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## Short-Communication

# *In-Vitro Anthelmintic Activity of Croton Bonplandianum Baill*

Hapse S.A., Pagar H.J. Suruse S.D. and Ugale S.S.

### ABSTRACT

The aim of present study was to evaluate anthelmintic activity of aqueous, ethanolic and petroleum ether extracts of leaves of *croton bonplandianum* baill using earthworms. Various concentrations i.e. 20, 40, and 60mg/ml of above mentioned extracts were tested in bioassay which involves determination of time of paralysis (P) and time of death (D) worms. Albendazole of same concentration was included as standard reference of normal saline solution as control. The results of present study indicated that the ethanolic and petroleum ether extracts of *Croton bonplandianum* shows significantly Anthelmintic activity when compared to the reference Albendazole drug. In conclusion the traditional use of leaves of plant *Croton bonplandianum* as an anthelmintic have been confirmed.

**Keywords:** Anthelmintic, *Croton – bonplandianum baill*, *Pheretima pothuma*, *Albendazole*.

**Hapse S.A., Pagar H.J.  
Suruse S.D. and Ugale S.S.**  
Department of Quality Assurance  
Technique, P.D.V.V.P.F'S College of  
Pharmacy, Vilad Ghat, M. I. D. C.  
Ahmednagar (MH), 414 111, India.

### INTRODUCTION

Anthelmintics are drugs that are used to treat infections with parasitic worms. This includes both flat worms, e.g., flukes and tapeworms and round worms, i.e., nematodes. They are of huge importance for human topical medicine and for veterinary medicine. The World Health Organization estimates that a staggering 2 billion people harbour parasitic worm infections. Parasitic worms also infect livestock and crops, affecting food production with a resultant economic impact. Also of importance is the infection of domestic pets. Indeed, the companion animal market is a major economic consideration for animal health companies undertaking drug discovery programmes (John, 2007; Evans, 2006). Despite the prevalence of parasitic worms, anthelmintic drug discovery is the poor relation of the pharmaceutical industry. The simple reason is that the nations which suffer most from these tropical diseases have little money to invest in drug discovery or therapy. It comes as no surprise therefore that the drugs available for human treatment were first developed as veterinary medicines.

**For Correspondence**  
**Hapse S.A.**  
Department of Quality Assurance  
Technique, P.D.V.V.P.F'S College of  
Pharmacy, Vilad Ghat, M. I. D. C.  
Ahmednagar (MH), 414 111, India.

There is thus a pitifully small repertoire of chemotherapeutic agents available for treatment. In some respects, this situation has been exacerbated by the remarkable success of ivermectin over the last twenty years, which has decreased motivation for anthelmintic drug discovery programmes. This prompts concern, as anthelmintic resistance has been widely reported in livestock and it may also only be a matter of time before this phenomenon occurs in parasites of humans. Anthelmintic - a medication capable of causing the evacuation of parasitic intestinal worms anthelmintic, helminthic, vermifugemedicament, medication, medicinal drug, medicine - (medicine) something that treats or prevents or alleviates the symptoms of disease (Kar, 2004).

## MATERIAL AND METHOD

### Plant Material Collection

*Croton bonplandianum* Baill. was collected from surrounding areas of M.E.S. College of pharmacy Campus.

### Preparation of Extract

Leaves were rinsed well with tap and distilled water (DW) and kept under shade still drying. Dried material coarsely powdered using mortar and pestle followed by oven dry and further reduced to powder using an electric blender and stored in air tight glass container. Leaves powder was extracted by using Petroleum ether, Ethanol and Distilled water by successive extraction method. for extraction with Pet. Ether and Ethanol, Soxhlet apparatus was used and for aqueous extraction maceration process was carried out. After completion of extraction process the solvent was evaporated by using waterbath and extract stored in well closed containers (Jabbar *et al.*, 2006).

### Preparation of Test drug and Reference drug

Samples for in vitro study were prepared, having concentration of 20mg/ml, 40mg/ml, and 60mg/ml.

Samples of aqueous extracts and standard Albendazole were prepared by dissolving 200mg,400mg, and ,600mg of each in 10ml of normal saline (0.9gm nacl in 100 ml distill water) to get samples of concentration 20mg/ml, 40mg/ml, and 60mg/ml respectively.

Samples of petroleum ether and ethanolic extracts were prepared by dissolving 200mg,400mg and of crude extract of each in 1ml of Dimethyl sulfoxide(DMSO) and then diluted upto 10ml with normal saline. All samples are labelled for identification. Normal saline was used as control.

### Anthelmintic activity

The anthelmintic activity was performed according to the method. On adult Indian earth worm *Pheretima pothuma* as it has anatomical and physiological resemblance with the intestinal round worm parasites of human beings.<sup>(3)</sup> *Pheretima pothuma* was placed in petridish containing three different concentrations (20,40,60mg/ml) each of *Croton bonplandianum* (pet. ether, ethanol, and water extract)solutions. Each petridish was placed with 6 worms and observed for paralysis (or) death. The mean time for paralysis was noted when no movement of any sort could be observed, except when the worm was shaken vigorously; the time death of worm (min) was recorded after ascertaining that worms neither moved when shaken nor when given external stimuli. In the same manner albendazole was included as reference compound. The Test results were compared with Reference compound Albendazole (20, 40, 60mg/ml) treated samples (Jeeva *et al.*, 2006; Jabbar *et al.*, 2006).

### Result and Discussion

The anthelmintic activity of *Croton bonplandianum* was proved on earthworms and it was found more potent than standard. The results from the suggested that the extract in the petroleum ether & ethanol were more effective as compared to standard drug but extract in aqueous found little less effective than standard drug.

**Table. 1:** In vitro anthelmintic activity of various extracts *Croton bonplandianum*.

Sr. No.	Treatment	Concent-ration (mg/ml)	Time for Paralysis(P) (Minute)	Time for Death (D) (Minute)
1	Petroleum ether extract	20	3.38±0.027**	5.93±0.15**
		40	1.90±0.13**	3.85±0.12**
		60	0.65±0.10**	2.00±0.09**
2	Ethanol extract	20	3.75±0.12**	5.90±0.13**
		40	2.03±0.11**	4.18±0.42**
		60	1.23±0.02**	2.93±0.12**
3	Aqueous extract	20	62.66±11.79 <sup>ns</sup>	77.33±3.27 <sup>ns</sup>
		40	37.83±2.24**	43.00±2.20**
		60	14.33±1.68**	18.00±1.26**
4	Albendazole(standared)	20	69.16±3.00	75.00±3.18
		40	48.83±1.01	53.66±1.20
		60	38.00±0.77	43.33±0.98

p>0.05, \*p<0.05, \*\*p<0.01. Values are in ± SEM, n=6, when compared with Albendazole followed by Dunntts multiple comparison test.

## CONCLUSION

The earthworms were treated with the leaves of *Croton bonplandianum* baill extracted in Petroleum ether, ethanol were found to be more effective as compared to standard drug albendazole at the same concentration. The results from the suggested that the extract in the petroleum ether & ethanol were more effective as compared to standard drug but extract in aqueous found little less effective than standard drug. Hence this study proves the traditional claim of *Croton bonplandianum* Baill as Anthelmintic drug.

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