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## INVITRO ANTILICE ACTIVITY OF *TAMILNADIA ULIGINOSA* FRUIT EXTRACT

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### ABSTRACT

**Introduction:** A significant challenge in relation to public health is the infestation of human head louse. Without regard to sex or social level, the illness spreads around the world, attacking different ethnic groups. The treatment involves a number of traditional medicines, but they have drawbacks such side effects and high cost. Therefore, efforts are being made to discover an effective alternative therapy for head louse infestation. **Objective:** The present study was aimed to evaluate pediculocidal activity of ethanolic extract of *Tamilnadia uliginosa* fruit on *Pediculus humanus capitis* by using filter paper assay. **Materials and Methods:** The diffusion method was used to test the pediculocidal activity on filter paper. **Results:** The solvent extract was evaluated for the presence of phytochemicals. Three different concentrations such as 10, 20 and 30% of the tests and standard showed dose dependent activity when compared with standard drug benzyl benzoate (25% w/v). **Conclusion:** The results confirmed that *Tamilnadia uliginosa* fruit showed pediculicidal efficacy.

**Keywords:** *Tamilnadia uliginosa*, head louse, benzyl benzoate and phytochemicals, traditional medicines

### INTRODUCTION:

The head louse, *Pthirus pubis* (crab louse), and *Pediculus humanus humanus* (body louse) are the three main types of lice that infest people; the head louse is the most prevalent. Human lice infestations are

widespread throughout the world, especially among kids between the ages of 5 and 11 in both industrialised and developing nations. Girls typically experience more infestations than boy's do [1]. Infection can result in

secondary bacterial infections, skin irritation, pain, and sleep loss. Despite the comparatively modest symptoms, *P. humanus capitis* infestation has led to a number of social, mental, and economic issues [2].

The female louse has a life span of around one month. She will lay between 7 and 10 eggs (or "nits") per day at this time, securely securing them to the area of the hair shaft adjacent to the scalp or torso. The nits generate nymphs after 6 to 10 days, and they develop into adults in 10 days [3]. Direct head-to-head contact and the use of personal items like combs, brushes, hats, and other items belonging to infected individuals are thought to be the two main ways that head lice are spread [4].

Currently, a wide range of pesticides, including lindane, malathion, carbaryl, and synthetic pyrethroids, have been used to control head louse. Unfortunately, some chemical pediculicides, like lindane, are too toxic for humans, and other chemical pediculicides have lost their effectiveness since head lice have been found to be becoming more resistant to these chemicals globally. As a result, there is a need for innovative alternative pediculicides for the treatment of head lice, particularly those made from plants or herbs. These pediculicides are good safer control agents that may offer

good anti-lice action and low levels of developed head lice resistance [5].

Adavimanga, also known as *Tamilnadia uliginosa* in Telugu, is a member of the Rubiaceae family. The plant is endemic to Bangladesh, India, Sri Lanka, and Thailand, where it is found in dry deciduous forests. It is an extremely rigid tree with quadrangular branches that is dry, ramous, and deciduous. The locals can utilise it to treat a variety of illnesses [6]. The current study is done for to evaluate the potential of crude *Tamilnadia uliginosa* fruit extract as anti- head lice agent.

#### **MATERIALS AND METHODS:**

The methodology adopted to evaluate the anti-lice activity of fruits of *Tamilnadia uliginosa* plant here under.

#### **Collection and Authentication of plant material:**

The fruits of *Tamilnadia uliginosa* were collected from the talakona regions of chittoor dist, Andhra Pradesh and India. The plant material was taxonomically identified by botanist Dr. Madhava Chetty, Asst. Prof, SVU, Tirupathi. A voucher specimen has been preserved in our laboratory for future reference. The plant material was dried in shade, pulverized, passed through sieve no. 40 and stored in air tight container and used for further extraction.

#### **Preparation of plant extracts:**

100 g air dried powder was packed in a filter paper and subjected to extraction

by using soxhlet apparatus for 72 hours (approx.) First the plant material is subjected to defatted with petroleum ether and finally extracted with ethanol and temperature was adjusted as per solvents been used in the extraction. The extract was concentrated under rotary evaporator. The resulting semisolid residue was pounded to dryness under hot-air dryer to obtain a powdery crude extract.

#### **Phytochemical screening: [7-10]**

The extract was subjected to preliminary phytochemical screening in order to detect the presence of various groups of phytoconstituents by using standard phytochemical procedures.

#### **Collection and maintenance of head lice:**

*Pediculus humanus capitis* were collected from school going children between the age group of 8-12 by combing using a clean, sharp teeth comb. After combing, the lice were carefully removed from the teeth of the comb into sterile petri plates containing human hair strands. The lid was loosely sealed by parafilm wax to permit ventilation and immediately transported to the research laboratory. The in-vitro tests for head lice were started within 1 hr after collection. The inclusion criterion was including subjects who had not been treated with any anti-lice Shampoo or products for the preceding 3 months.

#### **Experimental procedure [4, 11]**

The in-vitro tests were started within one hour after collection of lice. A filter paper diffusion bio assay was made. After careful selection of lice under a dissecting microscope, a filter paper discs (Whatman No.1) matching with internal diameter of Petri dish were cut and placed in petri plates. All three different concentrations (10%, 20% & 30%) were tested. All the test organisms are divided into three groups each group containing 10 lice were placed on a filter paper at the bottom of Petri plate and kept open. 0.5ml of each test sample was spread over the lice and filter paper. Group A was treated with 0.5ml distilled water and served as control. Group B (test group) received 0.5ml of various concentrations of ethanol extract respectively. Group C was treated with 0.5ml of 10%, 20% & 30% of Benzoyl benzoate 25% (w/v). All the Petri dishes were set aside for 1 hour in a dark chamber at  $26\pm 0.5$  and  $70\pm 1\%$  humidity. At the end of 1 hour the dishes were taken out and applied 0.5ml of distilled water and further placed in the chamber under the conditions mentioned above. After 18hours, the dishes were resolved under a dissecting microscope for any possible movements of lice and absence of any movement was considered as lice were dead. All the treatment was triplicate. The criteria used for survival of lice were extremely strict and clear if any minor signs of life, such as movements of

antennae or minimal leg movements were noted (with or without stimulation by a forceps), the lice were categorized as alive.

The lice were judged as dead if there were no vital signs at all.

## RESULTS AND DISCUSSION:

Table 1: Phytochemical screening of *Tamilnadia uliginosa* fruits

S. No.	Chemical constituents	Ethanollic extract
1	Carbohydrates	Absent
2	Proteins	Present
3	Amino acids	Absent
4	Tannins	Present
5	Glyosides	Absent
6	Alkaloids	Present
7	Flavonoids	Present
8	Steriods	Present
9	Saponins	Present
10	Gums	Present
11	Mucilages	Present

Table 2: Effect of *Tamilnadia uliginosa* fruits against the activity of *Pediculus humanus capitis*

S. No.	Sample	Concentration (%)	Average mortality (%)
01	Control (water)	-	-
02	Benzyl benzoate (Standard)	10%	43%
		20%	60%
		30%	84%
03	Ethanollic extract (Test)	10%	36%
		20%	58%
		30%	69%

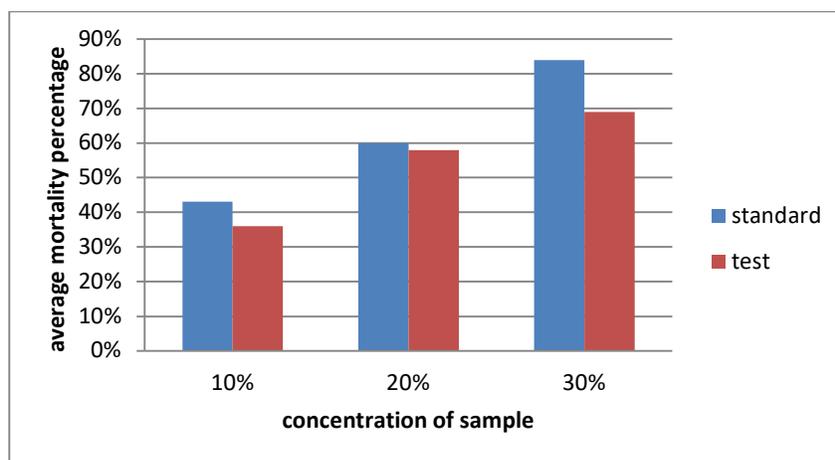


Figure 1: Graphical representation of mortality percentage

Lice infestations are one of the common problems in the world whereas synthetic pediculocides are expensive. Though all of the synthetic pediculicidal agents act efficiently against *P. humanus* capities, some of them are neurotoxic. Hence Non-toxic alternative options are

needed for treatment of head lice. Natural products have been used in traditional medicine for thousands of years and recently have been of increasing interest. Natural source remains attractive primarily because they are inexpensive, less toxic when compare with synthetic products, readily

available, capable of multitude of chemical modifications, potentially degradable and compatible due to their natural origin. Here an attempt to check the ethanolic extract of fruits of *Tamilnadia uliginosa* for antilice activity

The Phytochemical screening of ethanolic extract of fruits of *Tamilnadia uliginosa* revealed that the various phytoconstituents like tannins, alkaloids, saponins, steroids and flavonoids were present in the extract. All three different concentrations 10%, 20% & 30% of test drug and standard were tested. Benzyl benzoate 25% (w/v) was used as a standard. In our study, three different concentrations of the test and the standard drug such as 10%, 20% & 30% showed dose dependent activity when compared with standard drug benzyl benzoate.

The results revealed that the ethanolic extract showed the effective mortality 69% at the concentration of 30% whereas standard drug shows mortality 84% at the concentration of 30% respectively. The results were comparable with standard sample; the results are shown in Table 2. The activity of *Tamilnadia uliginosa* fruits extracts suggests that it is effective against lice infestations of humans. Further, in future it is necessary to identify and isolate the possible active phytoconstituents which are responsible for the antilice activity and study its pharmacological actions.

## CONCLUSION:

This study reveals that the fruit of *Tamilnadia uliginosa*, an ethanol extract, is beneficial in preventing human lice infestations. In the future, it will be important to discover and isolate any potential phytoconstituents that are active and are responsible of the antilice activity as well as to investigate their pharmacological effects.

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## CONFLICT OF INTEREST:

The authors have no competing interests to disclose.

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