

IN VITRO ANTHELMINTIC ACTIVITY OF *MURRAYA KOENIGII* LINN. LEAVES EXTRACTS**UMA SHANKAR SHARMA*, UMESH KUMAR SHARMA, ABHISHEK SINGH, NIRANJAN SUTAR, AND PUSPAK JYOTI SINGH**Department of Pharmacy
Sir Madanlal Group of Institution, Etawah-206001, (UP) India.**Corresponding author* us_cology@rediffmail.com**ABSTRACT**

Ethanollic and aqueous extracts from the *Murraya koenigii* leaves were investigated for their anthelmintic activity against *Pheretima posthuma*. Three concentrations (25, 50 and 100 mg/ml) of each extract were studied in activity, which involved the determination of time of paralysis and time of death of the worm. Both the extracts exhibited significant anthelmintic activity at highest concentration of 100 mg/ml. Piperazine citrate in same concentration as that of extracts was included as standard reference and distilled water as control. It was concluded from the present study that the plant revealed significant anthelmintic activity, therefore, *in vivo* trial may be conducted for further evidence for there use in livestock on scientific basis.

KEYWORDS

Murraya koenigii Linn, anthelmintic activity, *Pheretima posthuma*, leaves extracts.

INTRODUCTION

The WHO estimates that a staggering two billion people harbor parasitic worm infections. Parasitic worm also infect livestock and crops, affecting food production with a resultant economic impact. Despite this prevalence of parasitic infections, the research on anthelmintic drug is poor. As per WHO, only few drugs are frequently used in the treatment of these parasite infections¹.

The plant *Murraya koenigii* is an aromatic more or less deciduous shrub or a small tree up to 6m in height and 15-40 cm in diameter found

throughout India up to an altitude of 1,500m commonly in forests often as gregarious under-growths. The Plant *Murraya Koenigii* belongs to family Rutaceae, commonly called "Curry leaf plant" in English and locally known as "Karivepu". It is cultivated for its aromatic leaves. The plant used as Tonic, stomachic and carminative. Fresh juice of the root is taken to relieve pain associated with kidney. Leaves are used internally in dysentery, helmenthiasis and diarrhoea. The aqueous extracts of leaves, when administered parenterally to female guinea pigs, not only raised the phagocytic index but also

mobilized a greater number of leucocytes to take part in phagocytosis^{2,3}.

The plant has not been explored for its anthelmintic activity so far. The present study was therefore aimed at investigating the anthelmintic activity of the leaves extracts with a view to justifying the use of the plant in the treatment of helminths.

MATERIALS AND METHODS

1. Collection of plant materials and preparation of extracts:

The leaves of *Murraya koenigii* were collected in the month of August from the local field of Davangere, Karnataka state, India, and authenticated by Dr. Harish .K. Sharma, Ayurvedic Medical College, Davangere, Karnataka, India. A voucher specimen was submitted at Institute's herbarium department for future reference (AN 101). Dried leaves were ground to coarse powder. Powder was first defatted with pet. ether and then extracted with ethanol which is further evaporated to dryness to obtain alcoholic extract. Aqueous extract were obtained by maceration for 24 hrs.

2. Phytochemical screening:

Qualitative assay, for the presence of plant phytoconstituents such as carbohydrates, alkaloids, glycosides, flavonoids, tannins and saponins were carried out on the powdered seeds following standard procedure^{4,5}.

3. Animal:

Healthy adult Indian earthworms, *Pheretima postuma*, due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings^{6,7,8} were used in the present study. All earthworms were of approximately equal size (15 cm). They were collected from local moist place, washed and kept in water.

4. Drugs:

Piperazine citrate was purchased from GSK Pvt.Ltd. The solvents and other chemicals of analytical grade were used during experimental protocol.

ANTHELMINTIC ACTIVITY:

Ethanollic and aqueous extracts from the *Murraya koenigii* leaves were investigated for their anthelmintic activity against *Pheretima postuma*. The anthelmintic assay was carried as per the method of Ajaiyeoba *et al.*⁹ with minor modifications. Deore S.L. *et al.*¹⁰. Six groups of six earthworms were released in to 50 ml solutions of three different concentrations (25, 50 and 100 mg/ml each) of Piperazine citrate, ethanolic and aqueous extracts of *Murraya koenigii* leaves in distilled water. Observations were made for the time taken to paralysis and death of individual worms. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Death was concluded when the worms neither moved when shaken vigorously nor when dipped in warm (50°C) followed with fading away of their body colors.

RESULT AND DISCUSSION

The fruits extracts of *Murraya koenigii* displayed a significant anthelmintic activity ($p < 0.05$) in dose dependent manner as shown in Table 1. The anthelmintic activity of both the ethanolic and aqueous extracts was comparable with that of standard drug at 100mg/ml. The predominant effect of Piperazine citrate on the worm is to cause a flaccid paralysis that result in expulsion of the worm by peristalsis. Piperazine citrate by increasing chloride ion conductance of worm muscle membrane produces hyperpolarisation and reduced excitability that leads to muscle relaxation and flaccid paralysis. Both the extracts demonstrated paralysis (AE 12 min, EE 10 min) as well as death (AE 32 min, EE 29 min) of worms at a time comparable to Piperazine citrate (P 08 min and D 20 min) especially at higher concentration of 100 mg/ml. Phytochemical screening of the crude extracts revealed the presence of flavonoids and polyphenolic compound as one of the major chemical constituents. Polyphenolic compounds shown anthelmintic activity; chemically tannins are polyphenolic compounds¹¹. Some synthetic phenolic anthelmintics e.g. niclosamide, oxclozanide and bithionol are shown to interfere with energy generation in helminth parasites by uncoupling oxidative phosphorylation¹². It is

possible that tannins contained in the extracts of *Murraya koenigii* produced similar effects. Another possible anthelmintic effect of tannins is that they can bind to free protein in the

gastrointestinal tract of host animal or glycoprotein on the cuticle of the parasite and cause death¹³.

ILLUSTRATION:

Table 1.
In vitro Anthelmintic activity of *Murraya koenigii* leaves extracts.

Extracts	Concentrations mg/ml	<i>Pheretima Posthuma</i>	
		P	D
AE	25	25 ± 0.15	66 ± 0.17
	50	19 ± 0.14	49 ± 0.11
	100	12 ± 0.13	32 ± 0.10
EE	25	24 ± 0.14	63 ± 0.14
	50	17 ± 0.11	43 ± 0.10
	100	10 ± 0.07	29 ± 0.15
PC	25	21 ± 0.08	53 ± 0.13
	50	14 ± 0.10	38 ± 0.10
	100	08 ± 0.07	20 ± 0.9
Control	----	---	---

Values are mean ± S.E.M. from six observation.

*P<0.05 vs. standard group.

Where AE: Aqueous extract, EE: Ethanolic extract,

PC: Piperazine citrate

P: Time taken for Paralysis (min), D: Time taken for Death of worms (min)

CONCLUSION

It is concluded based on the findings of the present study that the *Murraya koenigii* leaves possess varying degree of anthelmintic activities. However, dose and the form in which they be used require standardization. Moreover, phytochemical studies and mechanism are also needed to lay down recommendation on scientific grounds.

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