

Short Communication

COMPARISON OF ANTHELMINTIC EFFICACY OF MARKETED FORMULATIONS OF ALBENDAZOLE: AN *IN-VITRO* INVESTIGATION

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Abstract

Background: Parasites are organism that feeds on another organism (known as a host) for its nourishment. Parasite worms are also known as helminths and cause various illnesses in the human body. Parasites are resilient and can survive in their host's body for several years due to their capability to secrete immunomodulatory products. **Objectives:** This study is intended to evaluate and compare of anthelmintic efficacy of the marketed formulations by determining of paralysis time and death time of *Pheretima posthuma* (earthworm) at different concentrations of albendazole in an in-vitro setup. **Methods:** The anthelmintic method was based on Raghavamma et al. with minor modifications. Thirteen groups, each consisting of 3 earthworms (of approximately similar size) were treated with 10ml of a formulation consisting of different concentrations of albendazole (25, 50, 100 mg/ml) and only normal saline as control. Time of paralysis and time of death was observed for each group by the slight pinprick method. **Results and Discussion:** In the study, it was observed that all the marketed albendazole exhibited a positive response to anthelmintic action. A higher concentration of the drug (100 mg/ml) produced more effective action against *Pheretima posthuma*. All anthelmintic essentially killed worms by either starving them to death or by paralyzing them.

Key words: Anthelmintic, immunomodulatory, formulation, paralysis time, death time, albendazole.

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Introduction

An organism that resides in or on another organism which is referred to as the host and also receives nourishment from the host is termed as parasite. Parasitic worms are also known as helminths. They are large macro parasites and, when turned adult, can be seen with the naked eye. They are mainly transmitted through the soil and cause infection in the Gastrointestinal tract. They feed on the host for nutrients, in turn weakening the host and causing disease in the host's body [1][2]. They are tough to a high degree and are therefore capable of dwelling in their host for several years due to their ability to manipulate the host's immune system by secreting immunomodulatory substances. An infection caused by a helminth is known as helminthiasis [3]. Different types of helminths like Roundworm, hookworm, pinworm, tapeworm, flatworm, etc., affect human beings and animals [4]. Helminthiasis transmitted via soil and schistosomiasis are the two extremely important helminthiasis and are also amongst the neglected tropical diseases [5].

Materials:

API- Albendazole

Brand and manufacturer- Noworms (Alkem), Lupibend (Lupin), Bandy (Mankind), Zental (Glaskomithe Kline)

Animal used- Earthworms (*Pheretimaposthuma*) of about 5-7 cm long were used for the anthelmintic activity.

Methods:

The anthelmintic method was based on the method of Raghavamma et al. [6]. Thirteen groups, each consisting of three earthworms of approximately similar size, were released into 10ml of the desired formulation. Each group was subjected to different concentrations of albendazole (25, 50, 100 mg/ml). Normal saline alone was used as control. The time of paralysis for each worm was recorded when no movement could be observed with a slight pinprick method. The time of death of each individual worm was noted when the worms showed no movement either by shaking vigorously or by dipping in warm water.

Result and Discussion:

On completion of the study, it was noticed that all the marketed brands of albendazole exhibited a positive action to anthelmintic action. The higher concentration of the drug (100mg/ml) produced more effective action against *Pheretimaposthuma*, and killed all the earthworms by paralyzing and starving them to death. The result of the anthelmintic activity is presented in Table 1 and graphical representation is depicted in Figure 1.

Table 1: Comparison of anthelmintic activity of different brands of albendazole

SL NO.	GROUP	OBSERVATION	CONCENTRATION(mg/ml)		
			25	50	100
1	CONTROLS	-	-	-	-
2	GROUP 1(NOWORMS)	PARALYSIS TIME	36±1	31.66±0.57	18±1
		DEATH TIME	55.66±1.52	45±2	26.33±1.52
3	GROUP 2 (LUIBEND)	PARALYSIS TIME	28.33±0.57	18.66±0.57	13±1
		DEATH TIME	35±1	24.33±1.15	17.33±0.57
4	GROUP 3 (BANDY)	PARALYSIS TIME	12.33±0.57	10.33±0.57	7.33±0.57
		DEATH TIME	17±1	15.66±0.57	13.33±1.52
5	GROUP 4 (ZENDEL)	PARALYSIS TIME	21±1	17.66±0.57	15.66±1.15
		DEATH TIME	32.66±0.57	29±1	26.66±1.52

COMPARISON OF PARALYSIS TIME AND DEATH TIME:

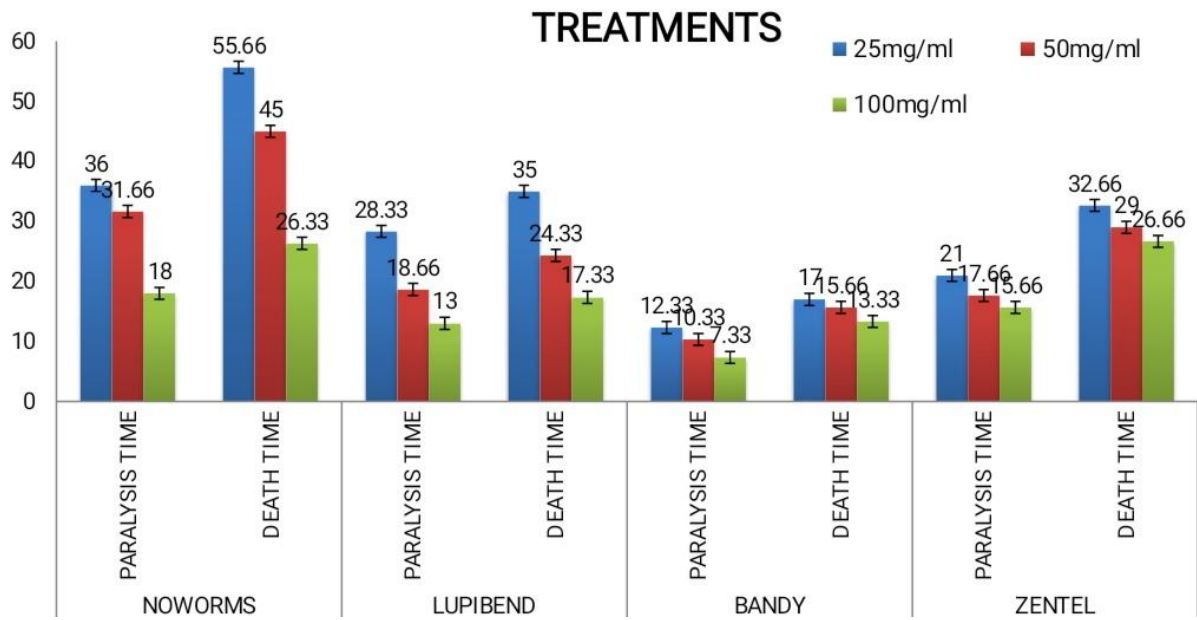


Fig 1: Graphical representation of anthelmintic activity of different brands of albendazole

Conclusion:

After performing the *in-vitro* experiment, evaluating, and comparing the results, it can be concluded that all the marketed formulations of albendazole were found to be effective against *Phretimapostuma* (earthworm). Furthermore, apart from all the formulations, Bandy® proved to be more effective. Further work may emphasize the *in-vivo* study.

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