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Der Pharmacia Lettre, 2014, 6 (1):157-159
(http://scholarsresearchlibrary.com/archive.html)

Der Pharmacia Lettre
Scholars Research Library
ISSN 0975-5071
USA CODEN: DPLEB4

Evaluation of anthelmintic activity of hydro-alcoholic extract of *Ailanthus excelsa* stem bark

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ABSTRACT

Main aim of present study is to evaluate anthelmintic potential of hydro - alcoholic extract of Ailanthus excelsa stem bark. During the study period, concentration (100mg/5ml, 250mg/5ml, 500mg/5ml) of hydro - alcoholic extract were used for determining the paralysis time and death time of earthworms (Pheretima posthuma). At the concentration of 500mg/5ml time required for paralysis (60±0.81 min) and death (73±2.44 min) is minimum. The time required for paralysis and death of earthworms at the concentration of 250 mg/5ml is (229±1.29 min), (249±2.70 min) respectively and at the concentration of 100 mg/5ml time required for paralysis and death of earthworms was (499±1.29 min), (539.5±1.30 min).From the study it was observed that at the higher concentration of the extract time required for causing paralysis (60±0.81 min) and death of earthworms (73±2.44 min) is less in comparison to the time required for causing paralysis (120.5±1.29 min) and death (148±2.36 min) of earthworms by the standard drug (Piperazine citrate).

Keywords: Anthelmintic potential, *Ailanthus excelsa*, *Pheretima posthuma*, Piperazine citrate.

INTRODUCTION

Common name of *Ailanthus excelsa* (Simaroubiaceae) is mahanimb. *Ailanthus excelsa* tree is originally from China. It is also called as 'tree of heaven' due to its many benefits for human beings. Traditionally it is used for curing diseases. Bark of the plant *Ailanthus excelsa* is used as astringent, appetizer, anthelmintic, febrifuge. To cure dysentery, skin disease, troubles of the rectum, gout, rheumatism, dyspepsia, bronchitis and asthma stem bark of the plant is beneficial. It is used to obtain pleasent taste of mouth. As mentioned in traditional medicine, *Ailanthus excelsa* is used for curing wounds and skin eruptions. The plant contain flavonoids, quassinoides, alkaloids, terpenoids, sterols and saponins. Different chemical compounds are present in Ailanthus excels in a large amount which show potential biological activities. The vast ethnomedical uses inspired us to investigate the anthelmintic potentials of *Ailanthus excelsa* stem bark[1].

A large amount of the world population are infected by helminthic infections. In the developing countries They cause a large threat to health of public especially in under developed countries and cause dangerous diseases like anaemia, malnutrition and pneumonia. Tape worm, round worm and flukes are the helminthes which infects the intestine. These infection mostly affects the population living in endemic areas with major social and economic consequences. In human beings ("the intestinal round worm parasite") resembles (anatomically and physiologically) to *Pheretima posthuma*(the adult Indian earthworm) this is the main reason for using *Pheretima posthuma* (the adult Indian earthworm) as a test worm for anthelmintic screening. Earthworms are used as suitable model for screening anthelmintic drug also due to their easy availability[2].

MATERIALS AND METHODS

Collection of Plant material

Stem bark of *Ailanthus excelsa* was collected from Jungle of Munda pandey , Moradabad (Uttar pradesh) in the month of feburary 2013 and aunthenticated by the the taxonomist. Specimen is deposited in the IFTM museum (Specimen No. 97895).

Extraction of Plant material

Maceration method - In this method 200 gm of drug powder (powdered form of stem bark of *Ailanthus excelsa*) was macerated with mixture of distilled water and ethanol (1:1) and make it stand for 48 hours. Then with the help of muslin cloth and whatman filter paper the extract was double filtered and the extract obtained was concentrated by evaporation on water bath. Finally the concentrated extract obtained was dried and used in powder form .It was observed that % yield of extract was 3.78%.

Anthelmintic activity

Anthelmintic activity was evaluated for hydro-alcoholic extract of stem bark of *Ailanthus excelsa*. *Pheretima posthuma* (Earthworm obtained at the site of Ram ganga (Kathghar) of nearly equal size (9±1cm) were selected for present study due to its anatomical and physiological resembelence with roundworm parasite of human being. Four Earthworm of equal size were placed in each petridish at room temperature. Piprazine citrate (200 mg/ 100ml) was used as reference standard. Before starting the experiments test solutions and standard drug solution were prepared freshly.The paralysis time (min)[Mean±SEM] was observed and noted when the earthworms(*Pheretima posthuma)* did not move except when they were shaken vigorously. Death time (min)[Mean±SEM] were observed and noted when earthworms (*Pheretima posthuma*) did not move even when they were shaken vigorously or kept in hot water (50°c).[3][4]

Figure no. I – Earthworm with tested extract

RESULTS AND DISCUSSION

The result were anlayzed for statistical significance using one way ANOVA followed by Dunnett's multiple comparison test. Difference at P<0.05 was considered significant. Hydro- alcoholic extract of *Ailanthus excelsa* stem bark (Table 1) showed concentration - dependent anthemintic activity against earthworm. *Ailanthus excelsa* showed significant effect (p<0.05) at the tested concentration 500 mg/5ml as determined by the paralysis time and death time.

Table no. I - Anthelmintic activity of hydro-alcoholic extract of stem bark of *Ailanthus excelsa* on earthworms (*Pheretima posthuma)*

S.No	Treatment	Concentration(mg/ml)	Paralysis Time(min) Mean±SEM	Death Time(min) Mean±SEM
1	Normal saline	0.9 mg/100 ml	-	-
2	Hydro-alcoholic Extract	100 mg/5 ml	499±1.29	539.5±1.30
		250 mg/5 ml	229±1.29	249±2.70
		500 mg/5 ml	60±0.81	73±2.44
3	Standard Drug	200 mg/100 ml	120.5±1.29	148±2.36

Result in Paralysis time expressed as Mean±SEM (n=4). F (4,12) =165633 with P<0.05 as compared to standard.
Result in Death time expressed as Mean±SEM (n=4). F (4,12) =33701 with P<0.05 as

CONCLUSION

From the present study, it is finally concluded that the hydro - alcoholic extract of *Ailanthus excelsa* stem bark showed significant anthelmintic potential. To isolate phytoconstituents form the hydro- alcoholic extract from the stem bark of *Ailanthus excelsa* is under investigation.

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