
Research Article



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EVALUATION OF ANTHELMINTIC ACTIVITY OF *EMBELIA RIBS*

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Abstract

Modern synthetic medicines are very effective in treating diseases but also suffering from certain shortcomings. Herbal drugs are less efficient with respect to treatment but are relatively having promising advantages. Since ages helminthes have been of concern to human being and animal. *Embelia ribs* has been used in ayurveda for curing various ailments. One of the major application of *Embelia ribs* is anthelmintic property. The objective of this study is to evaluate anthelmintic activity of this crude herb seeds by extracting it in ethanol and water. Extract of seeds or fruits of Significant anthelmintic effect of two the extract on live earth worms was observed in terms of the paralysis & death of the worms at different concentration. Both these extract showed significant better activity when compared to the standard drug albendazole.

Key words: *Embelia rib seeds*, Anthelmintic activity, Paralysis.

Introduction

Helminthic infection have been of concern to the medical field for centuries and the helminthes considered causing considerable problems for human being and animals majorly in tropical countries including India. Helminth include tape worm (*taenia solinum*), hookworm (*ancylostoma duodenale*), round worm (*ascaris lubriciods*)^[1]. Though many anthelmintic drugs are now a day's available for use each having their own advantages and disadvantages. The most major threatening disadvantage includes resistance to the chemical entity can be transfer from one generation of parasite to other and their high cost along with certain side effect^[2].

These factors force the search for newer anthelmintic molecules. India is rich source of medicinal plants. Since the past history of ancient ayurvedic traditional medicines numbers of medicinal plants are claimed to possess anthelmintic property and are also utilized by ethnic groups worldwide.

Embelia ribs reported to found in India, Srilanka, Singapore, Malaysia and china. Within India, it is present throughout up to an altitude of 5000 feet. Majorly in central Himalaya, Arunachal Pradesh, Assam, Maharashtra, Andhra Pradesh, Karnataka, Kerala and Tamilnadu^[3-7]. The major chemical constituents of embellica ribs are Embelin,

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Quercitol, Tannin, Christembine, Embelic acid, Resinoid, Vilangin, and potassium embedate. Parts of *embelia ribs* have been found effective as astringent, carminative, alterative, stimulant^[8-9]. It is used in ayurvedic preparation marketed as sundervati to treat *acne vulgaris*, reported to treat gastrointestinal disorders and act as liver protective agent^[10-11]. It is also known to have antibacterial, antitussive, antidiarrheal, and adaptogenic activity^[12-13]. Dried fruits of *Embelia Ribs* is also having anthelmintic activity. But not studied widely. So we are focusing mainly on this activity. Albendazole was used as the reference standard for the Anthelmintic activity. It binds to beta-tubulin of susceptible worms with high affinity and inhibit its polymerization^[14]. In vitro screening were performed on earth worm *Pheretima Posthuma* due to its anatomical and physiological resemblance with intestinal worms of human being^[15]. Exaction and Evaluation of these fruits as anthelmintic agent is detailed in this article.

Material and Methods

Plant Material and Drug

An authenticated plants fruits of *Embelia Ribs* was collected from the local ayurvedic shop in Pune. Albendazole reference standard was provided as a gift sample by Cipla Pharmaceuticals Pvt. Ltd. Analytical grade chemicals are used for extraction and phytochemical screening.

Preparation of Plant Extract

Alcoholic Extracts

The dried fruits of *Embelia Ribs* were cleaned, dried in oven at temperature 40^oc. It is powdered by a mechanical grinder and

screened through sieve no 60. Then the dried and powdered fruits of *Embelia Ribs* were extracted with 95% ethanol. The powdered fruit material 50gm was repeatedly extracted in a 250ml round bottomed flask with 200ml of 95% of ethanol. The reflux time for the solvent was 10 cycles. The extracts were cooled at room temperature^[16]

Aqueous extracts

The crude drug was taken in a macerating can. Water was added until the drug was completely immersed, so that its each part was in contact with the water. The macerating can was kept in the warm place for 1 day. Shaking of the can was done daily for 2 to 3 times. The extract obtained was filtered using filter paper. Continuous washing was done to the residue. The filtrate which was obtained was further concentrated^[17].

Preliminary Phytochemical Analysis

The crude drugs were reported for the presence of photochemical such as alkaloids, tannins, volatile oil and fats and resins^[18].

Preparation of the doses

The drug samples for the Anthelmintic activity were prepared by dissolving the dried extracts in 0.05% sodium carboxy methyl cellulose. Sodium carboxy methyl cellulose was used to suspend the extract. Required amount of extract was dissolved sufficient amount of water containing 0.05% sodium carboxy methyl cellulose finally volume was made up to 20ml with water.

Evaluation of anthelmintic activity

Anthelmintic activity of fruits of *Embelia Ribs* was studied using earth worm-*Pheretima*

Posthuma approximately 10 cm size^[19]. Albendazole was used as the reference standard for the Anthelmintic activity. The earthworms were divided into 10 groups of six in a group and placed in 10 Petri dishes containing the extract suspension or the reference drug as mentioned below.

- Group 1 - Received 0.05% carboxy methyl cellulose which served as the control.
- Group 2 – Received Albendazole at the dose of 400mg
- Group 3 – Received Albendazole at the dose of 800mg
- Group 4 – Received Albendazole at the dose of 1200mg
- Group 5 – Received Ethanol extract at the dose of 4mg/ml
- Group 6 – Received Ethanol extract at the dose of 8 mg/ml
- Group 7 – Received Ethanol extract at the dose of 12 mg/ml
- Group 8 – Received Aqueous extract at the dose of 4 mg/ml
- Group 9 – Received Aqueous extract at the dose of 8 mg/ml
- Group 10- Received Aqueous extract at the dose of 12 mg/ml

The living (or) viable worms were kept under close observation. Time taken for complete paralysis and death was recorded. Paralysis was said to occur when the worms dose not revive even in normal saline. Death was concluded when the worms lose their motility followed with fading of the body color. The mean paralysis time and mean lethal time for each sample was reported in triplicate. The worms were kept under observation for one day.

Result and Discussion

1. Percentage Yield

The percentage yield of alcoholic extract was found to be 8.9% having brownish black color. The percentage yield of aqueous extract was found to be 3% having brownish black color.

2. Phytochemical Evaluation

Ethanol and aqueous extract were subjected to preliminary phytochemical test. This study gives the presence of carbohydrates, amino acid, steroid, glycoside, flavonoids, tannins, phenolic compound. Results of these are summarized in table 1.

Table 01: Phytochemical results.

S.No	Test	Aqueous extract	Alcoholic extract
1.	Tests For Carbohydrates	(+)	(+)
	Test for Gums:	(+)	(+)
	Test for Mucilage	(-)	(+)
2.	Test For Proteins	(-)	(-)
3.	Test For Amino Acid	(+)	(+)
4.	Tests For Steroid	(-)	(+)
5.	Tests For Glycoside	(+)	(+)
	Test For Anthraquinone Glycoside	(+)	(+)
	Tests for Saponin Glycosides:	(+)	(+)
	Teste for Flavonoids:	(+)	(+)
6.	Tests For Alkaloids	(+)	(+)
7.	Tests for Tannins and Phenolic compound.	(+)	(+)

3. Evaluation of Anthelmintic Activity

The anthelmintic properties of plant may be due to the secondary metabolites present in the plant. From the experimental work it was found that 95% ethanol extract having better activity than aqueous extract. It shows about 36 minutes for paralysis and 78 minute for

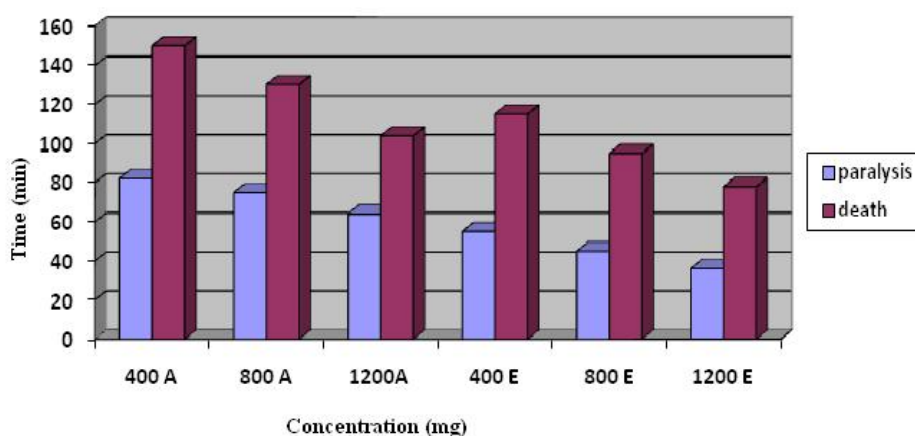
death at concentration of 12mg/ ml. Aqueous extract also shows excellent level of activity as

compare to standard drug albendazole. Results are summarized in table 2.

Table 02: Results of Anthelmintic activity of *Embelia Ribs*

S. No	Treatment	Dose	Time taken for Paralysis (in mins)	Time taken for Death (in mins)
1.	Control	-	-	-
2.	Albendazole	400mg	82 ± 0.24	150 ± 0.81
3.	Albendazole	800mg	75 ± 0.21	130 ± 0.24
4.	Albendazole	1200 mg	64 ± 0.41	104 ± 0.57
5.	95% Ethanol extract	4mg/ml	55 ± 0.31	115 ± 0.65
6.	95% Ethanol extract	8mg/ml	45 ± 0.57	95 ± 0.62
7.	95% Ethanol extract	12mg/ml	36 ± 0.43	78 ± 0.56
8.	Aqueous extract	4mg/ml	62 ± 0.61	128 ± 0.47
9.	Aqueous extract	8mg/ml	50 ± 0.73	105 ± 0.68
10.	Aqueous extract	12ml	41 ± 0.57	90 ± 0.84

Graphical representation of Fruit Extract of *Embelia Ribs*.



400A = 400mg Albendazole, 800A = 800mg Albendazole, 1200A = 1200mg Albendazole, 400E = 400mg Ethanol extract, 800E = 800mg Ethanol extract, 1200E = 1200mg Ethanol extract.

Conclusion

Thus from the result of current investigation it can be concluded that 95% of ethanolic extract and aqueous extract of seeds of *embelica ribs* having anthelmintic activity even it shows better activity as compared to the tandard albendazole drug in terms of paralysis and death time. Number of variables such as cultivation at different places, temperature, humidity, soil type, time of collection etc. affect phytoconstituents and hence may alter activity.

It is further needed to monitor the activity from fruits collected from different geographic

location and it is also needed to standardize the prepared herbal extract. Hence there is a wide scope of getting new drug for anthelmintic activity. Both these extracts show significantly better activity than reference standard. Both these extracts show significantly better activity than reference standard.

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