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## Evaluation of Anthelmintic Potentials of Ethanolic Extract of *Artocarpus heterophyllus* Leaf (Moraceae)

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 **HUMAN**

**<sup>1\*</sup>Ritesh Jain, <sup>2</sup>Nisha Banjare, <sup>3</sup>Kamlesh Lahre**

<sup>1,2</sup>*School of Pharmacy, Chouksey Engineering College,  
Bilaspur (C.G.)*

<sup>3</sup>*Dr. C.V.Raman University, Kargi Road, Kota, Bilaspur  
(C.G.)*

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### ABSTRACT

The plant *Artocarpus heterophyllus* belonging to the family Moraceae is a tropical evergreen plant of its own kind. The plant shows various medicinal properties and its phytochemical analysis shows that it has various phytoconstituents like alkaloids, tannins, fixed oils, proteins, phytosterols, etc. The anthelmintic study was performed using earthworms due to anatomical and physiological similarity with the intestinal roundworms of human beings. The reaction time is noted as paralysis time and death time for all the concentrations and compared with standard albendazole.



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## INTRODUCTION

The use of traditional medicine is widespread and plants still present a large source of novel active biological compounds with different activities, including anti-inflammatory, anti-cancer, antiviral, anti-bacterial and cardioprotective activities. This is the era of competition between Allopathic and Herbal Medicines where, Herbal medicinal products occupy a significant place in consumer consciousness in the developed world and are important in healthcare in most developing countries. There is increasing interest from the medical and scientific communities in giving them a place in evidence-based medicine, and this is consolidated by a more sympathetic attitude on the part of regulatory authorities than has previously been the case. The *Artocarpus* is widely utilized in traditional medicine systems. The leaves and stem barks have been used to treat anemia, asthma, dermatitis, diarrhea, cough and as an expectorant. The fruits, seeds and trunk would have been described as containing chemical compounds with aphrodisiac properties. The pulp and seeds are used in fever and as a tonic. Wood is used as sedative in convulsions, leaves are used to activate milk in women and leaf ash is applied to ulcers and wounds. Depending upon the ethnomedicinal research the desired plant was selected for anthelmintic activity.

## MATERIAL AND METHODS

**Plant Material-** The leaf of the plant *Artocarpus heterophyllus* was collected from Sambalpur district Orissa, in the month of may 2010. It was further identified and authenticated by the Botanical Department, Howrah, Kolkata. Some voucher specimen numbers were submitted to the authority for future references. The leaf plant parts were dried in shade and powdered to get a coarse powder. About a significant amount of dry coarse powder was extracted with ethanol (40-60<sup>0</sup>C) by continuous hot percolation using soxhlet apparatus. The ethanol extract was filtered and concentrated to a dry mass by using vacuum distillation. A deep green viscous residue obtained having characteristic odour. Further, the solvents were evaporated to dryness.

### Animals:

The anthelmintic experiment was carried as per the method described by Mali *et al* with minor modifications. The experiment was performed on adult Indian earthworm due to its anatomical and physiological resemblance with the intestinal roundworm parasite of human

beings. Because of easy availability, earthworms have been used widely for the initial evaluation of anthelmintic compounds *in vitro*.

### Experimental Study of Anthelmintic Activity

50ml of formulation containing three different concentration each of ethanol and water extract (10, 20 & 50mg/ml in distilled water) were prepared and six worms were placed in it. Time for paralysis was noted when no movement of any sort could be observed except when the worms were shaken vigorously. Time for death of worms was recorded after when worms neither moved when shaken vigorously nor when dipped in warm water (50°C). Albendazole (10mg/ml) was used as reference standard while distilled water as control. The results obtained during the experiments were showed in table-1.

Group	Concentration of extract in %	Time taken in minutes $\pm$ SEM	
		Paralysis	Death
Albendazole	1.0	30.66 $\pm$ 0.57	42.00 $\pm$ 1.57
	2.0	24.00 $\pm$ 0.57	37.00 $\pm$ 1.57
	5.0	17.33 $\pm$ 1.15	28.66 $\pm$ 0.91
Ethanol extract	1.0	20 $\pm$ 1.76	24 $\pm$ 0.88
	2.0	13 $\pm$ 0.66	10 $\pm$ 0.88
	5.0	6 $\pm$ 1.52	3 $\pm$ 0.33
Control	-	-	-

Control worms were alive up to 24 hrs. of observation.

### RESULTS AND DISCUSSION

The Phytochemical analysis of the plant has stated about the presence of alkaloids, proteins, tannins, flavonoids etc. The ethnomedicinal documentation confirms the potent activity of the leaf part of *Artocarpus heterophyllus*. From the observations made, higher concentration of extract produced paralytic effect much earlier and the time to death was shorter for all worms. Ethanolic extract showed anthelmintic activity in dose-dependent manner giving shortest time of paralysis and death with 50 mg/ml concentration, for all three types of worms. Evaluation of anthelmintic activity was compared with the standard drug albendazole.

## CONCLUSION

There are various polyherbal preparations present in the market which contain *Artocarpus heterophyllus* as a chief constituent due to its versatility in treating different disorders. The traditional healers used these plants as potent anthelmintic agent and this have been proved by above experiment. The dietary consumption of this plant not only provides protein carbohydrates and essential amino acids to our body as well as also gives a remarkable taste. The plant is blessed with immense potent activities in combating different types of diseases the requirement is to explore it the most for its active constituents and furthermore regarding its mode of action and structural analysis so that a better and more advanced formulation can be prepared for the mainstream administration of the drug.

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