the worms were shaken vigorously or when dipped in warm water (50 OC). Death (Vermicidal) was included when the worms lost their motility followed by white secretions and fading away of their body colour. Methanolic extract of *Muntingia calabura* leaves produce in-vitro anti anthelmintic activity in dose dependent manner, the 25mg takes 36.30 minutes for paralysis and 62 minutes for death of worms, 50mg/ml takes 13.30 minutes for paralysis and 46 minutes for death of worms and 100mg/ml takes 17 minutes for paralysis and 35 minutes for death of worms. In this project we used albendazole as standard in 25mg/ml, 50mg/ml and 100mg/ml dose manner respectively and it takes 10 minutes for paralysis and 30 minutes for death of worms, 8 minutes for paralysis and 26 minutes for death of worms and 3.30 minutes for paralysis and 12 minutes for death of worms in dose of 25mg/ml, 50mg/ml and 100mg/ respectively. The *Muntingia calabura* leaf extracts has showed significant anthelmintic activity at all the tested doses when compared to control as vermifuge and vermicides while highest activity exhibited by the higher conc. (100 mg/ml).

Keywords: *Muntingia calabura*, Anthelmintic activity, Albendazole, Vermifuge, Vermicidal

INTRODUCTION

Helminthiasis is a critical serious problem in the tropical regions including the Asian countries. Helminths produce major problem in human and also serious problem other animals around the world specifically to the third world countries¹. Different type of helminths infects the human and animals out of which intestinal round worms (*Ascaridia species*.) are most common². Nearly 300 million people suffer severe morbidity associated with these parasites and half of which are school-going children affected by massive infections. Several clinical symptoms arise due to this infection include dysentery, diarrhoea, nausea-vomiting, loss of appetite and weight, acidity and sometimes anaemia². Other manifestations of helminthic infections include respiratory symptoms, dermatological consequences and epilepsy. Helminthic infections may also subvert immune responses to pathogens of other diseases such as tuberculosis, HIV, and malaria.

The species of *Muntingia calabura* belong to the family *Elaeocarpaceae*, it is one of the widely distributed throughout the world. *M. calabura* is commonly known as Jamaican Cherry tree and is also known as capulin or capuli in Latin America. The various parts of the *M. calabura* plant have been documented for several medicinal uses. In traditional medicine, flowers can be used as an antiseptic

and treat abdominal cramps. The fruits are widely eaten by children as it is sweet and also cooked in tarts and made into jam. The *M. calabura* have nutritional values, scientifically a number of flavonoids and phenolic compounds have been isolated from various part of the plant and structures were elucidated by spectroscopic analysis. 8- Hydroxy-7, 3, 4, 5- tetramethoxyflavone and 8, 4-dihydroxy-7, 3, 5-trimethoxyflavone were isolated from the stem bark and root and screened the cytotoxic activities against A549 and HT-29 cells respectively^{3,4}. The leaves of *M. calabura* have potential antibacterial activity⁵, free radical scavenging activity⁶, antinociceptive, antipyretic, anti-inflammatory⁷ and antistaphylococcal activity⁸. It was able to internal transport of Hg, it reduces the soil pollution⁹ and the fruits can be used as carbon source for glutamic acids¹⁰.

In view of the above facts, in the present investigation, we have carried out the phytochemical analysis and in-vitro anthelmintic activity of methanolic extract of *Muntingia calabura* leaves

MATERIALS AND METHODS

Plant Material

Muntingia calabura leaves were collected from the Medicinal Plant garden of Shri Vishnu College of Pharmacy, Vishnupur, Bhimavaram, Andhra Pradesh, India and



authenticated by the Department of Botany, DNR degree college, Bhimavaram. A sample was kept for the future reference.

Drying and Grinding

The collected leaves were dried under shade at room temperature for two week. The dried leaves were ground into a coarse powder with a suitable grinder. The powder was stored in air tight container until the analysis was commenced.

Extraction

The powder of leaves (500 g) was successively extracted with petroleum ether (60-80°C) for 7 days to remove fatty and waste matter. The defatted marc was then subjected to Soxhlet extraction with 75% methanol to obtain methanolic extract. The methanolic extract was evaporated by using rota evaporator under reduced pressure to dryness and obtains a brownish colour extract.

Preliminary Phytochemical Screening

Methanolic extract of *Muntingia calabura* was analysed for preliminary Phytochemical for the detection of various constituents.

Selection of Experimental Model¹¹

In this experiment we are used Indian Adult earthworms (*Pheretima posthuma*). The earthworms were collected from the wet soil of medicinal garden. For the removal of all faecal matter of worms were washed with normal saline. The earthworms of 8-10 cm in length and 0.3-0.4 cm in width were used for all the experimental protocol. Ready availability it to be used initially for *in-vitro* evaluation of anthelmintic activity.

Experimental Design¹²⁻¹⁵

The anthelmintic activity was carried out as described by *Ajaiyeoba EO. et. al*, 2001, with minor modifications. The Indian earthworm (*Pheretima posthuma*) of nearly equal size, six in each group was taken for the experiment, dried extract was suspended in 1% w/v Carboxy Methyl Cellulose, prepared in normal saline water in three different conc. (25, 50, 100 mg/ml). Albendazole suspension of same conc. was taken as standard and normal saline water with 1% CMC was taken as a control. Worms were placed in petridish containing 15 ml of sample (drug) solution. Time for Vermifuge was noted either when any movement could not be observed except when the worms were shaken vigorously or when dipped in warm water (50 OC). Vermicidal was included when the worms lost their motility followed by white secretions and fading away of their body colour.

RESULTS AND DISCUSSION

Preliminary phytochemical screening of crude extract of the leaves of *Muntingia calabura* revealed the presence of tannins, steroids, flavonoids, saponin, and terpinoids Table 1.

Based the results the methanolic extract of *Muntingia calabura leaves* produce in dose dependent manner of *in-vitro* anti anthelmintic activity, the 25mg takes 36.30 minutes for paralysis and 62 minutes for death of worms, 50mg/ml takes 13.30 minutes for paralysis and 46 minutes for death of worms and 100mg/ml takes 17 minutes for paralysis and 35 minutes for death of worms. In this project we used albendazole as standard in 25mg/ml, 50mg/ml and 100mg/ml dose manner respectively and it takes 10 minutes for paralysis and 30 minutes for death of worms, 8 minutes for paralysis and 26 minutes for death of worms and 3.30 minutes for paralysis and 12 minutes for death of worms in dose of 25mg/ml, 50mg/ml and 100mg/ml respectively, results are shown in table 2.

Table 1: Preliminary Phyto-chemical screening of methanolic extract of *Muntingia calabura* Leaves

S.NO	Phytochemical tests	Methanolic extract
1	Alkaloids	–
2	Glycosides	+
3	Tannins	+
4	Phenols	+
5	Flavonoids	+
6	Saponins	–
7	Steroids	–

Where + indicates present and – indicates absent

Table 2: Anthelmintic activity of methanolic extract of *Muntingia calabura* Leaves

Group/treatment	Concentration	Time	
		Paralysis	death
Control (1% CMC)	-	-	-
Methanolic extract	25mg/ml	36.30±0.01	62±0.45
	50mg/ml	19.30±0.12	46±0.78
	100mg/ml	17±0.35	35±0.72
Albendazole	25mg/ml	10±0.65	30±0.21
	50mg/ml	8±0.39	26±0.35
	100mg/ml	3.30±0.45	12±0.36

CONCLUSION

The *Muntingia calabura* leaf extracts has showed significant anthelmintic activity at all the tested doses when compared to control as vermifuge and vermucidal while highest activity exhibited by the higher conc. (100 mg/ml) which assures the ethnomedicinal claim. Hence, we can use this herb as alternate source of anthelmintic drugs and also can isolate active chemical constituent for anthelmintic activity from extract.

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