

**ANTHELMINTIC ACTIVITY OF VIDANGADI CHURNA**

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**ABSTRACT**

Objective: The present study was done with the aim to evaluate the anthelmintic activity of Vidangadi churna. Method: The formulation containing traditionally used herbs viz., *Embelia ribes* (false black pepper fruit), *Hordeum vulgare*, *Mallotus philippinensis*, *Terminalia chebula*, was tested using adult earthworm *Pheretima posthuma* against Piperazine citrate (15 mg/ml) and albendazole (20 mg/ml) as standard references and normal saline as control. The time to achieve paralysis of the worms was determined. Result: Vidangadi churna produced a potent anthelmintic activity against the *P. posthuma* when compared with reference standards ( $p < 0.001$ ). Conclusion: This study shows Vidangadi churna has paralytic effect on Indian earthworms.

**Keywords:** Vidangadi churna, *Pheretima posthuma*, Piperazine citrate, Albendazole, Anthelmintic activity.

**INTRODUCTION**

Helminthes infections are among the most widespread infections in humans, distressing a huge population of the world. Although the majority of infections due to helminthes are generally restricted to tropical regions and cause enormous hazard to health and contribute to the prevalence of undernourishment, anemia, eosinophilia and pneumonia [1]. Parasitic diseases cause ruthless morbidity affecting principally population in endemic areas [2]. The gastro-intestinal helminthes becomes resistant to currently available anthelmintic drugs therefore there is a foremost problem in treatment of helminthes diseases [3]. Treatment with an anthelmintic drug kills worms whose genotype renders them susceptible to the drug. Worms that are resistant survive and pass on their "resistance" genes. Resistant worms accumulate and finally treatment failure occurs. Intestinal worm infections in general are more easily treated than those in other locations in the body [4]. Because the worms need not be killed by the drug and the drug need not be absorbed when given by mouth; there is usually a wider margin of safety than with drugs for worm infections in other sites. Indiscriminate use of synthetic anthelmintics can lead to resistance of parasites [5]. Food supplements like papaya (*Carica papaya*), cinnamon (*Cinnamomum camphora*, *Czeylanicum*), turmeric (*Curcuma longa*), asafoetida (*Ferula foetida*), long pepper (*Piper longum*), blackpepper (*Piper nigrum*), carrot (*Daucus carota*), saffron (*Crocus sativus*), Moringa (*Moringa pterygosperma*), bitter guard (*Momordica charantia*) and fresh juices of pine apple have anthelmintic property [6]. Hence there is an increasing demand towards natural anthelmintics and to prevent resistance.

Vidangadi churna is one of the traditional polyherbal preparations, composed of *Embelia ribes* (false black pepper fruit), *Hordeum vulgare*, *Mallotus philippinensis*, *Terminalia chebula* (fruit rind) and rock salt. *Embelia ribes* Burm F., a medicinal woody climber, belongs to the Myrsinaceae family. It is also commonly known as false black pepper or vidanga. *E. ribes* is a highly valuable medicinal plant with anthelmintic, carminative, antibacterial, antibiotic, hypoglycemic, and antifertility properties. *Embelia* species identified by *Susruta* (Father of surgery) as anthelmintic, alternative and tonic. Further Dr Harris found in ancient Arabian writing as birang-I-kabauli for remedy of tapeworm. Tribal societies identified a change in the uterine environment which inhibits the process of implantation. Modern world has been documented to possess significant anti-implantation-activity, pregnancy, & also possess anti estrogenic and weak progestational activity in rats and causes a disturbance in the hormonal levels and have a direct action on the behavioral system which act on hypothalamus and releasing factors thereby interfering

the secretion of gonadotrophins. It acts as ascaricidal, anthelmintic, carminative, diuretic, astringent, anti-inflammatory, antibacterial and febrifuge. Active principles are found to be estrogenic and weakly progestogenic. Pulp is purgative. Fresh juice is cooling, diuretic and laxative. The root acts as anti-diarrhoeal. The seeds are spermicidal, oxytoxic and diuretic. The plant is also useful and known for its blood purifying properties. Aqueous extract of the fruit shows anthelmintic against tapeworms [7]. Hence, the present study was undertaken to explore the anthelmintic activity of vidangadi churna. The present study is also aimed to establish its clinical validity.

**MATERIALS AND METHODS**

Vidangadi churna is an Ayurvedic preparation was purchased from market. Three concentrations (15mg/mL, 25 mg/mL and 50 mg/mL) of Vidangadi churna were prepared in normal saline and used for this study.

**DRUGS AND CHEMICALS**

Piperazine citrate (Noel, Mumbai) and Albendazole (Ranbaxy, New Delhi) were used as reference standards. Normal saline were used as control.

**ANTHELMINTIC INVESTIGATION**

The anthelmintic activity was evaluated in adult earthworm (*Pheretima posthuma*) due to its anatomical and physiological resemblance with the intestinal round worm parasites of human beings [8], [9], [10] using previously described procedure [11], [12]. Five groups of approximately equal sized Indian earthworms consisting of six earthworms in each group were released into 50 mL of desired solution. Each group was treated with normal saline (control), Piperazine citrate (15 mg/mL), albendazole (20 mg/mL) and vidangadi churna (15 mg/mL, 25 mg/mL and 50 mg/mL). Observations were made for the time of paralysis of individual worms. Paralysis assumed to occur when the worms did not revive even in normal saline. Observations were made for the time taken to paralyze and/or death of individual worms. Paralysis was said to occur when the worms do not revive even in normal saline. Death was concluded when the worms lost their motility, followed with fading away of their body colour [13].

**STATISTICAL ANALYSIS**

The data obtained were expressed as mean  $\pm$  SEM. Statistical analysis were performed by one way analysis of variance (ANOVA) followed

by student's test. At 95% confidence interval, p values < 0.001 were considered significant [14].

## RESULTS AND DISCUSSION

Vidangadi churna produced a potent anthelmintic activity against the *P. posthuma* when compared with reference standards ( $p < 0.001$ ). This activity was concentration dependent. The potency was found to be inversely proportional to the time (Table 1) taken for paralysis of the worms. Previous reports have noted the anticestode,

nematode activity and anthelmintic activity of *Embelia ribes* [15],[16],[17]. The possible mechanism of the anthelmintic activity of *vidangadi churna* cannot be explained on the basis of our present results. However, it may be due to its effect on inhibition of glucose uptake in the parasites and depletion of its glycogen synthesis. Vidangadi churna may also have activated nicotinic cholinergic receptor in the worms resulting in either persistent depolarization or hyperpolarisation [18].

**Table 1: Time taken for paralysis of *P. posthuma* to occur following contact with Piperazine citrate, Albendazole and Vidangadi churna**

Group	Treatment	Concentration (mg/ml)	Time of paralysis (min)
I	Normal saline	0.9% NaCl	No paralysis
II	Piperazine citrate	15	6.13±0.22
III	Albendazole	20	2.20±0.03
IV	Vidangadi churna	15	8.23±0.15
V		25	6.87±0.20
VI		50	3.54±0.06

## CONCLUSION

Vidangadi churna has paralytic effect on Indian *P.posthuma*. The product is used as an anthelmintic agent. Further the active constituent responsible for anthelmintic activity can be explored.

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