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Research Article

ANTHELMINTIC POTENTIAL OF *ECLIPTA ALBA* (L.) HASSK AGAINST *PHERETIMA POSTHUMA*

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ABSTRACT

Present study was carried out to investigate the anthelmintic potential of methanolic extract of whole plant of *Eclipta alba* (L.) Hassk against *Pheretima posthuma* as a species of earthworm. Various concentrations (25-100 mg/ml) of methanolic extract were evaluated for anthelmintic activity by recording the time required for paralysis and death of worms. Albendazole was used as standard. Result indicates that methanol extract significantly (p<0.01) exhibited paralysis at lower doses of 50, 75 and 100 mg/ml and causes death of worms at doses of concentrations 75 and 100 mg/ml when compared with standard. Further studies are under progress to confirm the possible chemical constituents responsible for activity.

Keywords: Anthelmintic activity, *Eclipta alba*, Albendazole, *Pheretima posthuma*

INTRODUCTION

Eclipta alba (L.) Hassk. is annual, erect or prostrate, branched, more or less strigose with appressed white hairs. In Ayurveda plant is used as alternative, good for the complexion, hair, eyes, teeth; cures inflammations, hernias, bronchitis, asthma, leucoderma, diseases of skin, heart, itching and night-blindness. It is principally used as a tonic and deobstruent in hepatic and splenic enlargements and in various chronic skin diseases[1].

The chemical composition of *Eclipta alba* contains coumestan derivatives such as wedelolactone (1.6%) and demethyl wedelolactone[2]. Alcoholic extract of the plant is known to show protective effect on experimental liver damage in rats and mice[3]. Recent studies showed that, *E. alba* has nootropic activity[4]. Studies revealed the antihepatitis B virus properties of *E.alba*[5]. Preliminary studies revealed the immunomodulatory activity of methanolic extract of *E. alba*[6]. The plant has been reported to possess antinociceptive, anti-inflammatorry and bronchodialator activites due to coumarin compounds[7]. The plant is reported to possess antihyperglycemic activity[8]. *E. alba* was also tested for its hair growth promoting activity[9].

MATERIALS AND METHODS

Plant material

The whole plant of *Eclipta alba* (L.) Hassk was collected from the local areas of Ahmednagar district, Maharashtra. The herbarium of this plant was identified and authenticated and specimen was deposited in herbarium of Botanical Survey of India, Pune under reference no. SUPE1.

Preparation of extract

Fresh whole plant of *E. alba* was collected and air dried in shade at room temperature. The powdered plant material was extracted with methanol by maceration for 72 hours. The extract was dried at low temperature under reduced pressure.

Worm collection and authentication

Indian adult earthworms (*Pheretima posthuma*) were collected from moist soil of the vermiculture plant, Sangamner Bhag Sahakari Sakhar Karkhana limited Sangamner, District Ahmednagar, Maharashtra and authenticated from the Department of Zoology, B. G. P. Sahyadri College, Sangamner. Then all collected worms were washed with normal saline to remove all the faecal matter and used for the anthelmintic study. The earthworms of 3-5 cm in length and 0.1-0.2 cm in width were used for all the experimental protocol.

Sample preparation

Test sample for in vitro study were prepared by dissolving and suspending 2.5 gm of methanol extract in minimum amount of DMF and the volume was adjusted to 25 ml with normal saline to obtain a stock solution of concentration of 100 mg/ml. from this stock solution different dilutions were made to get concentration range of 25, 50, 75 and 100 mg/ml.

Anthelmintic activity

The anthelmintic activity was performed according to the method of Ghosh et al.[10] on adult Indian earthworm *Pheritima posthuma* as it has anatomical and physiological resemblance with the intestinal roundworm parasites of human beings[11, 12]. *Pheritima posthuma* worms are easily available and used as suitable model for screening anthelmintic drugs[13]. In the 50 ml of formulations containing four different concentration of methanol extract (25, 50, 75 and 100 mg/ml in normal saline) and standard (20 mg/ml) were prepared and approximately equal sized six earthworms were released in each group. Observations were made for the time taken to paralyse 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 lose their motility followed with fading away of their body color. Albendazole (20 mg/ml) was used as standard while normal saline as control.

Table 1: Anthelmintic activity of methanolic extract of *Eclipta alba*

Test Substance	Concentration (mg/ml)	Time taken for paralysis (min)	Time taken for Death (min)
Vehicle	-	-	-
Albendazole (Std.)	20	13.27±0.23	18.27±0.18
Methanolic extract	25	53.8±0.39*	78.09±0.26**
	50	32.53±0.98**	49.74±0.31**
	75	18.15±0.43**	28.13±0.46**
	100	9.55±0.15**	16.66±0.32**

Values are expressed as MEAN±SEM, One way ANOVA followed by Dunnett's test. n=6 in each group. *P<0.05, **P<0.01.

RESULTS AND DISCUSSIONS

Experimental data showed that, the methanol extract of whole plant of *E. alba* has showed anthelmintic activity in dose dependent manner as shown in Table 1. The shortest time required for paralysis and death was observed with concentration of 100 mg/ml. Higher concentration of methanol extract showed maximum effect as 9.55±0.15 min paralysis time and 16.66±0.32 min death time. Standard Albendazole showed the paralysis at 13.27±0.23 min and death at 18.27±0.18 min after release of worms in it.

Albendazol by increaasing chloride ion conductance of worms muscle membrane produced hyperpolarization and reduced excitability that which led to muscle relaxation and flaccid paralysis[14]. The whole plant extract of *E. alba* not only showed paralysis but also caused death of worms at concentration of 50, 75 and 100 mg/ml.

CONCLUSION

The present study has shown that, the methanolic extract of *E. alba* whole plant have been confirmed to display anthelmintic activity. Further studies are in progress to identify the possible chemical constituents responsible for anthelmintic potential.

REFERENCES

1. Kirtikar KR, Basu BD. Indian Medicinal Plants, Vol. II. Deharadun (India): International book distributors; 1999.
2. Indian Herbal Pharmacopoeia. Vol. I. Jammu-Tavi: A Joint publication of regional lab; 1998.
3. Singh B, Saxena K, Chandan B, Agarwal S, Bhatia MS, Anand KK. Hepatoprotective effect of ethanolic extract of *Eclipta alba* on experimental liver damage. Phytother Res 1993; 7: 154-158.
4. Thakur VD, Mengi SA. Neuropharmacological profile of *Eclipta alba* (Linn) Hassk. J Ethanopharmacol 2005; 102: 23-31.
5. Jayaram S, Thyagrajan S, Panchanadam M, Subramanian S. Antihepatitis B virus properties of *Phyllanthus niruri* Linn and *Eclipta alba* Hassk, in vitro and in vivo safety studies. Bio-Medicine 1987; 7: 9-16.
6. Jayatirtha MG, Mishra SH. Preliminary immunomodulatory activities of methanolic extracts of *Eclipta alba* and *Centella asiatica*. Phytomedicine 2004; 11: 361-365.
7. Leal LK, Ferreira AA, Bezerra GA, Matos FJ, Viana GS. Antinociceptive, anti-inflammatory and Bronchodilator activities of Brazillian medicinal plants containing coumarin, a comparative study. J Ethnopharmacol 2000; 2: 51-59.
8. Ananthi J, Prakasam A, Pugalendi KV. Antihyperglycemic activity of *Eclipta alba* leaf on alloxan-induced diabetic rats. Yale J Biol Med 2003; 76: 97-102.
9. Roy RK, Thakur M, Dixit VK. Hair growth promoting activity of *Eclipta alba* in male albino rats. Arch Dermatol Res 2008; 300: 357-364.
10. Ghosh T, Maity TK, Bose A, Dash GK. Anthelmintic activity of *Bacopa monierri*. Indian J Nat Product 2005; 21: 16-19.
11. Girme AS, Bhalke RD, Ghogare PB, Tambe VD, Jadhav RS, Nirmal SA. Comparative *In vitro* Anthelmintic Activity of *Mentha piperita* and *Lantana camara* from Western India. *Dhaka* Univ J Pharm Sci 2006; 5: 5-7.
12. Tambe VD, Nirmal SA, Jadhav RS, Ghogare PB, Bhalke RD, Girme AS, Bhamber RS. Anthelmintic activity of *Wedelia trilobata* leaves. Ind J Nat Prod 22: 27- 29.
13. Dash GK, Sursh P, Sahu SK, Kar DM, Ganpaty S, Panda SB. Evaluation of *Evolvulus alsinoids* Linn. for anthelmintic and antimicrobial activities. J Nat Rem 2002; 2: 182-85.
14. Mali RG, Mahajan S, Patil KS. Anthelmintic activity of root bark of *Capparis spinosa*. Indian J Nat Prod 2005; 21: 50-51.