

**ANTIFUNGAL AND ANTHELMINTIC ACTIVITY OF EXTRACTS
OF MUCUNA PRURIENS SEEDS**

**Abedulla Khan K.,¹ Anupama Koneru,¹ Pavan Kumar K.,² Satyanarayana S.³
Eshwar Kumar,³ Sreedevi K.⁴**

¹Department of Pharmacology, ²Department of Pharmaceutical Chemistry, Sultan-ul-uloom College of Pharmacy, Banjara Hills, Hyderabad-500034, Andhra Pradesh, India,

³Department of Pharmaceutical Sciences, Andhra University, Visakhapatnam, India,

⁴Department of Biotechnology, Sultan-ul-uloom College of Pharmacy, Banjara Hills, Hyderabad-500034, Andhra Pradesh, India.

Summary

The present study was conducted to evaluate antifungal and anthelmintic activity of different extracts of seeds of *Mucuna pruriens* belonging to family Leguminosae. Preliminary studies revealed that the seeds contain L-Dihydroxy phenyl alanine (L-DOPA), alkaloids, epoxy fatty acids, lipid derivatives. The dried, powdered seeds were extracted with methanol, chloroform, butanol and water. Antifungal activity of the extracts was studied against *Aspergillus niger* and anthelmintic activity was studied against earthworms *Pheretima posthuma*. Results showed that methanol extracts showed more potent antifungal and anthelmintic activity than other extracts. The results were expressed as mean \pm SD, SEM.

Key words: Anthelmintic activity, Antifungal activity, *Mucuna pruriens*.

Mucuna pruriens is an annual climbing legume indigenous to tropical regions, especially Africa, India and West Indies. In India it is found in the foothills of the Himalayas, the plains of West Bengal, Madhya Pradesh, Karnataka, Kerala and Andhra Pradesh (1). The plant is commonly called as common cowitch, velvet bean, cowhage, kapikachhu and naikaranam. It is a constituent of more than 200 indigenous formulations. It contains L-Dihydroxy phenyl alanine (L-DOPA) as major constituent in seeds (2). Seeds contain alkaloid constituents mucanadine, mucunine, prurienidine, purienine (3), epoxy fatty acids such as cis-12,13-epoxyoctadec-trans-9-cis-acid, cis-12,13-epoxyoctadec-trans-9-enoic acid (4). Recently three lipid derivatives were reported from n-hexane extract of seeds of *Mucuna pruriens* - (z)-Triactont-5,7,9-triene; (z)-Docos-2,4,6-trien-1,8-diol and (z)-Docos-5-en-1-oi acid (5). *Mucuna pruriens* possess a wide range of pharmacologic activities such as antimicrobial activity (6), anti-protozoal activity (7), anti-inflammatory activity (8), neuroprotective activity (9), anti diabetic activity (10), antioxidant activity (11). The present study evaluated antifungal and anthelmintic activity of different extracts of seeds of *Mucuna pruriens*.

Materials and Methods

Collection and extraction of Seeds

The seeds were procured from M/s Munnalal Dawasaz, Hyderabad and authenticated by Dr. Najmunnisa Begum, Botanist, Ghulam Ahmed College of Education, Hyderabad. A voucher specimen has been deposited at the museum of our college. The collected seeds were powdered in a ball-mill. The powder was extracted in Soxhlet apparatus with solvents - methanol, chloroform, butanol & water. The extracts were filtered and concentrated under reduced pressure. All chemicals and reagents used for the study of pharmacological and microbiological investigations were of analytical grade.

Antifungal activity

The extract was prepared using suitable solvent system and the antifungal activity was studied employing the standard cup-plate method (12,13,14). The fungus used was *Aspergillus niger* and the antifungal activity was compared with standard fluconazole.

Anthelmintic activity

The anthelmintic activity was evaluated on adult earthworms, *Pheretima posthuma* (obtained from Horticulture Department, Hyderabad, India) as they possess anatomical and physiological resemblance with the intestinal roundworm parasite of human beings (15,16,17). The method of Nirmal et al., (18) was followed for anthelmintic screening, using albendazole as standard. The study protocol was approved by Institutional Animal Ethics Committee (IAEC/SUCP/2007/07).

Results

The antifungal activity of *Mucuna pruriens* seed extracts were studied by employing the standard cup-plate method against the fungus *Aspergillus niger*. Logarithmic series of concentrations were applied, starting from 10, 30, 100, 300 µg/ml. Lower concentrations did not show significant antifungal activity. 300µg/ml of all the extracts showed activity and methanol extract showed maximum potency compared to other extracts. All readings are expressed as mean ± standard deviation and standard error of means (Table 1) (Graph 1).

The results of anthelmintic activity reveal that, the methanol extract has shown good results when compared to other extracts at 20µg/ml concentration. The result are expressed as mean ± standard deviation and standard error of means (Table 2) (Graph 2).

ANOVA was applied and showed significant difference between groups with $P < 0.001$. The statistical calculations were done using Graphpad Prism 5 software.

Table 1. Antifungal activity of various extracts of *Mucuna pruriens* seeds and Fluconazole (Standard) on *Aspergillus niger*.

S.no of Plate	Zone of Inhibition (mm)				
	Methanol extract	Butanol extract	Chloroform extract	Aqueous Extract	Fluconazole
1	11	10	6	5	19
2	12	10	11	8	18
3	11	9	12	7	19
4	12	10	9	7	19
5	13	12	8	6	18
6	14	15	9	5	19
Mean	12.167	11	9.166667	6.333333	18.66667
SD	1.169	2.191	1.643	1.211	0.5164
SE	0.4773	0.8944	0.6708	0.4944	0.2108

P<0.0001

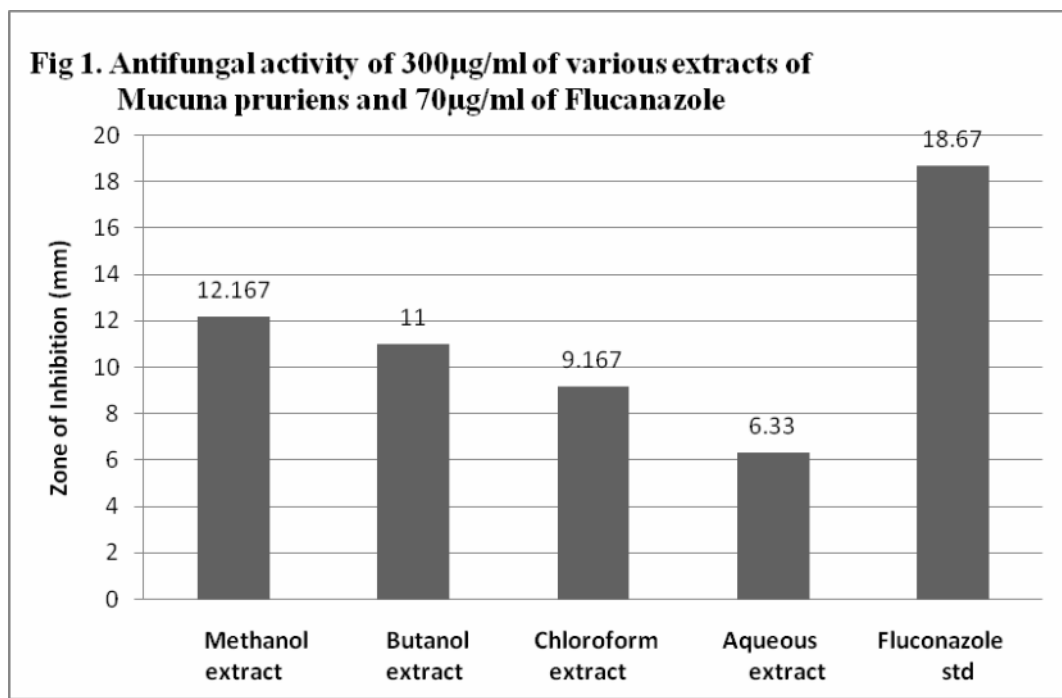
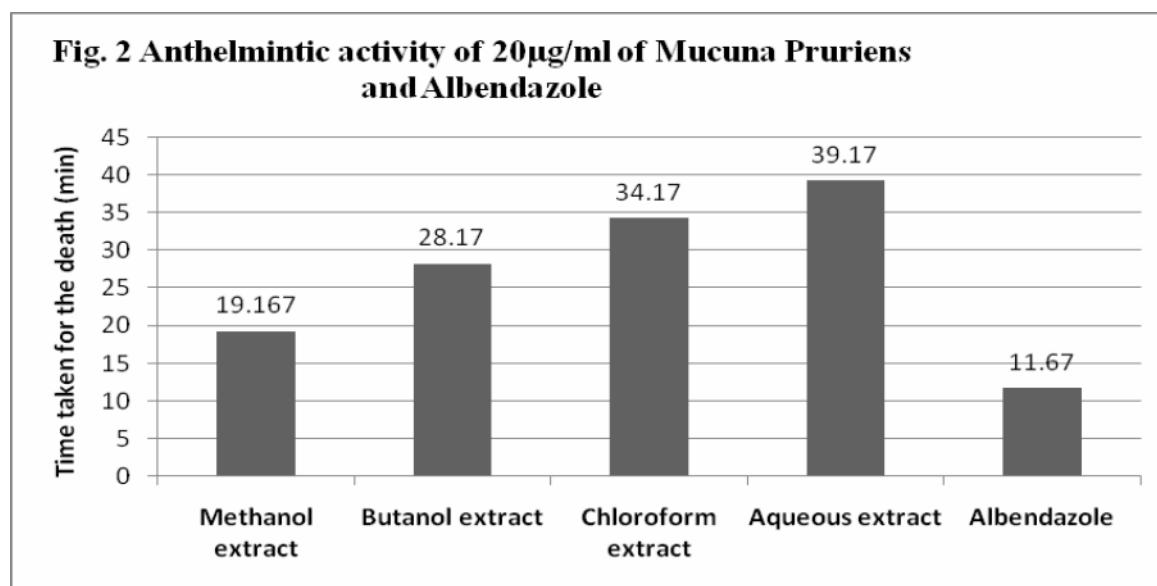


Table 2. Anthelmintic activity of various extracts of *Mucuna pruriens* seeds and Albendazole (standard) on *Pheretima posthuma*.

Test Substance (20mg/ml)	Time taken for paralysis (min) Mean±SEM	Time taken for death (min) Mean ± SEM
Saline	-	-
Methanolic extract	10 ±1.065	19.167 ± 1.537
Butanol extract	18.67 ± 1.430	28.17 ± 2.023
Chloroform extract	24 ± 1.155	34.17 ± 0.9098
Aqueous extract	26 ± 1.065	39.17 ± 0.9458
Albendazole	5.67 ± 0.9545	11.67 ± 1.45

P<0.001



Conclusions

The various extracts of the seeds were evaluated for antifungal and anthelmintic activity. Among the various extracts, methanol extract has shown potent activity compared to other extracts. Methanol extract showed promising activity when compared to the standards. The results are encouraging for further characterization and isolation of active principle responsible for these activities. As the current trend is to use more natural remedies for the existing diseases, further investigations for the activities of seeds of *Mucuna pruriens* and formulating dosage forms may result in better therapeutically available active constituents.

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