

## Research Article

# Phytochemical Screening and Anthelmintic Activity of *Crotalaria pulchra* (Andr).

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### ABSTRACT

Chloroform and methanolic extract from the leaves of *Crotalaria pulchra* Andr. were investigated for their anthelmintic activity against *pheretima posthuma* and *ascaridia galli*. Various concentrations (10-50mg/ ml) of each extract were tested in bioassay, which involved determination of time of paralysis and time of death of the worms. Both the extract exhibited significant anthelmintic activity at highest concentration of 50 mg/ ml. Albendazole (20mg/ ml) was used as standard reference and distilled water as control.

**Key words:** *Crotalaria pulchra* Andr., anthelmintic activity, *Pheretima posthuma*, *Ascaridia galli*

### INTRODUCTION

Helminthes infection are among the most wide spread infection in human, affecting a huge population of the world. In developing countries they pose a large threat to public health and contribute to the prevalence of malnutrition, anemia, eosinophilia and pneumonia<sup>1</sup>. The gastro-intestinal helminthes becomes resistant to currently available anthelmintic drugs therefore there is a foremost problem in treatment of helminthes disease<sup>2</sup>. Medicinal plants have served through ages, as constant source of medicaments for the exposure of a variety of disease. The history of herbal medicine is almost as old as human civilization; hence there is an increasing demand towards natural anthelmintics<sup>3</sup>.

*Crotalaria pulchra* Andr.(Fabaceae) commonly known as rattlebox. It is a viscous shrubs, leaves are simple bivate-oblongate, coriaceous, entire, obtuse-rounded. flowers are bright yellow in color, in terminal paniced racemes. Pods are oblong, pubescent, hardly exserted the calyx; 7-8 seeds<sup>4</sup>. Leafs were used by tribal people for inflammation, skin diseases like scabies, and anthelmintic properties. Based on this, an attempt has been made to evaluate the phytochemical screening and anthelmintic potency of *Crotalaria pulchra* Andr.;

### MATERIALS AND METHODS

#### Plant Material:

The leaves of *Crotalaria pulchra* Andr.; (fabaceae) was collected from the tirupathi district in January 2009, and was authenticated by taxonomist Dr. K. Madhava chetty, department of botany, S.V.University, Tirupathi. The herbarium specimen was deposited in the department of pharmacognosy of our college. The plant material was shade dried, pulverized and stored in air tight container and used for further extraction.

#### Preparation of Extract:

The chloroform and methanol extract of the leaves of *Crotalaria pulchra* Andr.; were prepared by maceration methods. In this process, 50 gm of dried powder was extracted with 500ml of chloroform and methanol kept at a room temperature for 24 hrs. And then filtered solvent was allowed to evaporate in a rotary vacuum evaporator. The dry extracts obtained were subjected to various chemical tests to detect the presence of different phytoconstituents present in the crude extract.<sup>5</sup>

**Table-1: Phytochemical Screening of *Crotalaria pulchra* (Andr)**

S. No	Tests	Chloroform extract	Methanol extract
1	Terpenoids	+	+
2	Flavonoids	+	+
3	Steroids	-	+
4	proteins	-	+
5	Glycosides	-	+
6	carbohydrates	-	+
7	Alkaloids	+	+
8	Phenols	-	+
9	Tannins	+	+
10	Saponins	-	-

#### Animals:

Adult earthworms (*pheretima posthuma*), round worm (*ascaridia galli*) were used to evaluate *in vitro* anthelmintic activity. Earthworms were collected from moist soil and round worms were obtained from intestine of freshly slaughtered fowls as well as infested intestines of fowls from the local slaughtered house and washed with normal saline solution to remove all the faecal

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**Table-2: Anthelmintic activity of *Crotalaria pulchra* (Andr) of chloroform & Methanolic extract**

S. No	Groups	Concentration (mg/ml)	<i>Pheretima posthuma</i> (Earth worm)		<i>Ascaridia galli</i> (Round worm)	
			Time taken for paralysis (P) in min	Time taken for death (D) in min.	Time taken for paralysis (P) in min	Time taken for death (D) in min.
01	Control	---	---	---	---	---
02	Chloroform extract	10	15±0.75	60±1.20	14±0.85	45±0.94
		30	14±0.95	55±1.24	10±0.66	40±1.21
		50	11±1.75	30±1.36	08±0.75	35±1.06
03	Methanolic extract	10	12±1.24	45±0.85	13±1.10	43±0.49
		30	10±1.10	35±1.20	10±0.96	36±0.96
		50	08±0.98	21±1.64	07±0.84	29±1.35
03	Albendazole (Standard)	20±	14±1.25	56±0.84	05±1.43	22±0.64

Each value represents mean ±SEM (N=6)

matter. These intestines were then dissected and worms were collected and kept in normal saline solution. Earthworm and helminthes were identified in department of zoology, Osmania University.

#### Drugs and Chemicals:

Albendazole (ABZ kare health specialities pvt.ltd) methanol and chloroform A.R (S. R laboratories) DMF (S. R laboratories)

#### Anthelmintic Activity:

The anthelmintic assay was performed in vitro using adult earthworm (*pheretima posthuma*) owing to its anatomical and physiological resemblance with the intestinal round worm (*ascaridia galli*) parasites of human being for preliminary evaluation of anthelmintic activity<sup>6,7,8</sup>. Test samples of the chloroform and methanol extract was prepared at the concentration 10, 30, 50mg/ml in normal saline containing 5% DMF. Albendazole (20mg/ml) was used as a standard and normal saline 5%DMF as control<sup>9, 10</sup>. All the test solution and standard drug solution were prepared freshly before starting the experiments. observation were made for the time taken for paralysis was noted when no movement of any sort could be observed except when the worms were recorded after ascertaining that worms neither moved when shaken vigorously nor when dipped in warm water (50°C)<sup>11</sup>. All the results were expressed as a mean±SEM of six worms in each group.

#### RESULTS & ISCUSSION

Preliminary phytochemical screening of chloroform and Methanolic extract revealed the presence of Terpenoids, Flavonoids, Proteins, Alkaloids and Tannins which were showed in Table - 1.

The chloroform & methanolic extract of leaves of *Crotalaria pulchra* displayed significant anthelmintic properties at higher concentration. Both the extract showed anthelmintic activities in dose dependent manner giving shortest time of paralysis (P) and death (D) with 50mg/ml concentration for both types of worms. the chloroform extract of *Crotalaria pulchra* caused paralysis in 11 min and death in 30min meanwhile methanol extract showed paralysis in 8 min and death in 21 min against the earth worm (*pheretima posthuma*)

the standard drug Albendazole showed paralysis at 14 min and death in 56 min.

*Ascaridia galli* worms showed sensitivity of the chloroform and methanolic extract of *Crotalaria pulchra*. The chloroform extract cause paralysis in 8 minutes, death in 35 min and methanolic extract cause paralysis in 7 minutes and death in 29 minutes respectively, at higher concentration of 50mg/ml. standard drug Albendazole showed paralysis at 5 min and death in 22 min. All the results were shown in Table -2

#### CONCLUSION

From the above results it is concluded that *crotalaria pulchra* (Andr) showed significant anthelmintic activity the plant may be further explored for its phytochemical profile to recognize the active constituents accountable for anthelmintic activity.

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#### REFERENCES

1. Bundy DA. Immunoepidemiology of intestinal helminthic infection I: The global burden of intestinal nematode disease. *Trans Royal Soc Trop Med Hyg* ., 1994; 8: 259-261
2. Sondhi SM, Shahu R , Magan archana. *Indian drugs.*, 1994; 31 (7): 317-320.
3. Satyavati GV, Raina MK , Sharma M. medicinal plants of india,vol.1, Indian council of medicinal research, new delhi, 1976, 201-206.
4. Madhava chetty K. Flowering plants of chitoor district. Edn 1, Students offset printers, Tirupati, 2008,86.
5. Khandelwal KR. Practical pharmacognosy. Edn 16, Nirali prakashan, Pune, 2006, 149-156
6. Ajaiyeoba EO, Onocha PA, Olarenwaju OT. In vitro anthelmintic properties of *buchholzia coriacea* and *gynandropsis gynandra* extract. *Pharm biol.* 2001; 39: 217-20

7. Dash GK, Suresh P, Kar DM, Ganpaty S, Panda SB. Evaluation of *Evolvulus alsinoides* Linn. For anthelmintic and antimicrobial activities *J. Nat Rem.* 2002; 2: 182-185
8. Shivakumar YM, kumar VL. Antihelmintic activity of latex of *calotropis procera*. *Pharma biol.* 2003; 41: 263-265
9. Tambe VD, Nirmal,SA, Jadhav RS, Ghogare PB, Bhambar RS. Anthelmintic activity of *wedelia trilobata* leaves. *Indian J .Nat. Product.*, 2006; 22: 27-29.
10. Nirmal SA, Malwadkar G ,Laware RB. Anthelmintic activity of *pongamia glabra*. *Songklanakarim J Sci Technol* 2007; 29: 755-757.
11. Sathish BK, Fursule R. Invitro anthelmintic activity of *thespesia lampas* (cav) *Asian .J.pharma and clinical research* 2009; 2 ;69-7