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PHARMACEUTICAL STUDY OF *NIMB HARIDRA KHAND* AND *SHUNTHYADI TAILA* – A POLY HERBAL FORMULATIONS

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ABSTRACT

Pratishyaya is a condition of continuous Nasal discharge, *Vata Pradhana* disease and accumulation of *Doshas* in *Uttamanga.* The clinical features of *Vataja Pratishyaya* as explained in *Ayurvedic* literature have the relevance with Allergic Rhinitis. Allergic Rhinitis is an IgE-mediated immunologic response of nasal mucosa and is characterized by watery nasal discharge, nasal obstruction, sneezing and itching in the nose etc. So the present study was carried out to standardize the finished product *Nimba Haridra Khand* and *Shunthyadi Taila* to confirm its identity, purity and quality. Physicochemical analysis of *Nimba Haridra Khand* shows loss on drying 09.31%, total solid content is 90.69%, total ash 03.93%, Acid insoluble ash 01.02%, Water soluble Extractive 51.65, Methanol soluble Extractive 34.58%, pH 5.1, Thin Layer Chromatography showed 13, 9 and 5 Spots. Physicochemical analysis of *Shunthyadi Taila* shows loss on drying is 0.81%, total solid content is 99.19%, refrective index is1.478, Thin Layer Chromatography showed 12 Spots. This shows the presence of certain definite constituents in the *Nimba Haridra Khand* and *Shunthyadi Taila* and is helpful for the easy separation of these constituents.

KEYWORDS: *Pratishyaya,* Allergic Rhinitis, *Nimba Haridra Khand, Shunthyadi Taila* HPTLC, Pharmaceutics.

INTRODUCTION

Pratishyaya is a condition of continuous Nasal discharge, *Vata Pradhana* disease and accumulation of *Doshas* in *Uttamanga.*[1] The clinical features of *Vataja Pratishyaya* as

explained in *Ayurvedic* literature have the relevance with Allergic Rhinitis. Allergic Rhinitis is an IgE-mediated immunologic response of nasal mucosa and is characterized by watery nasal discharge, nasal obstruction, sneezing and itching in the nose etc. *Pratishyaya* is the *Vata Kapha* dominant disease. So the ingredients of the selected drug were those which were having *Vata kapha* shamaka properties. So the present study was carried out to analyze the physico-chemical properties of *Nimba Haridra Khand* and *Shunthyadi Taila.*

MATERIALS AND METHODS

Collection of the Drug

Raw drugs of *Nimba Haridra Khand*[2] and *Shunthyadi Taila*[3] were procured from and were Identified and Authenticated at Pharmacognosy laboratory.

Table no 1: Ingredients of Nimb Haridra Khand (Nagarjun Samhita).

Sr. No	Name of Plant	Bootanical Name	Family	Part used	Quantity
1.	*Neem*	*Azadirachta indica*	Meliaceae	Swarasa	30 part
2.	*Sharkara*	*Saccharum officinarum*	Gramineae	Stem	16 part
3.	*Chitraka*	*Plumbago zeylanicum*	Plumbaginaceae	Root bark	1 part
4.	*Haritaki*	*Terminalia chebula*	Combretaceae	Fruit pericarp	1 part
5.	*Vibhitka*	*Terminalia bellarica*	Combretaceae	Fruit pericarp	1 part
6.	*Aamalaki*	*Emblica officinale*	Euphorbiaceae	Fruit pericarp	1 part
7.	*Nagarmotha*	*Cyperus rotundus*	Cyperaceae	Stem	1 part
8.	*Kalajeera*	*Carum bulbocastanum*	Umbelliferae	Seed	1 part
9.	*Ajvayana*	*Trachyspermum ammi*	Umbelliferae	Fruit	1 part
10.	*Ajmoda*	*Carum roxburghianum*	Umbelliferae	Fruit	1 part
11.	*Nirgundi*	*Vitex nigundo*	Verbenaceae	Seed	1 part
12.	*Shunthi*	*Zingiber officinale*	Zingiberaceae	Rhizome	1 part
13.	*Pippali*	*Piper longum*	Piperaceae	Fruit	1 part
14.	*Marich*	*Piper nigrum*	Piperaceae	Fruit	1 part
15.	*Nishoth*	*Operculina terpenthum*	Convolvulaceae	Root	1 part
16.	*Danti*	*Baliospermum montanum*	Euphorbiaceaea	Root, seed, Leaf	1 part
17.	*Neem*	*Azadirachta indica*	Meliaceae	Seed	1 part
18.	*Bakuchi*	*Psoralia corylifolia*	Leguminaceae	Seed	1 part
19.	*Vayavidanga*	*Embelia ribes*	Myrsinaceae	Fruit	1 part
20.	*Anantamoola*	*Hemidesmus indicus*	Asclepidiaceae	Root	1 part

Method of preparation of *Nimba Haridra Khand*

- Washed, dried and powdered the ingredients numbered 3 to 19 in table no, 1 *(Prakshepa dravya)* separately and passed through sieve no. 85 to obtain a fine powder.
- Dried *Nimba* leaves were taken and dipped in 8 times of water in a vessel for one night.
- Next morning the mixture was heated over *mandagni* till the total quantity reduced to 1/4th (*kwath*). The 1/4 reduced mixture was filtered with the help of muslin cloth.

- Then filtered *kwath* of *nimb* was taken into stainless steel vessel. Then sugar was added into it and heated over *mandagni*, till it become into concentrated form and come up thread like. (If taken out in rod).
- At last *Prakeshapa dravyas* no. 3 to no. 19 in table no. 1 which was already grinded was added into it and heated at 50^0. Mixed *Prakeshapa dravyas* thoroughly till it become a homogenous blend. Then allowed to cool at room temperature.
- Packed it in tightly closed containers to protect from light and moisture.
- **Description:** Dark Brownish, granular powder with pleasant odour and Astringent bitter-sweet and slightly pungent taste.

Table No. 2: Ingredients of *Shunthyadi Tail.*

Sr. No.	Name of Plant	Botanical name	Family	Part used	Quantity
1.	*Shunthi*	*Zingiber officinale Linn.*	Zingiberaceae	Rhizome	1/4 part
2.	*Kustha*	*Saussurea lappa*	Compositae	Root	1/4 part
3.	*Pippali*	*Piper longum Linn.*	Piperaceae	Fruit and Root	1/4 parts
4.	*Bilva*	*Aegle marmelos Linn.*	Rutaceae	Root	1/4 parts
5.	*Draksha*	*Vitis vinifera*	Vitaceae	Fruit, stem, leaf, flower	1/4 part
6.	*Tila taila*	*Sesamum indicum*	Pedaliaceae	Oil, seed, root, leaf	1 part

Table No. 3: Ingredients for *Til Tail Murchna*.

Sr. No	Name of plant	Botanical Name	Family	Part used	Quantity
1.	*Manjishtha*	*Rubia codifolia* Linn.	Rubiaceae	Root	4 parts
2.	*Haritaki*	*Terminalia chebula* Retz.	Combretaceae	Fruit	1 part
3.	*Bibhitak*	*Terminalia bellirica* Roxb.	Combretaceae	Fruit	1 part
4	*Amalaki*	*Emblica officinalis* Gaertn.	Euphorbiaceae	Fruit	1 part
5	*Haridra*	*Curcuma longa* Linn.	Zingiberaceae	Stem	1 part
6	*Lodhra*	*Symplocos racemosa* Roxb.	Symplocaceae	Bark	1 part
7	*Nagarmotha*	*Cyperus rotundus* Linn.	Cyperaceae	Stem	1 part
8	*Dalchini*	*Cinnamomum zeylanicum*	Lauraceae	Bark	1 part
9	*Kevda*	*Pandanus odorotissimus* Linn.	Pandanaceae	Root	1 part
10	*Vatt*	*Ficus bengalensis* Linn.	Moraceae	Leafbud	1 part
11	*Til taila*	*Sesammum indicum*	Pedaliaceae	Oil	64 part

Method of preparation of *Shunthyadi Taila*

- **Procedure:-***Murchhana* of *Til taila* is done as per *Bhaisjya Ratnawali*.
- Paka of *Til taila* done with drugs sr. no. 1 & 10 in table no. 3 in this section.

Equal parts of *Shunthi, Kushta, Pippali, Bilwa, Draksha* made into *kalka* form, Than 4 parts of *Moorchita Tila Taila* and 16 parts of *Shuddhajala* were added into it and took in a steel vessel and heated over *Madhyama Agni* till complete evaporation of moisture content. Again heat was applied with intermediate stirring. Heating duration was adjusted until the

appearance or *lakshana* of *Samyaka sneha Siddhi* by 5 nights. When *taila paka* completed with all its examination, allowed to cool and packing done. Then *Shunthyadi Taila* was used as medicine for *Nasya* purpose.

Physico-chemical Analysis

Physico-chemical analyses were carried out by following the parameters. Physico‑chemical analysis like loss on drying at 110°C[4], pH value[5], ash value[6], water soluble extractive[7], methanol soluble extractive[8], Sp. Gravity were recorded.

Physico-chemical parameters for

1) Loss on drying
2) Water soluble extractive
3) Alcohol soluble extractive
4) Ash value
5) pH Value
6) HPTLC

1) Loss on drying (LOD)

The moisture content of a drug should be determined to know the amount of moisture present in the drug. So, the moisture content of the drug should be minimized in order to prevent decomposition of the crude drugs either due to chemical change or microbial contamination.

Procedure: 1 gm of drug sample was taken in a pre-weighed dried petri dish. It was dried in an oven at 105ºC until reaching a constant weight. The petri dish was taken out, self-cooled and weighed immediately. The weight loss i.e. loss on drying was calculated and expressed as % w/w7.[9]

2) Water soluble extractive (WSE)

This test was carried out to determine the water soluble extractive and approximate measures of their chemical constituents of the test drug which are water soluble.

Procedure: 5 gm. of the sample was weighed accurately. 100 ml of distilled water was added to it and kept covered overnight. It was stirred intermittently in the initial period. It was filtered after keeping for 24 hours. 25 ml of the filtrate was accurately measured with a pipette and transferred to the already weighed evaporating dish. The evaporating dish was

placed on a water bath for evaporation of the water. After evaporation of the water it was dried in an oven, allowed to cool and weighed immediately. From the weight of the extract obtained, the percentage of water soluble extractive was calculated and expressed as % w/w.[10]

3) Alcohol soluble extractive (AST)

This test was carried out to determine the alcohol soluble extractive of the test drug and determine the alcohol soluble chemical constituents.

Procedure

The method adopted for this experiment was same as that of water-soluble extract but methanol was used instead of water. Percentage of alcohol soluble extract was calculated and expressed as % w/w.[11]

4) Ash value (AV)

This test was conducted to evaluate the percentage of inorganic salts, carbonates, phosphates, silicates etc. naturally occurring in the drug or adhering to it or deliberately added as a form of adulteration.

Procedure

The ash value of the samples was determined according to IP'85. 2 grams accurately weighed sample was taken in a pre-weighed dried crucible. It was incinerated in a muffle furnace up to 650ºC. The crucible was taken out, self-cooled and weighed immediately. From the weight of the ash, the ash value was derived with reference to the air dried drug. It was calculated and expressed as % w/w.[12]

5) pH Value

This test is carried out to determine the pH of the test drug with the help of pH meter.

Procedure

Total 10gms of test drug sample was weighed and taken in a conical flask. Then add 50 ml accurately measured water and stirred well for few minutes. Keep this solution for some time and then filter it through filter paper. Take the filtered solution in a beaker. Standardize the pH meter and electrodes with buffer solution of known pH i.e. 7 pH Rinse the electrodes with distilled water and introduce it into the test solution contained in a small beaker. Read the pH value of solution.[13]

6. High Performance Thin Layer Chromatography[14]

High performance thin layer chromatography (HPTLC) is an invaluable quality assessment tool for the evaluation of botanical materials. It allows for the analysis of a broad number of compounds both efficiently and cost effectively. Additionally, numerous samples can be run in a single analysis thereby dramatically reducing analytical time. With HPTLC, the same analysis can be viewed using different wavelengths of light thereby providing a more complete profile of the plant than is typically observed with more specific types of analyses.

Procedure

First of all, take a drop of sample and diluted with haxen (as per require) then application of the sample at the one end of the precoated plate through linomat V (150 µl/sec) then on the sample zone again applied 7% alcoholic KOH then leave for 10-15 minutes at 60-80ºc in oven. The plate is then developed by the suitable mobile phase in a chromatographic chamber which was previously saturated with the mobile phase. Then after development it is visualized into day light, short UV (254nm) and / or by derivatization of the plate with suitable reagent. The Rf value and the colours of resolved bands and fingerprinting profiles are recorded.

Determination of Specific gravity

The specific gravity of a liquid is the weight of a given volume of the liquid at 25 0C (Unless otherwise specified) compared with the weight of an equal volume of water at the same temperature, all weighing being taken in air.

Procedure

A Pycnometer of 25 ml, capacity is cleaned, dried and weighed. It is filled up to the mark with water at the required temperature and weighed. The Pycnometer is next filled up to the mark with the sample, at the same temperature and weighed. The specific gravity is determined by dividing the weight at the sample in grams by the weight of the water, expressed in gram.

OBSERVATIONS AND RESULTS

Organoleptic Evaluation

Various parameters of the material such as colour, odour, touch and taste of the *Nimba Haridra Khand* and *Shunthyadi Taila* were observed and recorded**.**

Table no 4: Organoleptic characters of *Nimba Haridra Khand.*

No	Properties	Observation
1.	Rupa (colour)	Dark brown
2.	Gandha (odour)	Characteristic
3.	Rasa (Taste)	Astringent, Bitter, Sweet and slight pungent

Table no 5: Organoleptic characters *of Shunthyadi Taila.*

No	**Properties**	Observation
1.	Rupa (colour)	Reddish Yellow
2.	Gandha (odour)	Characteristic
3.	Rasa (Taste)	
4.	Sparsh (Touch)	Smooth

Analytical Study

Results of the analytical study of *Nimba Haridra Khand* and *Shunthyadi Taila* are as follows.

Physico-chemical Constants

The results are depicted in **(Table no: 6-7).**

Table no 6: Physico-chemical Constants of *Nimba Haridra Khand.*

Sr. No	Test	Result
1	Loss on drying	09.31%
2	Total Ash	03.93%
3	Acid soluble ash	01.02%
4.	Water Soluble Extractive	51.65%
5.	Methanol soluble Extractive	34.58%
6.	Total solid	90.69%

Table no 7: Physico-chemical Constants of *Shunthyadi Taila.*

Sr. No	Test	Result
1	Loss on drying	0.81%
2	R.I	1.478
3	Sp. Gravity	0.9297
4	Total solid	99.19%

High Performance Thin Layer Chromatography (HPTLC)

In HPTLC, 13,9,6 spots were observed in *Nimba Haridra Khand.* In HPTLC, 12 spots were observed in *Shunthyadi Taila.*

Table no 8: Chromatographic results of *Nimba Haridra Khand.*

Rf values	0.14,0.26,0.36,0.48,0,56,0.62,0.68,0.72,0.78,0.84,0.86,0.88,0.92 0.11,0.14,0.32,0.46,0.59,0.68,0.72,0.84 0,33,0.46,0.53,0.63,0.76

Table no 9: Chromatographic results of *Shunthyadi Taila.*

Rf values	0.10, 0.16, 0.23, 0.26,0.23, 0.40, 0.52, 0.58, 0.65,0.78, 0.86, 0.92

CONCLUSION

Results obtained in Physiochemical parameters of *Nimb Haridra Khanda* and *Shunthyadi taila* are with in limits mentioned by Ayurvedic Pharmacopia of India. HPTLC profile of *Nimb Haridra Khanda* and *Shunthyadi taila* showed similar in number of spots. This profile can be used for the identification of the medicinally important formulation of *Nimb Haridra Khanda* and *Shunthyadi taila*. Present work can be considered as the first step towards identifying the following methods through HPTLC analysis. This is the preliminary analysis and meticulous nature along with depiction is to be carried out.

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