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EVALUATION OF *IN-VITRO* ANTHELMINTIC ACTIVITY OF *LAGENARIA SICERARIA* FRUIT POWDER

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ABSTRACT

Parasitic helminthes affects both human being as well as animals. Most illnesses caused by helminthes are of a long-lasting and debilitating in nature. The parasitic gastroenteritis is caused by mixed infection with several species of stomach intestinal worms. Here We try to explore scientifically the anthelmintic potential of and substantiate its folklore claims. In present study *Lagenaria siceraria* fruit powder in aqueous was investigated for its anthelmintic activity against *Pheretima posthuma* and *Ascardia galli*. Increasing concentrations were used while doing the bioassay, which involved paralysis and death time of the worms. A significant anthelmintic activity was observed at a higher concentration.

KEYWORDS: Anthelmintic activity; *Lagenaria siceraria* fruit powder*; Ascardia galli; Pheretima posthuma.*

INTRODUCTION

Helminthic infections are very common in humans with a large threat to health in developing countries. It contributes malnutrition and anemia. The World Health Organization discloses that over one billion people are suffering from opportunistic worm infections.[1] In most developing and less developed countries, helminth infections are a major health concern because they predispose humans to many acute as well as chronic health problems. The parasitic gastroenteritis is caused by mixed infection with several species of stomach and intestinal worms[2], Most of the existing anthelmintic produce side effects such as abdominal pain, loss of appetite, nausea, vomiting, headache and diarrhea.[3] Anthelmintic from the natural sources may play a key role in the treatment of these parasite infections.[4] Because of

the increasing anthelmintic resistance and the impact of conventional anthelmintic on the environment, it is important to look for alternative strategies against parasitic worms. Earthworms have been used widely for the initial evaluation of anthelmintic compound in vitro.[5,8]

Lagenaria siceraria fruit juice and powder is part of complementary and alternative therapy which is widely prevalent in India.[9] It is believed to possess beneficial in diabetes mellitus, hypertension, flatulence, liver diseases, weight loss and other associated benefits like an antioxidant, anti-dysentery, anti-carbuncle detoxification and anti-hemorrhoid.[10] The fruit powder given in worm cases and in certain bowel affections of children like diarrhea and dysentery in the country. In northern India, it is considered stimulant and laxative. Present study targets at exploring the facts of anthelmintic action of *Lagenaria siceraria* fruit powder (LSFP).

MATERIALS AND METHODS

Collection, authentication and Preparation of Fruit Powder

The fresh fruits of *Lagenaria siceraria* were procured from vegetable market of nanded, Maharashtra, India. The plant material was authenticated by Dept. of Botany, V.N. Agriculture University, Parbhani, India. Whole fruits were cut in slices, shed dried and pulverized to coarse powder.

Experimental Design Animals

The adult *Pheretima posthuma* earthworms were collected from farms water logged areas and *Ascardia galli* (nematode) worm from freshly slaughtered fowls *(gallus*). The worms were identified at the dept. of zoology, B.S. college, Nanded, India.

Evaluation of anthelmintic activity[11,12]

The anthelmintic activity was evaluated on adult *Pheretima posthuma and Ascardia galli* (nematode) worm due to its structural and physiological closeness with the intestinal round worm parasites of humans. Three different concentrations of LSFP (10, 50 and100 mg/ml in distilled water) were prepared in glass dishes and five worms (same size) of both types were placed in it. Worms were observed for the time taken to get paralyzed and death of the individual worms. Mean time to get paralyze (P) in min was noted when no movement of any sort could be observed, except when the worm was shaken vigorously. While time of death (D) in min was note down after ascertaining the worms neither moved when shaken

vigorously nor when dipped in warm muddy water (45°C). Piperazine citrate (10 mg/ml) was taken as reference standard.

Statistical Analysis

All the results were expressed as Mean ± SD (n=5). The statistical significance between means were analyzed using one-way analysis of variance [ANOVA] followed by Dunnett's test by using Graph pad software. $p < 0.05$ was considered significant.

RESULTS AND DISCUSSION

LSFP in aqueous exhibited anthelmintic activity in dose-dependent manner giving shortest time of paralysis (P) and death (D) with 100 mg/ml concentration. Table 01 revealed paralysis and death of *P. posthuma at* 14.46 and 48.33 min., while of *A. galli* at 19.10 and 46.15 min respectively, at higher concentration of 100 mg/ml. Reference standard Piperazine citrate did the same anthelmintic effect with *P. posthuma at* 18.73 and 57.53 min., while of *A. galli* at 16.17 and 43.61 min. respectively.

Table 01: Anthelmintic activity of LSFP.

Test compound	Concentrations (mg/ml)	Time taken for paralysis (P) and death (D) of worms in min.			
		P. posthuma		*A. galli*	
		Paralysis	Death	Paralysis	Death
Control	--	--	--	--	--
	10	30.17 ± 0.47	70.83 ± 0.60	40.72 ± 0.64	72.07 ± 0.78
LSFP	50	21.76 ± 0.81	59.87 ± 0.75	39.30 ± 0.34	56.35 ± 0.54
	100	14.46 ± 0.37*	48.33 ± 0.86*	19.10 ± 0.49*	46.15 ± 0.13*
Standard (Piperazine citrate)	10	18.73 ± 0.40	57.53 ± 0.39	16.17 ± 0.42	43.61 ± 0.66

The values were expressed as MEAN ± SD (n=5). *indicates significant ($p < 0.05$) when compared with standard drug treated group. Two-way ANOVA followed by *Dunnett's* tests.

Preliminary phytochemical screening of *Lagenaria siceraria* fruit revealed the presence of essential phytochemical such as terpenoids, steroids, tannins and alkaloids.[13] The observed anthelmintic activity may have contributed by the presence of tannins, chemically tannins are polyphenolic compounds. Anthelmintic effect of LSFP was may be due to binding of tannins to free proteins in the gastrointestinal tract of host animal or glycoprotein on the cuticle of the parasite and may cause death. Further studies are in process to identify the possible exact phytoconstituent responsible for the observed anthelmintic activity.

CONCLUSION

Lagenaria siceraria fruit powder was assessed for antihelmenthetic study. antihelmenthetic activity was observed at the higher concentration of 100 mg/ml. The paralysis and death of *P. posthuma* and *A. galli* organisms validates the continued use of this LSFP in folk and customary medicinal practices. Studies should therefore be done in order to identify the active phytoconstituents and appraise their effectiveness *in-vitro* and *in-vivo* so that they can be blended in commercial products.

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Conflict-of-Interest

No Conflict-of-Interest.

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