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Research Article

**IN-VITRO SCREENING OF ANTI-LICE ACTIVITY OF
ANDROGRAPHIS PANICULATA.**Nadeem Hasan¹, Ziaurrahman², Syed Feroz³, Dr. Mohd Rafiq⁴, and Dr. Sadath Ali⁵**Abstract:**

Pediculus humanus capitis also called as human head louse, infestation is a major concern in public health associated problem. Resistance of human head louse drug towards louse laid the foundation for research in exploring antilice medicine from medicinal plants.

In present study, petroleum ether and methanolic extracts of *Andrographis Paniculata* were tested against the *Pediculus humanus capitis* by a simple filter paper diffusion method.

The methanolic extract showed 98.4% mortality in 30 minutes and 100% mortality in 60 minutes whereas petroleum ether extracts showed 94.8% mortality in 30 minutes and 100% mortality in 60 minutes. In order to reduce the mortality time, the extracts are mixed with carrier oil like castor oil, coconut oil and olive oil. The methanolic extract with all the three-carrier oil showed significant reduction in mortality in 30 minutes whereas petroleum ether showed moderate pediculocidal effects. All the results were well compared with benzoyl benzoate (25% w/v) as standard.

These results showed the prospect of using *Andrographis paniculata* extracts against *Pediculus humanus capitis* in difficult situations of emergence of resistance to synthetic anti-lice agents.

Key Words: *Andrographis paniculata*, Antilice activity, Filter paper diffusion, Pediculocidal medicine, head lice.

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INTRODUCTION:

Insects like lice, mites and ticks are nasty contemporaries which not only produce pain due to the severe itching at the biting sides but they also may transmit many agents of often severe diseases in humans and animals¹.

Pediculus humanus capitis infestations and are prevalent worldwide and especially common among school children in both developed and developing countries. *Pediculus humanus capitis* infection cause skin irritation, pruritis and sleep loss as well as occasional secondary bacterial infection².



In India people spend so much money to buy the synthetic marketed products to solve the problems of lice. the lack of efficacy of these synthetic products is due to the emergence of resistance by the head Louse and researchers were aimed on the search of new substitutes to synthetic ingredients, such as phytoconstituents obtained from plant sources.

Andrographis peniculata plant possesses valuable medicinal properties and it has studied for activities like antioxidant, hepatoprotective activity, anti-inflammatory, anti-allergy, Vaso-protective analgesic

and antipyretic. The leaf juice of *Andrographis peniculata* boiled with coconut oil is applied on head to prevent falling and greying of hairs.

The plant is still not investigated for anti-lice activity therefore the aim of the study is to investigate the effect of shade dried leaves of *Andrographis peniculata* on head Louse³⁻⁶.

MATERIALS AND METHODS:**Plant material:**

Fresh plant material of *Andrographis peniculata* was collected from the local fields of Gulbarga. The plant specimen was identified and authenticated by Prof. Dr. Srinath rao, Department of Botany, Gulbarga University, Gulbarga. A voucher specimen is preserved in the herbarium of Department of Botany (Voucher No.5098), Gulbarga University Gulbarga. Then the plant was washed under tap water to remove debris and dried under shade for 10 days. The dried leaves were size reduced to coarse powder in a grinder.

Extraction:

The coarse powder of *Andrographis peniculata* (500 gm) extracted with Petroleum ether and Methanol by soxhlet extraction technique. All the extracts were concentrated using Rotary vacuum evaporator and kept in a desiccator until further studies the color, consistency and percentage yield were observed⁷. (Figure 01)



Figure 01: Extraction by soxhlet extraction technique.

Collection of head lice:

Adult pediculus humanus capitis were collected from government school children between the age group of 3 to 12 with the approval of the teachers residing near kotnoor in Gulbarga district. The lice were collected by combing the children's scalp. after combing, the lice were carefully removed from the teeth of the comb into plastic boxes all the subjects had not been treated with any anti-lice products for the preceding twomonths.

ANTI LICE ACTIVITY**Filter paper diffusion method:**

Now a days filter paper assays in Petri dishes are common bioassay method to determine the level of topical insecticides resistance in head lice which provides informative and comparable results. insecticide treated lices are likely able to continue blood feeding and blood injection alter the availability of insecticide or the physiology of louse modify subsequent mortality so it was decided to feed head lice with blood meal by placing the lice on the bare lower leg of one of the authors after collection from the host. Microscopic examination was done in the midgut region and confirmed the blood ingestion. Colony of pediculus humanus capitis was collected by

combing the hair of 20-25 infected children at the age group of 3-12. Adult lice were placed in small plastic containers (50 ml polypropylene containers containing 1.5 CM human hair tufts). the mouth was covered with nylon mesh (1 strand/mm) to permit ventilation. for this study the hair tufts were coated with test drugs.

the activity was carried out at $37 \pm 1^\circ\text{C}$ and $65 \pm 5\%$ relative humidity in dark room using water as control.

In the majority of situations, carrier oil has sufficient suffocating capabilities to make almost any mixture of essential and carrier oil effective in killing lice and possible effectiveness of penetration using lipid-based compounds. So the extract was mixed with the different carrier oils like coconut oil, castor oil and olive oil in the ratio of 10% 20% and 30% and performed the anti-lice activity⁸.

RESULT AND DISCUSSION:

The color, consistency and percentage yield of the petroleum ether and methanol extracts of *Andrographis peniculata* were recorded (Table 01). All the extracts displayed concentration (10% 20% and 30%) dependent activity among which methanolic extract showed higher mortality followed by petroleum ether extract respectively and was well comparable with the standard. (Table02 and 03).

Table: 01: The color, consistency, and percentage yield of extracts.

S. No.	Extract	Nature of Extract	Colour	Weight (gm)	% Yield (w/w)
1.	Petroleum Ether (40-60°C)	Semi solid	Yellowish brown	7.54	1.94
3.	Methanol		Dark Green	52.59	10.99

Table: 02: Effects of Petroleum ether extract of *Andrographis peniculata* (PEAP) against *Pediculus humanus capitis*

SL. NO	NUMBER OF LICE	TEST DRUG	CONCENTRATION (gm/ml)	AVERAGE MORTALITY % IN 30 MIN	AVERAGE MORTALITY % IN 60 MIN
1	20	Distilled water (control)	-----	-----	-----
2	20	Benzyl benzoate (standard)	10%	67.4%	100%
			20%	98.5%	100%
			30%	99.7%	100%
3	20	PEAP + Coconut oil	10%	47.98%	90.28%
			20%	58.18%	97.17%
			30%	98.38%	100%
4	20	PEAP + Castor oil	10%	41.22%	92.64%
			20%	51.26%	96.73%
			30%	97.13%	100%
5	20	PEAP + Olive oil	10%	39.99%	93.82%
			20%	78.41%	98.38%
			30%	91.82%	100%
6	20	PEAP	-----	93.8%	100%

Table: 03: Effects of Methanolic extract of *Andrographis peniculata* (MEAP) against *Pediculus humanus capitis*

SL. NO	NUMBER OF LICE	TEST DRUG	CONCENTRATION (gm/ml)	AVERAGE MORTALITY % IN 30 MIN	AVERAGE MORTALITY % IN 60 MIN
1	20	Distilled water (control)	-----	-----	-----
2	20	Benzyl benzoate (standard)	10%	64.4%	100%
			20%	97.5%	100%
			30%	99.1%	100%
3	20	MEAP + Coconut oil	10%	48.33%	96.66%
			20%	58.33%	100%
			30%	98.33%	-----
4	20	MEAP + Castor oil	10%	50.00%	98.33%
			20%	63.33%	100 %
			30%	100%	-----
5	20	MEAP + Olive oil	10%	41.66%	95.00%
			20%	78.33%	100%
			30%	96.66%	-----
6	20	MEAP	-----	97.4%	-----

The findings of this study showed excellent anti-lice activity of *Andrographis peniculata* which may be due to the presence of sterol derivatives⁹ responsible for the enhanced penetration and bioavailability of oil components into the body of lice.

Penetration of extracts into the alimentary tract of lice could be ignored since all the extracts was applied on lice placed on the filter paper which also subsequently avoided immense dissemination of active constituents into the cuticle when the compound is directly applied to the insect skin.

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REFERENCES:

1. Seetharam Y.N. *et al.*, A dichotomous key to identify genera and species. Flora of Gulbarga District :2000; 14-15.
2. Basu. S. K *et al.*, (2009) Studies on the anti-inflammatory, analgesic and antipyretic properties of *Andrographis peniculata*.

- International journal of pharmacology 5(4): 251-256.
3. Mathison.B.A *Et al.*, Laboratory Identification of Arthropod Ectoparasites. Clinical Microbiology Review. 2014 Jan; 27(1): 48–67.
 4. Burkhart CG, Burkhart CN, Burkhart KM. An assessment of topical and oral prescription and over-the-counter treatments for head lice. Journal American Academic Dermatology. 1998; 38: 979–982.
 5. Sermakkani *et al.*, 2010. Evaluation of preliminary phytochemical and antimicrobial activity of *Andrographis peniculata*. International journal of pharmaceutical sciences: 540-550.
 6. Shanmugam. S *et al.*, 2009. Plants used as medicine by palisas tribes of shenbagathope in virudhunagar district of tamilnadu, India. Ethnobotanical leaflets 13: 370-378.
 7. AnbuJebaSunilson J, Suraj R, Anandarajagopal K, Rejitha G, Vignesh M, Promwichit P. Preliminary phytochemical analysis, elemental determination and antibacterial screening of *Codiumdecorticum*-A marine green algae. Intentional Journal of Bio Chem. 2009; 3: 84–89.
 8. Picollo MI, Vassena CV, Mougabure Cueto GA, Verneti M, Zerba EN. Resistance to insecticides and effect of synergists on permethrin toxicity in *Pediculus capitis* (Anoplura: Pediculidae) from Buenos Aires. Journal of Med Entomol 2000; 37: 721-725.
 9. Elaiyaraja. A *et al.*, Phytochemical Screening, Antioxidant and Antimicrobial activities of *Andrographis peniculata* Leaves. World scientific news. 2015; 98 – 110.