

## EVALUATION OF *HYOPHILA INVOLUTA* (HOOK.) A. JAEGER AQUEOUS EXTRACT FOR ANTHELMINTIC ACTIVITY

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### ABSTRACT

Bryophytes are a common sight in and around the world. Being small and relatively common, bryophytes are often over looked and understated. The present study aims at exploring one such kind - *Hyophila involuta* (Hook.) A. Jaeger for its anthelmintic property. Anthelmintic activity of *Hyophila involuta* (Hook.) A. Jaeger aqueous extract was evaluated using Indian earthworms *Phertima posthuma* at 10mg/ml, 20mg/ml, 30mg/ml, 40mg/ml and 50mg/ml, using piperazine citrate as standard. A negative control group was maintained using normal saline. The time taken for paralysis and death was calculated for all the groups. *Hyophila involuta* (Hook.) A. Jaeger aqueous extract exhibited significant anthelmintic activity as compared to the negative

control group. However, the anthelmintic property of the extract was found to be less than that of the standard drug piperazine citrate.

**KEY WORDS:** Bryophytes, *Hyophila involuta*, *Phertima posthuma* and anthelmintic.

### 1.0 INTRODUCTION

Bryophytes are the simplest non-vascular land plants with undifferentiated plant. They are more advanced than aquatic algae. They are generally believed to have evolved from algae. They are commonly called as "non vascular plants" because they do not have true vascular tissue and are therefore called "non-vascular plants".<sup>[1]</sup> They usually grows on tree bases, trunks, branches, twigs, or leaves, or on fallen logs as dense patches usually in a undisturbed forest.<sup>[2]</sup> *Hyophila involuta* (Hook.) A. Jaeger (Pottiaceae) is tiny bryophytes, which are loose or dense, with dark greenish to red brown or blackish in colour. They are found to be erect, simple or branched; with long shoots.<sup>[3]</sup>

As per World Health Organization (WHO) estimates there are about 2 billion people harbor of parasitic worm infections. These parasitic worms also infect livestock and crops. According to the WHO, only a few drugs are used in treatment of helminthes in humans. Anthelmintic drug from herbal sources will play an important role for these kinds of parasitic infections.<sup>[4]</sup> In the current study, an attempt has been made to evaluate the anthelmintic potential of the commonly available bryophyte of Malabar region(Kerala) *Hyophila involuta* (Hook.) A. Jaeger.

## 2.0 MATERIALS AND METHODS

**2.1 Plant Material Collection:** *Hyophila involuta* (Hook.) A. Jaeger bryophytes were collected from the Malabar region of Kerala and the same was authenticated by Mrs. Manju.K.Nair, Asst. Proffessor, Guruvayoorappan college of Arts and Science, Calicut.

**2.2 Preparation of extract:** The collected plant materials were made completely free of soil by thorough washings and it is dried. The dried materials were extracted using water by cold maceration technique and it is dissolved in water prior to the use of study.

**2.3 Animals:** *Pheretima posthuma* (Indian Earthworms) resembles in anatomical and physiological aspects as that of human intestinal roundworm parasite.<sup>[5-7]</sup> The healthy adult earthworms were collected from soil, washed and sorted out based on their size and length and used for the study.

## 2.4 Anthelmintic studies

Earthworms of uniform size and length ranging between 3-5cm in length and 0.1-.2cm width were selected for the study. 11 groups of 6 earthworms each were released into 10ml of desired solutions. Group I, serves as a negative control and contain normal saline. Group II to VI were treated *Hyophila involuta* (Hook.) A. Jaeger aqueous extract of 10mg/ml, 20mg/ml, 30mg/ml, 40mg/ml and 50mg/ml respectively. Group VII to XI were treated with piperazine citrate of 10mg/ml, 20mg/ml, 30mg/ml, 40mg/ml and 50mg/ml respectively. The earthworms were kept under observation for the time taken by them to paralyze and the death of the individual worm up to 5hrs of test period. Paralysis of the worms were confirmed when they did not revive in normal saline and death was concluded by losing up of their motility followed by fading away of their body colours.<sup>[8&9]</sup>

## 2.5 Statistical Analysis

Statistical analysis was performed by one way ANOVA and the results were expressed as mean $\pm$  S.E.M for 6 earthworms in each group.  $P<0.05$  was considered as significant.

## 3.0 RESULTS AND DISCUSSIONS

**Table: 01 Anthelmintic activity of *Hyophila involuta* (Hook.) A. Jaeger and Piperazine citrate**

Group	Treatment	Dose	Time taken for Paralysis in min	Time taken for Death in min
I	Control	-	-	-
II	<i>Hyophila involuta</i> aqueous extract	10mg/ml	294.5 $\pm$ 1.6199***	>300min
III		20mg/ml	220.1 $\pm$ 2.5034***	254 $\pm$ 3.2642***
IV		30mg/ml	140.4 $\pm$ 2.7625***	156 $\pm$ 1.5978***
V		40mg/ml	125.6 $\pm$ 1.4612***	132 $\pm$ 0.8627***
VI		50mg/ml	075.4 $\pm$ 0.5062***	081 $\pm$ 1.3458***
VII	Piperazine citrate	10mg/ml	85.6 $\pm$ 0.5099***	104.8 $\pm$ 0.3742***
VIII		20mg/ml	32.4 $\pm$ 0.5099***	047.4 $\pm$ 0.4000***
IX		30mg/ml	16.4 $\pm$ 0.5085***	026.6 $\pm$ 0.7483***
X		40mg/ml	10.1 $\pm$ 0.7071***	020.4 $\pm$ 0.5099***
XI		50mg/ml	05.6 $\pm$ 0.2449***	008.2 $\pm$ 0.3742***

All the values are expressed in mean $\pm$ SEM and compared to control group. \*\*\* $p<0.001$   
ns=Non significant, n=6

Helminthiasis is a common condition prevailing in most part of the world due to worm infestation. This condition mostly prevails due to the lack of adequate sanitary facilities and supply of pure water associated with poverty and illiteracy.<sup>[10]</sup> Helminthiasis is prevalent globally in 1/3 of population but most common in a developing country like India. In India, helminthiasis is a common problem largely seen in rural areas and to some extent in urban regions also. Anthelmintics are the drugs which expel the parasitic worms(helminths) from the body by either stunning or killing them. But the major drawback associated with this anthelmintic is that, most of the gastrointestinal helminthes are become resistant to the currently available drugs.<sup>[11]</sup> Moreover, these drugs are also at high cost.<sup>[12]</sup> These factors contributed the way for trying out novel anthelmintic agent from herbal resources. Bryophytes are a common sight in and around the world. Being small and relatively common bryophytes are often over looked and understated. In the present study an attempt had been made to evaluate anthelmintic potential of *Hyophila involuta* (Hook.) A. Jaeger. Preliminary phytochemical studies on *Hyophila involuta* (Hook.) A. Jaeger revealed that the extract contains trace levels of carbohydrates, flavonoids and proteins. Aqueous extract of *Hyophila*

*involuta* (Hook.) A. Jaeger was evaluated for its anthelmintic property using Indian earthworm *Pheretima posthuma* at 5 different concentrations 10mg/ml, 20mg/ml, 30mg/ml, 40mg/ml and 50mg/ml against the standard drug piperazine citrate at the same doses of treatment. The study clearly depicts that the bryophyte- *Hyophila involuta* (Hook.) A. Jaeger possess significant anthelmintic property as compared to the negative control group. The results were comparable to that of the standard drug.

#### 4.0 CONCLUSIONS

Bryophytes are a common sight in and around the world. In the present study an attempt had been made to evaluate anthelmintic potential of *Hyophila involuta* (Hook.) A. Jaeger aqueous extract at 10mg/ml, 20mg/ml, 30mg/ml, 40mg/ml and 50mg/ml against the standard drug piperazine citrate. The study concludes that the bryophyte- *Hyophila involuta* (Hook.) A. Jaeger aqueous extract possess significant anthelmintic property as compared to the negative control group. However, the results were not highly significant as that of the standard drug piperazine citrate to formulate *Hyophila involuta* (Hook.) A. Jaeger aqueous extract as novel drug of choice for anthelmintic properties.

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