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HELMINTHOLYTIC ACTIVITY OF *SOLANUM VERBASCIFOLIUM*

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ABSTRACT

In the present study an endeavour has been made to compare the helmintholytic potential of various extract of *Solanum verbascifolium* with Albendazole against *Eisenia fetida*. Aqueous extract of *Solanum verbascifolium* was used as test solution. Albendazole was used as allopathic standard. Normal saline served as a control. Study involved the determination of time of paralysis as well as time for death of worms. The results revealed that methanolic extract of *Solanum verbascifolium* have significant anthelmintic activity in 50 mg/ml concentration.

INTRODUCTION

Natural medicines including plants, animals and minerals have been the basis of treatment of human diseases. In the early part of the century, plants were a vital source of raw material of medicines. Greek physician Galen (129-200 A.D) devised the first Pharmacopoeia describing the appearance, properties and use of many plants of his time. The current accepted Modern Medicine or allopathy has gradually developed over the years of scientific and observational works of scientists, however, the basis of its development remains in the roots of traditional medicines and therapies. At the moment scientific research into medicinal plants is continuing most intensely than ever in many research institutes, Universities and pharmaceutical laboratories as well as in the clinics of many developed countries. According to many experts we may look into these Plants in the future to treat the constantly spreading diseases of civilization.

All parts *Solanum verbascifolium* are traditionally used in the treatment of variety of diseases and disorders. The fruit and seeds are edible. The literature review reveals that, different parts of plant being useful in variety of ailments. Flowers are used as astringent, emetic, analgesic, anti-inflammatory, diuretic. It is often used in treatment of psoriasis. So present study was designed to validate the anthelmintic claim. The plant was collected, authenticated and extracted in aqueous solvent. The aqueous extract was subjected to phytochemical tests to identify the phytoconstituents.

PLANT PROFILE

Solanum verbascifolium

Family- Solanaceae.

No significant data is available in the existing literature about *Solanum verbascifolium*, Solanaceae. Hence, we are trying to explore details of the plant including the pharmacognostic studies and helmintholytic activity for the first time.

EXPERIMENTAL WORK

MATERIALS AND METHODS

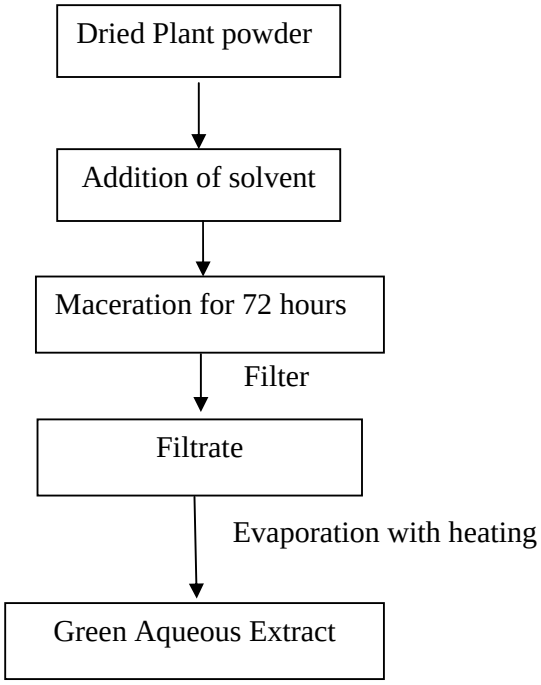
Collection and Authentication of *Solanum verbascifolium*

The leaves of *Solanum verbascifolium* were collected from MIDC region of Satara, the collected plant was authenticated by Head, Department of Botany, Y.C. Institute of Science, Satara.

Extraction of Plant Sample

The fresh leaves were washed with tap water 3 to 4 time, cleaned, cut in small strips and shade dried for several day, powered (200g) with the help of electric grinder. The powder was extracted by maceration process using water as solvent to obtain the aqueous extract. Soxhlation method was utilised for Pet ether, Chloroform and Methanol extraction.

Schematic diagram of successive extraction procedure for selected plant



PHARMACOGNOSTIC STUDY OF *SOLANUM VERBASCIFOLIUM*

The plant extract was subjected to pharmacognostic studies for the detection of various plant parameters. It includes powder mixture, ash value, extractive values, loss on drying etc.

ANTHELMINTIC ACTIVITY OF EXTRACTS OF *SOLANUM VERBASCIFOLIUM*

Preparation of Test Suspension:

Different extracts of *Solanum verbascifolium* were suspended in normal saline as a vehicle and used for anthelmintic evaluation and the suspensions were made up of 50 mg/ml in normal saline.

Preparation of Drug Solution:

For positive control, an Albendazole suspension was used. The selected Albendazole suspension was a marketed formulation i.e. ABZ suspension, Indoco Pvt. Ltd. 20 mg/ml concentration was prepared.

Chemicals:

Drug: Albendazole : ABZ suspension, Indoco Pvt. Ltd

Testing sample : Various extracts of plant *Solanum verbascifolium*

Vehicle : Normal saline

Grouping of animals:

The experimental design of the investigation was carried out in six groups with six worms in each group and carried out in the following regimes.

Group I

Served on solvent control, which received only normal saline.

Group II

Received anthelmintic drug (Albendazole 20 mg/ml) in normal saline.

Group III

Suspended in test solution Pet ether extract at concentration 50 mg/ml in normal saline.

Group IV

Suspended in test solution Chloroform extract at concentration 50 mg/ml in normal saline.

Group V

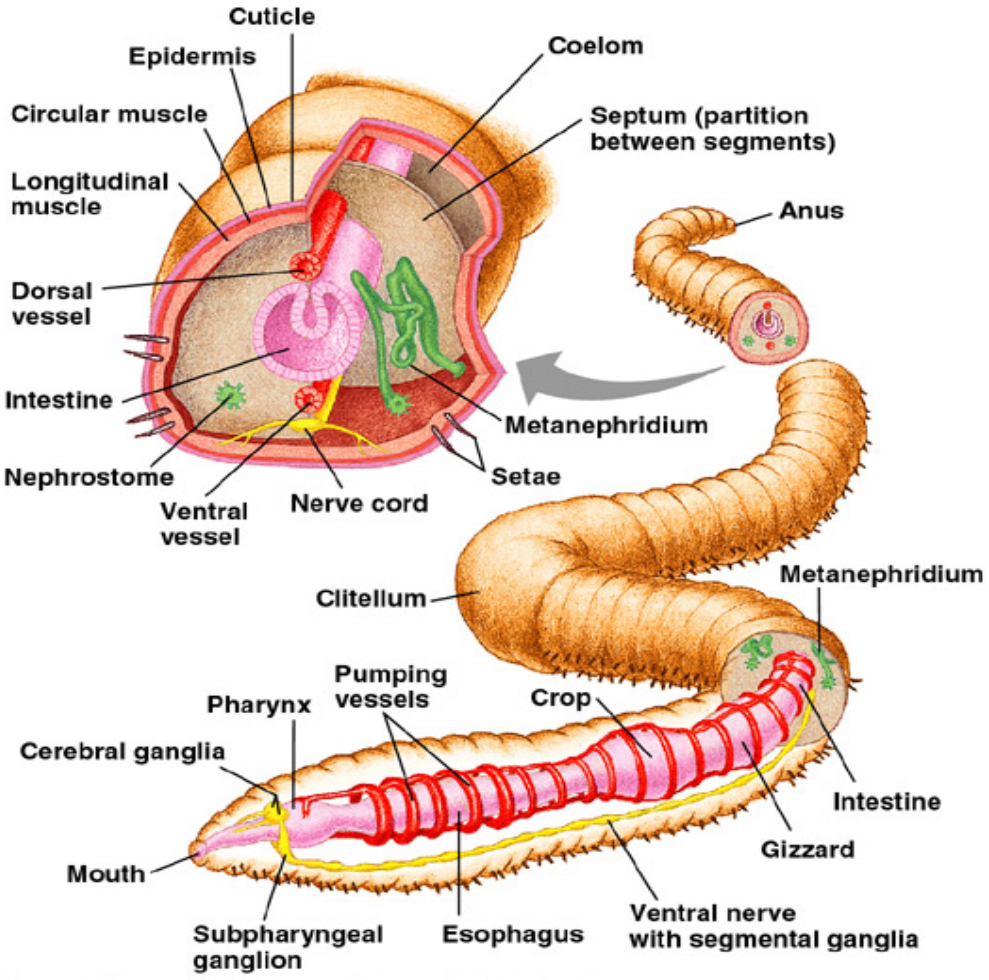
Suspended in test solution Methanolic extract at concentration 50 mg/ml in normal saline.

Group VI

Suspended in test solution Aqueous extract at concentration 50 mg/ml in normal saline.

Selection of Worm

Adult Indian earthworms, *Eisenia fetida* were used for present study.



Anatomy of *Eisenia foetida*

Anthelmintic Activity

Adult Indian earthworms, *Eisenia fetida* were obtained from Pratapsinh Farm School, Satara and authenticated from the Zoology department of Y.C. College, Satara. These worms were used to screen anthelmintic activity. Six groups of six earthworms of approximately same size (5 to 8cm) were released in to 20ml of desired formulation at room temperature. Each of group is first treated with normal saline solution and then treated with one of the following solution. The Allopathic standard Albendazole (20mg /ml) and the test extract i.e. Pet ether extract, Chloroform extract, Methanolic extract and Aqueous extract (50 mg/ml) were evaluated for anthelmintic activity. Observations were made for the time taken for paralysis and death of individual worms. The mean paralysis time and mean lethal time of each extract was recorded. Paralysis was said to be occurred when worms did not revive even in normal saline. Death was concluded when worm lost their motility followed with fading away of their body colour.

RESULTS AND DISCUSSION

The Pharmacognostic study of *Solanum verbascifolium* revealed following results,

Total Ash Value = 14.4% w/w

Loss on Drying = 90.2% w/w

Alcohol Soluble Extractive Value = 6%

Water Soluble Extractive Value = 10%

Powder Characteristics

Solanum verbascifolium leaves powder was containing following characters,

1. Lignified phloem fibres
2. Spiral Vessels (Xylem vessels)
3. Lamina portion
4. Epidermal cells

Table No.1 Data showing the time taken for paralysis and death by Indian earthworm (i.e. *Eisenia fetida*)

Treatment	Concentrations mg/ml	Time for Paralysis (P) in min (Mean &SEM)	Time for death (D) in min. (Mean &SEM)
Control (Saline)	------	------	------
Pet ether Extract	50mg/ml	3.517±0.240	4.83±0.31
Chloroform Extract	50mg/ml	3.83±0.31	5.67±0.33
Methanolic Extract	50mg/ml	2.5500±0.2062	4.33±0.33
Aqueous Extract	50mg/ml	4.17±0.40	6.67±0.49
Std. Albendazole	20mg/ml	6.27±0.11	9.65±0.45

Result expressed as Mean ± SEM from six observations.

CONCLUSION

In the pharmacognostic studies of selected plant i.e. leaves of *Solanum verbascifolium*, reveals the nature of the phytoconstituent present in the plant. In the pharmacological evaluation of selected plants for the anthelmintic activity by *in vitro* model by using the Indian adult worm *Eisenia fetida*, All the extracts of *Solanum verbascifolium* significantly exhibit anthelmintic activity in dose-dependent manner giving shortest time of paralysis and death at 50mg/ml concentration of methanolic extract as compared to standard drug. From the results, it is concluded that the extracts in moderate concentrations are useful in treatment of worm infection (Helminthiasis).

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