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Anthelmintic activity of *Acorus calamus L*

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ABSTRACT

The anthelmintic activity of various extracts (Viz., chloroform, ethyl acetate and 50% aqueous-ethanol) obtained from the rhizomes of *Acorus calamus L.* was studied. All extracts except 50% aqueous-ethanol extract showed significant and dose dependent activity compared to that of the standard drug-Albendazole. Of all the extracts screened for activity against the adult Indian earth worm, chloroform extract demonstrated the best activity. Thus the present study is clearly indicative of the traditional claim and usage of the plant as a prophylactic and also for treatment of various disorders in children of neonatal age.

KEYWORDS

Acorus calamus L.;
Anthelmintic activity.

INTRODUCTION

Acorus is a genus of monocot flowering plants belonging to the family Acoraceae Common names include Calamus and Sweet Flag. It is known as *vasambu* in Tamil language.The name 'acorus' is derived from the Greek word 'acoron', a name used by Dioscorides, which in turn was derived from 'coreon', meaning 'pupil', because it was used in herbal medicine as a treatment for inflammation of the eye.The genus acorus includes as many as six species: *Acorus americanus, Acorus calamus* L., *Acorus gramineus, Acorus triqueter, Acorus latifolius, Acorus xiangyeus , of which Calamus* has been an item of trade in many cultures for thousands of years. *Calamus* has been used medicinally for a wide variety of ailments. *Acorus calamus* was often added to wine, and the root is also one of the possible ingredients of absinthe. Among the northern Native Americans, it is used both medicinally and as a stimulant; in addition, the root is thought to have been used as an entheogen among the northern Native Americans. In high doses, it is hallucinogenic; *Calamus* has been used as a "street drug alternative". The earlier reported studies on the plant *Acorus calamus* revealed the presence of anti-epileptic, inhibition of tyrosine L-DOPA oxidation in melanin synthesis, choline esterase inhitor, anti-diabetic, prevention of hyperproliferation response in kidneys, insecticidal, antispasmodic, neuroprotective, anti-stress, anti-oxidant, anti-cancer , hypolipidemic, anti- diarrheal, nematocidal, and sedative and hypnotic properties of the plant[1-15]. But there exixt a lacunae in the microbial properties of the plant. On careful literature review it was found to possess strong anti-microbial activities even among many resistant pathogens[16] and it was found to be put in traditional medicine to cure various stomach disorders and also in the treatment of diarrhea etc. Hence in the present study an attempt was made to study the anthelmintic properties of the plant *Acorus calamus*, which may through light on the minds of the researches to come out with a potent template with potent anthelmintic property.

MATERIAL

The plant specimen for the proposed study were

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TABLE 1: Anthelmintic activity of *Acorus calamus L.*

S. no	Treatment	Concentration (mg /ml)	Time taken for paralysis (secs)	Time taken for death (mins)
1.	Ethyl acetate extract	25	54.72	2.45
		50	48.82	2.24
		75	30.63	2.14
		100	28.14	1.48
2.	Chloroform extract	25	24	2.59
		50	18	2.16
		75	14.26	1.55
		100	12.59	1.40
3.	50% aqueous-ethanol extract	25	-	-
		50	-	
		75	-	
		100	8.24 (MIN)	
4.	Standard (albendazole)	25	120	4.50
		50	95	4.02
		75	65	3.38
		100	60	3.01

procured from crude drug merchant, chennai, Tamil Nadu and its authenticity was confirmed by survey of Medical plants unit, Siddha C.C.R.A.S., Govt of India, Palayamkottai, Thirunelveli-627 002, Tamil Nadu, India and PARC, Tambaram, Chennai, 600 018, India. Voucher specimen of *A. calamus L.* (N0.12008) deposited in the herbarium of the Department of Pharmacognosy, Mohamed Sathak A.J. College of Pharmacy, Sholinganallur, Chennai-119. The rhizomes were used for the study.The following micro-organisms were procured from standard laboratory maintained in the Institute of Microbiology, Madras Medical College, Chennai-600 003 and used for the study. Indian earthworm was used for the study., which was procured from the horticulture laboratory in chennai.

METHOD

Anthelmintic activity: Samples for anthelmintic activity were prepared by dissolving 2.5 gm of the various dried crude extracts in 25 ml of 1% gum acacia solution prepared in normal saline (vehicle) to obtain a stock solution of 100mg/ml. From this stock solution, different working dilutions were prepared to get a concentration range of 25, 50, 75 and 100 mg / ml.

The anthelmintic activity was evaluated on adult Indian earthworms Pheretima posthuma due to its anatomical and physiological resemblance with the intestinal round worm parasite of human being[17-19]. The activity of various crude extracts of the rhizomes of Acorus calamus was assessed by the method described by Mathew et al.[20]. Five groups of approximately equal sized Indian earth worms consisting of six numbers in each group was treated with one of the following., group I- vehicle (1% gum acacia in normal saline), group II- standard drug (Albendazole- conc.25, 50, 75 and 100 mg/ml), group III- chloroform extract (conc.25, 50, 75 and 100 mg/ml),group IV- ethyl acetate extract (conc.25, 50, 75 and 100 mg/ml) and group V- 50% aqueous-ethanol extract (conc.25, 50, 75 and 100 mg/ml). Observations were made for the time taken to paralyse / death of the individual worms. Paralysis was said to occur when the worms do not revive even in normal saline. Death was concluded when the worms are immobile followed with fading away of their body colour[21].

RESULTS AND DISCUSSION

Of all the tested extract chloroform extract presented a remarkable and potent activity than the reference standard albendazole. The extract exhibited paralysis followed by death of the worms at all tested doses. The potency of the extract was found to be dose dependent (TABLE 1). The 50% aqueous extract showed only paralysis at concentration 100 mg /ml. Thus the present study clearly enlightens the traditional folklore use of the plant as a prophylactic and for treatment of various disorders in children of neonatal age. Hence further investigation in the area of characterization and identification of template responsible for the potent activity can throw more light on the minds of the researchers to come out with a new template with potent activity.

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