



Pharmaceutico- Analytical Study of Nimbadi Ubatan and It's Antimicrobial Activity.

Sarita Pasi¹, Shivani J. Mishra^{*2}

1. Associate professor, Rasshastra and Bhaishajya Kalpana Department, SNKD Trust's Nallasopara, Ayurved Medical College, Nallasopara, Dist. Thane, Maharashtra.
2. PhD Scholar, Rasshastra and Bhaishajya Kalpana Department, APM's Ayurved Mahavidyalaya, Sion, Mumbai, Sion, Maharashtra.

***Corresponding Author:** dr.shivanimishra25@gmail.com

ABSTRACT:

Aim: To Study Physico chemical analysis of *Nimbadi ubatan* and it's antimicrobial activity.

Objectives: 1) Preparation of *Nimbadi ubatan*. 2) To Study literature of dravyas used in preparation of *Nimbadi ubatan*. 3) Study of Microbes used to check antimicrobial activity of *Nimbadi ubatan*.

Materials and Methods: Preparation of *Nimbadi ubatan* according to the reference of *Astang hrudaya chikitsa sthana kushthchikitsa adhyay* 19/65-66. Analytical study of *Nimbadi ubatan* and it's antimicrobial activity of *Nimbadi ubatan* was performed by time kill test method.

Discussion: As per reference of *Astang hrudaya*, *Nimbadi ubatan* was prepared and was analysed. Physico chemical parameters of *Nimbadi ubatan* was also done.

Antimicrobial activity of *Nimbadi ubatan* shown 2.25_4 log reduction / 99% reduction of *S. aureus*, *S. Pyogenes*, *p. aeruginosa* and *Candida albicans* in 1 minute. **Conclusion:** The present Study entitled " pharmaceutico analytical study of *Nimbadi ubatan* and it's antimicrobial activity" was aimed to prepare and perform all analytical test and antimicrobial analysis of *Nimbadi ubatan*.

KEYWORDS: *Nimbadi ubatan*, *Astang hrudaya*, Antimicrobial activity,

INTRODUCTION:

Rasa Shastra and *Bhaishajya Kalpana* is one of the branch of *Ayurveda* in which all methods of ayurvedic medicine purification, formation, dose and indication are available. *Ashtang hrudaya* is a very famous *samhita* which has many *kalpas* for various diseases.

Now a days with increasing competition in every field, the fast life with unhealthy eating habits like fast food, Milk shakes (*Virudha aahar*) and lack of exercise , lack of sleep , stress, more use of electronic gadgets (*Mithya Vihar*) add to the cause of skin diseases.

All above mentioned hetus can be correlated with hetus described in *Kushtha vyadhi*. In *Astang Hrudaya*, *Nimbadi ubatan* is a formulation mentioned in *Kushtha adhikar*, it can be used as *varnya* and to treat skin disorders in the form of *udvartan*, *churna* or as *lepa*.

In ayurvedic classics, according to *acharya vaghbhata*, the word *kushtha* is "Kusnati vapu" which means the disease that makes the body disfigured and ugly. *Kushtha* is a condition in which different body parts *dhatu*, *upadhatu* are destroyed. Even though the term *kushtha* is used in ayurveda for entire dermatological problem, all the *acharyas* of *bruhatrayee* unanimously have accepted the numerology of *kushtha* as eighteen.

Giving friction to the body by *kashayadi choorna* is called as *udvartana*. The concept of *udvartana* is explained right from the oldest textbook *charaka Samhita*

and most of the other authors under *rookshana* karma which is one among the *shadvidhopakrama*. The word meaning of *rookshana* is making thin or inducing dryness^[1,2,3]

AIM: To Study *Physico* chemical analysis of *Nimbadi ubatan* and it's antimicrobial activity.

OBJECTIVES:

- 1) Preparation of *Nimbadi ubatan* .
- 2) Study of Microbes used to check antimicrobial activity of *Nimbadi ubatan*.

MATERIALS AND METHODS:

Preparation of *Nimbadi ubatan*:^[4]

Reference:

निम्बादि उबटन -

निम्बहरिद्रेसुरसंपटोलकुष्ठाश्वगंधेसुरदारुशिगुः।

ससर्षपंतुम्बरुधान्यवन्यचण्डाचचूर्णानिसमानिकुर्यात्।

तैस्तक्रपिष्टैः प्रथमंशरीरं तैलक्तमुद्धर्तयितुं यतेत।

तथास्यकण्डूःपिटिकाःसकोठाःकुष्ठानिशोफाश्वशमं व्रजन्ति॥

(अ.ह.चि.१९/६५-६६)

Table No. 1: Herbal raw materials for Preparation of *Nimbadi Ubatan*:^[5,6]

Coarse powder (Pata churna) form with mesh no.60.

Sr. No.	Name	Latin Name	Part Used	Quantity
1	<i>Nimb</i>	<i>Azadirachta indica</i>	<i>Patra</i>	50 gms
2	<i>Haridra</i>	<i>Curcuma longa</i>	<i>Kand</i>	50 gms
3	<i>Daruharidra</i>	<i>Berberis aristata</i>	<i>Twak</i>	50 gms

4	<i>Surasa</i>	<i>Ocimum sanctum</i>	<i>Beej</i>	50 gms
5	<i>Patol</i>	<i>Tricosanthes dioica</i>	<i>panchang</i>	50 gms
6	<i>Kushtha</i>	<i>Saussurea lappa</i>	<i>Mool</i>	50 gms
7	<i>Ashwagandha</i>	<i>Withania somnifera</i>	<i>Mool</i>	50 gms
8	<i>Surdaaru</i>	<i>Cedrus deodaru</i>	<i>Saar</i>	50 gms
9	<i>Shigru</i>	<i>Moringa pterygospermum</i>	<i>Twak</i>	50 gms
10	<i>Sarshap</i>	<i>Brassica campestris</i>	<i>Beej</i>	50 gms
11	<i>Tumbaru</i>	<i>Zanthoxylum alatum</i>	<i>Phal</i>	50 gms
12	<i>Musta</i>	<i>Cyperus rotundus</i>	<i>Kand</i>	50 gms
13	<i>Chanda</i>	<i>Angelica glauca</i>	<i>Mool</i>	50 gms

Procedure of Preparation of *Nimbadi Ubatan*:^[4,7]

- Coarse powder (*pata churna*) of the ingredients of *Nimbadi Ubatan* is required for this *Kalpana*.
- Coarse powder (*pata churna*) of all the ingredients of *Nimbadi Ubatan* was purchased from local market.
- All the ingredients of *Nimbadi Ubatan* were authenticated from certified Lab.
- All the ingredients of *Nimbadi Ubatan* were weighed on a weighing scale.
- 50 gms of each of the raw material were taken.
- Coarse powder of all the ingredients of *Nimbadi Ubatan* was taken in sieve no. 60 according to the sequence explained in the shloka.
- Equal quantity of *Nimba* Powder, *Haridra* powder, *Daruharidra* powder, *Surasa* powder, *Patol*

Powder, *Kushtha* powder, *Ashwagandha* powder, *Shurdaru* powder, *Shigru* Powder, *Sharshap* Powder, *Tumbaru* Powder, *Musta* Powder, *Chanda* Powder were taken into sieve respectively.

- After sieving all the above ingredients, the mixture was taken into *khalvayantra* for *mardan* process.
- 80 ml of *Takra* was added to the mixture and it was triturated in *khalvayantra* for 30 minutes.
- Another 50 ml of *Takra* was added to the mixture and triturated in *khalvayantra* for 40 minutes.
- After trituration, mixture was taken out of the *khalvayantra*.
- The final product obtained was then weighted on a weighing scale which was 650 gms of *Nimbadi Ubatan* and kept in an air tight container.



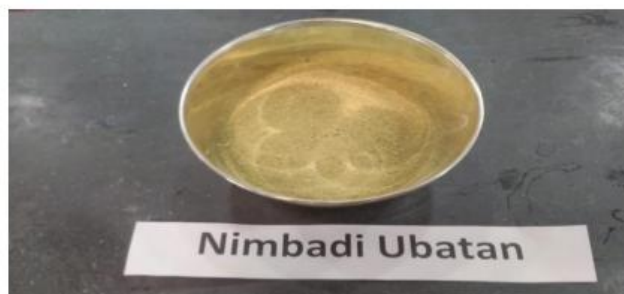
PREPARATION OF NIMBADI UBATAN:



Takra



TRITURATION OF NIMBADI UBATAN WITH TAKRA



ayurlog
N J-R A S

Antimicrobial activity of *Nimbadi ubatan* by Time kill test method:^[8,9]

The Time Kill Analysis measures the change in a population of microorganisms within a specified sampling time after exposure to an antimicrobial test material *in vitro*. The test article or its dilution is brought into contact with a known population of microorganisms for a specified period of time at a specified temperature. The test article is then neutralized at the target sampling time and the surviving organisms are enumerated. The percent and/or *log10* reduction from either an initial microbial population or test blank is calculated. The four organism which were taken to perform antimicrobial activities those are *Staphylococcus Aureus*,

Streptococcus pyogenes, *Pseudomonas aeruginosa*, *Candida albicans* which causes skin infections like boils, *folliculitis*, impetigo, *cellulitis* etc.

Procedure of Antimicrobial activity of *Nimbadi ubatan* by Time kill test method:

- Test product was inoculated with test *inoculum* individually (approximately 10^8 CFU/ ml). After the specified exposure time of 1 minute, surviving microorganisms were recovered by drawing an aliquot, neutralizing it and

performing Standard Pour Plate Technique.

- Culture count was ascertained by dilution Blank. Adequate Validation of Neutralizing agent was also carried.

- Test was carried out in duplicate and average count was taken as CFU/ ml.

OBSERVATION AND RESULTS:^[10]

Table no. 2 Observations and Result of Analytical process of *Nimbadi Ubatan*:

Sr. No.	Test	Result
1	Appearance	Fine powder
2	Colour	Faint yellowish green
3	Odour	Herbaceous
4	Taste	Bitter
5	Moisture Content	4.0%
6	Toal Ash Value	8.71%
7	Acid Insoluble Ash	3.30%
8	Alcohol Soluble Extractive	12.96%
9	Water Soluble Extractive	25.03%
10	pH	4.9

Table no. 3 Observations and Result of Antimicrobial process of *Nimbadi Ubatan*: By Time Kill Test method:

Sample Identification	Test Organism	Exposure Time	Count of Test Organism			Antimicrobial activity	
			Initial Count	After Exposure		Log Reduction	Percentage Reduction
Nimbadi Ubtan	Staph. aureus	1 minute	1.80×10^5 CFU/ ml L = 5.25	1.00×10^3	3.00	2.25	99.44
	St. pyogenes		1.53×10^5 CFU/ ml L = 5.18	< 10	< 1	>4.18	>99.99
	Ps. aeruginosa		2.30×10^5 CFU/ ml L = 5.36	2.40×10^2	2.38	2.98	99.89
	Candida albicans		1.50×10^5 CFU/ ml L = 5.17	7.40×10^2	2.86	2.31	99.50

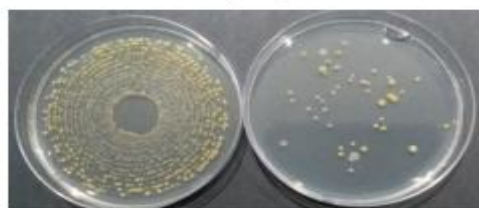
RESULT:

Test Product labeled as *Nimbadi Ubtan* has shown **2 – 4 log reduction/ >99% reduction** of *Staphylococcus aureus*,

Streptococcus pyogenes, *Pseudomonas aeruginosa*, and *Candida albicans* in 1 minute when analyzed as per ASTM E 2315 - 16 Method.

1) RESULT OF ANTIMICROBIAL ANALYSIS OF NIMBADI UBATAN

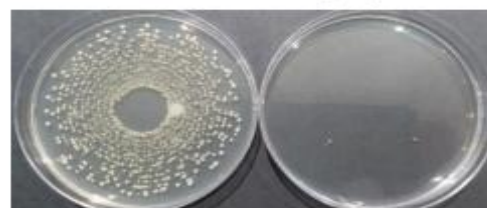
IMAGE-A (SA)



AT ZERO MIN.

AT ONE MIN.

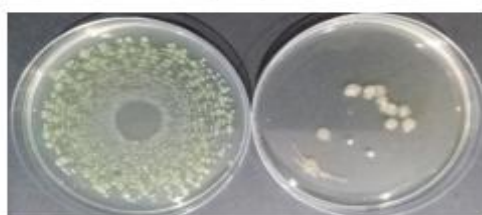
IMAGE-B (SP)



AT ZERO MIN.

AT ONE MIN.

IMAGE-C (PS)



AT ZERO MIN.

AT ONE MIN.

IMAGE-D (CA)



AT ZERO MIN.

AT ONE MIN.

ALL FOUR IMAGES OF NIMBADI UBATAN HAS SHOWN 2-4 LOG REDUCTION/ >99% REDUCTION OF STAPHYLOCOCCUS AUREUS, STREPTOCOCCUS PYOGENES, PSEUDOMONAS AERUGINOSA, CANDIDA ALBICANS IN ONE MINUTE.

DISCUSSION:

Now a days society is more conscious about external beauty compare to internal beauty and also some professional fields they require good looking and charming beauty. Usually 10-15% cases present before general practitioners are pertaining to skin diseases. Due to altered life style, lack of physical exercise, unhygienic, mental stress, over eating, nutrition deficiency skin diseases are commonly observed. In modern medicine there is a treatment for skin disease, but there is no permanent solution. So to avoid recurrence of skin disease this topic had been chosen. The study entitled “Pharmaceutico- Analytical Study of

Nimbadi ubatan and It's Antimicrobial activity”. As per reference of *Astang Hrudaya*, *Nimbadi ubatan* was prepared and was analysed. According to classical text *Nimbadi ubatan* can be used in the form of lepa in skin disorder. *Nimbadi ubatan* was analysed for physico chemical parameters. It was in a fine powder form with faint yellowish green in colour, bitter in taste.

Analytical testing of *Nimbadi ubatan*:

Moisture Content:

This method is used to measure the amount of water content and other volatile material in a sample upon drying or heat treatment.

Moisture Content of *Nimbadi ubatan* was found 4.0% which is within the limit.

Total ash value:

The residue remaining of incineration is the ash content of the drug. It Measures the amount of carbon-free ash present in a prepared sample which represents the inorganic salts naturally occurring in drug or adhering to it or deliberately added to it as a form of adulteration.

Total ash value of *Nimbadi ubatan* was 8.71% which is within the limit.

Acid insoluble ash:

A high value of acid insoluble ash suggests the presence of sand, dust, dirt, stones, etc. that get mixed during processing or are present in the parent material as contamination. The higher value indicates inferior quality and low hygiene standards in the production process.

Acid insoluble ash of *Nimbadi ubatan* was 3.30% which is within the limit.

p^H:

The pH value of an aqueous solution may be defined as the logarithm of the reciprocal of the hydrogen ion concentration. Drug gets easily absorbable in acidic media and hence enters into the system and produces quick results.

The pH of *Nimbadi ubatan* was 4.9 (acidic).

Extractive values:

These are useful for the evaluation of a crude drug. Gives an idea about the nature of the chemical constituents present in the crude drug. Useful for the estimation of constituents extracted with the solvent used for extraction. Employed for material for which as yet no suitable chemical or biological assay exists.

Alcohol soluble extractive of *Nimbadi ubatan* was 12.96% and water soluble extractive of *Nimbadi ubatan* was 25.03%.

Thin Layer Chromatography:

TLC can be used to help determine the number of components in a mixture, the identity of compounds, and the purity of a compound.

TLC of *Nimbadi Ubatan* was done using stationary phase of Aluminum coated silica plates 60F254 and mobile phase of Toluene: Ethyl acetate: Formic acid in a ratio of (9.7: 0.3: 0.5) (v/v/v) with saturation time of 20 minutes.

After the whole process TLC plate was observed under different wavelengths and under different wavelengths different colour and different number of bands were noted.

Antimicrobial activity of *Nimbadi ubatan* by Time kill test method:

According to this method *Nimbadi ubatan* shown 2-4 log reduction/ >99% reduction of *S. aureus*, *S. Pyogenes*, *P.aeruginosa*, and *Candida albicans* in 1 minute, So from above results we can say that *Nimbadi ubatan* shows good inhibitory action against

S.aureus, S.pyogenes, Pseudomonas aeruginosa, candida albicans.

CONCLUSION:

The present study entitled “Pharmaceutico- Analytical Study of *Nimbadi Ubatan* and It's Antimicrobial activity” was aimed to prepare and perform all Analytical tests and Antimicrobial analysis of *Nimbadi ubatan*. *Nimbadi ubatan* was analysed for physico chemical parameters. It was in a fine powder form with faint yellowish green in colour, bitter in taste. It's Moisture Content was found 4%, Total ash value was 8.71%, acid insoluble ash was 3.30%. The pH was 4.9(acidic), alcohol soluble extractive was 12.96% and water soluble extractive was 25.03%. *Nimbadi Ubatan* shows good inhibitory action against *S. aureus, S. pyogenes, Pseudomonas aeruginosa, candida albicans*.

REFERENCES:

1. Vd. Bramhanand Tripathi, Ashtang Hridayam, Sutrasthan 2nd chapter Chaukhamba Sanskrit prakashan, Delhi 2003.
2. Vd. Brahmanand Tripathi , Sharangdhar Samhita, , annotated with Dipika, Hindi commentary, Madhyam khand, 6th

Chapter, Chaukhamba Surbharati Prakashan, Varanasi, Reprint 2016.

3. Vd. Brahmanand Tripathi , Sharangdhar Samhita, , annotated with Dipika, Hindi commentary, Uttar Khanda, 11th Chapter, Chaukhamba Surbharati Prakashan, Varanasi, Reprint 2016.
4. Vd. Bramhanand Tripathi, Ashtang Hridayam, Chikitsa Sthana, 19th Chapter, Shloka no 65-66, page no. 791, Chaukhamba Sanskrit prakashan, Delhi 2003.
5. Vd. Priyavat Sharma, Dravyaguna vidnyanam, Vol 02, Chaukhamba Bharati Academic, 2008.
6. Vd. Manasi Deshpande, Dravyaguna vidnyanam. Vol 02, Chaukhamba Sanskrit pratishthan , 2009.
7. Sri bhavamishra, Bhavprakash Nighantu, edited by Dr. G S pandey, commentary by prof KC Chuneekar , Chaukhamba Prakashan, reprinted 2010, Takra varg, Page no 771.
8. Ananthanarayan and Paniker's Textbook Of Microbiology, 8th Edition, Reprint 2010.
9. Overview Of Microbiology, <http://en.wikipedia.com>.
10. Ayurvedic Pharmacopoeia of India, dept of Ayush, Govt. of India, Part I, Vol II, Page no.190,191.(For Analytical test).

Conflict of Interest: Non

DOI: <https://doi.org/10.52482/ayurlog.v9i04.920>

Source of funding: Nil

Cite this article:

Pharmaceutico- Analytical Study of Nimbadi Ubatan and It's Antimicrobial Activity.

Sarita Pasi, Shivani J. Mishra

Ayurlog: National Journal of Research in Ayurved Science- 2021; (09) (04): 01- 09