



ANTHELMINTIC ACTIVITY OF ETHANOLIC EXTRACTS OF *EUGENIA JAMBOLANA* LINN

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ABSTRACT

Background: Helminthes have been common cause of concern and pose many problems to human beings and animals. Many medicinal plants claimed to possess anthelmintic activity and can be effectively used against these types of disorders. *Eugenia Jambalana* plant commonly known as “Jamun” (family-Myrtaceae), was traditionally used to treat Helminthiasis.

Objective: To test Anthelmintic activity of leaves and seed ethanolic extracts of *Eugenia Jambalana*.

Materials and Methods: Indian adult earthworms (*Pheretima posthuma*) were used to study anthelmintic activity. The activity was checked in leaves and seed ethanolic extracts at three different concentration (10, 20 and 40mg/ml) and results were expressed in terms of paralysis time and death time for worms. The results were compared with standard solution, Albendazole (10, 20 and 40mg/ml). **Results:** Both the extract showed significant anthelmintic activity. The effect was dose dependant and shortest time taken for paralysis and death was observed in case of seed ethanol extract at 40 mg/ml concentration.

Conclusion: It was concluded that seeds of *Eugenia Jambalana* have potential anthelmintic activity.

Key words: Anthelmintic, *Eugenia Jambalana*, seed ethanol extract, leaves ethanol extract.

INTRODUCTION

The half of world suffering from bacterial and helminthes infection, due to poor sanitation, poor family hygiene, malnutrition, and crowded living conditions.⁽¹⁾ 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 under nourishment, anemia, eosinophilia and pneumonia.⁽²⁾ Due to discovery and development of anthelmintic physician now have effective, and in some cases, broad spectrum of agents that will cure or control most infections caused by flukes or intestinal helminthes.⁽³⁾ Development of resistance to most of the commercially available antihelminthiasis became a severe problem worldwide.⁽⁴⁾ The gastro-intestinal helminthes becomes resistant to currently available anthelmintic drugs therefore there is a foremost problem in treatment of helminthes diseases. Hence there is an increasing demand towards natural anthelmintics.⁽⁵⁾ There is lot of the organic & inorganic and antibiotics are anthelmintics drug which has some side effects such as constipation, vomiting, gastric irritation hypersensitivity, immune suppression and allergic

reaction. Therefore, there is a need to develop alternative antimicrobial drugs for the treatment of infectious diseases from medicinal plants.

Plants have provided mankind with herbal remedies for several diseases for many centuries. In India herbal medicines have been the bases of treatment and cure for various diseases in traditional methods such as Ayurveda, Unani and Sidha. *Syzygium cumin* Linn (syn. *Eugenia jambolana*) commonly known as a “Jamun” (family-Myrtaceae), is fast growing ever green tropical tree, native to India. Traditionally *Eugenia Jambalana* seed is used for treatment of diabetes, pharyngitis, spleenopathy, urethrorrhea, and ring worm infections. Leaves have been extensively used to treat many diseases like diabetes, constipation, leucorrhoea, stomachalgia, fever, gastropathy, strangury and dermopathy and to inhibit hematochezia.⁽⁶⁾ Present work was undertaken to screen anthelmintic potential of ethanolic extract of leaves and seeds of plant *Eugenia Jambalana* in adult earth worms (*Pheretima posthuma*).

MATERIALS AND METHODS:

Plant material: The seeds of *Eugenia Jambalana* were purchased from the local market of Latur. The leaves of *E. jambolana* were procured from Hasori hill region (Maharashtra) in July- August. The plant & plant material seed and leaves were identified & authenticated in Department of Botany, Dayanand Science College, Latur. And voucher herbarium a specimen was deposited in Botany department of, Dayanand Science College, Latur. The plant material was dried in sunlight, pulverized, and stored in air tight container.

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Experimental worms: ^{(7) (8) (9)(10)}

Indian adult earthworms (*Pheretima posthuma*) were used to study anthelmintic activity. They were collected from local Nursery. The earthworms were collected from moist soil and washed with normal saline to remove all fecal matter. Adult earthworms were used for all experimental protocol. The earthworm resembles both anatomically and physiologically to the intestinal roundworm parasites of human beings, hence can be used to study the anthelmintic activity

Preparation of extracts:

Leaves extract:

Leaves of *Eugenia Jambalana* were powdered and then soaked in Ethanol for 48 hrs. It was filtered through muslin cloth and filtrate was evaporated to get dry extract. It was stored in airtight container

Seed extract:

Powder of seeds was soaked in Ethanol for 48 hrs day. Then it was filtered through muslin cloth and concentrated. The extract was stored in air tight container and was used for anthelmintic activity. Preliminary phytochemical analysis was carried out to find of nature of chemical constituents present in extracts.

Phytochemical Screening

The leaves ethanol extract was tested and it revealed that the positive result of Steroids,, Phenolic compounds,, Saponins, Tannins, Glycosides and Aminoacids. Seed Ethanolic extract was tested and it revealed that the positive result of Steroids,, Carbohydrates Phenolic compounds,Flavonoids, Saponins, Tannins, Fat and oil Glyosides, Aminoacids , Fat and oil. Phytochemical screening of the extract was carried out according to the standard method .⁽¹¹⁾

Standard solution:

Albendazole (10 mg/ml 20 mg/ml & 40mg/ml) was administered as standard solution.

Test solution:

The different concentration (10, 20 and 40mg/ml) of Leaves Ethanol Extracts (LEE) and Seed Ethanol Extract of concentration (10, 20 and 40mg/ml) were also prepared. All the extracts and the standard drug solution were freshly prepared before starting the experiments

Experimental design: ⁽¹²⁾

The anthelmintic activity was carried out in 10 groups; each group consists of 6 worms and worms were released into 10 ml of desired formulations. Group 1 were the control worms placed in normal saline; Group 2-4 received Leaves ethanol extract *Eugenia Jambalana* at 10, 20 and 40mg/ml concentrations; Group 5-7 were treated with Seed Ethanol extract of various (10, 20 and 40mg/ml) concentrations. Group 9-10 serves as standard and was treated with Albendazole (10, 20 and 40mg/ml). The observations were made for the time taken for paralysis and Death of worm. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Death was concluded when the worms lost their motility followed with their body colors fading away.

RESULTS AND DISCUSSION:

In vitro Anthelmintic activity:

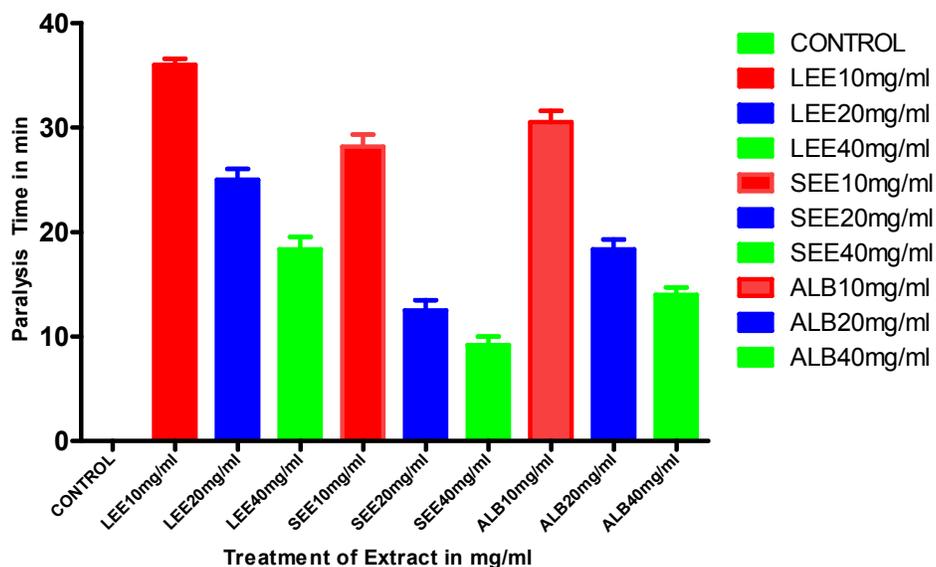
In anthelmintic assay, the leaves and seed extracts showed paralysis and death of worms. The effect was dose dependant and shortest time taken for paralysis and death was observed in case of seed ethanol extract at 40 mg/ml concentration with potent activity against Indian adult earthworms (*Pheretima posthuma*). Both the extracts showed comparable results as that of standard drug as displayed in Table 1.

Table 1: Anthelmintic Activity of Leaves and seed Extracts of *Eugenia Jambalana*

| Treatment | Concentration mg/ml | Time taken for paralysis (min) | Time taken for death (min.) |
|-------------------------|---------------------|--------------------------------|-----------------------------|
| Control (Normal Saline) | - | - | - |
| Leaves ethanol extract | 10 | 36.07±0.57 | 79.67±0.67 |
| | 20 | 25.00± 1.02 | 57.67±0.78 |
| | 40 | 18.33±1.02 | 47.50±0.76 |
| Seed ethanol extract | 10 | 28.17±1.16 | 58.67±1.03 |
| | 20 | 12.50±0.99 | 43.17±1.53 |
| | 40 | 09.86±0.83 | 30.17±1.10 |
| Albendazole | 10 | 30.50±1.08 | 77.50±1.52 |
| | 20 | 18.33±0.95 | 54.83±1.51 |
| | 40 | 14.00±0.68 | 40.00±0.57 |

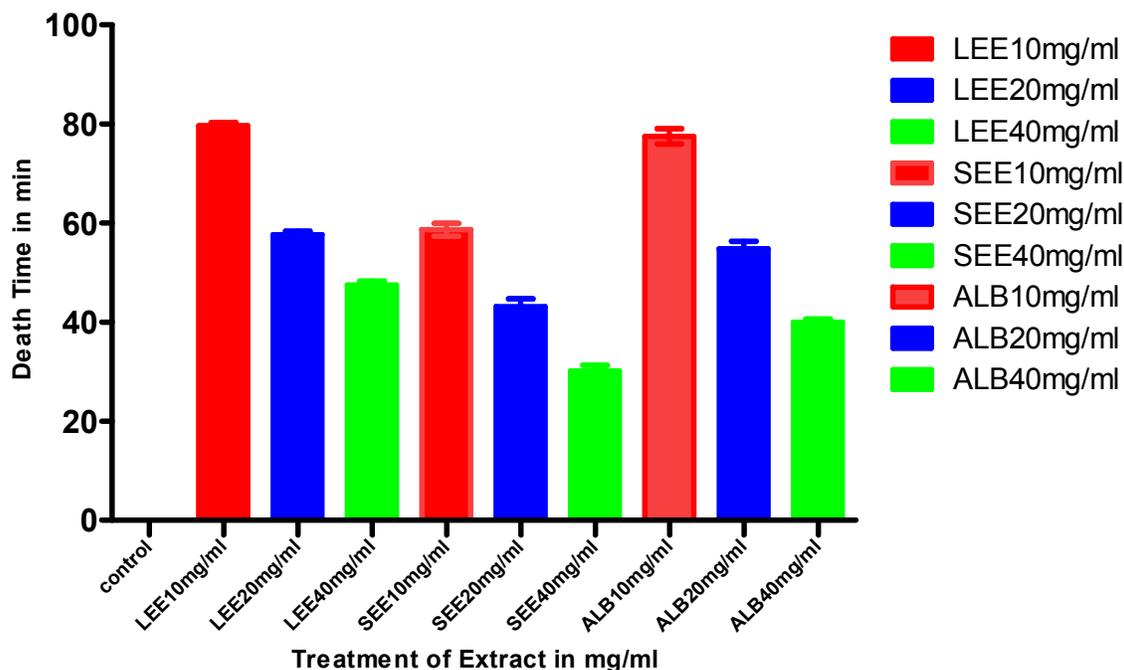
All Values represents Mean± SEM; n=6 in each group

EUGENIA (paralysis)



Graph 1: Time taken for paralysis after treatment with different extract Where LEE -Leaves Ethanol Extracts ,SEE- Seed Ethanol Extract,ALB- Albendazole. The number represents concentration

EUGENIA (Death)



Graph 2: Time taken for Dead after treatment with different extract where LEE - Leaves Ethanol Extracts ,SEE- Seed Ethanol Extract, ALB- Albendazole. The number represents concentration.

As displayed in Graph -1 and Graph -2, Ethanolic leaves and seed extract of *Eugenia Jambalana* exhibited significant anthelmintic activity in dose dependent when compared with reference standard Albendazole. Seed ethanol extract in concentration 40mg/ml was found to be paralytic and death of worm in 09.86 and 30.17 respectively which is potentially more effective as compared with leaves ethanolic extract with standard reference drug Albendazole. The seed extract required less concentration as compared to Albendazole as standard drug for anthelmintic activity. The compound constituents responsible for anthelmintic activity were not investigated, however preliminary phytochemical screening of seed ethanolic extract gave positive test for Flavonoides, phenolic compound and steroids. The role of Flavonoides, phenolic compound and steroids as anthelmintic activity.^{(13) (14)}

The activity of seed ethanol extract may be attributed due to presence of Flavonoides, phenolic compound and steroids which is reported in *Eugenia Jambalana*. The comparison between treated groups with standards was carried out using one way ANOVA test. All the results were found to be significant with P value less than 0.0001 (P < 0.0001)

CONCLUSION:

It was concluded that seeds of *Eugenia Jambalana* showed potential anthelmintic activity. Further research work is needed to isolate phytoconstituent responsible for anthelmintic activity.

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