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**PHARMACOLOGICAL EXPOSURE OF THE ANTHELMINTIC
PROPERTIES OF *ANANAS COMOSUS* LEAVES' HYDROALCOHOLIC
EXTRACT ON *TUBIFEX TUBIFEX***

**MUKHERJEE M*, PRAMANICK K, BHATTACHARJEE P, MITRA S, SARKAR U,
SAHA K, MAJUMDAR M, ROY S, SARDAR P, BHUNIA I, MANNA M AND
MONDAL M**

Department of Pharmacology, Netaji Subhas Chandra Bose Institute of Pharmacy, Chakdaha,
Nadia 741222, West Bengal, India

*Corresponding Author: Mr. Mainak Mukherjee; E Mail: mukherjee.mainak2015@gmail.com

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ABSTRACT

This study aims to analyze a hydroalcoholic extract of *Ananas comosus* leaf for anthelmintic properties. It is frequently utilized in the Ayurvedic medical system to treat oxidative stress, joint discomfort, anti-inflammatory, enzyme inhibitory, and cytotoxic effects. It is also used as a folk remedy for these conditions. It has been demonstrated by science that the remaining plant portions have anthelmintic properties. We try to look into this activity because there are currently no scientific data on *Ananas comosus* leaves, despite the fact that the most significant activities such as glucose uptake, enzyme inhibitory action, and auxin transportation have already been demonstrated.

Ananas comosus leaves were allowed to macerate to produce a hydroalcoholic extract, and several phytochemical analyses were carried out. An investigation into the anthelmintic activity was carried out using the limit test, main test, and comparative test.

The '*Tubifex tubifex* worms' paralysis and death time were tracked, and the lowest dose concentration needed to kill every test a worm in 4 hours was computed. The usual medication was albendazole as suspension. Using a one-way ANNOVA and Dunnett's post-parametric test between the test group and the standard group data, the data is highly significant ($P < 0.01$).

Consequently, there may be an essential for *Ananas comosus* leaf hydroalcoholic extract as a natural anthelmintic.

Keywords: Hydroalcoholic extract, *Ananas comosus*, *Tubifex tubifex*, paralysis and death time, albendazole, ANNOVA

INTRODUCTION:

Prescription drug use is common in modern nations, which has led to a significant increase in interest in traditional or folk treatments in recent years.

All across the world, tropical plants are used to make drugs. Conventional plants have been used in various parts of the world [1], when they provided a reliable, inexpensive, and safe natural alternative to prescription drugs [2]. We have a number of medicinal plants from the natural world that we use to heal all human ailments [3]. India has a rich and diverse flora that is found all around the country. Herbal remedies have been the cornerstone of treatment and recovery for a wide range of ailments and physiological states in the application of traditional therapies like Ayurveda, Unani, and Siddha [4].

Infections with worms are more prevalent in underdeveloped nations. Those who practice bad hygiene exhibit it [5]. The deworming agents are called anthelmintics. A vermifuge destroys, whereas a vermifuge encourages worm growth. One of the most prevalent illnesses in humans is helminth contamination.[6] have a significant impact on the entire population. In addition to depriving the host of food, anthelmintics can

harm organs, cause blood disorders, obstruct the lymphatic or digestive systems, and release toxins. Though rarely fatal, helminthiases are a major cause of grimness [7].

The market is filled with an enormous number of medications. Many plant parts including *Coriandrum sativum*, *Hibiscus rosasinesis* and *Piper betel* have been employed in anthelmintic studies in the past [8]. The same chemical components such as alkaloids, saponins, carbohydrates, etc., are present in the plants mentioned above. Additionally, this chemical component exhibits anthelmintic activity.[9] The same chemical components are also present in *Ananas comosus*. In anthelmintic research, other plant parts are employed, but not the leaves. Thus, leaves of *Ananas comosus* are chosen for the study for this reason.

MATERIALS AND METHODS:

Worm used:

Aquarium worms (*Tubifex tubifex*) were brought from the neighborhood market and provided a suitable environment them in an earthen pot. The worms ranged in length from 1 to 1.5 cm. Prior to the trial, these worms were acclimated to the lab setting.

Drug and chemical used:

Distilled water, albendazole oral suspension IP (Zentel 400 mg by GSK) and ethanol (Dr. S.C. Deb's Dilution). All of the medications and chemicals utilized were laboratory or analytical-grade products from reputable suppliers.

Plant Extraction:

The *Ananas comosus* plant was collected from a farm in Chakdaha, West Bengal, India. Following a water wash, the leaves were allowed to air dry in the shade at room temperature. After that, the dried leaves were manually ground into a coarse texture and extracted. For 48 hours, the dried leaves were macerated in a mixture of 70% alcohol and 30% water. After that, the extract was gathered, dried, and put to use in more research.

Preliminary phytochemical studies:

A preliminary phytochemical screening was conducted on the hydroalcoholic extract of *Ananas comosus* leaves to identify several plant elements such as alkaloids, glycosides, flavonoids, saponins, carbohydrates, amino acids, lipids, and steroids [10], [11].

Anthelmintic activity:

In accordance with OECD guidelines [12], the limit test, main test, and comparison test were used to assess the anthelmintic activity of the hydroalcoholic extract of *Ananas comosus* leaves. For this experiment, a random selection of worms was made. The greatest paralysis and death time were

recorded, along with the minimal dose required to paralyze and kill every worm in 4 hours. It was assumed that pre-complete paralysis had begun when the worms ceased their regular motions. By repeatedly providing external stimuli to an aquatic worm, the full paralysis time was verified. When the worms were submerged in hot water (50°C), their movement ceased completely, their body color vanished, and they showed no signs of activity. This was the death time. The control and reference medication, albendazole, was contrasted with the leaf extract's activity. A dosage of 5000 mg/kg was administered in six petri dishes, each holding 20 ml of distilled water, for the limit test. There was a single worm in each petri dish. The study took four hours to complete. In this study, every worm perished. The primary test was then run. Four Petri dishes with 20 millilitres of distilled water were used for the primary test, and dosages of 175 mg/kg, 550 mg/kg, 2000 mg/kg and 5000 mg/kg were added to each Petri dish, in that order. Six worms were inserted in each Petri plate, and the LD100 dose was calculated. The paralysis and death time were recorded during the four hours when this investigation was conducted. Using several divisions of doses, the minimal dose of LD100 in this investigation was found to be 550 mg/kg, at which point 100% of the worms perished.

The comparative test was conducted following the main test. In this case, the conventional medication and the minimum LD100 dose of hydroalcoholic extract from *Ananas comosus* leaves were compared. Two Petri dishes with 20 millilitres of distilled water were used. As the test and standard drugs, respectively 550 mg/kg of hydroalcoholic extract from *Ananas comosus* leaves and albendazole suspension (the same dosage as the plant extract, i.e., 550 mg/kg) were added to the Petri dish. Subsequently, 6 worms were put in each Petri dish, and for four hours, the worms' paralysis and death times were noted.

Statistical analysis:

The standard error of mean (SEM) for every treatment group is represented as the mean \pm

SEM in the experimental data. Dunnett's post-parametric test comparing test group and standard group data, one-way ANOVA (Analysis of variance), was used to determine the significance of the activity. It was deemed statistically significant at $P < 0.01$ [13].

RESULTS & DISCUSSION:

Results:

Extract preparation: After 48 hours of continuous maceration extraction using 70% ethanol on *Ananas comosus* leaves, a 9.01% yield was achieved.

Preliminary phytochemical investigation:

Corresponding a preliminary phytochemical analysis of the extract made from *Ananas comosus* leaves, the following phytoconstituents were discovered.

Table 1: Result of preliminary phytochemical investigation

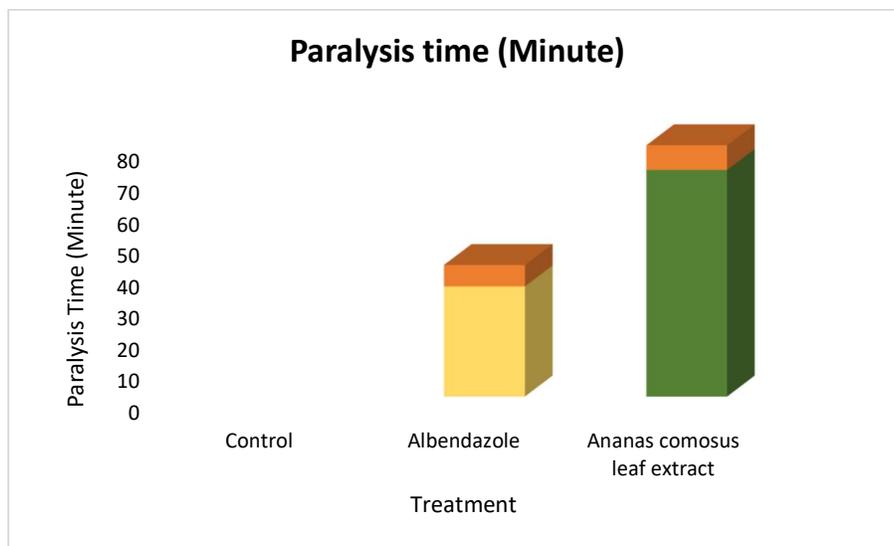
Sl. No.	Phytoconstituents	Result
1.	Alkaloids	Positive
2.	Carbohydrates	Positive
3.	Glycoside	Positive
5.	Flavonoids	Positive
6.	Saponins	Negative
7.	Steroids	Positive

Effect of the extract:

Table 2: Effect of control, albendazole and *Ananas comosus* leaf extract on aquatic worm (*Tubifex tubifex*)

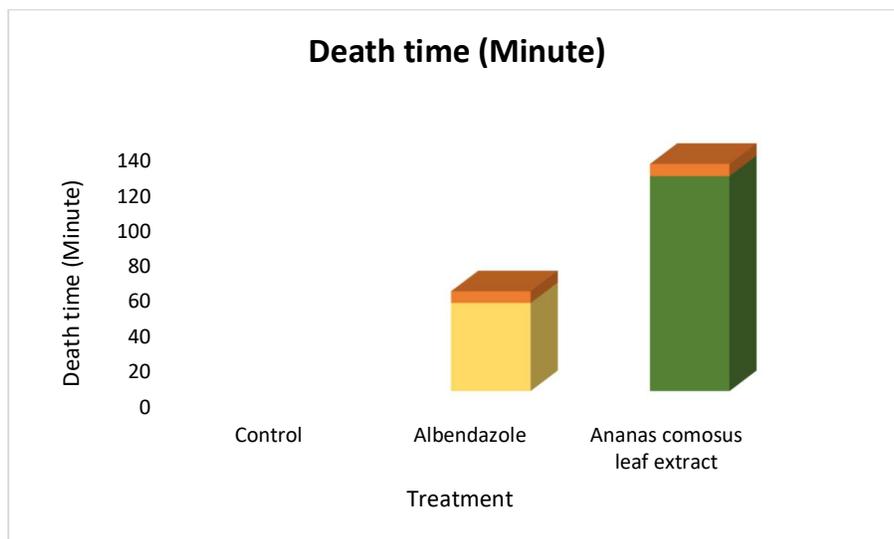
Treatment	Paralyze time (Minute)	Death time (Minute)
Control	-	-
Albendazole	35 \pm 6.81**	50 \pm 6.65**
<i>Ananas comosus</i> leaf extract	72 \pm 7.84**	122 \pm 6.95**

All values are mean \pm SEM, n = 6, and statistical significance was defined as ** $P < 0.01$.



All values are mean \pm SEM, n = 6

Figure 1: Graphical representation of the effect of *Ananas comosus* against Albendazole on paralysis time of *Tubifex tubifex*.



All values are mean \pm SEM, n = 6

Figure 2: Graphical representation of the effect of *Ananas comosus* against Albendazole on death time of *Tubifex tubifex*.

DISCUSSION:

In general, anthelmintics attach to the parasite's beta tubulin and prevent the creation of new microtubules. They also prevent the parasite from absorbing glucose, which results in the worm becoming paralyzed and dying [14]. Through our current examination, we have learned that

the anthelmintic activity of *Ananas comosus* may be attributed to the presence of alkaloid carbohydrate glycoside flavonoid steroid in chemical tests. A portion of the chemical components are responsible for exhibiting the anthelmintic impact. Alkaloids target the acetylcholine receptor and outperform glucose absorption to demonstrate

anthelmintic action [15]. As a result, hunger caused the helminths to perish. Flavonoids prevent the absorption of glucose. Flavonoids aid in allopathy, auxin transport inhibition, floral coloration, and UV protection. demonstrating activity by preventing the phosphorylation reaction, which prevents the parasite from producing energy and ultimately causes it to die [16]. The glycosides and carbohydrates exhibit strong action against certain helminths. Transportation of sodium and potassium ions into helminthic tissues is disrupted by cardenolide. The anthelmintic action of *Ananas comosus* has been verified by science to be caused by its activities [17].

To put it briefly, *Ananas comosus* is a miraculous herb with a variety of pharmacological effects. It is evident from all of the above binding that *Ananas comosus* has demonstrated a strong anthelmintic impact, which may be related to the existence of its chemical constituent. Some of them are established, but the anthelmintic property of this plant's leaves has not been disclosed. These ingredients further distinguish the plant as a special herb.

CONCLUSION:

The anthelmintic activity of a hydroalcoholic leaf extract from *Ananas comosus* has been assessed in this study. The albendazole suspension has been used as a standard. *Ananas comosus* has

demonstrated a notable anthelmintic effect through tubifex worm paralyzation and death time. The mortality time of *Tubifex tubifex* caused by *Ananas comosus* extraction has demonstrated an equivalent impact of oral albendazole suspension. The presence of active compounds, including as steroids, alkaloids, carbohydrates, glycosides may be the cause of this action. These chemicals are also known to have cytotoxic and enzyme-inhibitory properties, as well as to block glucose uptake and auxin transport. It is clear from the sample extract used to generate these activities that it has anthelmintic properties. The anthelmintic effect of this medication may offer some hope.

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