

**EVALUATION OF ANTHELMINTIC ACTIVITY OF THE LEAVES OF
AILANTHUS EXCELSA ROXB. (SIMAROUBACEAE)**

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Summary

Ailanthus excelsa Roxb. is a large deciduous tree of up to 24 m height with a straight cylindrical bole. It grows well in semi-arid and semi-moist regions and has been found suitable for planting in dry areas with annual rainfall of about 400 mm. It is commonly found in mixed deciduous forests and some sal forests, but is rare in moist areas with high monsoons. Traditionally plant was known to have activity against worms and have been used in the treatment of dysentery caused by worms. Thus the present study aims to evaluate the traditional anthelmintic properties of the plant. Petroleum ether extract, ethyl acetate extract and methanol extract of the leaves of *A. excelsa* were screened for anthelmintic activity. Results showed that methanol extract of the leaves of *A. excelsa* is having potent anthelmintic activity. Thus we can conclude that, the anthelmintic property of the plant is due to the polar phytoconstituents present in the leaves.

Key Words: *Ailanthus excelsa*, Anthelmintic activity, *Pherotima posthuma*.

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Introduction

Ailanthus excelsa Roxb. (Simarubaceae) is lofty deciduous tree 22-25m in height and 2-5m in girth. The tree is frequently found on dry stony hills and on laterite soil. Grows well in semi-arid and semi-moist regions and has been found suitable for planting in dry areas with annual rainfall of about 400 mm. It is commonly found in mixed deciduous forests and some forests, but is rare in moist areas with high monsoons. In its natural habitat the absolute maximum temperature varies from 40⁰C to 46⁰C, and the absolute minimum temperature from 0⁰C to 10⁰C. The normal rainfall is from 65 to 150 cm.^{1, 2}. The world health organization estimates that a staggering two billion people harbor parasitic worm infection. Parasitic worm also infects liver stocks and crops; affecting food production with a resultant economic impact. Despite this prevalence of parasitic infection the research of anthelmintic drug is poor. As per WHO, only few drugs are frequently used in the treatment of helminthes in human beings. Anthelmintics from natural source may play a key role in treatment of these parasitic infections. In view of this an attempts has been made to study the anthelmintic activity of leaves of *A. excelsa* Roxb. Traditionally plant was known to have activity against worms and have been used in the treatment of dysentery caused by worms¹. In this study petroleum ether, ethyl acetate and methanol extracts of leaves of *A. excelsa* Roxb. were used and observed for paralysis and death of earthworm.

Materials and methods

Plant material

The leaves of the plant was collected from Nashik district of Maharashtra and was authenticated by Mr. P. G. Diwakar, Joint Director, Botanical Survey of India, Koregaon road, Pune. (Voucher Specimen no. SGAIEPL1).

Test animal

Earthworms (*Pherotima posthuma*) of about 3-5 cm long were used for anthelmintic activity, collected from vermiculture plant, Kopergaon, Dist-Ahmednagar (Maharashtra).

Drugs and Chemicals

Petroleum ether (PCL), ethyl acetate (PCL), methanol (PCL), albendazole (Intas),

Preparation of extract

Dried and coarsely powdered leaves of *A. excelsa* was subjected to successive solvent extraction in Soxhlet extractor using petroleum ether, ethyl acetate, and methanol as solvent³. All the extracts were vacuum dried to produce PEE (1.21%), EAE (2.58%), ME (6.94%) extracts respectively.

Evaluation of anthelmintic activity⁴

Five groups of approximately equal size earthworms consisting of six earthworms in each group were used for the present study. Group first serve as control, receive only normal saline; Group second serve as standard, receives standard drug albendazole 10mg/ml. Group third serve as petroleum ether; Group fourth serve as ethyl acetate, Group fifth serve as methanol extract of 20mg/ml. each. Observations were made for the time taken to paralysis and death of individual worms. Paralysis was set to occur when the worms do not revive even in normal saline. Death was concluded when the worms lost their motility followed with fading away of their body color.

Phytochemical screening of extracts

Various phytochemical studies including test for carbohydrates, proteins, alkaloids, glycosides, steroids, flavonoids, tannins and phenolic compounds were carried out⁵.

Statistical Analysis

The extract treated groups were treated with one way ANOVA followed by Dunnett's test and compared with vehicle treated group.

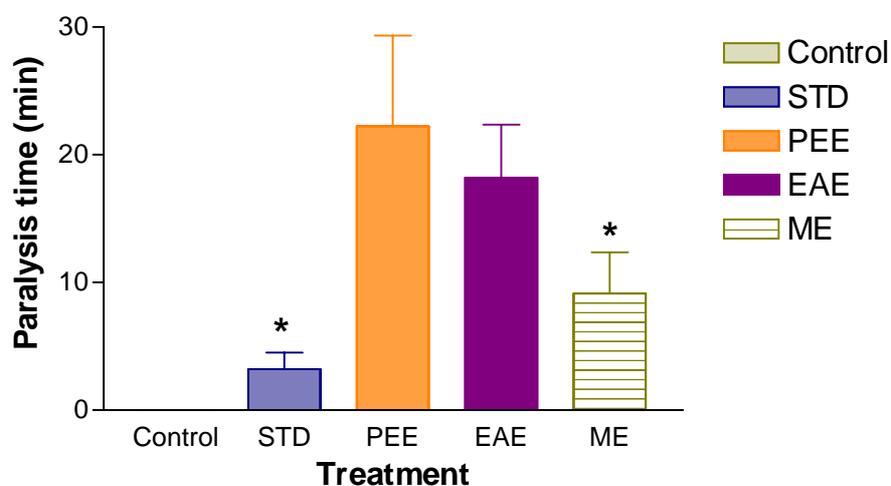
Results and Discussion

In the present study it was observed that, methanol extract (ME) was more potent than the other extract (table 1.). Methanol extract at the dose of 20 mg/Kg shows significant anthelmintic activity (graph 1 and 2).

Table 1: Evaluation of anthelmintic activity: -

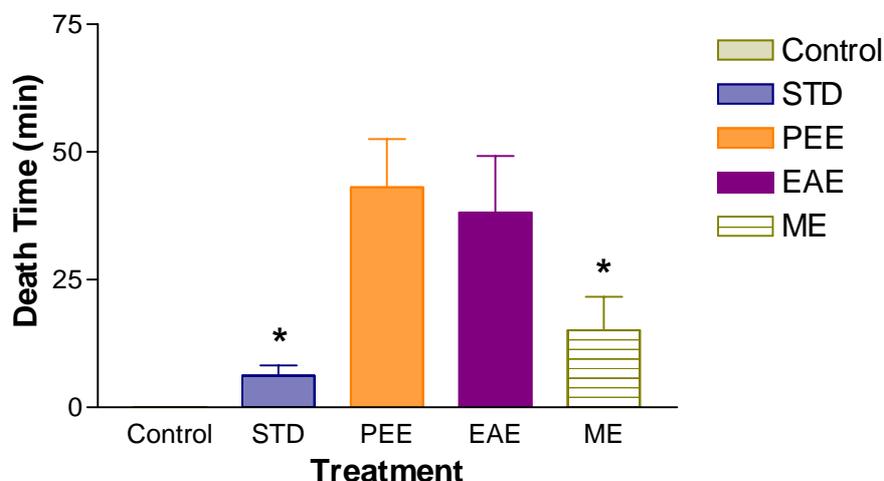
Group	Treatment	Time for Paralysis (min)	Time for death (min)
I	Control	No paralysis (up to 15min)	No death (up to 15min)
II	Albendazole (10 mg/ml)	3.22 ± 1.30	6.21 ± 2.01
III	PEE (20 mg/ml)	22.24 ± 7.09	43.11 ± 9.43
IV	EAE (20 mg/ml)	18.20 ± 4.17	38.14 ± 11.05
V	ME(20 mg/ml)	9.13 ± 3.23	15.12 ± 6.51

Graph 1. Time for paralysis



*P<0.01 compared to vehicle treated group (One way ANOVA followed by Dunnett's test)

Graph 2. Graph showing death time



*P<0.01 compared to vehicle treated group (One way ANOVA followed by Dunnett's test)

Phytochemical screening

Tests	PEE	EAE	ME
Steroids	+	-	-
Alkaloids	+	+	-
Glycosides	-	-	+
Flavonoids	-	-	+
Tannins and phenolic compounds	-	-	+

Conclusion

Phytochemical screening performed on various extracts of *A. excelsa* shows that methanol extract of the leaves contains glycosides, flavonoids, tannins and phenolic compounds. Thus, we can conclude that the polar constituents in the plants like glycosides, flavonoids, tannins and phenolic compounds may be responsible for the anthelmintic activity of the plant.

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