

ANTHELMINTIC ACTIVITY OF *HIBISCUS CANNABINUS* LEAF EXTRACT

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ABSTRACT

The aim of the present study was to investigate the anthelmintic activity of *Hibiscus cannabinus* leaf extract using adult earthworm, *Pheritima posthuma*. The methanolic extract of the crude drug at concentrations of 10mg/ml, 20mg/ml, 30mg/ml, 40mg/ml were tested which involve determination of paralysis time and death time. Albendazole was used as standard and it was found that the concentrated methanolic extract (with no traces of solvent) of the *Hibiscus cannabinus* leaves which is used as food in many parts of the world, showed a better anthelmintic activity in comparison with the standard.

KEYWORDS: Anthelmintic activity, Albendazole, Earthworm, *Hibiscus cannabinus*.

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INTRODUCTION

Helminthiasis is a macroparasitic disease of humans and animals in which a part of the body is infested with parasitic worms such as pinworm, roundworm, or tapeworm. Typically, the worms reside in the gastrointestinal tract but may also burrow into the liver or other organs. Helminthiasis can have immunomodulatory effects on the host, with implications for any coinfecting pathogens¹. More than half of the population of the world suffers from infection of one or the other and majority of cattle's suffers from worm infections.

Anthelmintics or antihelminthics are the drugs or the agents that destroy or cause the expulsion of parasitic intestinal worms. Treatment with an anthelmintic drug kills worms whose genotype renders them susceptible to the drug. Worms that are resistant survive and pass on their "resistance" genes. Resistant worms accumulate and finally treatment failure occurs². Intestinal worm infections in general are more easily treated than those in other locations in the body. Because the worms need not be killed by the drug and the drug need not be absorbed when given by mouth, there is usually a wider margin of safety than with drugs for worm infections in other sites³. Albendazole is the first drug of choice for the treatment of worm infections. It is also first reported anthelmintic

which promises to have useful activity against all the types of helminth parasites menacing the domestic animals⁴. Herbal remedies are considered the oldest forms of health care known to mankind on this earth. The parts of the plant used for medicinal purposes are leaves, root, stem, fruits, the complete aerial parts, the whole plant, barks (root and stem) and flowers. However, leaves were found as the most frequently used part⁵.

Traditional system of medicine reports the efficacy of several natural plants in eliminating worms. We have focused our attention on search of herbal remedy and selected *Hibiscus cannabinus* plant to evaluate the anthelmintic activity using adult earthworm, *Pheritima posthuma*. *Hibiscus cannabinus* leaves were chosen as they are easily available and can be used as leafy vegetable in our daily diet to treat helminthic infections.

MATERIAL AND METHODS

The *Hibiscus cannabinus* (Malvaceae) have many therapeutic activities like Antifungal⁶, Antimicrobial⁷, Haematinic⁸, Hepatoprotective⁹, Anti ulcer¹⁰ and Antioxidant¹¹ activities. Vernacular names include Bimli, Ambary, Ambari Hemp, Deccan Hemp, and Bimplipatum Jute. It is labelled as Gongoora in Telugu. The leaves are 10–15cm long, variable in shape, with leaves near the base of the stems being deeply lobed with 3-7 lobes,

while leaves near the top of the stem are shallowly lobed or unlobed lanceolate. The flowers are 8–15cm diameter, white, yellow, or purple; when white or yellow, the centre is still dark purple. The fruit is a capsule 2cm diameter, containing several seeds¹².

Collection of Plant Materials

The *Hibiscus cannabinus* (Malvaceae) plant leaves were collected from the fields nearby Vignan hills, Deshmukhi, Andhra Pradesh during September – October 2010 which was authenticated and confirmed by Ms. K. Chaitanya Sravanthi, Head of Department - Pharmacognosy, Vignan Institute of Pharmaceutical Sciences, Hyderabad. The leaves after collection were washed to remove the debris and then shade dried and the dried leaves were powdered to get a coarse powder.

Preparation of Extract

The dried powder material of *Hibiscus cannabinus*, (300gm) was taken in 1 lit beaker and sufficient quantity of methanol was added, then it was kept for maceration for 72 hours. The methanolic extract obtained was filtered and distilled to obtain a concentrate of 20gm.

Experimental Model

Adult earthworm *phertima prosthuma* were collected (due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human being^{13,14}) from moist soil, obtained from agricultural fields nearby Vignan hills, Deshmukhi, A.P.-India. Three test groups were taken each containing six earth worms of approximately equal size (8±1 cm). Albendazole was taken as standard drug and different concentrations (10mg/ml, 20mg/ml, 30mg/ml and 40mg/ml) were prepared in normal saline containing 5% DMF^{15, 16, 17}. The methanolic *Hibiscus cannabinus* leaf extract of different concentrations were prepared by dissolving in minimum quantity of DMF and making up to the final volume with normal saline to obtain 10mg/ml, 20mg/ml, 30mg/ml and 40mg/ml concentrations. One of the groups is taken as control group which was treated with normal saline containing 5% DMF. Paralysis onset time and death time of individual worms were noted. Paralysis was said to occur when the worms do not revive even in normal saline. Death was concluded when the worms lost their motility followed by fading away of color of worm.

RESULTS AND DISCUSSION

The data in **Table I** reveals that the methanolic extract of the *Hibiscus cannabinus* leaves showed significant anthelmintic activity compared to the standard.

CONCLUSION

Hibiscus cannabinus leaf extract was more effective even at lower concentrations in causing death of earthworms than the Standard drug, Albendazole.

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Table 1: Anthelmintic activity of methanolic *Hibiscus cannabinus* leaf extract

S. No.	Test group	Concentration (mg/ml)	Paralysis onset time (min)	Death time (min)
1.	Control	-	-	-
2.	Methanolic <i>Hibiscus cannabinus</i> leaf extract	10	6.60±0.16.	36.31±.81
		20	3.66±0.17	29.46±0.72
		30	6.49±0.23	21.84±0.32
		40	5.91±0.17	20.55±0.23
3.	Albendazole	10	7.15±0.42	74.33±0.84
		20	5.33±0.32	32.43±0.83
		30	1.42±0.18	29.99±0.32
		40	1.1±0.05	26.67±0.92

Results are expressed as mean ± SEM from six observations; Control worms were alive up to 24 hrs of observation



FIG 1: *Hibiscus cannabinus*

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