ISSN 2456-3110
Vol 9 · Issue 6
June 2024

JAiMS
INTERNATIONAL

Journal of Ayurveda and Integrated Medical Sciences

www.jaims.in

JAIMS

An International Journal for Researches in Ayurveda and Allied Sciences

Maharshi Charaka
Ayurveda

Indexed

Journal of
Ayurveda and Integrated Medical Sciences
ISSN 2456-3110
ORIGINAL ARTICLE June 2024

In Vitro Anti-Dandruff Activity of *Karnasphotha* (*Cardiospermum helicacabum* Linn.) against Malassezia furfur

Ashwini Kochari[1], Sarojini D Byadigi[2]

[1]*4th Year BAMS Scholar, SNVVS'S SGV Ayurvedic Medical College, Hospital and Research Centre, Bailhongal, Karnataka, India.*

[2]*Professor, Department of Dravyaguna Vignana, SNVVS'S SGV Ayurvedic Medical College, Hospital and Research Centre, Bailhongal, Karnataka, India.*

ABSTRACT

Background: Dandruff is a common skin condition that mainly affects the scalp. Almost half of the population at the pre-pubertal age and of any gender and ethnicity will be affected. It was discovered that the responsible agent is a scalp specific fungus, *Malassezia globosa*. *Karnasphotha (Cardiospermum helicacabum* Linn.*)* commonly known as Balloon vine from Sapindaceae family is traditionally used for dandruff. So here an attempt is made to study the in vitro efficacy of *Karnasphota* (*Cardiospermum helicacabum* Linn.) decoction against dandruff. **Aims and Objectives:** In vitro Antidandruff activity of *Karnasphota Mula* and *Beeja* by Agar cup method and Biocidal activity. **Methodology:** In vitro Antidandruff activity of *Karnasphota* (*Cardiospermum helicacabum Linn.*) *Bija* and *Mula Kwatha* against dandruff by – Agar cup method and Biocidal activity. **Result:** The *Karnasphotha Moola* showed good antidandruff activity against *Malassezia furfur* in different concentrations. Whereas *Karnasphotha Beeja* showed no antidandruff activity against *Malassezia furfur* in any concentrations. **Conclusion:** The *Karnasphotha Moola* is having significant Antidandruff properties.

Key words: *Dandruff, Malassezia globosa, Karnasphota, Agar cup method, Biocidal activity.*

INTRODUCTION

Dandruff is a common skin condition that mainly affects the scalp.[1] Almost half of the population at the pre-pubertal age and of any gender and ethnicity will be affected.[2] No population in any geographical region would have passed through freely without being affected by dandruff at some stage in their life.[3] The word dandruff (dandruff, dandriffe) is of Anglo-Saxon origin, a combination of 'tan' meaning 'tetter' and 'drof' meaning 'dirty'. Dandruff affects aesthetic value and often causes itching.[4] The severity of dandruff may fluctuate with season as it often worsens in winter.[5] The extrapolated prevalence of Dandruff in India is 195,785,036.[6]

Symptoms include flaking and sometimes mild itchiness.[7] Older literature cites the fungus *Malassezia furfur* (previously known as *Pityrosporum ovale*) as the cause of dandruff. It was discovered that the responsible agent is a scalp specific fungus, *Malassezia globosa*,[8] that metabolizes triglycerides present in sebum by the expression of lipase, resulting in a lipid byproduct: oleic acid. During dandruff, the levels of *Malassezia* increase by 1.5 to 2 times its normal level.[9] Oleic acid penetrates the top layer of the epidermis, the stratum corneum, and evokes an inflammatory response in susceptible people which disturbs homeostasis and results in erratic cleavage of stratum

Address for correspondence:
Dr. Sarojini D Byadigi
Professor, Department of Dravyaguna Vignana, SNVVS'S SGV Ayurvedic Medical College, Hospital and Research Centre, Bailhongal, Karnataka, India.
E-mail: bsaru.com@gmail.com
Submission Date: 04/04/2024 Accepted Date: 17/05/2024

Access this article online

Quick Response Code

Website: www.jaims.in

DOI: 10.21760/jaims.9.6.8

ISSN: 2456-3110 ORIGINAL ARTICLE June 2024

corneum cells. The main symptoms of dandruff are an itchy scalp and flakiness.[10] Red and greasy patches of skin and a tingly feeling on the skin are also symptoms.

Treatment available is shampoos with combination of special ingredients to control dandruff.[11] Antifungal treatments including ketoconazole, zinc pyrithione, antimicrobials-selenium disulfide, steroids and regulators of keratanization have been found to be effective. In spite of this the reoccurrence of dandruff is reported.

Ayurveda explains many remedies to combat hair problems under *Keshya Karma*. One among is *Karnasphotha. Karnasphotha (Cardiospermum helicacabum* Linn.*)* commonly known as Balloon vine from Sapindaceae family, A climbing tendril bearing herb with wiry stem throughout the plains of India. Branches slender and leaves deltoid, 2-ternate, petioles 2-3.8 cm long and flowers are white. Seeds are globose.[12] Chemically plant has: saponin, quebrachitol, apigenin, proanthocyanidin and stigmasterol.[13] *Rajanighantukara* explains the properties of *Karnasphotha* as *Katu Tikta Rasayukta, Shita Virya*, and *Karma* as *Sarvavishapaha* and indicated in *Graha* and *Bhuta Roga.*[14] Ayurvedic pharmacopoeia of India has explained the *Karma* of *Karnasphotha* (seed and root) as *Keshya.*[15] Traditionally, the herb is used in hair oils for treating dandruff, alopecia and for darkening hair. The leaf paste is applied on domestic animals to kill lice and other insects.[16] *Sahasrayoga* under *Taila Yoga Prakarana*, explains the formulation named *Nili Bhringadi Taila* containing Swarasa of *Karnasphotha* (*Shatakaratulata*).[17]

So here an attempt is made to study the in vitro efficacy of *Karnasphota* (*Cardiospermum helicacabum* Linn.) decoction against dandruff.

Objectives

1. Collection and preparation of *Kwatha* of *Karnasphotha (Cardiospermum helicacabum* Linn.*)* by decoction method of Root and Seed as per API.
2. Collection of Dandruff flakes from subjects and isolation of Fungi.
3. In vitro Antidandruff activity – Agar cup method and Biocidal activity.

Hypothesis

H_0 **:** *Karnasphotha* (*Cardiospermum helicacabum* Linn.) *Kwatha* is not having antidandruff effect.

H_1: *Karnasphotha(Cardiospermum helicacabum* Linn*) Kwatha* is having antidandruff effect.

Methodology

Type of study: Experimental study

Collection of study drug

Root and Seeds of *Karnasphotha* (*Cardiospermum helicacabum* Linn.) were collected from fields of Bailhongal and authenticated by Dr. S.V. Bagade, Professor and HOD Department of Dravyaguna Vignana, SNVVS's SGV Ayurvedic Medical College Hospital, Research Center, Bailhongal.

Image 1: *Karnasphotha*

Image 2: *Karnasphotha Moola*

ISSN: 2456-3110 ORIGINAL ARTICLE June 2024

Image 3: *Karnasphotha Beeja*

Preparation of *Kwatha Churna:*

The root and seeds were shade dried weighed and powdered coarsely following the SOP of API.

Image 4: Weighing of *Karnasphotha Beeja*

Image 5: *Kwatha Churna* of *Karnasphotha Beeja*

Image 6: Weighing of *Karnasphotha Moola*

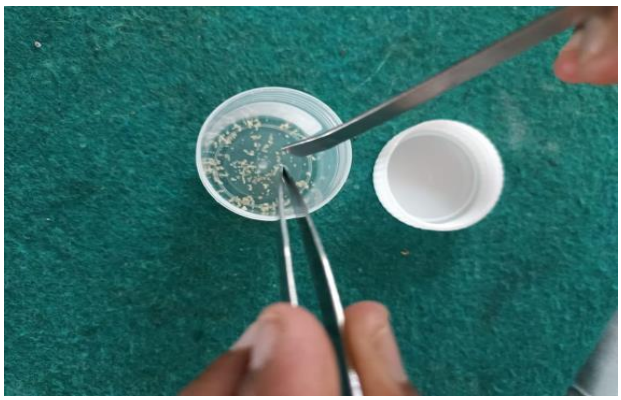
Image 7: *Kwatha Churna* of *Karnasphotha Beeja*

Collection of Dandruff

Samples of dandruff were collected from volunteers by scraping the scalp with sterile scalpel and stored in sterile container.

Image 8,9,10: Showing the collection of dandruff

ISSN: 2456-3110 ORIGINAL ARTICLE June 2024



Isolation of Fungi in Pure culture

The dandruff collected was inoculated on sterile Sabouraud dextrose agar plate. It was incubated at 32ºc to 37ºc for 3-5 days. Characteristic white growths around the flakes were indicative of an organism causing dandruff.

Growth and Identification

The organism was identified based on cultural, microscopic and biochemical methods. The colonies were identified as Malassezia furfur, identified fungal species of Malassezia furfur was isolated by pure culture in Sabouraud dextrose agar medium with added chloramphenicol. The agar provides a selective media for the growth of medically significant fungi while the antibiotic chloramphenicol serves to inhibit the growth of unwanted bacterial floras (Sabouraud, 1892).

Table 4: Chemicals and Media

Chemical	Lot/Cat No.	Manufacturer
Sabouraud dextrose agar (SDA)	MM1067	Himedia, India
Sodium chloride	MB023	Himedia, India

Table 5: Equipments

SN	Name of the Instrument	Make	Instrument ID
1.	Weighing Balance	Orion Automation Systems	RRS/INS/MCR/05
2.	Autoclave (Sterilization)	Ascension Innovation India	RRS/INS/MCR/10
3.	Autoclave (decontamination)	Ascension Innovation India	RRS/INS/MCR/20
4.	Bacteriological Incubator -II	Biovision India /BVL 01	RRS/INS/MCR/21
5.	Biological Safety Cabinet-II	Thermocon	RRS/INS/MCR/27
6.	Fungal incubator	Ascension Innovation India	RRS/INS/MCR/08
7.	Micropipettes 2-200 µl 100-1000 µl	Gilson Gilson	RRS/INS/MCR/11 RRS/INS/MCR/25
8.	Refrigerator	LG India / GL 191PMEH	RRS/INS/MCR/02

Preparation of test sample

Test sample was prepared at 100%, 75%, 50%, and 25% in distilled water for conducting zone of inhibition.

Method[40-42]

Evaluation of Antidandruff Activity against *M. furfur* By Zone of Inhibition By Agar Cup Plate Method.

On sterile SDA plates were prepared and wells are made using sterile borer. Plates were spread with inoculum of *M. furfur*. In each plate 100%, 75%, 50% and 25% of test sample (*Karnasphotha Moola*) was loaded using micropipette. All plates were incubated at 30 ±2°C for 72hours. After incubation, the zone of

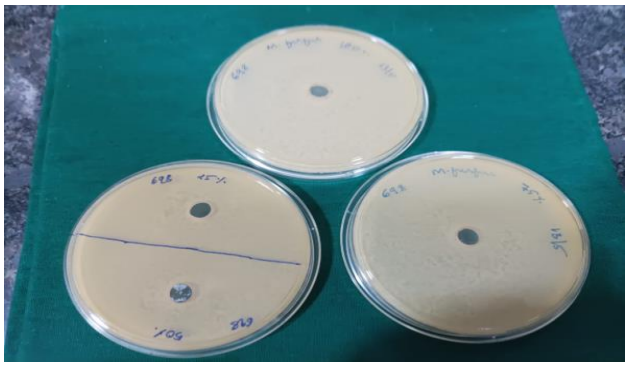
ISSN: 2456-3110 ORIGINAL ARTICLE June 2024

inhibition around the well was measured and antimicrobial activity was determined.

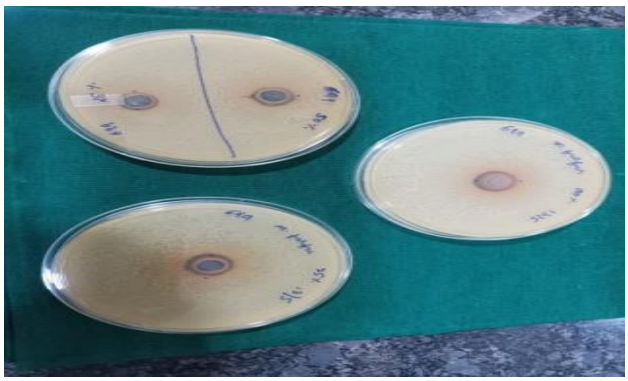
The same procedure repeated for *Karnasphotha Beeja*.

Result

Image 11 A & B: Antidandruff activity of test sample by zone of inhibition using agar cup plate method.



A (*Beeja*)



B (*Moola*)

Table 6: Antidandruff activity of test sample by zone of inhibition using agar cup plate method

Samples	Sample Code	conc. of test sample in (%)	zone of inhibition in (mm)
Karnasphotha Beeja	RR230698	100	No inhibition
		75	No inhibition
		50	No inhibition
		25	No inhibition
	RR230699	100	17mm
Karnasphotha Moola		75	16mm
		50	14mm
		25	13mm

The *Karnasphotha Moola* showed good antidandruff activity against *Malassezia furfur*. The antidandruff activity was found to be concentration dependent. In 100% concentration, the highest inhibition zone of 17 mm diameter clear zone was noticed against *Malassezia furfur*. In 75% concentration, *Karnasphotha Moola* showed activity of 16 mm inhibition zone, in 50% concentration, *Karnasphotha Moola* showed activity of 14 mm inhibition zone and in 25% concentration, *Karnasphotha Moola* showed activity of 13 mm inhibition zone against *Malassezia furfur*.

Whereas *Karnasphotha Beeja* showed no antidandruff activity against *Malassezia furfur* in any concentrations.

Discussion

The overall goal of the present study was to know which part of the plant *Karnasphotha* is having antidandruff property. API explains *Karma* of *Moola* and *Beeja* as *Keshya* but present study confirms that *Moola* of *Karnasphotha* is having antidandruff property against *Malassezia furfur*.

Karnasphotha is having *Katu, Tikta Rasa Katu Vipaka* acts as *Prakruti Vighatana Chikitsa* for *Krimi* and hence same can be proposed for its antidandruff activity. Its *Prakruti Vighata* action prevents new formation of dandruff and also removes *Nidana* for it. Its *Vishahara* property helps in healing dandruff.

Conclusion

The antidandruff activity of *Karnaspota Moola* was tested by MIC against *M. furfur* indicated as recorded in Table No.6. Hence, it shall be concluded that the test sample is having significant Antidandruff properties. The antidandruff activity of *Karnaspota Beeja* was tested by MIC tested against *M. furfur* indicated as recorded in Table No.6. Hence, it shall be concluded that the test sample is not having significant Antidandruff properties.

ISSN: 2456-3110 **ORIGINAL ARTICLE** June 2024

ACKNOWLEDGEMENT

We acknowledge CCRAS Spark for funding for the research project.

REFERENCES

1. Tucker D, Masood S (August 2021). "Seborrheic Dermatitis". StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. PMID 31869171
2. Elewski BE. Clinical diagnosis of common scalp disorders. J Investig Dermatol Symp Proc. 2005;10:190–3. [PubMed] [Google Scholar]
3. Gupta AK, Batra R, Bluhm R, Boekhout T, Dawson TL., Jr Skin diseases associated with Malassezia species. J Am Acad Dermatol. 2004;51:785–98. [PubMed] [Google Scholar]
4. Piérard-Franchimont C, Xhauflaire-Uhoda E, Piérard GE. Revisiting dandruff. Int J Cosmet Sci. 2006;28:311–8. [PubMed] [Google Scholar]
5. Piérard-Franchimont C, Piérard GE, Kligman A. Seasonal modulation of the sebum excretion. Dermatoligica. 1990;181:21–2. [PubMed] [Google Scholar]
6. https://www.omicsonline.org/india/dandruff-peer-reviewed-pdf-ppt-articles.
7. nhs.uk. 18 October 2017. Retrieved 1 January 2020.
8. BBC News. 6 November 2007. Archived from the original on 22 December 2008. Retrieved 30 April 2010.
9. Ranganathan S, Mukhopadhyay T (2010). "Dandruff: the most commercially exploited skin disease"
10. Turner GA, Hoptroff M, Harding CR (August 2012). "Stratum corneum dysfunction in dandruff". International Journal of Cosmetic Science. 34 (4): 298–306.
11. https://en.wikipedia.org/wiki/Dandruff
12. Kirtikar K K, Basu B D. Indian Medicinal plants. International book distributors Deharadun.1993 Year, page no.622-625.
13. Deepan T, Alekhya V, Saravanakumar P, Dhanaraju MD. Phytochemical and Anti- Microbial Studies on the Leaves Extracts of Cardiospermum halicacabum Linn. Adv. Biol. Res., 2012; 6(1): 14-18
14. Rajnighantu with Dravyagunaprakashika hindi vyakhya by Indradev Tripathi, Choukhamba krishnadas academy,Varanasi, (136-137) pp 58.
15. http://www.ayurveda.hu/api/API-Vol-5.pdf
16. Mayura Asra, Ten Sacred Angiosperm Treasures of Kerala (Dashapushpam). https://www.ijsr.net/archive/v11i6/SR22604124955.pdf
17. Mistry Zoya, Gaurav Shah. Anti-Dandruff activity of synthetic and herbal shampoos on dandruff causing isolate: Malassezia. International journal of Applied Research.2016;2(7):80-85

How to cite this article: Ashwini Kochari, Sarojini D Byadigi. In Vitro Anti-Dandruff Activity of Karnasphotha (Cardiospermum helicacabum Linn.) against Malassezia furfur. J Ayurveda Integr Med Sci 2024;6:61-66. http://dx.doi.org/10.21760/jaims.9.6.8

Source of Support: Nil, **Conflict of Interest:** None declared.

****