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A COMPARATIVE REVIEW ARTICLE ON GUNJADI TAILAM & DURVADI TAILUM IN DANDRUFF

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ABSTRACT

The research work entitled "A Comparative Pharmaceutico-Analytical Study of Gunja Taila and Durvadi Taila in Darunak w.s.r. to Their Antifungal Activity in Dandruff" was planned to compare the efficacy of two formulations based on In vitro Anti-Fungal activity analysis. Therefore, samples of Gunja Taila and Durvadi Taila were prepared with their conceptual references. Both the samples were analyzed based on Organoleptic Parameters, i.e.,Appearance ,Colour ,Odour, Touch, etc. and Physico-chemical Parameters i.e Weight per milliliter, pH, Iodine value, Peroxide value, Saponification value, Acid value, Viscosity, TLC & Refractive index. The findings for these parameters were found to be satisfactory for quality assurance. Assay of heavy metals (Pb, Cd, As, Hg),Total bacterial count and Total fungal count are under the permissible limit depicted in the study. Specific pathogens and aflatoxins (B1, B2, G1, G2) are absent in all samples. The antifungal study of GunjaTaila and Durvadi Taila was seen on Malassezia furfur (MTCC NO: 1374), Trichophyton rubrum: (MTCC NO 296) and Candida albicans(MTCC NO: 183) strains. It is determined by the 'Well-diffusion method.' By observing the values in the two samples, the activity index value of GunjaTaila was found to be greater than 0.5, indicating a significant antifungal activity against the defined fungi. In contrast, the Durvadi tail activity index remains below 0.5, which shows its less activity against the selected strains.

KEYWORDS: Gunja Taila, Durvadi Taila, Anti-Fungal, Activity index.

INTRODUCTION

Bhaishajya Kalpana is a pharmaceutical branch of Ayurveda dealing with medicinal preparations, formulations, dosage, etc. Broadly two main types of *Sneh Kalpana* are described in *Ayurvedic* classics i.e., *Ghrita & Taila Kalpana*. *Sneha Kalpana* is successfully used for treating various disorders of nerve, skin conditions etc. *Gunja taila* and *Durvadi taila* are examples of Sneh Kalpana, which are effectively used for the treatment of *Darunak.*

Aacharya Vagbhata1 and *Sharangadhar2* described *Darunaka* as a *Kapalagata Roga*, but *Sushruta3* and other *Acharyas* explained it in *Kshudra Rogas*, caused by vitiated *Vata* and *Kapha*.

कण्डूकेशच्युतिस्वापरौक्ष्यकृत् स्फुटनंत्वचः।
सुसूक्ष्मंकफवाताभ्यांविद्यादारूणकंतुतत्।। (अ.ह. उ. त. 23/ 24)
दारूणाकण्डूरा रूक्षा केशभूमिः प्रपाटयते।
कफवातप्रकोपेणविद्यादारूणकंतुतम्।। (सु. नि. 13/ 34)

Various *Sneha Kalpanas are* described in different *Ayurvedic* texts for *Shiro Roga*; *Gunja taila* has been mentioned in *Darunaka* by *Acharya Chakrapani* in his commentary *Chakradatt4*.

श्गुंजाफलैः पचेत्तैलंभृंगराजरसेनतु।
कण्डूदारूणजित्कुष्ठकपालव्याधिनाशनम।।
(च.द.-55/90)

Gunja Taila is also mentioned in *Vridhmadhav*, *Vangsen*, *Bhaavprakash5*, *Yogratnakar6*, *Bhaishajya Ratnavali*, *VradhYogTarangni*, *Ras Tarangni* etc. whereas *Durvadi taila* is mentioned in Ayurveda *Yoga Sangraha* and prepare using *Durva panchangaswarasa*, *Nimbapatraswarasa*, *Yashtimadhukalka*, *Narikela kshira* and *Narikela taila*.

Worldwide awareness of health, as well as beauty, has a significant role. Hair loss is a major problem in present days and Dandruff is the most common cause of hair loss. Dandruff is compared with *Darunak* based on its symptomatology. Shedding of dead skin cells from the scalp is Dandruff. Excessive or severe Dandruff with itching is Seborrheic dermatitis. It affects the scalp, forehead, nasolabial fold, eyelash, eyebrows, and skin behind the ears, trunk and flexures. It requires medical treatment.

Dandruff is usually not severe, although it can be embarrassing and itchy. Dandruff can occur at any age

but is most commonly found at a young age, with much more prevalent in females than males. Dandruff responds very well to treatment but will commonly reoccur when treatment is stopped. There are some factors that cause Dandruff i.e. Fungus, Hormonal Imbalance, Poor Health, Poor Hygiene, Allergic Hyper Sensitivity, Stress, Anxiety, Excessive Consumption of Sugars, Fat, Starch, Malnutrition and Heredity, etc. An overgrowth of yeast fungus can lead to Dandruff. The condition may improve in the summer and worsen in winter because UVA light (a type of U.V. light) from the sun counteracts these fungi.

Need of Study

There is a need to prove the efficacy of classical formulations for *Dandruff* on scientific parameters.

Generally, Dandruff is caused by Fungus. Therefore the antifungal properties of *Gunja Taila and Durvadi Taila* will be evaluated by in vitro method. Considering their cost-effectiveness, easy and routine applicability, This work has paved new avenues for research to find a better remedy for this illness further. At the end of the pharmaceutical, Analytical and Antifungal study assessment, a more successful Ayurvedic formulation has been determined for Dandruff.

Aim and objectives

To Compare the Antifungal Activity of Gunja Taila and Durvadi Taila.To prepare Gunja Taila and Durvadi Taila according to their respective classical references.To evaluate *Gunja Taila* and Durvadi Taila on various analytical parameters.To evaluate the in-vitro antifungal activity of *GunjaTaila and Durvadi Taila* on specific pathogens causing Dandruff.

MATERIAL AND METHODS

Fresh *Til Taila, Nariyal Taila* and All dry herbs needed for the pharmaceutical procedure were collected from Local treaders. All the herbs were authenticated in P.G. Department of *Dravyaguna.*

Preparation of *Gunjadi Tailum*

The ratio between the *Kalka, Sneha,* and *Drava Dravya (Swarasa)* were taken as per the reference (1:4:16).
Shodhan of *Gunja* for preparation of '***Gunja Taila'.***

Classical Advertence2-

नवानिगुंजाबीजानिचूर्णीकृत्य प्रयत्नतः।
द्विगुणीकृतवस्त्रान्तः पोट्टल्यांरोधयेत्ततः।।
स्वेदयेद्दोलिकायन्त्रे द्वियामं गव्यदुग्धतः।
इत्थंतुगुंजाबीजानि शुद्धिमायान्त्यनुत्तमाम्।।

Procedure

Two major steps were involved in *Gunja Shodhana-*

1) Potali nirmaan

A small piece of cotton cloth was taken. *Gunja* seeds were tied in it to make a *Pottali*. This *Pottali* was hanged in the vessel with the help of iron rod without touching the bottom of the vessel.

2) Swedana process

The *Pottali* was hanged in a steel vessel and freshly collected *Gaudugdha* was filled in the vessel, up to the complete immersion of the *Pottali* as per standard *Swedana* procedure.

Boiled on an L.P.G gas burner, for six hours at 100°C throughout the experiment. Total 7 litres of *Gau dugdha* was utilized for one batch throughout the process. After boiling for six hours, the seeds were taken out from *Pottali* and washed with lukewarm water followed by removal of seed coat .Kept on a glass plate, for the shade drying. After proper drying, the seeds were collected and stored in air tight glass container.

Preparation of *Bhringraaj Swarasa* by *Anukalp*

Classical Advertence3-

आदाय शुष्कद्रव्यं वा स्वरसानामसम्भवे।
जलेऽष्टगुणितेसाध्यंपादशिष्टं च गृह्यते।।

Procedure:-Initially 2.5kg *Bhringraaj*(*Eclipta alba*) whole plant was taken, cut it into small pieces and washed properly.These small pieces of *Bhringraaj* poured with 4.8 litre water in a stainless steel vessel for whole night. Next morning 19.20 lit. Water (8 times) was added in it and *Swarasa* was prepared by heating on low flame till it was reduced to 1/4th of initial volume of water and was strained with a double layered cotton cloth and measured to 4.8 lit. After self cooling *Bhringraaj Swaras* was kept in stainless steel vessel which was covered by cotton cloth.

Preparation of *Gunja Kalka* for *Tila Taila Murcchana*.

Classical Consideration4-

द्रव्यमार्द्रंशिलापिष्टं शुष्कै वा सजलंभवेत्।
प्रक्षेपावापकल्कास्तेतन्मानंकर्षसंमितम्।।
कल्के मधु घृतंतैलंदेयं द्विगुणमात्रया।
सितागुडं समं दद्याद् द्रवादेयाश्चतुर्गुणाः।।

Procedure-250mg of *gunja* and 480ml water were taken and kept in a container. These ingredients were mixed with each other very well after that dipped in adequate amount of water.

Allowed to soak in water over night. Next morning soaked *Gunja Beej* were mixed well in Electrical mixer grinder.

Preparation of *Gunja Taila*

Classical Advertence5

गुन्जाफलैः पचेत्तैलंभृंगराजरसेनतु।
कण्डूदारूणजित्कुष्ठकपालव्याधिनाषनम।।

Procedure:-*Tila Taila* was poured in a big wide mouthed stainless steel container and kept over fire for heating. *Taila* was heated till characteristic vapour on the heated *Taila* was observed.

Then the vessel was removed from fire and added *Shodhit Gunja Beej Kalka*, at this time temperature of the *Tail* was 60°C -70°C. After that *Bhringraaj Swarasa* was

added and whole mass was again kept over fire & heated on mild fire to evaporate the *Swarasa* content completely.

During this process to avoid adhering of the material with the wall of the vessel, it was quite important to stir the mass continuously with the help of ladle. This process was performed for 3 days on mild fire.After attaining the *Sneha Siddhi Lakshan* the fire was withdrawn and the *Taila* was filtered by help of a new previously washed and dried cloth when it is lukewarm.

Preparation of *Durvadi Taila*

Method of preparation:- The drug *Durva* collected directly from field was rinsed and cleaned of physical impurities by using plain water. Then it was chopped to smaller pieces, 2 litres of *Swarasa* was extracted from 4 kg of *Durva panchanga* using a mixer grinder. Similarly, the drug *Nimba* which was collected was rinsed and washed by using plain water. then it was chopped to smaller pieces, 2 litres of *swarasa* was extracted from 3.5 kgs of *Nimbapatra*. Four *narikela* of west coast tall variety were cut and grated, total 1.5 kg of grated coconut was obtained, 1 litre of *Narikela Kshira* was extracted by adding 200ml of water. 62.5 gms of *Yastimadhu* was made in to fine powder and little amount of water was added and triturated homogenously to form *kalka*.Vessel was kept over the fire to this the narikela Taila, *Yastimadhukalka* and prescribed quantity of *Durva* & *Nimbaswarasa* was added .Constant stirring was carried to avoid sticking of the *Kalka dravya*.On the first day, heating was continued for 2 hours till it gets boiled well. Later it is allowed for cooling and closed with a lid to prevent contamination.Next day, again heating was continued on mild fire for 3 hours and allowed for self cooling. On the 3rd day, 1 litre of Coconut milk was added heating was continued till the completion of Paka i.e. till the attainment of *Sneha Siddhi Lakshanas*. Later it was taken out from the fire and filtered when it was warm and stored in containers.

1. Organoleptic Analysis

Table: Results of Organoleptic study.

S. No	Organoleptic characters	Observation
1.	Colour	Dark Cadmium Scarlet
2.	Odour	Characteristic
3.	Appearance	Oily viscous liquid
4.	Touch	Oily/ Slimy

2. Physio- Chemical Analysis

Table Showing Physio- Chemical Analysis*of GunjaTaila.*

S. No	Test	Values
1.	Refractive index	1.47
2.	Acid value	1.03
3.	Rancidity	Absent
4.	Peroxide value	6.63
5.	Iodine value	113.71
6.	Saponification value	197.98
7.	Viscosity (cps)	3778

3. Heavy metals test

Table Showing Heavy metals test result of *GunjaTaila.*

S.No	Name of Test	*GunjaTaila*	Limits
1.	Lead	0.65 ppm	NMT- 10 ppm
2.	Arsenic	< 0.5 ppm	NMT- 3 ppm
3.	Cadmium	< 0.01 ppm	NMT- 0.3 ppm
4.	Mercury	< 0.13 ppm	NMT- 1 ppm

4. Aflatoxins test

Table showing Aflatoxins test result Of *GunjaTaila.*

S.No	Name of Test	*GunjaTaila*	Limits
1.	B1	Absent	NMT- 0.5 ppm
2.	B2	Absent	NMT- 0.1 ppm
3.	G1	Absent	NMT- 0.5 ppm
4.	G2	Absent	NMT- 0.1 ppm

Analysis of Durvadi Taila

1. Organoleptic Analysis

Table Results of Organoleptic study.

Organoleptic characters	Observation
Colour	Green
Odour	Characteristic
Appearance	Oily viscous liquid
Touch	Oily/ Slimy

2. Physio- Chemical Analysis

Table Showing Physio- Chemical Analysis*of DurvadiTaila.*

S. No	Parameter	Durvadi Taila
1.	Refractive index	1.4525
2.	Saponification value	263.77
3.	Acid value	1.45
4.	Iodine value	11.67
5.	Rancidity	Absent
6.	Viscosity	3180cps
7.	Peroxide value	1.43

3. Heavy metals test

Table showing Heavy metals test result of Durvadi Taila.

S.No	Name of Test	Durvadi Taila	Limits
1.	Lead	0.24 ppm	NMT- 10 ppm
2.	Arsenic	<0.2 ppm	NMT- 3 ppm
3.	Cadmium	< 0.01 ppm	NMT- 0.3 ppm
4.	Mercury	< 0.07 ppm	NMT- 1 ppm

4. Aflatoxins test

Table Showing Aflatoxins test result of Durvadi Taila.

S. No.	Name of Test	GTS	Limits
1.	B1	Absent	NMT- 0.5 ppm
2.	B2	Absent	NMT- 0.1 ppm
3.	G1	Absent	NMT- 0.5 ppm
4.	G2	Absent	NMT- 0.1 ppm

In- Vitro Antimicrobial Activity

Table Showing In-Vitro Antimicrobial Activity of Gunja Taila &Durvadi Taila.

Pathogenic strains	Zone of Inhibition in (mm)		
	Gunja Taila	Durvadi Taila	Possitive Control
Malassezia Furfur	13	05	21
Trichophyton rubrum	11	07	22
Candida albicans	15	08	26

Table Showing Activity Index of Gunja Taila &Durvadi Taila.

Pathogenic strains	Activity Index	
	Gunja Taila	Durvadi Taila
Malassezia Furfur	0.61	0.23
Trichophyton rubrum	0.5	0.31
Candida albicans	0.57	0.30

Analytical Study

In the past, the *Ayurvedic* scholars have their methods of standardization, mentioning of *Dravya Sangraha, Sanrakshana vidhi, Paka Siddhi Lakshan* of many doses forms storage specification, etc. make this fact evident. However, with increased adulteration and substitution & malpractices in manufacturing have necessitated modern techniques of standardization of each product is the need of the hour. However, qualitative and quantitative

analysis of drugs by using the advanced techniques and instruments of science is also the need of the time.

The quality control of *Ayurvedic* formulations is much more complicated than Allopathic products because *Ayurvedic* products show the effect of a group of chemical entities. Quality of any product is recognized not only by its exterior appearance, but also it has to pass with perilous analysis in the drug testing laboratory.

Parameters Studied

Parameters for the various studies were taken according to "Protocol of testing of Ayurvedic, Siddha, and Unani Medicines," written by Dr. D.R. Lohar, published by the Government Of India, Ministry of Ayush, and Pharmacopoeial Laboratory For Indian Medicines, Ghaziabad.

1.Organoleptic characters:-Organoleptic character like colour, appearance, odour, touch, taste, etc. are considered by using sense organs, which are beneficial parameters to determine and compare the quality of samples.2. pH:- The pH of a given solution was measured by using a digital pH meter.4. Refractive Index (η)4: refractive index was noted by Abbe type Refractometer.

5. Specific gravity: The specific gravity is the weight of a given volume of liquid at a specific temperature as compared to the same volume of water at the same temperature. It was measured using pycnometer. 6. Acid Value: It is the no. of KOH required to neutralize the free acid in 1 gram of the substance.7. Peroxide Value: The number of milliequivalent of active oxygen expressing the amount of peroxide contained in 1000g of substance.8. Iodine Value: it is the weight of absorbed iodine by 100 parts by the weight of the substance 9. Saponification value: The no. of milligrams required to neutralize the fatty acids by the complete hydrolysis of 1 gram of the fat or oil.

10. Rancidity: (Qualitative Determination) No change in colour was observed.

11. Microbiological Analysis: Water-soluble product, Membrane filtration, Plate count for bacteria, Plate count for fungi is done *Sabouraud dextrose* agar *with antibiotics* was used for fungal plate count and casein soya bean digest agar is used for plate count for bacteria. The plates were incubated at 250c for five days unless a more reliable count is obtained in a shorter time.The results were calculated using plates with not more than 100 colonies.

Antifungal Study:- In-vitro Antimicrobial Activity is carried using *Malassezia furfur*:(MTCC NO: 1374), *Trichophyton rubrum*:(MTCC NO 296),*Candida albicans*:(MTCC NO: 183).

All the results are enclosed in tabular form.

Discussion:- A total loss of 3.23% was seen in *Gunja Taila* Preparation whereas in *Durvadi Taila* 1000ml of *Narikela taila* was used as a base therefore, the volume of the end product of *Durvadi Taila* was 1300 ml, as *Narikela kshira* was one of the *drava dravya*, the fat globules from it may have led to increase in the end product.

Organoleptic features: In *sneha kalpana* the oil imbibes the qualities of the drugs added to it during the *paka*. The end product of the preparation of the *taila* was Dark Cadmium Scarlet in case of *Gunja Taila* & green coloured in *Durvadi Taila*. The colour may be due to addition of *Durva* and *Nimba swarasa* as *dravadravya* in *Durvadi Taila* and *Gunja Kalka* and *Bhringraa jSwaras* in Gunja Taila.

Changes during the paka and status of kalka: Colour of both the *taila* gradually changes during the *paka.* As,*Swarasa* was the *dravadravya* the total time required for *sneha paka* was divided through 3 days for completion of the preparation. The changes during the preparation of the taila indicates the different chemical changes occurring during the transferring of the properties from *drava* medium into the *taila* medium. The aqueous medium in the preparation of *taila* facilitates the imbibitions of the water soluble extracts into the oil medium.

Temperature: The intensity of agni for preparation of both the taila was found to be maintained at 90-98°C by using mandagni. This is because the boiling point of water, coconut oil and Til Taila being 100°C, 171°C and 160°C respectively. Here the temperature is maintained below it. By this the reaction between the water molecule and the fat molecule occurs in a consistent manner over a specific duration of time. This temperature facilitates easy evaporation of the water molecule remaining water-soluble extractives which is slowly imbibed into the oil medium by loosening the bondage in between the fat molecule. Hence *mandagni* have been explained in books of Ayurveda for preparation of *snehakalpana*. Also *guna sanchaya* in the *sneha* with longer duration take place as explained in books of Ayurveda. General Temperature range required for proper *paka* of *Taila* and *Ghrita* is 50°C to 90°C 177.

Discussion on anti- fungal study:- *Gunja Taila* sample inhibited the growth of all the tested strains of fungi But *Durvadi Taila* does not show any significant activity on strains. The *GunjaTaila* was more effective on *Malassezia Furfur*, *Trichophytonrubrum*, *Candidaal-bicans* pathogens with 13 mm, 11mm, 15mm zone of inhibition. *DurvadiTaila* was less effective in comparison *GunjaTaila* with 05 mm, 07 mm, 08 mm zone of inhibition. Both the samples were compared with Positive control 5%w/w Vancomycin with 21 mm, 22 mm, 26 mm zone of inhibition.

The activity index of the test substance above 0.5 is considered as significant activity. Only Gunja Taila sample have activity index above 0.5 but sample of

Durvadi Taila have activity index is lower than *0.5*. which shows its inactivity. *Durvadi Taila* does not show any significant activity in present anti-fungal study but textually mentioned for the treatment of *Darunak* by *acharyas*. Either it is not effective for present strains only or other methods should be adopted to know the cause of its antifungal activity mentioned by acharyas. Other methods may include other then present strains or animal study.

CONCLUSION

The present research work entitled as "A Comparative Pharmaceutico-Analytical Study of *Gunja Taila* and *Durvadi Taila* in *Darunak* wsr to Their Antifungal Activity in Dandruff"has been framed to undertake a critical Literary, conceptual, pharmaceutical and physico-chemical analysis and Comparison of the prepared *GunjaTaila and Durvadi Taila*.On the basis of detail description conclusion have been drawn that *Sneha Kalpana* is one of the most popular *Bhaishajya Kalpana* preparations of *Ayurvedic* medicine. It was first described by *Charak Samhita*. Maximum number of *Ghrita*&*Taila* were indicated respectively in *CharakSamhita* (203), *Chakradatta* (162). For the preparation of *Sneha Kalpana, Mruduagni and Madhyamagni* pattern should be applied. Continuous stirring should be done because due to continuous stirring homogenous distribution of active constituents in the solvent occurs and hence reducing the concentration gradient and thereby reducing boundary wall thickness. *Gunja*- the main content of *Gunja Taila* has been used in number of formulations indicated in Skin disorders (especially fungal disorder). *Doorva* constitutes *Kapha pitta hara* properties and thus does *Daha prashamana*. *Doorva* is said to be *Kushtagna Dravya* there by acts as *a kandughnadravya.* As *Narikela kshira* was one of the dravadravya in *Durvadi Taila* there was increase in the output of oil due to the high fat content in it. *Gunjataila and Durvadi Taila both are* mentioned as beneficial in *Darunaka*. *Darunaka* is a *Kapalagat Roga* (Disease of the scalp). *Kapala* is the region which covers the skull. It is not counted in *shiroroga* but explained as *Kapalaroga* by *Vagbhata* and *Sharangadhar* and as *Kshudraroga* by *Sushruta, Bhavaprakasa, Madhavanidana, Yogaratnakara, Bhaishajya Ratnavali*, *Chakradatta*. All the *Acharyas* have the same opinion about the seat of this disease, which is *Kapala*, caused by vitiated *Vata* and *Kapha*.Parameters adopted for analysis of *GunjaTaila* can be used for routine quality control of this formulation. The results obtained indicate no remarkable changes as in organoleptic characters such as color, odor, touch and appearance. Analytical parameter for both Taila shows expected findings. Anti- microbial study showed that*Gunja Taila is* therapeutically effectual on all three pathogens i.e. *Malasseziafurfur, Trichophyton rubrum, Candida albicans. But Durvadi Taila* does not show any invitro antifungal activity against these strains. The reason for the negative results of anti-microbial activity of *Durvadi Taila* would be due to the fact that microorganism was procured which may be genetically resistant or virulent or it might be because there is lot of difference between Invitro and Invivo studies.

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