

EFFECT OF AQUEOUS EXTRACT OF *Ipomoea staphylina* ON INDIAN EARTHWORM

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ABSTRACT

Objective: Aqueous extract from the leaves of *Ipomoea staphylina* was investigated for its anthelmintic activity against *Perionyx excavatus*.

Methods: Three concentrations (25, 50, 100 mg/ml) of extract were studied in activity, which involved the determination of time of paralysis and time of death of the worms. Piperazine citrate was included as standard reference and normal saline as control. Results: The extract exhibited no anthelmintic activity at all three concentrations.

Conclusion: Further study is required on the different solvent extract to evaluate if there is any anthelmintic activity.

Keywords: *Ipomoea staphylina*, anthelmintic, *Perionyx excavatus* and Piperazine citrate.

INTRODUCTION

Among the most widespread of all chronic infection are those caused by various species of parasitic helminths (worms). Inhabitants of tropical or subtropical, low income countries are most at risk; children often become infected with one or more species almost as soon as they are born and may remain infected throughout their lives. In some cases these infection results mainly in discomforts and does not because substantial ill health, but others such as schistosomiasis and hookworm disease, can produce very serious morbidity. Worm infestations are also a major cause for concern in veterinary medicine, affecting domestic pets form animals. [1-2]

Worm infestations are more common in the developing countries; it is seen in people with poor hygiene. Anthelmintics has two properties either vermifuge which kill the worm or vermicide which promotes expulsion of worms. [3-4] There are so many types of worms like pinworms, hookworms, roundworms, tapeworms and liver flukes etc. A person may infect with a worm either eating contaminated food, or drinking contaminated water. [5] Most substances that are toxic to earthworms produce a primary irritation or agitation, which results in the withdrawal of the worm from the neighbourhood of the poison. This is observed with santonin, but is no more marked with this than with other anthelmintics. [6] Please note that many of these pharmaceuticals are extremely toxic. Taken in improper dosages they can be dangerous to humans as well as lethal to parasites. [7] Anthelmintics are poisonous in nature and, in improper dosages, dangerous to humans. Even most common drug like piperazine salts have been shown to have side effects like nausea, intestinal disturbances & giddiness [8]. Resistant of parasites to existing drugs & their high cost warrants the search for newer anthelmintic molecule. Hence there is an increasing demand towards natural anthelmintics.

The present study was done with the aim to investigate the anthelmintic activity of natural drugs such as *Ipomoea staphylina*. In this experiment we performed the *in vitro* study of anthelmintic activity of natural drug and compared with the standard drug piperazine citrate. [9]

MATERIAL AND METHODS**Plant Material**

Leaves of *Ipomoea staphylina* were collected from forest area of Karnataka near to Bangalore. The *Ipomoea staphylina* plant taxonomically identified and authenticated by Dr. K. Karthigeyan at Central National Herbarium, Botanical Garden, Howrah, where the voucher specimen is conserved under the reference number SMF-01.

The leaves of *Ipomoea staphylina* were cleaned and dried under shade at room temperature for several days and powdered. The powder was defatted with petroleum ether (60-80 GR) for 72 h.

Extraction Method

The powder material of crude drug was subject to soxhlet extraction with distilled water. The extracts were concentrated with the help of water bath and made suitable semi solid mass for further studies. These extracted semisolid mass further diluted with distilled water to produce 25, 50 and 100 mg/ml concentration.

Drug and chemicals

Piperazine citrate purchased from commercial sources and all other chemicals were of

analytical grade.

Worm Collection and Authentication

All the experiments were carried out in Indian adult earthworms (*Perionyx excavatus*) collected from moist soil and pond area of Howrah, West Bengal, India and washed with normal saline to remove all fecal matter were used for anthelmintic activity [10] due to its anatomical and physiological resemblance with the intestinal roundworm parasite *Ascaris lumbricoides*, of human beings. [11] The collected earth worms were authenticated by Zoological Survey of India. Because of easy availability, earthworms have been used widely for the initial evaluation of anthelmintic compounds *in vitro*. [12, 13]

Evaluation of Anthelmintic activity

Anthelmintic activity of *Ipomoea staphylina* was evaluated by exposing the adult *Perionyx excavatus* to the aqueous extract of *Ipomoea staphylina*. For extract, three petri dishes were used i.e. two for extracts to be tested and one for normal as control. Observations were made on the basis of motility/survival of worms. The anthelmintic activity was performed according to the method of Ghosh et al. [14] on adult Indian earthworm *Perionyx excavatus* it has anatomical and physiological resemblance with the intestinal roundworm parasites of human beings. Five groups of approximately equal sized Indian earthworms consisting of six earthworms in each group. Group III, IV AND V were released into 50 ml each extract of three concentrations 25 mg/ml, 50 mg/ml and 100 mg/ml respectively prepared in distilled water. These three concentration (25, 50 and 100 mg/ml) of each extracts studies for anthelmintic activity. First group were prepared as control i.e.

Piperazine citrate in concentration of 15 mg/ml has been used as standard reference. Observations were made on the basis of time taken for paralysis and death of individual worm. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Death was confirmed when the worms lost their motility followed by fading away of their body colours. Observations were made for the time taken to paralyze or death of individual worm. Death was confirmed when the worms lose their motility followed by fading away of their body colours.

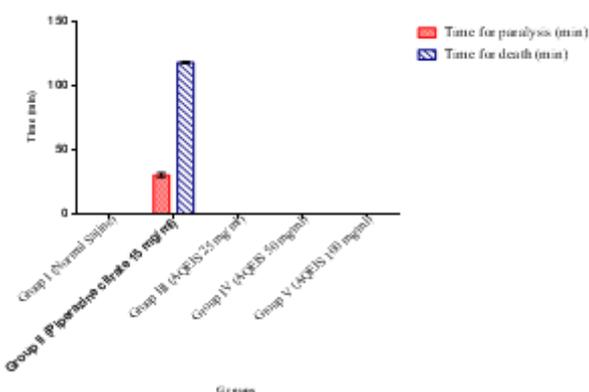
RESULTS AND DISCUSSION

From the observation made in table 1 the piperazine citrate in concentration of 15 mg/ml

showed paralysis at 30.333±1.726 mints and death of 118.67±0.9545 mints. The aqueous extract of *Ipomoea staphylina* does not showed any paralysis or death of the earth worm at the concentration of (25, 50 and 100 mg/ml). Earth worm treated with the extract of (25, 50 and 100 mg/ml) concentration and observed for 3 hours within which no paralysis or decrease in their motility or fading of their body colour observed. Results are shown in figure 1 & table 1.

Piperazine citrate shown significant paralysis and the action is mediatory by its agonistic effect upon the inhibitory GABA (γ-aminobutyric acid) receptor, which decreases the excitability that leads to muscle relaxation and flaccid paralysis.

Figure 1: Showing the anthelmintic activity of aqueous extract of *Ipomoea staphylina*.



All the values are expressed as mean±SEM, n=6, ***p<0.001 (One way Analysis of Variance [ANOVA] followed by multiple comparison Dunnett's test) as compared to standard group. AQEIS = Aqueous extract of *Ipomoea staphylina*

Table: Effect of aqueous extract of *Ipomoea staphylina* on Indian earthworm.

| Treatment | Group | Concentration (mg/ml) | Time of paralysis (min) (Mean±S.E.M) | Time of death (min) (Mean±S.E.M) |
|--|-------|-----------------------|--------------------------------------|----------------------------------|
| Normal Saline (Control) | I | - | - | - |
| Piperszine citrate | II | 15 | 30.333±1.726* ** | 118.67±0.9545*** |
| Aqueous extract of <i>Ipomoea staphylina</i> | III | 25 | - | - |
| | IV | 50 | - | - |

| <i>Ipomoea staphylina</i> | V | 100 | - | - |
|---|---|-----|---|---|
| Aqueous extract of <i>Ipomoea staphylina</i> | | | | |

All values represent mean ± SEM; n=6 in each group. This activity was Concentration dependent. ***p<0.001

Figure 2: Showing the anthelmintic activity of piperazine citrate.



CONCLUSION

From the result it concludes that water extract of *Ipomoea staphylina* does not possess any anthelmintic activities. Further study is required on the different solvent extract to evaluate if there is any anthelmintic activity.

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