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ANALYTICAL STUDY OF *PHALTRIKADI GHRITA*: AN AYURVEDIC FORMULATION

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ABSTRACT

In Ayurveda, *Timira* is one of the 80 diseases that described by *Acharya Charaka* as *Vatananatmaja Vyadhi*.[1] *Timira* is one among *Drishtigata Rogas*, which starts from *Avyakta Darshan* and end in complete loss of vision.[2] All *Acharyas* have mentioned various drugs through *Kriya Kalpa* which improve and enhance the visual acuity as well as improve the general health of the eye.[3] *Phaltrikadi Ghrita* was mentioned by *Chakradutta* in *Timira* under *Netra Rogs Chikitsha*.[4] *Phaltrikadi Ghrita* comes under *Sneha Paka Kalpna* which is best for *Vata Pradhana Vyadhi.* The current research aims to uphold the 'quality control' of *Phalatrikadi Ghrita* through meticulous identification of raw materials at a fundamental level and morphological characteristics, alongside physio-chemical analysis.

KEYWORDS: Ayurveda, *Phaltrikadi Ghrita*, *Timira*, Physiochemical analysis.

INTRODUCTION

In ayurvedic system of medicine, *Sneha Kalpna* is one of the widely used and preferred dosage forms. It is used to extract fat soluble active principles from drugs and also to increase permeability of drugs so that they can be absorbed easily through the cell membrane. It is the only dosage form that can be administered through all routes of body, viz., *Nasya* (nasal route), *Tarpan* (ocular route), *Karnapooran* (auditory route), *Snehapan* (oral route), *Abhyanga* (topical route), *Basti* (vaginal, urethral, anal route).[5] Out of four types of *Sneha*, *Ghrita* is the best because of its *Yogavahi* & *Sanskaranuvartana* property means it attains the properties of the ingredients with which its processed without losing its own properties.[6] Due to its properties, it reduces *Vata* and *Pita Dosha* and used as *Rasyana*, *Medhya*, *Chakshushya* and beneficial for *Rasa*, *Shukra*, *Oja Dhatu*.[7] Here *Phaltrikadi Ghrita* is used in *Pratham Patalgata Timra* which is *Vatapradhan Tridoshaja Vyadhi*. The objective was to evaluate the safety and effectiveness of the formulation through pharmacodynamic, physio analytical, and microbial studies, with the results subsequently analyzed and discussed.

AIMS AND OBJECTIVES

1. To analyse the physical or the organoleptic character of drug.
2. To find out the pH, heavy metal content and microbiological study of *Phaltrikadi Ghrita*.

MATERIAL AND METHODS

Collection of Drug – The Raw drugs were collected from the Midback Private Limited Pharmacy, Saharanpur.

Identification and Authentication

The raw drugs were identified and authenticated by Dravyaguna Department of Gurukul Campus Haridwar Uttarakhand Ayurved University and the voucher of the specimen was kept in the department. The final drug was prepared in Midback Private Limited Pharmacy, Saharanpur.

Table No. 1: Ingredients and composition of *Phaltrikadi Ghrita.*[8]

Dravya	**Family**	**Latin Name**	***Dosha Shamakta***	***Karma***
Amalaki	*Euphorbiaceae*	*Embelica officinale*	*Tridosha-Shamaka*	*Chakshushya, Rasayana, Dahaprashamana, Balya, Deepana,Anulomana, Nadibalya, Kaphaghna*
Haritaki	*Combretaceae*	*Terminalia chebula*	*Tridosha-Shamaka*	*Chakshushya, Kaphaghna, Rasayana, Vedanasthapana, Deepana, Pachana*
Vibhitaka	*Combretaceae*	*Terminalia belerica*	*Tridosha-Shamaka*	*Chakshushya, Anulomana, Deepana, Rechana, Kaphaghna, Dhatuvardhaka*
Satavari	*Asparagaceae*	*Asparagus racemosus*	*Vattapitta-shamak*	*Balya, Rasyana, Chakshushya, Drishtimandya, Daurbalya*
Yasthimadhu	*Fabaceae*	*Glycyrrhiza glabra*	*Vata Pitta-Shamak*	*Chakshushya, Dahashamaka, Vedanasthapana, Medhya, Mridurechana, Jeevaniya, Rasayana, Balya*
Goghrita	-	*Butyrum Departum*	*Vata Pitta-Shamak*	*Ojo Vardhak, Balya, Rasayana, Indriya Bala Vriddhikara, Rasayana, Agnivardhaka, Rasavardhaka, Kaantivardhaka, Buddhivardhaka, Deepaniya, Medhya, Vrishya, Chakshushya,*

Figure 1: Terminalia chebula.

Figure 2: Terminalia belerica.

Figure 3: Embelica officinale.

Figure 4: Asparagus racemosus.

Figure 5: Glycyrrhiza glabra.

Method of Preperation

The *Phaltrikadi Ghrita* was prepared by classical method of *Ghritapaka* mention in *Sharangdhar Samhita Madhyam Khand 9/1 & 9/8*

- Cow's ghee-10 kg
- *Kalka Dravya* (*Yastimadhu*)- 2.5 kg
- *Kwatha Darvyas* (*Amalaki, Haritaki, Vibhitaka, Satavari*)- 5 kg Each

PROCEDURE

1. *Ghrita* was taken in a stainless-steel vessel and heated mildly to remove any moisture.
2. Preparation of *Kwatha:* Sixteen times water was added to *Kwatha Dravyas* for decoction, soaked for four hours, heated on mild to moderate flame till the volume was reduced to one – fourth. It was then filtered with muslin cloth to obtain the *Kwatha.*
3. Preparation of *Kalka:* The *Kalka Dravya* was transferred to wet grinder and grinded with sufficient quantity of water to prepare homogenous blend.
4. Prepared *Kalka* was then added into *Ghrita* and thoroughly stirred while adding.
5. Then it was heated with constant stirring. Heating was continued till the evaporation of *Kwatha* & allowed to stand overnight. Heating was again started on next day while keeping a watch over the subsidence of froth (*Phena Shanti*) and the *Kalka* was constantly checked formation of *Varti (Madhyama Paka Lakshana).*
6. Heating was stopped when *Varti* was formed and froth subsided.
7. *Ghrita* was than filtered through a muslin cloth and allowed to cool.

Storage of medicine

After cooling the *Ghrita* was packed in 100ml sterile air tight plastic bottles and labelled.

Table No. 2: Pharmacodynamics of *Phaltrikadi Ghrita.*[8]

DRUG	*RASA*	*GUNA*	*VEERYA*	*VIPAKA*	*PART USED*	*RATIO*
Amalaki	*Pancha Rasa (Alavana)*	*Guru,Ruksha, Sheeta*	*Sheeta*	*Madhura*	Fruit	2
Haritaki	*Pancha Rasa (Alavana)*	*Laghu, Ruksha*	*Ushna*	*Madhura*	Fruit	2
Vibhitaka	*Kashaya*	*Ruksha, Laghu*	*Ushna*	*Madhura*	Fruit	2
Satavari	*Madhur Tikta*	*Guru Snigdha*	*Sheeta*	*Madhura*	Tuber	2
Yasthimadhu	*Madhura*	*Guru, Snigdha*	*Sheeta*	*Madhur*	Root	1
Goghrita	*Madhura*	*Guru, Snigdha*	*Sheeta*	*Madhur*	-	4

Table No. 3: Organoleptic Parameters of *Phaltrikadi Ghrita.*

Properties	***Phaltrikadi Ghrita***
Colour	Light Brown
Odour	Pleasant
Touch	Unctuous
Taste	Sweetish
Appearance	Light

PHYSIOCHEMICAL PROPERTIES OF *PHALTRIKADI GHRITA*

Various tests for physical and chemical parameters of *Phaltrikadi Ghrita* was carried out such as acid value, specific gravity, refractive index, peroxide value, saponification value, iodine value, mineral oil.

Table No. 4: Physiochemical Parameters of *Phaltrikadi Ghrita.*

Test Parameters	**Result**
Specific gravity at 40 degree C	0.760
Refractive index at 40 degree C	1.4646
Acid Value	1.08
Peroxide value	2.20
Saponification value	196.22
Iodine value	103.01
Mineral oil	Absent

MICROBIOLOGICAL ANALYSIS

Phaltrikadi Ghrita was evaluated for the total fungal count and total bacterial count.

Table No. 5: Microbiological limit test of *Phaltrikadi Ghrita.*

Microorganism	**Result**
Total Bacterial Count (cfu/ml)	<10
Yeast and Mould count (cfu/ml)	<10
E. coli	Absent
S. aureus	Absent
P. aeruginosa	Absent
Salmonella sp.	Absent

AFLATOXINS

Table No. 6: AFLATOXINS IN PHALTRIKADI GHRITA.

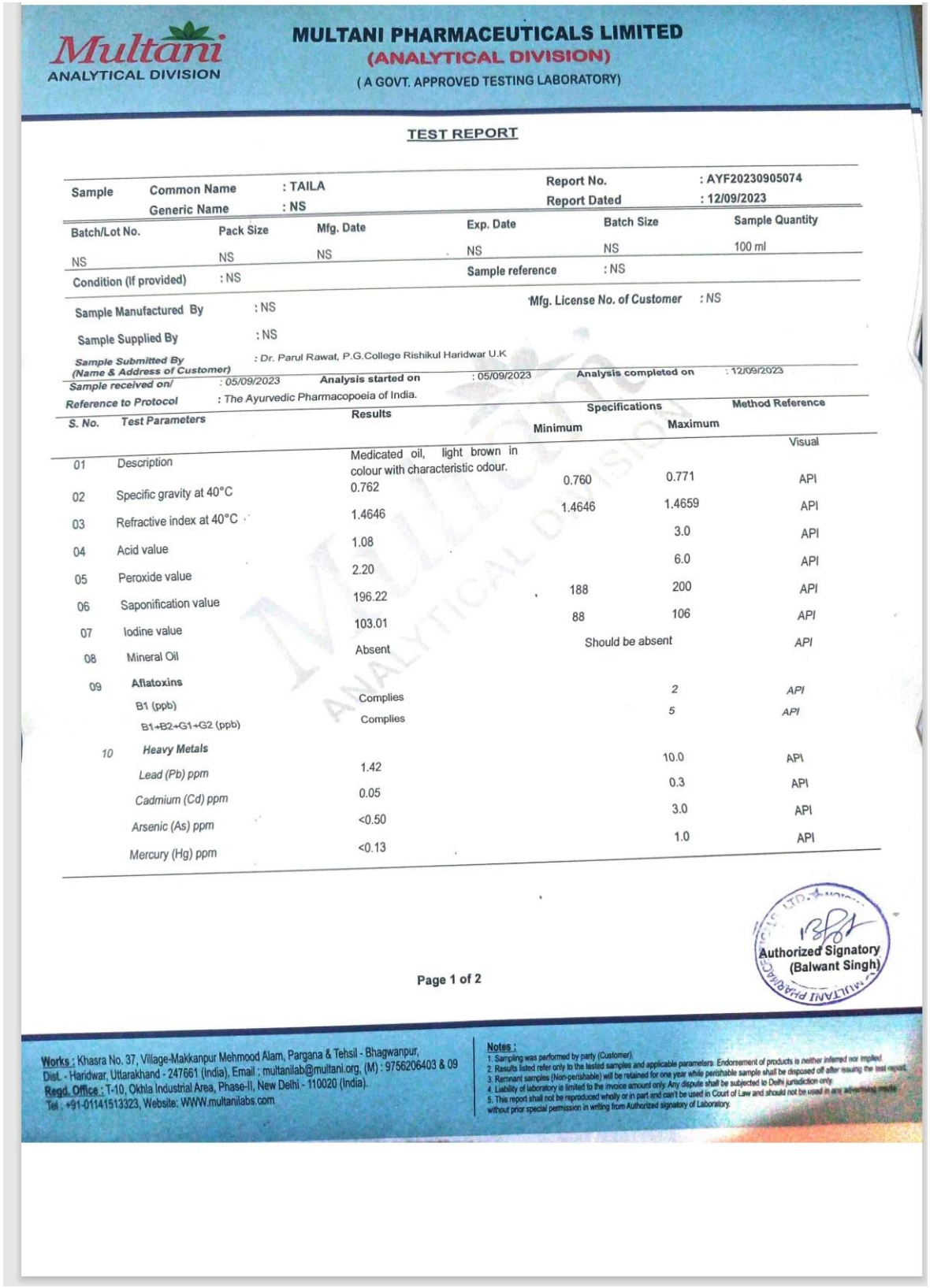
B1 (ppb)	Complies
B1+B2+G1+G2 (ppb)	Complies

HEAVY METAL IN PHALTRIKADI GHRITA

Heavy metals such as lead (Pb), cadmium (Cd), mercury (Hg), and arsenic (As) were detected using spectrometery. Every heavy metal in *Ghrita* is within the normal range.

Table No. 7: Heavy Metals in *Phaltrikadi Ghrita.*

Total Heavy metal (mg/kg)	***Result***
Lead (Pb) ppm	1.42
Cadmium (Cd) ppm	0.05
Arsenic (As) ppm	<0.50
Mercury (Hg) ppm	<0.13



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(A GOVT. APPROVED TESTING LABORATORY)

TEST REPORT

Sample — Common Name : TAILA; Generic Name : NS
Report No. : AYF20230905074
Report Dated : 12/09/2023

Batch/Lot No.	Pack Size	Mfg. Date	Exp. Date	Batch Size	Sample Quantity
NS	NS	NS	NS	NS	100 ml

Condition (If provided) : NS
Sample reference : NS
Sample Manufactured By : NS
Mfg. License No. of Customer : NS
Sample Supplied By : NS
Sample Submitted By (Name & Address of Customer) : Dr. Parul Rawat, P.G.College Rishikul Haridwar U.K
Sample received on/ : 05/09/2023 Analysis started on : 05/09/2023 Analysis completed on : 12/09/2023
Reference to Protocol : The Ayurvedic Pharmacopoeia of India.

S. No.	Test Parameters	Results	Specifications Minimum	Specifications Maximum	Method Reference
01	Description	Medicated oil, light brown in colour with characteristic odour.			Visual
02	Specific gravity at 40°C	0.762	0.760	0.771	API
03	Refractive index at 40°C	1.4646	1.4646	1.4659	API
04	Acid value	1.08		3.0	API
05	Peroxide value	2.20		6.0	API
06	Saponification value	196.22	188	200	API
07	Iodine value	103.01	88	106	API
08	Mineral Oil	Absent	Should be absent		API
09	**Aflatoxins**				
	B1 (ppb)	Complies		2	API
	B1+B2+G1+G2 (ppb)	Complies		5	API
10	***Heavy Metals***				
	Lead (Pb) ppm	1.42		10.0	API
	Cadmium (Cd) ppm	0.05		0.3	API
	Arsenic (As) ppm	<0.50		3.0	API
	Mercury (Hg) ppm	<0.13		1.0	API

Authorized Signatory (Balwant Singh)

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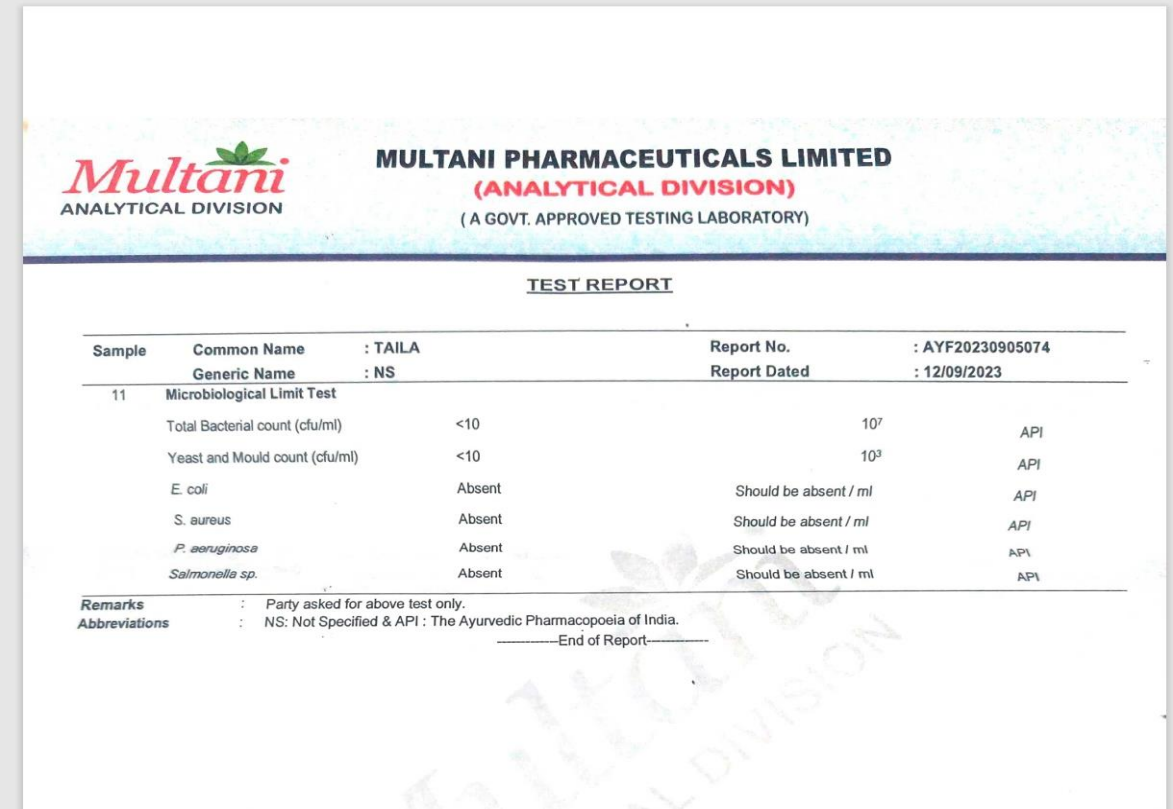
Works : Khasra No. 37, Village-Makkanpur Mehmood Alam, Pargana & Tehsil - Bhagwanpur, Dist. - Haridwar, Uttarakhand - 247661 (India), Email : multanilab@multani.org, (M) : 9756206403 & 09
Regd. Office : T-10, Okhla Industrial Area, Phase-II, New Delhi - 110020 (India).
Tel : +91-01141513323, Website: WWW.multanilabs.com

Notes :
1. Sampling was performed by party (Customer).
2. Results listed refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
3. Remnant samples (Non-perishable) will be retained for one year while perishable sample shall be disposed off after issuing the test report.
4. Liability of laboratory is limited to the invoice amount only. Any dispute shall be subjected to Delhi jurisdiction only.
5. This report shall not be reproduced wholly or in part and can't be used in Court of Law and should not be used in any advertising media without prior special permission in writing from Authorized signatory of Laboratory.



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TEST REPORT

Sample	Common Name	: TAILA	Report No.	: AYF20230905074
	Generic Name	: NS	Report Dated	: 12/09/2023
11	Microbiological Limit Test			
	Total Bacterial count (cfu/ml)	<10	10^7	API
	Yeast and Mould count (cfu/ml)	<10	10^3	API
	E. coli	Absent	Should be absent / ml	API
	S. aureus	Absent	Should be absent / ml	API
	P. aeruginosa	Absent	Should be absent / ml	API
	Salmonella sp.	Absent	Should be absent / ml	API

Remarks : Party asked for above test only.
Abbreviations : NS: Not Specified & API : The Ayurvedic Pharmacopoeia of India.

----------End of Report----------

RESULT AND DISCUSSION

The pharmacological assessment of the medication was prepared on the final form of drug i.e. *Phaltrikadi Ghrita*. The prepared drug's chemical and physical properties are the subjects of the analytical evaluation. The readings were within the normal range as specified by the WHO standards for herbal preparation.[9] It was determined that *Phaltrikadi Ghrita* was safe to use based on the analysis above.

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