

**DETERMINATION OF PHYTOCHEMICAL CONSTITUENTS AND ANTHELMINTHIC ACTIVITY OF ETHYL ACETATE EXTRACT OF EVOLVULUS NUMMULARIUS L****Biotechnology****Rashmi T S**

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**ABSTRACT**

*Evolvulus nummularius* L is a medicinal plant that is used in India. The plant contains many medicinal properties, such as antimicrobial, antioxidant, wound-healing, and anthelmintic properties. The phytochemical and anthelmintic properties of *E. nummularius* L is determined using ethyl acetate as the solvent. The anthelmintic activity was determined using the earthworm *Eudrilus eugeniae*, different concentrations of plant extracts such as (15,30,45 mg/ml) were prepared. Paralysis and death times of the earthworms were noted. We found that as the concentration of the extract increased, the death time decreased. A lethal dose of 45 mg/ml was found, with a death time of 6.45 minutes against the standard albendazole 20 mg/ml. Preliminary phytochemical qualitative analysis of the promising ethyl acetate extract showed the presence of alkaloids, flavonoids, saponins, phenols, tannins, and phytosterols.

**KEYWORDS***Evolvulus nummularius*, *Eudrilus eugeniae*, Anthelmintic.**INTRODUCTION**

A significant percentage of the world's population is prone to helminth infections, which are among the most common infections in humans. They are a serious threat to public health in underdeveloped nations and increase the risk of pneumonia, eosinophilia, anemia, and malnutrition. The gastrointestinal system is the primary residence of many helminths; however, some also abide in tissues or have larvae that migrate into tissues. Anthelmintics are medications that either kill or expel infesting helminths. They cause harm to the host by denying him access to food, resulting in blood loss, organ damage, intestinal or lymphatic obstruction, and secreting toxic substances. Helminthiasis is a common cause of illness but rarely results in death [1]. According to the World Health Organization, roundworm, a common parasitic worm, is responsible for 35% of infections. Worldwide, soil-transmitted helminth pollution affects more than 1.5 billion people, or 24% of the population (WHO, 2016). The investigation of anthelmintic drugs is limited despite the prevalence of parasitic diseases. Only a few drugs, according to WHO, are regularly used to treat these parasitic diseases. However, the tools we now have for managing worm illnesses are constrained to just four drugs. Ivermectin, piperazine, oxfamiquine, and albendazole were developed as helminthiasis treatments. These drugs, along with mebendazole and diethylcarbamazine, represent practically the entirety of our pharmacopeia for combating the most well-known contaminations on the globe. To treat parasite infections in humans and other animals, a variety of restorative plants have been used. Industrially accessible anthelmintics have become serious global issue around the world. Some of the medicinal plant extracts possess anthelmintic activity such as *Buchholzia coriacea*, *Gynandropsis gynandra*, *Tamarindus indica* L [2]. The present study was carried out to investigate phytochemical and anthelmintic properties of *Evolvulus nummularius* L using Ethyl acetate as solvent. *Evolvulus nummularius* L belongs to the family *Convolvulaceae*, commonly found in India and other countries, and is a creeper having round leaves and small flowers that grow adhering to the ground [3]. In traditional medicine system whole plant is used to treat diseases. *E. nummularius* L have many medicinal properties such as anthelmintic, wound healing [4], poor sedative, anticonvulsant anti-microbial, to treat hysteria and scorpion stings [5].

**MATERIALS AND METHOD**

*Evolvulus nummularius* L. is widely distributed in local areas of Shivamogga, it was collected from the campus of Sir M.V government science college Bommanakatte Bhadravathi (T) Shivamogga (D) Karnataka. The plant was authenticated by Department of botany Sir M.V government science college, Bhadravathi and website Plants of world online (POWO). The plant was harvested, shade-dried, and pulverized into a fine powder. was extracted with ethyl acetate using a Soxhlet apparatus for 72 hours. Extracts was kept in desiccators for later use after being concentrated in a rotary evaporator at a temperature below 45 degrees. A small portion of the dry extracts was subjected to the phytochemical test using M K Patil et al [6] methods to

test for alkaloids, tannins, flavonoids, saponins, glycosides, terpenoids etc.

**Performance Of The Anthelmintic Assay  
Collection And Authentication Of Earth Worm**

The earthworm *Eudrilus eugeniae* bearing 6-8cm in size was collected in the early morning from Vermicompost Pit Sir MV government science college, Bommanakatte Bhadravathi. And were authenticated by Lecture Department of Zoology, Sir MV government science college Bommanakatte Bhadravathi. As the adult earthworm *Eudrilus eugeniae* resembles human intestinal roundworm parasites anatomically and physiologically, it was used for an anthelmintic assay. Worms called *Eudrilus eugeniae* are readily available and serve as an effective model for testing anthelmintic properties.

**Anthelmintic assay**

This assay was performed as described by Kalpesh B et al. [7]. the earthworm *Eudrilus eugeniae* was placed in water to remove dust particles, then the worms were placed in 9cm petri dishes, three worms were placed in each petri dish. From the crude extract of *Evolvulus nummularius* L. 20ml concoctions with different concentration solution like 15,30,45mg/ml are prepared by dissolving the extract in distilled water. Water was used as the control and Albendazole 20mg/ml was used as the reference drug. The solution was labelled and poured to the petri dishes containing worms, a stopwatch is used, the paralysis and death time of earth worms were noted, time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously, the time for death of the worms was recorded after ascertaining that the worms did not move when shaken vigorously and placed in hot water.

**RESULTS**

Qualitative screening of the phytochemical constituents of ethyl acetate extract of *Evolvulus nummularius* L revealed the presence of Alkaloids, Carbohydrates, Cardiac glycosides, Proteins, Tannins, Phytosterols, Phenolic compounds, coumarins Table 1.

**Table-1. Phytochemical Screening Test Results**

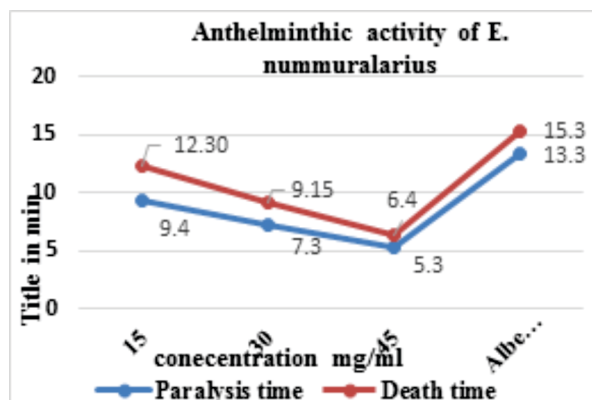
| Sl. No | phytochemical          | Name of the test        | Result |
|--------|------------------------|-------------------------|--------|
| 1      | Alkaloids              | Wagner's test           | +      |
|        |                        | Dragendorff's test      | +      |
| 2      | Carbohydrates          | Seliwanoff's test       | +      |
| 3      | Cardiac glycoside      | Bromine water test      | +      |
| 4      | Protein and amino acid | Xanthoproteic test      | +      |
| 5      | Flavonoids             | Ammonia test            | +      |
| 6      | Tannins                | Braymer's test          | +      |
| 7      | Phytosterols           | Sulphur test            | +      |
| 8      | Phenolic compounds     | Ferric chloride test    | +      |
| 9      | Antraquinones          | Boratrager's test       | +      |
| 10     | Saponins               | NaHCO <sub>3</sub> test | +      |
| 11     | Coumarins              | NaOH test               | +      |

### Anthelmintic Activity

The earthworms were tested for anthelmintic activity, and mean death and paralysis times were noted. The ethyl acetate extract of *Evolvulus nummularius* L activity at different concentration 15,30,45mg/ml took paralysis time 9.47, 7.30, 5.30 minutes and death time is 12.30, 9.15, 6.40 minutes. The standard drug albendazole (20mg/ml) showed a paralysis time of 13.30 min and death time 15.30 min. The paralysis time of earthworm was completed between 5 and 10 min and death time was completed between 10 and 13 min. We found that as the concentration increased, the death time of earthworms decreased (fig1). The test plant was found to be more effective than the standard drug. The detailed data of the assay are described in Table2.

**Table-2. Anthelmintic Activity Of Ethyl Acetate Extract Of *Evolvulus nummularius* L**

| Concentration mg/ml | Paralysis time in minutes | Death time in minutes | Standard Albendazole 20mg/ml |
|---------------------|---------------------------|-----------------------|------------------------------|
| 15                  | 9.47± 1.50                | 12.30± 1.50           | Paralysis time               |
| 30                  | 7.30± 1.50                | 9.15± 1.50            | 13.30± 1.50                  |
| 45                  | 5.30± 1.50                | 6.40± 1.50            | Death time                   |
|                     |                           |                       | 15.30± 1.50                  |



**Fig1. Graph Showing Anthelmintic Activity *Evolvulus nummularius* L**

### DISCUSSION

Medicinal plants are of great importance to the health of both individuals and communities. Phytochemical analysis of the extracts revealed the presence of constituents that are known to exhibit medicinal and physiological activities. In the present study, preliminary phytochemical analysis revealed a large amount of proteins, carbohydrates, phenols, tannins, flavonoids, saponins, glycosides, Anthraquinones, and alkaloids present in ethyl acetate extract of *E. nummularius*. Many of these phytochemicals are useful in the treatment of certain diseases, such as glycosides, which are used as anti-inflammatory agents and alkaloids to treat certain cancer disease. Helminths are more infectious now a day and generally cause symptoms of stomach pain and vomiting etc; standard drugs are available in the market such as albendazole, and the current study objective showed the presence of anthelmintic properties. It has come to know the extract showed least death time compared to standard drug. Anthelmintic activity is due to the presence of tannins, which can bind to free proteins in the gastrointestinal tract of host animals or glycoproteins on the cuticle of the parasite, thereby causing the death of worms. These assays show effective results for tested organisms, and it is interesting to identify the active principle responsible for the anthelmintic activity and to study its further pharmacological action.

### CONCLUSION

*Evolvulus nummularius* has been utilized as an herbal medicine for a very long time. Many studies have been conducted on this plant, but many claims are inspired and based on traditional evidence instead of scientific studies. The potentiality embedded inside this plant by nature is surprising; however, exact and accurate combinations are needed for the correct detection of the plant and its full utilization. Anthelmintic and antibacterial properties are present in the plant, and the effect is mainly due to phytochemicals, such as like alkaloids, tannins, and flavonoids, revealing the importance of medicinal herbs and their usage. The test plant *Evolvulus nummularius* has many pharmacological effects. Identifying the key component beneath the anthelmintic activity and investigating its other pharmacological

effects would be intriguing.

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