



AN IN VITRO SCREENING TO COMPARE THE ANTI HEAD LICE ACTIVITY OF KSHEERAVIDARYADI TAILA PREPARED WITH NARIKELA TAILA AND KARANJA TAILA

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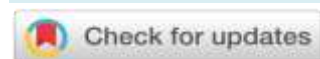
<https://doi.org/10.46607/iamj0512032024>

(Published Online: March 2024)

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Article Received: 07/02/2024 - Peer Reviewed: 04/03/2024 - Accepted for Publication: 11/03/2024.



ABSTRACT

Pediculosis capitis, or head louse infestation, is a longstanding global concern, particularly prevalent in tropical and subtropical regions. Despite not posing a primary health threat, it remains a significant social problem, affecting millions worldwide. Existing treatments, including Permethrin, Malathion, and Lindane, often result in side effects such as irritation and swelling. While Ayurvedic texts mention references to head lice and their management, studies have yet to explore these aspects. This study investigates the efficacy of Ksheeravidaryadi Taila, a Taila yoga formulation, for treating head louse infestations. Two formulations, Sample-A (Narikela taila base) and Sample-B (Karanja taila base) were subjected to in-vitro screening, evaluating their effects on head lice movements, irritability, and vital signs over time. **Methods:** In-vitro screening involved the application of Sample-A and Sample-B on head lice, with comparative assessments against plain Narikela taila, Karanja taila, and distilled water. Observations were made on movements, irritability, and vital signs of the lice. Microscopic studies were conducted to analyze the effects further. **Results:** Sample B demonstrated a quicker and more potent action,

inducing irritability and cessation of vital signs in head lice within 45 minutes. Sample A exhibited similar effects, albeit with milder intensity and a prolonged duration. Microscopic studies revealed no crucial signs in either sample, with bleeding observed in Sample B. **Conclusion:** The study underscores the potential efficacy of Ksheeravidaryadi Taila, particularly Sample B with Karanja taila base, which might be helpful for the treatment of head louse infestations. The formulation's alignment with Ayurvedic principles, including Tikta rasa and Krimihara attributes, coupled with faster drug action and higher saponification values, suggests its effectiveness.

Keywords: *Pediculosis capitis, Ksheeravidaryadi Taila, Karanja Taila, Narikela taila, anti-lice activity*

INTRODUCTION

Pediculosis capitis, or head louse infestation, has been well-known since antiquity. Although not considered a primary health hazard, it is a common social problem in tropical and subtropical nations worldwide, especially in rural areas¹. The prevalence of head louse infestation is estimated to be 0.7%- 59% in Asian populations, 0.48%- 22.4% in European populations, 3.3%- 58.9% in African populations, and 3.6%- 61.4% in American populations².

Head lice are minute, wingless parasitic insects that must live on a person to survive. They survive by piercing the skin to feed our blood and are almost exclusively associated with hair on the neck and scalp. They are flattened dorso-ventrally and have three pairs of legs with specially adapted claws for holding onto hair; they can move about readily from hair to hair. But they are adept at clinging to prevent dislodgement. Head lice vary from red to brown, grey or black. These head louse feed by using grasping teeth to penetrate scalp skin, so this feeding activity can irritate the skin, causing itching/scratching thereby leading to infestation³.

Around 282 studies on head louse infestation with medications like Permerthrin, Malathion Lindane, etc., used for lice treatment show side effects like irritation, swelling, and redness⁴.

Ayurvedic texts mention the management of head lice (Kesha kita, Swedaja krimi, and Yooka)⁵. The dosage from Sneha Kalpana emboldened the study as it is easily accessible and applied.

Sneha kalpana⁶ may be defined as “A pharmaceutical process to prepare oleaginous medicaments from the substances Kalka (paste) (oleaginous substance) and Drava dravyas (liquids) in specific proportions

by subjecting to a unique heating pattern & duration. This can be used internally or externally, according to the need for therapeutics.

One such taila yoga (oil preparation) explained in “Anaghatabada Pratisheda Adhyaya” in Sushruta Samhitha is Ksheeravidaryadi taila⁷, consisting of drugs Ksheeravidari, Madhuka, Laghu panchamula, Sarala, Devadaru used for treating Jantumurdhni (head lice)

Objective:

To perform in vitro screening of Anti head lice activity by using Ksheeravidaryadi taila with Narikela taila (sample-A) and Karanja taila (sample-B) as a base and comparing the same.

Materials and methods:

Materials:

Collection of head lice was done in Government High School, Saneguruvanahalli., Bangalore, Karnataka.

In-vitro screening was conducted in the QC lab of Sri Kalabyraweshwaraswamy Ayurvedic Medical College, Hospital and Research Centre, Vijayanagar, Bangalore, Karnataka.

Methods:

Preparation of oil: Ksheeravidarayadi taila was prepared as per Snehapaka Vidhi using the ingredients mentioned in Table 1.

Collection of lice⁸: By inspecting the nape of the neck and area behind the ears, carefully part the hair and examine the scalp for crawling lice. The hair debris was easily detachable/ loosened from the hair shaft to differentiate between nits and other debris. In contrast, the nits were firmly attached to the hair shaft and not easily removed. The clean, fine-toothed comb was used to collect the hair lice. The hair lice collect-

ed by combing the hair were placed in small plastic containers (50ml polypropylene). A small hole was made in the container's cover to permit ventilation. In-vitro screening for testing anti-head lice activity⁹ - This activity was performed using filter paper diffusion bioassay. The two filter papers (Whatman No. 1) were cut coinciding with the internal diameter of the petri dish and were then placed in two separate Petri dishes. Five lice were carefully positioned on filter paper using a thin brush, leaving the dish open. 0.5ml

of sample A and sample B were added carefully to the organisms and allowed to spread as a thin layer of 4cm. The petri dish was continuously observed, and a stopwatch was kept nearby to record the time and monitor the survival of the lice every 15 minutes. By the end of 1 hour, the in-vitro screening was completed by confirming the absence of vital signs (that is, movements of the leg & antennae). The recordings are shown in table 2.

Table- 1 Showing the ingredients of Ksheeravidaryadi taila.

Sl no	Sample –A (Narikela taila as a base) Ingredients for Kalka and Kashaya	Sample –B (Karanja taila as a base) Ingredients for Kalka and Kashaya
1	Ksheera vidari <i>Pueraria tuberosa</i>	Ksheera vidari <i>Pueraria tuberosa</i>
2	Madhuka <i>Glyzrhiza glabra</i>	Madhuka <i>Glyzrhiza glabra</i>
3	Shaliparni <i>Desmodium gangeticum</i>	Shaliparni <i>Desmodium gangeticum</i>
4	Prishnaparni <i>Uraria picta</i>	Prishnaparni <i>Uraria picta</i>
5	Kantakari <i>Solanum virginianum</i>	Kantakari <i>Solanum virginianum</i>
5	Brihati <i>Solanum indicum</i>	Brihati <i>Solanum indicum</i>
6	Gokshura <i>Tribulus Terrestris</i>	Gokshura <i>Tribulus Terrestris</i>
7	Devadaru <i>Cedrus deodara</i>	Devadaru <i>Cedrus deodara</i>
8	Sarala <i>Cedrus deodara</i>	Sarala <i>Cedrus deodara</i>
	For kashaya preparation Drugs - total 1.8kg(each 225gm) Water-12.2ltrs For kalka – total 192 gms(each 22gm)	For kashaya preparation Drugs - total 1.8kg(each 225gm) Water-12.2ltrs 192 gms (each 22gm) for kalka – total
9	Narikela taila- 750ml	Karanja taila- 750ml

Table 2: Showing the observation of anti-lice activity.

Time interval (min)	Sample- A	Sample- B
15	All the lice remained still.	All the lice showed irritability and there were rapid movements of leg & antennae
30	2 out of 5 lice showed mild leg & antennae movements.	3 out of 5 lice showed no movements of leg & antennae.
45	All the lice showed rapid leg & antennae movements.	All lice showed no vital signs.
60	After 55mins- 4 lice showed no vital signs.	-

DISCUSSION

Pediculosis capitis, or head louse infestation, although not considered a primary health hazard, is a common social problem encountered worldwide, especially in rural areas. Many studies about treating head louse infestations show side effects like irritation, swelling, redness, etc. So, an attempt was made using *Ksheeravidaryadi Taila* (*Narikela taila* and *Karanja taila* as a base) as mentioned for *Jantumurdni chikitsa* (treatment of head lice infestation). In-vitro screening of Sample-A did not show any movements for 15 minutes. Later, there were mild leg and antennae movements, but at the end of 55 minutes, 4/5 lice did not show vital signs. Whereas all the louse showed irritability and rapid movements of the leg & antennae in sample-B at the end of 15mins, and all louse showed an absence of movements by 45mins. To know the formulation's efficacy, the same lice were treated with plain *Narikela taila*, *Karanja taila* and distilled water, where they showed active movements and crawled out of their respective Petri dishes. The properties of the ingredients in the oil predominantly consist of *Tikta rasa*, *katu rasa*, and *Ushna veerya* and possess *Krimihara* and *Kanduhara* properties. *Karanja taila*, being known for its *Krimigna*, *Kandugna*, *Ushna* and *Teekshna* properties, might have caused irritability to the lice, leading to the absence of vital signs, potentially aiding in the treatment of head lice infestations, whereas similar observation was found in sample- A but with milder intensity and increased duration of time. Both samples A & B were further evaluated for microscopic study, which revealed the following observation that is a) The lice in both samples- A & B showed no vital signs, and b) B the lice showed bleeding at the lower part of the abdomen. Also, the Article⁹ revealed a higher saponification value of *Ksheeravidaryadi taila* with *Karanja taila* base, indicating its quicker absorption, thereby showing faster drug action.

CONCLUSION

Chikitsa of *Jantumurdhni* in *Sushruta Samhitha* mentions using *Chakrataila* (*Yantrapidita taila*).

In support of the above *Chikitsa Sutra*, *Ksheeravidaryadi taila* with two different bases - *Narikela taila* (sample- A) and *Karanja taila* (sample- B) was prepared as per *Snehapaka vidhi* & evaluated for its anti-head lice activity. Both the samples revealed anti-head lice activity, but sample B showed quicker drug action with a higher saponification value and maximum anti-head lice activity in a short time.

Scope for further study: Clinical trials should be conducted to validate the findings.

Acknowledgement: We thank Rajiv Gandhi University of Health Sciences for the financial support and encouragement. We also want to thank the management and administration of Sri Kalabyraveshwaraswamy Ayurvedic Medical College, Hospital and Research Centre, Vijayanagar, Bangalore, for all their support.

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Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL: Ananya L et al: An in vitro screening to compare the anti-head lice activity of ksheeravidaryadi taila prepared with narikela taila and karanja taila. International Ayurvedic Medical Journal {online} 2024 {cited March 2024} Available from: http://www.iamj.in/posts/images/upload/500_504.pdf

