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SCREENING OF IN-VITRO ANTHELMINTIC ACTIVITY OF ALLOPHYLUS SERRATUS (ROXB.) KURTZ ON INDIAN EARTHWORMS

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ABSTRACT: Aim: The study was aimed to evaluate the In-Vitro anthelmintic activity of Allophylus serratus on Indian earthworms. Materials & Methods: Different concentrations like 100mg/ml, 200mg/ml and 400mg/ml of Allophylus serratus leaf extract with ethanol were taken and were tested for time of paralysis and time of death in the worms according to the method Ajaiyeoba et al. Results: It showed that all the concentrations of Allophylus serratus had anthelmintic activity according to the dose dependant manner. Efficacy of the test samples were found to be decreased the time for paralysis & death of the worms with increased dose. The test samples were compared with the standard drug Albendazole (20mg/ml) showed that the test concentration of 400mg/ml had equalled potent with standard drug. Conclusion: The extract of 400mg/ml dose had potent anthelmintic activity than other extracts like 100mg/ml, 200mg/ml. On phytochemical screening of Allophylus serratus extract with ethanol was found to be Phenolic compounds, Flavonoids, tri-terpenoids, steroids and Glycosides. The study concluded that Allophylus serratus used as an anthelmentic drug in future.

Key Words: Anthelmintic; Allophylus serratus extract; ethanol; earth worms; Albendazole.

I. INTRODUCTION

Helminths like worm infections are the most common infections in human beings anf affecting the large population in the world.in developing countries like India, they cause a threat in health of public and also cause malnutrition, anaemia, pneumonia and eosinophilia. The infections of worms are generally in tropical regions. They also occur in travellers who are visited tropical areas and some of them develop in temperate climates also[1]. Parasitic infections cause severe morbidity, lymphatic filariasis (a cause of elephantiasis). schistosomiasis and onchocerciasis (river blindness). these infections can cause major social and economic consequences.

Allophylus serratus (Roxb.) Kurz (Sapindaceae) is a large shrub, which is widely distributed in south India and Assam hills[3]. The plant has been used in Indian system of medicine as an anti-inflammatory, carminative, elephantiasis, oedema, fracture of bones and gastric disorders like dyspepsia, anorexia and diarrhoea[4]. The fruits have cooling effect and nourishing tonic. The leaves and even roots have been showed that to be eaten to induce lactation. The root had astringent effect due to presence of tannin; they also to be used for treating nose bleeding and piles[5].The Allophylus serratus leaf extract of ethanol had shown activity against Ranikhet disease virus and had maximum effects on central nervous system and hypothermia[6].

The review of literature revealed that no studies were found on the anthelmintic activity of Allophylus serratus leaf extract of ethanol. So, we investigated the anthelmintic activity of leaves extracts of Allophylus serratus.

II. MATERIALS &METHODS

Plant material: The leaves were taken from the talkona forest, Andhra pradesh, India during month of January 2020 and its identified and authenticated as Allophylus serratus.it was done by Assistant professor Madhava Setti, in the department of botany, Sri venkateswara University, Tirupati.

Preparation of extract: The powdered leaf of the plant material was extracted with 70% ethanol by using soxhlet apparatus. The extracts were concentrated under reduced pressure, dried and stored at 4^{o}c temp in air tight containers for further studies.

Phytochemical screening: The Allophylus serratus leaf extract was tested for phytochemical screening by using different reagents: Liebermann-Burchard reagent[7] was used to detect the presence of steroids and penta cyclic tri terpenes, observed in the form of violet spots. Neutral ferric chloride was used to detect phenolic compounds that observed in the form of blue spots. Shinoda test[8] and Fiegel' test[9] was used to detect flavonoids and glycoside, respectively. The extract was found to be lack of alkaloids as detected by the Dragon Droff's reagent[10].

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Experimental Animals: Earth worms are obtained from water logged area of soil and using for the experiment. The experimental protocol was approved by the Institutional Animal Ethical Committee of A.S.N.Pharmacy College (1423/Po/11/CPCSEA/102/2011).

ANTHELMINTIC ASSAY: Anthelmintic activity was evaluated using earthworms by the method of Ajaiyeoba et al., with little modification[11]. Emulsion of the crude extracts with Tween-80 (0.1%) containing 100, 200, 400 mg/ml of extracts was prepared by using dextrose (6%) solution. Albendazole (20mg/ml), standard drug with Tween-80 (0.1%), was prepared by adding dextrose (6%) solution. 25 ml of each solution was poured into petri-dishes. four worms of about the same size were used. They were used for their motility and responses. The paralysis time was recorded. Immediately after not showing of response to external stimuli, the worms were placed in normal water and seen for recovery. Final recovery/death time was noted; mean paralytic score was shown in graph against time[12]. The death and total paralysis time was noted at room temperature. The death of the worm was noted by transferring it into a beaker containing hot water (45°C), which stimulated and induced movements if the worm was alive.

Statistical Analysis: All the values of were expressed as mean ±SEM, and tested for one way ANOVA and Dunnet's test and were considered significant at $P < 0.001$ levels Vs standard group.

III. EXPERIMENT AND RESULT

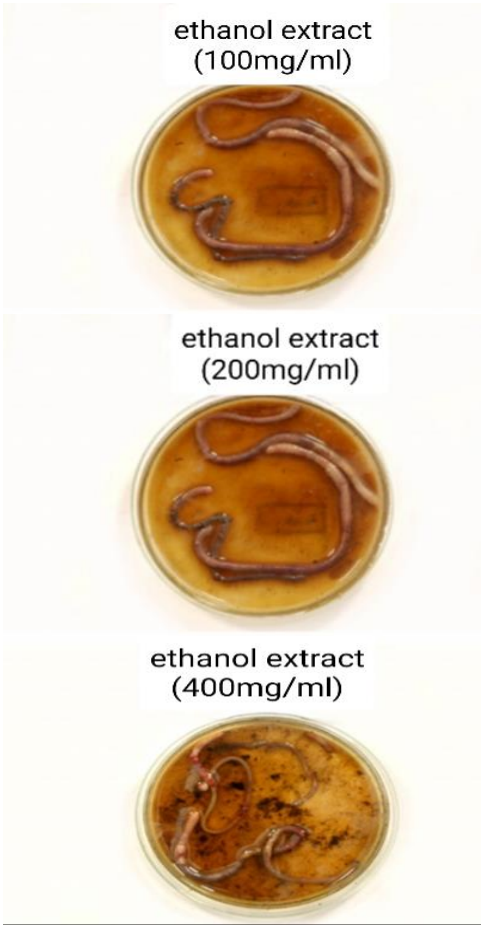

Table: Anthelmintic activity of allophylus serratus leaf extract

S.No	Group	Dose in mg/dl	Paralysis(P) Time taken (in min)	Death(D) Time taken (in min)
1	Control	-	0.000	0.000
2	Standard (albendazole)	20mg/mll	2.083±0.3005*	23.50±0.8466***
3	Ethanolic extract 1	100mg/ml	17.33±0.8028***	70.00±1.461***
4	Ethanolic extract 2	200mg/ml	8.333±0.4944***	61.67±1.256***
5	Ethanolic extract 3	400mg/ml	4.25±0.4787***	30.50±1.057***

Values are mean ± SEM;***P<0.0001 Vs test groups calculated by ANOVA (Dunnett's test)

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Fig1: Histogram shows anthelmintic activity of test extracts on paralysis time of earth worms

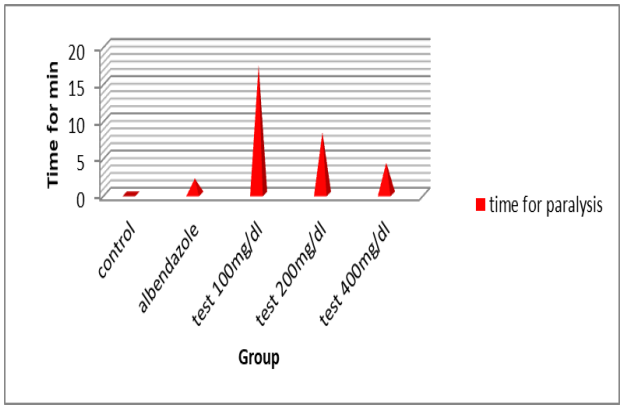
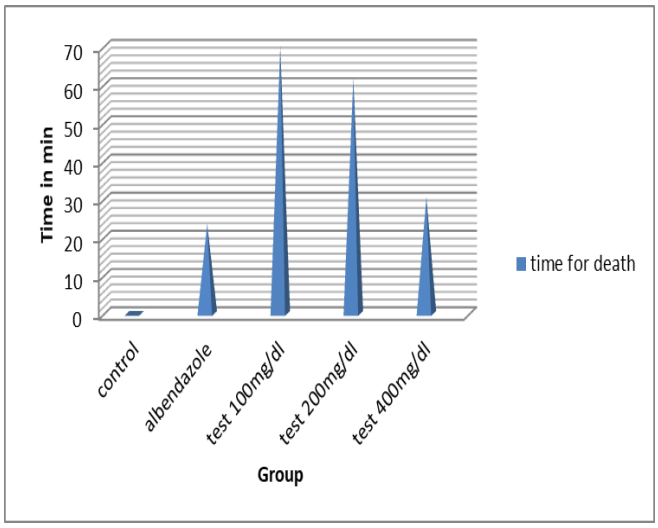


Fig2: Histogram shows anthelmintic activity of test extracts on death time of earth worms



IV. DISCUSSION

Phytochemical screening of Allophylus serratus leaf extract with ethanol was shown to be Phenolic compounds, Flavonoids, tri-terpenoids, steroids and Glycosides. The extract of allophylus serratus shown anthelmintic activity as decreased time for paralysis and death with increased dose. The leaf extract at dose 400mg/dl showed paralysis in 4 min and death in 30 min against Indian earthworm compared to the reference standard Albendazole (20mg/dl) showed the paralysis time 2min and death take 23min.The leaf extract of the plant not only shown paralysis but also caused death in shorter time as compared to reference drug albendazole.

V. CONCLUSION

The leaf extract of allophylus serratus shown significant anthelmintic activity when compared to the reference drug albendazole. The study concluded that Allophylus serratus used as an anthelmentic drug in future.

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