Pharmaceutical standardisation of bhasma kalpana w. s. r. to Shankha Bhasma

A THESIS

SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF PHARMACY (AYURVEDA**)**

IN

RASASHASTRA AND BHAISHJYA KALPANA

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May, 2015

Statement by the candidate

This is to submit that this written submission in my thesis entitled "Pharmaceutical standardization of bhasma kalpana w.s.r. to Shankha Bhasma" represents original ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have stuck to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the School and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when required. Patents related to API, process, product, method and equipment, if any, have been examined to ensure non-infringing approach to the existing patents. This thesis encompasses the information generated by me based on experimental work carried out in the Institute / Industry. I assure and hold full responsibility for its genuineness.

Vinod Kumar

Forwarded Through

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The work described in this thesis entitled "Pharmaceutical standardisation of bhasma kalpana w. s. r. to Shankh Bhasma" has been carried out by **Mr. Vinod Kumar** under my supervision. I certify that this is his bonafide work. The work described is original and has not been submitted for any degree to this or any other university.

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I sincerely thank them all.

Date: - **Vinod Kumar**

Place: - LPU

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ABBREVATIONS

AD	Anno Domini
BC	Before Christ
e.g.	Example
i.e.	That is
SOP	Standard Operating Process
&	And
W	Weight
G	Gramm
Ml	Millilitre
^{o}C	Degree calicoes
nm	Nanometre
LOD	Loss on drying
E.V	Extractive value
T.A	Total ash
Vol.	Volume
F.M	Foreign matter
A.I.A	Acid insoluble ash
W.S.E	water soluble extractive
A.S.E	Alcohol soluble extractive
P	Purified drug
Fig.	Figure
%	Percentage
Hcl	Hydrochloric acid
L	Bhavana with lemon juice

V	Bhavana with aloe vera juice
L+V	Bhavana with lemon juice+ aloe vera juice
S	Solid
G	Gas
H	Height
R	Radius
+	Present
B	Batch
Kg	Kilogram
Sr.	Serial
Lit.	Litter
IR	Infrared
cm	Centimetre
D_p	Projected diameter
NaoH	Sodium hydroxide
#	Mesh size
EDTA	Ethylenediaminetetraacetic acid
No.	Number
W_1	Bhavana with water

CHAPTER – 1

INTRODUCTION

Ayurveda is a sanskrit word made up of two components, Ayu (life) and Veda (knowledge). Therefore, Ayurveda is known as the "knowledge of life". It is based upon Atharvaveda, one of the veda out of four vedic scriptures. The main objectives of Ayurveda are to maintain of the health of healthy individual and to treat the patients.[1]

स्वस्थस्य स्वस्थयरक्षणम् |

आतुरस्य विकार् प्रशनाम्चा || [2]

According Acharya Charka,"Ayu" comprises the mind, body senses and the soul. [2]

हिताहितम् सुखम् दुखमायुस्तस्य हिताहितम्।

मानम् च् यत्रोक्तायुर्वेदे स् उच्यते।। च्0.\ स0\सु0.\१/४१[3, 4 , 91, 92]

Ayurveda is the science which deals with life and their good, bad, happiness and unhappiness deals with good, bad, happy and unhappy life. It is the promoteres, measurement and nature. The source of raw materials for the ayurvedic formulations are plants, animals, minerals and metals. The formulations which are prepared by using minerals and metals are known as Rasaausadhis. The formulation which is prepared by using plants as an ingredient is known as Kastausadhi. Rasaosadhis are more active therapeutically because of their small dose, palatability, rapid action and easy administration. There are two categories of Rasashatra Dhatuvad and Dehavad. Dhatuvad is involved in changing parad into gold. Dehavad on the other word helps in the rejuvenation of the mind and body. The science is often referred to as Dhatuvad and the resultant medications are called rasas, which mainly comprise of metallic ashes called bhasma. After giving the desired action bhasma is eliminated through our excretory systems, specifically by urine, stool.

The ayurvedic calcium compounds are considered in sudha varga dravya, so sudha varga is named latterly, but knowledge of various dravyas concerned to this group is available since Vedic Kala. In Atharvaveda shankh and mriga sringa are used as medicine. In samhita period eight drugs are mentioned these are asthi, kukkutandatwak, mukta, praval, shank, shukti, varatika and samudra phane. In charak samhita sudha verga mentioned as bhoumik dravya. In

rasa ratanakar described in 7th century, kurma prista, varatika, chuna, shukti in sukla varga. Rasarnava included shank in 11th, century. Rasa trangini has discussed sudha varga in three different lesions these are manasiladi vignaniyan, shankhadi vignaniyan and ratanadi vignaniyan. In rasaamrita achrya yadavji trikramji firstly named the sudha varga in which only khatika and godanti were included .In this study bhasma is prepared with classical references such as sodhana, marana, bhavana and puta.

Ethanopharmacology of Ayurvedic Sudha drugs [5]:-

As most of the sudha (marine) drugs are rich in calcium salts they are more effective in combating hyperacidity, dyspepsia and osteoporosis. The calcium salt aids in acid neutralization and bone remineralisation, some are useful in mental disorders, paralysis and blood disorder, some of these are useful in eye disorders and act as aphrodisiac.

Standardization [6, 90]:-

The meaning of standardization is to conformation of product its identity, purity, efficacy and quality. The drug is identified by the standard description. The present era available of advancement in the chemical present in crudes drugs by various technology just like botanical, spectroscopic, chemical and biological process is apply for estimating active chemical constituents present in the drugs. The Ayurvedic compound formulation are broadly classified under the heading Rasaausadhi (predominately metals & minerals are used for preparation and dealt in Rasashastra) and kasthausadhi (predominantly plant drugs used for preparation and dealt in Bhaisajyakalpana).

Infrared spectroscopy is one of the most common spectroscopic techniques used by organic and inorganic chemist. Simply it is the absorption measurement of different IR frequencies by a sample placed in the path of an IR beam. The main aim of IR is measured functional groups present in sample. Different functional groups absorb characteristic frequencies of IR radiation. It accepts wide range of sample types i.e. gases, liquids and solids. Thus IR spectroscopy is an important tool for structural elucidation and compound identification.

Need of standardization [7]:-

Standardization is very important for formulations in order to acquire of quality of drugs, depend upon the concentration of their active constituents, chemical, phytochemical, standardization, and In-vivo, In-vitro parameters.

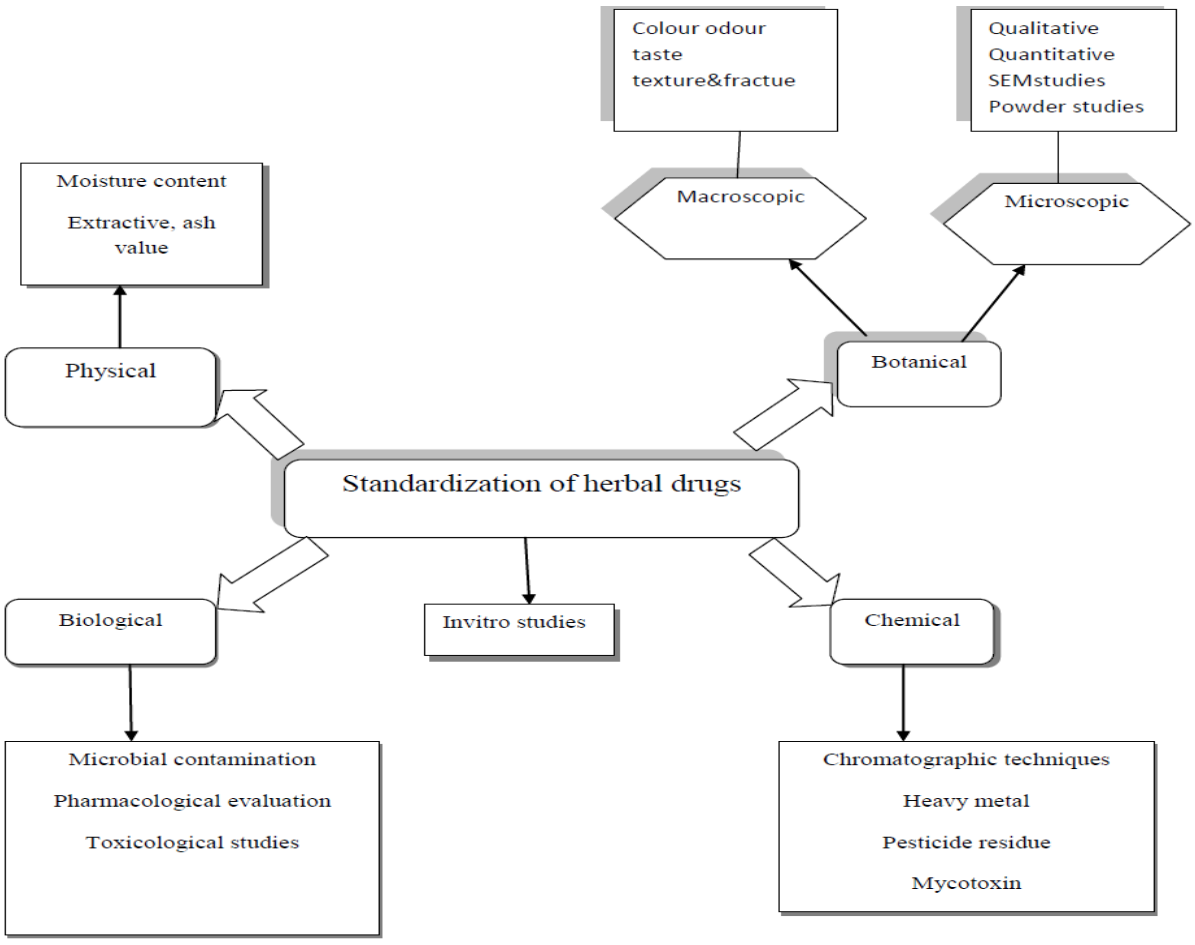


Fig. 1.1 Steps involve in standardisation

CHAPTER - 2

LITERATURE REVIEW

A literature review is a body of text that motive to review the critical points of current knowledge including basic finding as well as theoretical and methodological contribution to a particular topic. Whereas the drugs is used as medicine, its references is found everywhere in Indian literature.

2.1 Shodhana [8, 9, 10]:-

It is the method intended for removal of impurities of substances by using various processes such as Mardana, Swedana, Galan, Vilyan etc. This makes the substance nontoxic, easily absorbable and more effective therapeutically.

Shodhana process is mentioned in rasa text is not only a process of physical, chemical and biological purification but it is a specific process of addition and separation which physical, chemical and biological changes Occurred. These changes depend upon the structure, constituents, impurity and properties of particular substances. The motives are involved the shodhana as bellows:-

1) Removal of harmful matter from the drugs.
2) Modification of undesirable physical properties of the drug.
3) Conversion of some of the characteristics of the drug to different stages.
4) Enhancement of the therapeutics action.

A. Types for Shodhana [11]:-

In the context of Rasa Shastra there are two types of shodhana are metioned.

a) Samanya shodhana (General purification)

It is common procedure applied for a group of drug e.g. dhatu Varg with tila tail.Takra gomutra, kulatha kwtha and kanji.

b) Vishesha shodhana (Special purification)

The process is done for a particular to purify them by them by some specific procedure with specific drug in order to remove particular doshas. It helps to eliminate the impurities and also making the drugs therapeutically more effective by treating them with specific drugs i.e. Astatasamskara of parad.

2.1.1 Methodology for Shodhana [12, 13]

Kshalanam/Parkshalana (Washing):

The material is washed with prescribed liquid to remove its physical impurities, e.g. Godanti.

Vilayana (Elutriation):

The material is first dissolved in prescribed liquid and left such for some time. Then the upper part of the liquid containing the soluble drug material is decanted into another pot leaving behind the impurities in the bottom of the first pot e.g. Shilajatu.

Nirjalikaran (Evaporation of water):

The whole water content of the material is evaporated by heating e.g. Shartika.

Parisravana (Filtration):

Soluble material is separated from insoluble impurities through Guggulu.

Prithakkarana (Separation):

Physical impurities are removed with the naked eye e.g. Abhraka.

Swedana (Boiling under liquid media):

The substance are boiled with prescribed shodhana media like cows urine or juice of various plant using dola yantra this is called swedana e.g. Sudhavarga, Vishavarga etc.

Bhavana (Levigation):

Bhavana is the process by which the material is completely submerged in prescribed liquid and triturated till it gets dry. During bhavana friction and pressure are applied simultaneously and both are synergistic to each other. The particle size of substance is reduce, increasing its properties it creates heat during the procedure which helps purifying the substances e.g. Hingul and Tuttha etc.

Mardana (Trituration and grinding):

It is the process of trituration of drug to a fine division it reduce the larger particles in to powder with other material e.g. Parad.

Nirvapana (Heating and quenching):

The material is heated till red hot and immediately dipped in to specific liquid material e.g. Dhatu shodhana.

Avapa/Dhalana (Melting and pouring):

Material is melted by intense heat and then poured in to liquid, e.g. Naag, Vanga etc.

Bhrajana (Roasting):

Frying the drug in the pain with or without other substance or medium is known as bharjana. This can done by dry or wet method e.g. Gairiak, Tankana etc.

Atapa/Agni shoshana (Drying):

The drug is kept on fire are exposed to sun rays till it gets dried .e.g. Tankana etc.

Achushana (Absorption):

The Oily content**s** are certain toxic material is minimized through different absorption method e.g. Bhallatak shodhana.

Patana (Sublimation):

The material is heated up to vapour from than pass through a condenser that be condensed again its normal stage e.g. Parad.

Abhisheka (Sprinkling):

The material is heated strongly and liquid media sprinkaled on it .e.g. Mandoor shodhana.

Galana (Straining):

In which drug is melted on mild fire and the straining is done in with cloth, e.g. Gandhak and Navasadar.

Nimajjana (Dipping):

In which drugs are dip in mentioned liquid media for specific period of time, e.g. Vatshnabh, Kapillu etc.

2.1.2 Effect of shodhana process:-

In which materials free from visible or invisible impurities, drugs of minerals converted into fine and brittle form. Partial reduction may take places and provided the organic therapeutic property in the inorganic material.

2.2 Marana [14]:-

Marana is a process of calcination by which raw material like metals, minerals and gems etc. converted in to micro fine taste less, known hazardous acceptable, and absorbed from which can be used as medicines. A pit is made in an open space. The diameter of the pit depend is upon the metal or mineral that is to be calcite. Half the pit is filled with cow dung cake. The sealed earthen pot is kept in it and the remaining area is filed with more cow dung cakes fire is than ignited four sides and the middle of the pit when the processes of calcination is complete, it is allowed to be cool down, earthen pot is removed, sealed is open and the

contents is taken out. The drug is ground into a fine powder in a khalva. The process of levigation with the mention liquid, making chakrika and giving putas, is repeated as many times as mentioned in text book for till proper fineness and good quality of drugs is obtained.

2.2.1 Marana Dravya [15]**: -** Dhatu or updhatu bhasmas are prepared by these:-

1. By using Parad or Kajjali or combination of Hingul.
2. By using plants churan,kalak or bhavana.
3. By using Somal, Harital, Manahshila etc.
4. By using Ariloha.

2.2.2 Concept and relevance of Bhavana [61]:-

It is a process of wet or dry trituration used for shodhita metals with prescribed liquid media for a specific period of time and change into very fine forms.by this method the coarse powder of the metals or minerals is converted into fine particles, developed softness, smoothness and stickiness in the material increase better binding in the material and increase the therapeutic efficacy of the drugs and physiochemical changes are observed.

2.2.3 Chackrika karan [69]:-

1. Take the bhavit material and make the chackrika with the help of machine or manually.
2. The chackrika is made in round in shape and in equal weight.
3. Then dry in sun rays or hot air oven, tray drier.

2.2.4 Critical care point [69]:-

1. Material should be free from large particles i.e. subhabit lakshan.
2. The chackrika should be dried.
3. The size of the chackrika should be in same.

2.2.5 Sarava samputikarana [69]:-

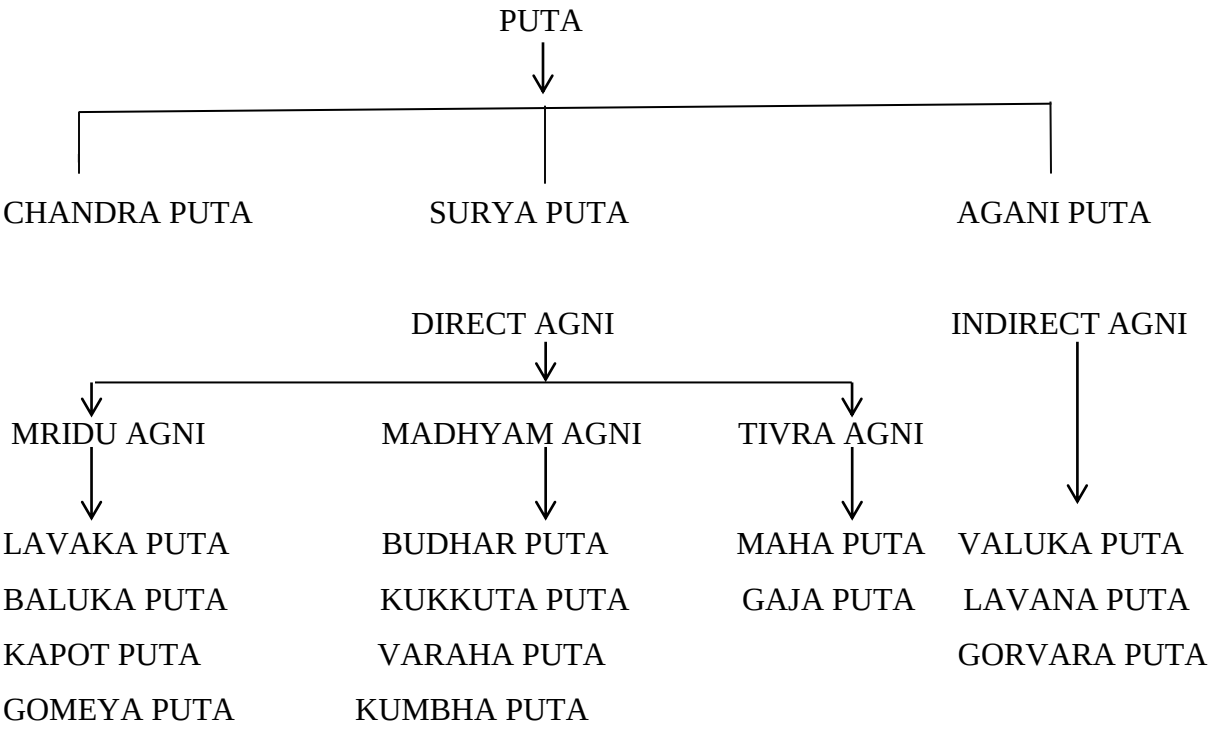
1. Take the dry chackrika and kept in sarava.
2. Then closed the sarava with clothe, multani mitti in a seven time and dry in sun rays or hot air oven, then give the gajahaputa.

2.3 Puta [16]:-

The quantum of heat needed to incinerate or calcinate the substance used in Rasa Shastra is called puta. During process neither is more or less heat is given order to get the best quality of medicine. The drug is calcinated in a specially designed place that is puta. The puta is a measure of the heating arrangement meant for preparing various types of Bhasma. The putas are described under different names and size of the pit and the number of the cow dung cakes used. They also indicate the amount of heat required and the period of calcination.

2.3.1 Classification of puta [17]:-

It is depending upon the size of fuel, size of the pit and on the basis of heat it is classified. Mainly puta is classified on the basis of heat and name of the putas are given on the basis on the animals and fuel used in it.



2.3.2 Puta yantra [18]:- Puta is the ancient method of heating device explained by Achryas which is used for the Marana (Calcination) of different metals and minerals. A samputa is prepared by taking two saravas (Earthen pots). The earthen pot is used for the puta are known as puta yantra.

2.4 Bhasma [19, 60]

The bhasma are prepared from purified minerals, metal, marine and animal products. A bhasma means an ash obtained through calcination. Marana is the second step for formulated of bhasma. Purified drug is kept in Khalva yantra and grind with liquid media which is mention for specific. These all mentioned in rasa shastra gems, mineral, metals etc. these products used after converted into bhasma form. So they absorbed soon into the system and get mixed with blood (Rakat dhatu) and show effect without producing side effect. The bhasma is the oldest application of nano particles. The concept of size reduction is written evident from Charak Samhita (1500 B.C.), Louhadi Rasayana. The bhasma preparation was introduced 7th century B.C. the properties of the bhasma are Rasyana, yogavahi, shigharvyapi and agnideepana.

2.4.1 Bhasma preeksha [68]:-The bhasma are testing by the following:-

Sr.no.	Physical Method	Chemical Method
1.	Varitara (Float on the water)	Amal preekisha(Sour test)
2.	Rekhapuran (Enter into the lines)	Nirutha(Irreversibility)
3.	Varna(colour)	Apunarbhav (Re-obtained)
4.	Uttam (i.e. not sink)	Gatarastva (Tastelessness)
5.	Avami(Not producing vomiting)	Nirdoom (Not produced smoke)
6.	Nisawadu (Taste less)	
7.	Nishchander (Lusterless)	
8.	Laguta (Light in weight)	
9.	Sukshamatava (Fineness)	

2.4.2 Metabolism and absorbance of bhasmas [20]:-

The calcium is current in the form of cereals and vegetables are less consumed due to the presence of oxalates, phytates are present in them. The calcium preparation are alkaline in nature The ancient calcium preparation such as bhasmas are more effective then synthetic calcium due to the reason behind that they contain easily absorbable and assailable form of oxide and they contains other some amount of elements e.g., magnesium, copper, zinc,

chloride etc. Irrespective of the gastrointestinal condition they do exhibit their efficacy unlike synthetic molecules which cannot be absorbed in unhealthy gut conditions i.e. hormonal in balances, indigestion, and chronic gut motility disorder. The addition advantages of bhasmas they exhibit other therapeutic action such as correcting indigestion, ulcer healing and anti-colic properties which cannot be expected with synthetic molecules.

The absorbability of calcium compound bhasmas which are oxide form:-

Calcium carbonate(s) ⟶ Calcium oxide(s) + Carbon dioxide(g)

(Drug) Anupana (Water / honey)

Calcium oxide +Water ⟶ Calcium hydroxide

(Gastric juice)

Calcium hydroxide +2Hydroxide ⟶ Calcium chloried+2Water

(Calcium chloride is absorbable form)

Here:- s (Solid) and g (gas)

2.5 Shankh:-

2.5.1 In vedic period:-

Atharva veda shankha and mriga sringa are used as medicine. Mahabharta and Ramayana kala shankh also used as pooja karma.

2.5.2 Samhita period

2.5.2.1 Charaka samhita [21]:-

In charaka samhita shankh bhasma used as in the form of shankh varti in sampakav netrorogoo upchara (trimarmiya chikitsa adhyaaya 26th, chikitsasthanam),varishaya varga under anapana vidhy adhaya 27th , sutrastanam.sudha verga mentioned as bhoumik dravya.

2.5.2.2 Susruta samhita [22]:-In a samhita shankh mention in kosthavarga, sukati, sambuk, adhya 46th, sutrasthanam.

2.5.2.3 Astanga- Samagraha [23]:-

In this book shankh is mention as pachaka, amalapita, nasaka, grahani in vividhoshdavighyaniyo 12th adhaya.

2.5.3 According to nighntu

2.5.3.1 Priya Nigantu [24]:-

This is written by acharya priya varta sharma in which shankh is mentioned in kasturiyadivarga.

शङ्ख कतुकस्तिक्शनै क्शर्यि भेदनो मलग्रहि।

आमल्तवहच्र्चुरन् लेखनमरदिरोगैशु॥ ११।१७॥

Shankh katu,kashriya,tikshan,gulambedhan, sangrahi, and amaltanasaka.its churan used in lekhan and eyes diseases.

2.5.3.2 Shankar Nighantu [25]:-

In which he mention Sanskrit,marathi,bangala and english name.types of shankh, identification character and properties.

2.5.3.3 Dhanvantry Nighantu [26]:-

The Shankh is mention in 3rd chepter chandanadhi varga, hindi,eng.name synonyms, properties and action.

2.5.3.4 Bhavaprakasa Nighantu [27]:-

In this text mentioned dhatvaadhivarga about sanskrit name,and its properties.

2.5.3.5 Raj Righantu [28]:-

In this text they mentioned synonyms,properties, under suvaranadi varga.

2.5.4 According to various books

2.5.4.1 Rasatarangini [29]:-

Pandit Kashinath shastri in his text rasa trangini mentioned about synonyms, types, features, sodhana method, marana, uses, formulations like shankh dravak and properties.

2.5.4.2 Ayurved Sarsangary [30]:-

Mention about specific introduction, identification, method for sodhana, bhasmikar, dose, anupana and properties.

2.5.4.3 Rasa tantra sar & sidhi prayuog sangreh [31]:-

He explains about method dose and uses of shankh bhasam.

2.5.4.4 Rasa ratana samuchya [32]:-

In his text they mention about Shankhanabhayadivarti, procedure and used in netra vikara.

2.5.4.5 Rasa- Bhaishajyakalpana Vigyana [33]:-

In this text related to complete text book of Rasa Shastra & bhaishaiyakalpana vigyana he mentioned about sudha varga as synonyms, identification, types, occurrences, sodhan, marana, properties, dose, and therapeutic uses.

2.5.4.6 Rasa-Bhaishajya Paribhasha [34]:-

In this text vaidya Sureshanand thapaliyal mentioned the Bhasma testing or identification test.

2.5.4.7 Yogratanakara [35]:-

In his text he mentioned about shankh propeties and its sodhana.

2.5.4.8 Yoga Traingani [36]:-

In this shankh used as a shankhdravaras preparation method,shankh vati and its uses is mention.

2.5.4.9 Vaidya Rajinder Mahajan [37]:-

In his text book Adhyatan Rasa shastra mention shankh bhasm used in shankh vati,shankhodhar rasa,its procedure,uses,dose and anupana.

2.5.4.10 Rasamrita [38]:-

Achrya yadavji trikramji firstly named the sudha varga.

2.5.4.11 Dravya Guna Vigyana [39]:-

The shankh is mention in 4th, chepter as swadaj dravya, interoduction, name, properties, occurences, constituents, pharmacological action, dose and formulations.

2.5.4.12 Protocoal for testing of AYUSH medicines[40]:-

In his text he mentioned protocol for testing of shankh bhasma.

2.5.4.13 Ayurvediya rasa shashtra [41]:-

In his text they mentioned synonmys, occurance, types, sodhana, marana, properties and formulation physico-chemical properties of bhasam.

2.5.4.14 According to Pharmacopoeial Standards for Ayuvedic Formulations[42] :-

In this the analytical parameters of the Shankh is given, organoleptic properties, quantitative estimation, therapeutic indication and dose are given.

2.5.4.15 According to Indian Materia Medica [43]**:-**

In this it kept the sudha varga in first group i.e. parval, mauktik.they mention bhasma defination and bhasma storage condition.

2.5.4.16 According to Rasa- Jala-Nidhi [44]:-

In which they described about the Shankha dhisha Rasa, shankha rasa, shankheswar rasa mahashankheswar rasa, its quanity of drugs, method of preparation, dose and used in phthisis.

2.5.4.17 Publications [45, 46, 47, 48, 49, 50, 51, 52]:-

1. Comparison of two purification of shankha bhasma a prospective randomized control trial.
2. Anti- ulcer effect of shankh bhasma in rats.
3. Role of Shankha Bhasma in the management of Amalapitta.
4. Preparation, physic-chemical analysis of shankha nabhi bhasma and evaluation of its hepato protective activity-an experimental study.
5. Pharmaceutical Standardisation of shankhapani rasa an efficatious remedy in kashtaratva.
6. Therapeutic potentials of sudha varga dravyas vis –a-vis calcium compounds.
7. Standardization of bhasma classical & modern view.
8. Formulation development, characterization & estimation of acid neutralization capacity of shankha bhasma tablet for the treatment of dyspepsia.

2.5.4.18 Shankha [52]:-

The gastropoda is the largest class of Mollusca's containing 30,000-4000 species and includes snail, slugs, whelks etc. The most identified feature of class is the spirally coiled shell. These animals have in a head distinct bearing tentacles, eyes and mouth. Body is unsegmenting, asymmetrical with a coiled shell. These are enclosed within a shell and visceral mass is spirally coiled exhibiting torsion. The shell is very hard and dense calcareous structure. It is square or narrowed in shape, the rectangle form is bulged in the middle and tapering each end. The upper portion is like corkscrew, twisted and tapering at the each end, upper surface is highly tuberculated, the under surface is shining, very brittle and translucent.

Vernaculars name [52]:-

Sanskrit	Sankha
Kannada	Sankha
Marathi	Sankha
Gujarati	Du-sukk
Oriya	Sankha

Bengali	Shankho
English Name	Conch
Hindi	Sankh
Phylum	Moflusca
Class	Gastropoda
Sub–class	Opisthobranch
Order	Pyramidellacea
Latin name	*Turbinella pyrum*

Varieties of shankh (according to classic) [52]**:-**According to the Rasatrangini shankh is two types:-

1. Dakshinavarta shankha:- This types of shank is used for praying of the God. It has tridosha nashaka properties and reduced the disease.
2. Vamavarta shankha:-these types of shankha are easily available in Indian sea. Therefore Rasashastra practicion is used in the preparation of bhasma.

Types of shankh (according to modern) [52]**:-**

The commonly species found in Indian sea these are,

(a)Turbinella rapa

(b)Turbinella pyrum

(c)Xanchus pyrum

On the bases of size [62]**:-** It is two types-

(a) Big size conch- It is approximately measure 8” -10” in length and 6”-7” in breadth and weight about 2-5 kg.

(b) Small size conch –commonly it is 4” in length and 2”-3” in breadth.

According to the figure [63] **:-** It is two type, Shankh and Kshudhara shankh.

Properties and action:-

Rasa	Katu
Guna	Lagu, Ruksh, Tikashan
Verya	Usan.
Vipak	Katu.
Karma	It is kapha, vatta shamaka.

Important formulations [53]:-Shankha vatti, Chanderodya varti, and Kaphaketu rasa.

Occurrence: - It is found in Indian Ocean coasts. The land forms are usually found on and under plants in the sea, the shallow water of the littoral zone with abundant seaweeds form their favourite habitat.

Shodhana of shankh [64]**:-**

Do the Small pieces of shankha are bundled in a piece of cloth. Make a potali and svedana in dola yantra with jambiri nimbu is given for twelve hours. After this when proper cool the potali open it and wash the shankha pieces with hot water.

Marana [64]**:-**Marana is a process of calcination by which raw material like metals, minerals and gems etc. converted in to micro fine taste less, known hazardous acceptable and absorbed from which can be used as medicine.

Constituents [55]**:-**It contains mainly carbonate of calcium, iron, magnesium, sulphate, phosphate and chloride.

Dose: - 250-300mg

Anupana: - Nimbu Swarasa, Triphala Kwatha.

2.6 Nimbu [56]

It consists of fresh fruit of citrus limon (Linn.) a Var. Burm.f. Syn. C. medica. Var. limonum(Fam. Rutaceae); a straggling bush or small tree, 3 to 4 meter high with thorny branches, cultivated in many parts of the country.

Synonyms [56]

Sanskrit	Jambhera, Maha Nimbu.
Bengali	Patinebu, Kagghinebu, Baranebu.
English	The lemon of India, Lemon.
Gujrati	Limbu.
Hindi	Nimbu, Bara Nimbu, Pakari Nimbu.
Kannada	Nimbe, Lime hannu, Nimbe hannu
Malayalam	Cherunakaram, Vadukappulinarakam
Marthi	Nimbu
Punjabi	Nimbu
Tamil	Elumichai, Elumichangai, Elumicchai, Cherunaranka

Telugu	Pedda Nimma, Jambira, Nimmu, Bijapuram.
Urdu	Limu, Neebu.

Verities of Nimbu [57]:-

According to country and shape:- There is so many varieties of lemon are present. In Punjab Gagle and jambri are famous name. Some foreign varieties are also available such as Italian, Nepali, Malta, Liven and Ureca etc.

Description:-

a) Macroscopic character:-

Fruit a berry, hesperidium, yellow when ripe, ovoid or oblong, 5 to 10 cm long, external surface even or rugged showing opening of oil glands usually with 9 mammillate extremity and thin rind, transversely cut surface show thin rind and an inwardly grown endocarp forming 10 to 12 segments, each containing 2or 4 seed with pulp formed by succulent hairs and juice acidic.

Properties and acti on [58]:-

Rasa	Amla
Guna	Lagu
Virya	Ushna
Vipaka	Amla
Karma	Deepana, Kaphahara, Pittakara, Pachana

Important Formulations [58]:-

Vanga bhasma, kasisa bhasma, Gandhaka Vatti, Shankha Vatti, Kalakuta Rasa, Nasika churan, Varishoshana Rasa, Vasantamalati Rasa and ajirnakanaka rasa.

Therapeutics Uses: - Agnimandya (loss of appetite), aruchi (anorexia), Chaedi (Vomiting), Krimighan (anti –helmentic), Trishna (thirst), Vibanda (constipation), Vatika shula (body ache), Udra roga (disease of abdomen) and Visuchika (gastro-enteritis).

Dose: - 6 -12 gm of the drug in juice form.

2.6.1 Kanyasara[59]

It is obtained from dried juice of leaves of *Aloe barbadensis* mill. Syn. *Aloevera* Tourn. ex. *linn*, *Aloe indica Royle*. Family *Liliaceae*, it is a shrub and found growing throughout India.

Synonyms

Sanskrit	Kumarirasasambhava, sahasara.
Assamese	Musabhar, machambar.
Bengali	Ghritakalmi.
English	Indian aloe.
Gujrati	Eliyo, Eariyo
Hindi	Musabhar, Elva.
Kanada	Karibola, Lolesara satva, Lovalsara, lolesara
Kashmiri	Mussabar, Siber.
Malayalam	Chenninayakam.
Marathi	Korphad
Oriya	Musabara.
Punjabi	Kalasohaga, Mussabar, Alua.
Tamil	Kattazhi.
Telugu	Musambaram.
Urdu	Musabbar, Ailiva, Siber.

Description [59]:-

Macroscopic character

Colour	Dark brown to black.
Shape	Compact, irregular, masses.
Surface	Dull, opaque with slightly.
Appearance	Vitreous.
Taste	Bitter.
Odour	Characteristic.

Microscopic character:-

When powder mounted in glycerine or lacto phenol and observed innumerable crystalline, yellowish- brown to chocolate coloured particles of varying size and shape.

Identity, Purity and Strength [59]**:-**

Identification:-

Mixed 0.5g in 50ml of water, boil till completely dissolved, cool the solution add 0.5g of Kieselguhr and filter it and filtrate is used for test-

(A) Heat 5 g of filtrate with 0.2g of Borax until dissolved. Add a few drops of this solution to a test tube with water a green fluorescence are produced.

(B) Add 2ml of filtrate with 2ml of freshly prepared solution of Bromine, a pale yellow precipitate is produced.

Identity, Purity and Strength [59]**:-**

Foreign matter (w/w)	Not more than 2 %
Total Ash (w/w)	Not more than 5 %
Acid-insoluble ash (w/v)	Not more than 10 %
Alcohol-soluble extractive (w/v)	Not less than 8 %
Water-soluble extractive (w/v)	Not less than 6 %
Moisture content (w/w)	Not more than10 %

Chemical Constituents: - Anthraquinone, glycoside.

Properties and Action [59]**:-**

Rasa	Katu
Guna	Usan
Virya	Usan
Vipaka	Katu
Karma	Bhedi, Pittanirharana, Rajahpravartaka, Jvaranut

Importents Formulations: – Rajahpravartini Vati, Cukkumtippalyadi Gutika.

Therapeutics Uses: - Jvara, Udararoga, Kastartava, Yakrdvikara.

Dose: - 125 - 500 mg in powder form.

CHAPTER - 3

RESEARCH ENVISAGE AND PLAN OF WORK

3.1 Rationale of study:-

Shankha is a drug which described in Rasashatra under the category of Sudha Varga. Its Bhasma kalpa is utilised for various medicinal activity individual as well as in compound formulations. Various preparatory methodologies are available for compounding the Shankha bhasma kalpa with the applications of Puta and Bhawana dravyas.

For the preparation of Bhasma Kalpa various steps are involved i.e. Shodhana, Bhawana, Chakrika-nirmana and Puta. In present study i try to overcome the lacuna which is associated with the development and validation of SOPs for the preparation of Shankha Bhasma.

This experimental study is done to evaluate the identity, purity and strength of Shankha Bhasma with the help of various analytical methods.

3.2 Aim and object:-

1. To procure, identify and authentication of raw samples (Shankha, Nimbu and Kumari).
2. Preparation of Shankha Bhasma.
3. Processing of techniques according to Rasatrangini (12/17-19).
4. To standardized prepared sample of Shankha Bhasma.

3.3 Comprehensive plan:-

1. To carries out the review from classic to modern literature of shankha.
2. Selection of raw drug.
3. To authentified the raw sample and standardization.
4. Preparation of formulation with classical reference for four samples by using different bhavana dravya i.e. Water, Kumari sawarasa, Nimbu sawarasa and Kumari+ Nimbu sawarasa and divided into three batches each so the total samples are twelve.
5. To carry out the analytical parameter in process and prepared formulation.
6. Results and discussions.
7. Summary and conclusions.
8. References.

CHAPTER - 4

EXPERIMENTAL WORK

The experiment work incorporates:-

1. Pharmaceutical study
2. Analytical study

4.1 Collection of Raw drugs

The Sankhanabhi was procured from the local market of Jalandhar (Bill no. 204, dated 02/ 01/ 2015) and herbal drug i.e. Kumari (Aloe vera) is collect from the LPU herbal garden and Nimbu is purchase from the local market of Jalandhar.

Table 4.1.1: Detail depicting the purchased and collection of raw material

Sr.no	Date of Purchased / Collected	Sample	Name of Vendor	City
1.	02/01/2015	Shankhanabhi	M/S Charan Dass Pawan Kumar	Jalandhar
2.	04/02/2015	Nimbu (Fresh)	Local Market	Jalandhar
3.	03/03/ 2015	Kumari(Fresh)	LPU Campus	Jalandhar

4.2 Authentication of Raw drugs

The drug is authenticate with reference no. (HHRC / TP / 01 / 15 / 061, dated 22/ 01/2015) from Herbal Health Research Consortium Amritsar, Punjab.

4.3 Pharmacognostic study

4.3.1 Macroscopic examination [71]

This test is used to determine the morphological feature of drug. It gives details concerning the drug aspect, size, colour, odour and taste.

4.3.2 Procedure

Morphological characters and the odour can be examined with the naked eye or by using a magnified glass. The size can be determined by using a ruler or a calliper. The colour can be

determined by shattering the drug between two fingers and smell, or using extract solution. The taste can be determined by putting a piece of drug or an extractive solution in the mouth.

4.4 Pharmaceutical study

4.4.1 To do Shodhana (purification) of shankhanabhi [72]

Start Date: - 05/02/2015 **End Date:-**05/02/2015

4.4.1.1 Equipment required

Weighing balance, Match box, Gas stove, Muslin cloth, Beaker, Stainless steel vessel, Measuring cylinder, Thread, Iron rod, Dola Yantra, Thermometer and water.

4.4.1.2 Ingredient

Raw Shankhanabhi	1300gm
Fresh Nimbu use	8 kg
Fresh Nimbu Sawarasa obtain	4 lit.

4.4.1.3 Procedure for nimbu sawarasa

1. Collect the fresh nimbu.
2. Wash the whole nimbu for removing the foreign matter.
3. Discard the waste material.
4. Weight whole fruit of nimb.
5. Cut the nimbu fruit in the centre with the help of the knife.
6. Squeeze it to obtain the nimbu sawarasa.
7. Filter the sawarasa with the help of muslin cloth.
8. Measure the sawarasa with the help of measuring cylinder.
9. Then preserve the nimbu sawarasa in well closed container to prevent the oxidation.

4.4.1.4 Procedure for Shodhana of shankhanabhi

1. The drug is take and weight properly on the weighing balance.
2. Prepare the pottali of Shankhnabhi.
3. Then fill the vessel with nimbu Sawarasa.
4. Then hanging the pottali in the sawarasa of nimbu
5. Then turn on the gas stove in moderate flame for three hours.
6. Then check the Temperature after every half hour and record it.
7. If the nimbu sawarasa is less in process then add more nimbu sawarasa in the vessel.

8. After complete the three hours then stop the process, cool down it and then wash with warm water then dry in sun rays or hot air oven.
9. Then after drying keep in well close container for next process.

4.4.1.5 Precautions:-

1. The equipment must be neat and clean before use.
2. Pottali must be tied with thread in well form.
3. Pottali must be placed in the center of the vessel not touch any part of them.
4. Heat must be in moderate.
5. The purified Shankhanabhi must be kept in well closed container.

4.4.1.6 To prepare Shankha Bhasma [(99)]

The shankha bhasma is prepared by using water, nimbu sawarasa, kumari sawarasa and kumarai + nimbu sawarasa as a bhavna drvaya. Three batches are prepared for each bhavna dravya.

Start date:-26/02/2015 **End Date:-**05/03/2015

Ingredient:-

Shodhit Shankha: - 120gm

Bhavana Dravya: - 120 ml

Total time consumed for bhavana: - Three hour

Apparatus Taken: - Mortal pestle, Spatula and Measuring cylinder.

Procedure: -

1. Take the Sudha shankhanabhi and kept in sarava then seal it by kapad mitti and kept it in sun rays or hot air oven for drying.
2. After complete drying, give gajaputa.
3. After sarwangsheetikarana, take out the shankhanabhi from the saravasamputa and give the bhavana with water.
4. After showing the subhabhit lakshana, stop the bhavana process and made the chacrika in shape of kupilu seed and dry it.
5. Then keep the dry chacrika in sarava and seal with kapad mitti and dry it.
6. After proper drying give again gajaputa samanskara.
7. When complete the puta samanskara after sarwansheetikara take out the chacrika and triturate it, collect the white shankha bhasma weighing it and keep in well close container

for therapeutic uses repeat this procedure for the same two samples with water bhavana darvya.

4.4.1.7 To prepare Shankha Bhasma [99]

Start date:-26/02/2015 **End Date:-**05/03/2015

Ingredient:-

Shodhit Shankha: - 120gm

Bhavana Dravya: - 120 ml

Total time consumed for bhavana: - Three hour

Apparatus Taken: - Mortal pestle, Spatula and Measuring cylinder.

Procedure: -

1. Take the Sudha shankhanabhi and kept in sarava then seal it by kapad mitti and kept it in sun rays or hot air oven for drying.
2. After complete drying, give gajaputa.
3. After sarwangsheetikarana, take out the shankhanabhi from the saravasamputa and give the bhavana with nimbu sawarasa.
4. After showing the subhabhit lakshana, stop the bhavana process and made the chacrika in shape of kupilu seed and dry it.
5. Then keep the dry chacrika in sarava and seal with kapad mitti and dry it.
6. After proper drying give again gajaputa samanskara.
7. When complete the puta samanskara after sarwansheetikara take out the chacrika and triturate it, collect the white shankha bhasma weighing it and keep in well close container for therapeutic uses repeat this procedure for the same two samples with nimbu sawarasa bhavana darvya.

4.4.1.8 To prepare Shankha Bhasma [99]

Start date:-26/02/2015 **End Date:-**05/03/2015

Ingredient:-

Shodhit Shankha: - 120gm

Bhavana Dravya: - 120 ml

Total time consumed for bhavana: - Three hour

Apparatus Taken: - Mortal pestle, Spatula and Measuring cylinder.

Procedure: -

1. Take the Sudha shankhanabhi and kept in sarava then seal it by kapad mitti and kept it in sun rays or hot air oven for drying.
2. After complete drying, give gajaputa.
3. After sarwangsheetikarana, take out the shankhanabhi from the saravasamputa and give the bhavana with kumari sawarasa.
4. After showing the subhabhit lakshana, stop the bhavana process and made the chacrika in shape of kupilu seed and dry it.
5. Then keep the dry chacrika in sarava and seal with kapad mitti and dry it.
6. After proper drying give again gajaputa samanskara.
7. When complete the puta samanskara after sarwansheetikara take out the chacrika and triturate it, collect the white shankha bhasma weighing it and keep in well close container for therapeutic uses repeat this procedure for the same two samples with kumari sawarasa bhavana darvya.

4.4.1.9 To prepare Shankha Bhasma [99]

Start date:-26/02/2015 **End Date:-**05/03/2015

Ingredient:-

Shodhit Shankha: - 120gm

Bhavana Dravya: - 120 ml

Total time consumed for bhavana: - Three hour

Apparatus Taken: - Mortal pestle, Spatula and Measuring cylinder.

Procedure: -

1. Take the Sudha shankhanabhi and kept in sarava then seal it by kapad mitti and kept it in sun rays or hot air oven for drying.

2. After complete drying, give gajaputa.
3. After sarwangsheetikarana, take out the shankhanabhi from the saravasamputa and give the bhavana with kumari + nimbu sawarasa.
4. After showing the subhabhit lakshana, stop the bhavana process and made the chacrika in shape of kupilu seed and dry it.
5. Then keep the dry chacrika in sarava and seal with kapad mitti and dry it.
6. After proper drying give again gajaputa samanskara.
7. When complete the puta samanskara after sarwansheetikara take out the chacrika and triturate it, collect the white shankha bhasma weighing it and keep in well close container for therapeutic uses repeat this procedure for the same two samples with kumari+ nimbu sawarasa bhavana darvya.

4.5 Analytical / Physicochemical study

Foreign Matter and Determination of Foreign Matter

4.5.1 Foreign Matter [73]

Drugs should be free from moulds, insects, animal faecal matter and other contaminations such as earth, stones and extraneous material.

Foreign matter is material consisting of any or all of the following:-

1. In particular, parts of the organ or organs from which the drug is derived other than the parts named in the definition or for which a limit is prescribed in the individual monograph.
2. Any organ or part of organ, other than those named in the definition and description. The amount of foreign matter shall not be more than the percentage prescribed in the monograph.

4.5.2 Determination of Foreign Matter [74]

Weigh 100 –500 g of the drug sample to be examined or the minimum quantity prescribed in the monograph, and spread it out in a thin layer. The foreign matter should be detected by inspection with the unaided eye or by the use of a lens (6x). Separate and weigh it and calculate the percentage present.

$$\text{Percentage of Foreign Matter} = \frac{\text{Initial weight} - \text{Final weight}}{\text{Initial weight}} \times 100$$

Here:- Initial weight = weight of foreign matter.

Final weight = Weight without foreign matter.

4.5.3 Description [75]: Organoleptic determination of the sample.

4.5.4 Determination of Moisture Content (Loss on Drying at 105ºC) [76]

1. After placing the weighed amount of the drug in the evaporating dish dry at 105ºC for 5 hours and weigh.
2. Continue the drying and weighing at one hour interval until difference between two successive weighing corresponds to not more than 0.25 per cent.
3. Constant weight is reach when two consecutive weighing after drying of sample for 30 minutes and cooling for 30 minutes in desiccators, shows not more than 0.01 g difference.

$$\text{Percentage of LOD at } 105\ ^{0}\text{C} = \frac{\text{Initial weight} - \text{Final weight}}{\text{Final weight}} \times 100$$

Here:- Initial weight = Weight of watch glass + Sample.

Final weight = Weight of dried sample

4.5.5 Determination of Total Ash at 650ºC [77]

1. Incinerate 2 g of ground drug in a platinum or silica dish at a temperature not exceeding 650ºC until free from carbon, cool and weigh.
2. If a carbon free ash cannot be obtain by this way, exhaust the char mass with hot water, collect the residue on an ash less filter paper, incinerate the residue and filter paper, add the filtrate, evaporate to dryness, and ignite at a temperature not exceeding 650ºC.
3. Calculate the percentage of ash with reference to the air-dry sample.

$$\text{Percentage of Ash} = \frac{\text{Weight of Ash}}{\text{Weight of Sample}} \times 100$$

4.5.6 Determination of Acid Insoluble Ash [78]

Boil the ash obtains in for 5 minutes with 25 ml of dilute Hcl; collect the insoluble matter in a Gooch crucible or on an ash less filter paper, wash with hot water than treat with silver nitrate solution to check the presence of chloride which gives the white precipitate if chloride present and ignite to constant weight. Calculate the percentage of acid - insoluble ash with reference to air dried drug.

$$\text{Percentage of A.I.A} = \frac{\text{Weight of Acid Insoluble Ash}}{\text{Weight of sample}} \times 100$$

4.5.7 Determination of Alcohol Soluble Extractive [79]

1. Macerate 5 g of the air dry drug with 100 ml of alcohol of the specify strength in a close flask for twenty-four hours, shaking frequently during six hours and allowing to stand for eighteen hours.
2. Filter rapidly, taking precautions against loss of solvent, evaporate 25 ml of the filtrate to dryness in a flat bottom shallow dish, and dry at 105ºC, to constant weight and weigh.
3. Calculate the percentage of alcohol- soluble extractive with reference to the air- dried drug.

$$\text{Percentage of A.S.E} = \frac{\text{Weight of Residue x Volume made}}{\text{Weight of Sample x Volume Taken}} \text{ X } 100$$

4.5.8 Determination of Water Soluble Extractive [80]

1. Macerate 5 g of the air dry drug with 100 ml of water of the specify strength in a close flask for twenty-four hours, shaking frequently during six hours and allow to stand for eighteen hours.
2. Filter rapidly, taking precautions against loss of solvent, evaporate 25 ml of the filtrate to dryness in a flat bottom shallow dish, and dry at 105ºC, to constant weight and weigh.

3. Calculate the percentage of alcohol-Soluble extractive with reference to the air-dried drug.

$$\text{Percentage of W.S.E} = \frac{\text{Weight of residue x Volume made}}{\text{Weight of Sample x Volume Taken}} \times 100$$

4.5.9 Determination of p^H (81)

The p^H of an aqueous liquid may be defined as the logarithm of the reciprocal of hydrogen ion concentration expressed in g per litter. This definition provide a useful practical means for the quantitative indication of the acidity or alkalinity of a solution, it is less satisfactory from strictly theoretical point of view. The p^H value of liquid can be determining potentiometrically by means of the glass electrode, a reference electrode and a p^H meter.

4.5.10 Determination of Bulk density (82)

It is the ratio of given mass of powder and its bulk volume. It is determined by transferring an accurately weighted amount of powder sample to the graduated cylinder with the aid of the funnel. The initial volume was noted. The ratio of weight of the volume is occupied was calculated.

$$\text{Bulk density} = \text{Weight}/\text{Volume}$$

Here,

W = Mass of the powder

V = Untapped volume

4.5.11 Tapped density (83)

This is calculated by transferring a known quantity (g) of powder into a graduated cylinder and tapping it for specific time of period. The initial volume was noted. The graduated cylinder was tapped continuously for a period of 5-10 min. The density can be determined as the ratio of mass of the powder to the tapped volume.

$$\text{Tapped volume} = w/v_t$$

Here,

W= Mass of the powder

V_t = Tapped volume

4.5.12 Compressibility index (84)

It is the tendency of the powder to be compressed. Base on the apparent bulk density and

tapped density the percentage compressibility of the powder can be determined by using the following formula.

$$\text{Percentage of compressibility} = \frac{\text{Tapped density} - \text{bulk density}}{\text{Tapped density}} \times 100$$

Table no. 4.1.2: Depicting the flow properties and corresponding compressibility index

Compressibility Index (%)	Flow Character
1- 10	Excellent
11 – 15	Good
16 – 20	Fair
21 – 25	Passable
26 – 31	Poor
32 – 37	Very poor
38 – 40	Very, very poor

4.5.13 Hausner ratio [85]

It shows the flow properties of the powder. The ratio of the tapped density to the bulk density of the powder is called Hausner ratio. Hausner ratio = Tapped density / Bulk density

Table no. 4.1.3: Depicting the properties and corresponding Hausner Ratio

Sr. No.	Hausner ratio	Flow property
1	1.00 – 1.11	Excellent
2	1.12 – 1.18	Good
3	1.19 -1.25	Fair
4	1.26 – 1.34	Passable
5	1.35 – 1.45	Poor
6	1.46 – 1.59	Very poor
7	More than 1.60	Very, very poor

4.5.14 Angle of repose [86]

The internal angle between the surface of the pile of powder and the horizontal surface is known as the angle of the repose. The powder is passing through funnel fixed to the burette at a height of 4 cm. A graph paper is placed down the funnel on the table. The height and the radius of the pile were measured. Angle of repose of the powder was calculated by using this

formula.

$$\text{Angle of repose } (Ø) = \tan^{-1} (h/ r)$$

Here,

H = height of the pile

R = radius of the pile

Table no .4.1.4: Depicting the flow properties and corresponding angle of repose

Sr.no.	Flow property	Angle of repose
1	Excellent	25- 30
2	Good	31- 35
3	Fair	36 – 40
4	Passable	41 – 45
5	Poor	46 – 55
6	Very poor	56 – 65
7	Very, very poor	More than 66

4.5.15 To perform the Ayurvedic parameter for twelve samples of shankha bhasma [87, 88]

Starting date: 18/03/2015

Completion date: 19/03/2015

Apparatus required: Crucible, Match box, Weighing balance, Mortar pestle, Muffle furnace.

Ingredient use	**Quantity use**
Shankha bhasma	1 part

Test performed: For twelve samples

Procedure:

1. **Rekhapurnatavam**: A pinch of bhasma was taken in between the thumb and the index finger rubbed then the bhasma entered into the lines of the finger and was not easily washed out from the cleavage of the lines.
2. **Nirdhoomatavam:** A pinch of bhasma was taken and sprinkled over the fire no smoke produced by the bhasma.
3. **Salkshnatavam:** In this method it is observed that the particle of the bhasma was not adhesive to each other.
4. **Sukshutavam:** In this procedure observed that the bhasma was smooth in touch if found in rough form then bhasma was not prepared.

5. **Visheshvarana:** In this method the colour of the bhasma was noted because each bhasma have an individual colour.
6. **Gata Rasatavam:** The properly prepared bhasma must be in tasteless on taste perception. The bhasma was tasteless when small amount was kept on toung.
7. **Avami:** Administration of 2-5 milligram of bhasma did not produce any nausea or vomiting.
8. **Amla:** when bhasma was put with lemon juice it should retain its colour and form.

4.5.16 To performs IR analysis for twelve sample of shankha Bhasma. [89]

IR analysis of all these samples have been performed SHIMADZU Analytical Instrumentation from Lovely Professional University Phagwara (punjab) on 27/03/2015.

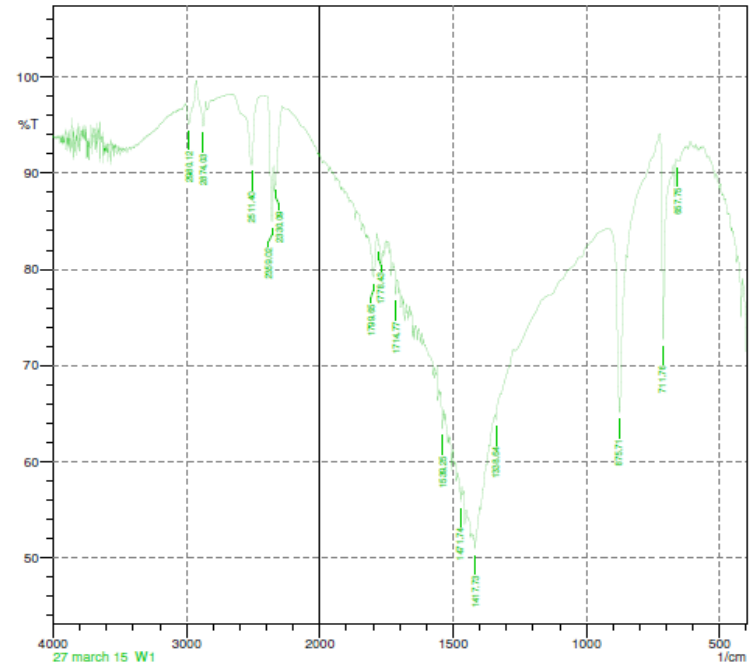
Test performed: For twelve samples

4.5.16.1 Infra-Red Spectroscopy: [90, 94]

IR is the study of the reflected, absorbed or transmitted radiant energy region of electromagnetic spectrum ranging from wavelength 0.8- 500 nm. A commonly used measurement is the frequency and expressed in wave number. The IR spectrum usually divided into three region i.e. near IR (12500- 400 cm^{-1}), mid IR (4000 – 400 cm^{-1}) and for IR (400 -20 cm^{-1}). Commonly mid IR region is used. IR is widely used in analysis of drugs and pharmaceuticals.IR spectrophotometer single or double beam instrument.

The widespread use of IR spectroscopy for the identification of the drug, Polymorphic, Modification, Excipients and raw material used in pharmaceutical manufacturing is due to its sensitivity and the ease with which spectra obtained on any type of sample including insoluble solids, polymers, solution and gases. It is very useful instrument detection of function group of biomolecules, quantitative analysis of antibiotic, alkaloids and steroidal sapogeni.

SHIMADZU



	Peak	Intensity	Corr. Int	Base (H)	Base (L)	Area	Corr. Are
1	657.75	91.269	0.06	663.53	655.82	0.304	0.002
2	711.76	72.688	20.626	725.26	673.18	3.216	1.463
3	875.71	65.076	17.484	916.22	850.64	7.34	1.991
4	1338.64	64.295	1.018	1342.5	1321.28	3.842	0.013
5	1417.73	50.933	1.383	1419.66	1400.37	5.316	0.098
6	1471.74	55.803	2.011	1477.52	1465.95	2.826	0.072
7	1539.25	63.372	2.651	1546.96	1535.39	2.159	0.095
8	1714.77	77.353	2.231	1720.56	1708.99	1.21	0.062
9	1778.43	82.435	0.351	1786.14	1776.5	0.782	0.009
10	1799.65	79.125	4.565	1820.86	1786.14	3.059	0.37
11	2330.09	88.853	0.671	2333.94	2281.87	1.586	-0.089
12	2359.02	84.955	7.401	2401.46	2347.45	1.922	0.557
13	2511.4	90.852	6.202	2578.91	2443.89	2.882	1.125
14	2874.03	94.873	3.155	2926.11	2854.74	0.994	0.535
15	2980.12	95.092	1.966	3007.12	2953.12	0.916	0.215

Comment;
27 march 15 W1

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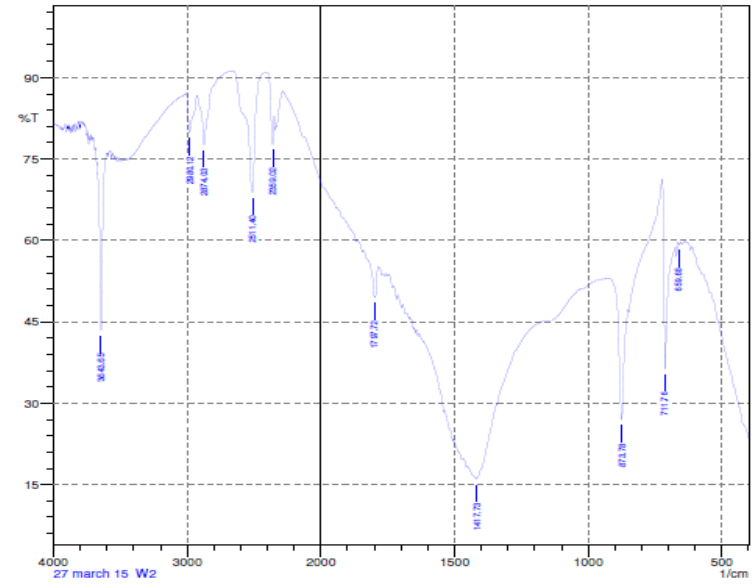
Infrared spectroscopy for sample (w_1)



SHIMADZU

	Peak	Intensity	Corr. Int	Base (H)	Base (L)	Area	Corr. Are
1	659.68	59.168	0.484	665.46	653.89	2.616	0.019
2	711.76	36.281	32.17	723.33	673.18	13.743	4.295
3	873.78	26.898	22.168	925.86	850.64	27.039	4.456
4	1417.73	15.982	6.19	1454.38	1342.5	77.987	7.524
5	1797.72	49.463	6.128	1822.79	1784.21	10.589	0.804
6	2359.02	77.648	6.576	2409.17	2349.38	4.055	0.39
7	2511.4	68.829	17.618	2578.91	2416.89	13.72	3.92
8	2874.03	77.593	6.219	2924.18	2850.88	6.207	0.873
9	2980.12	79.828	7.13	3007.12	2924.18	6.494	1.435
10	3643.65	43.338	30.524	3668.73	3605.08	12.975	4.738

Comment;
27 march 15 W2

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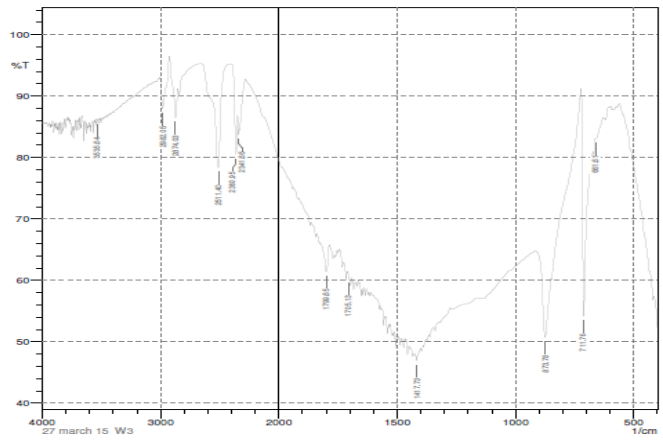
Apodization; Happ-Genzel
User; DELL

Infrared spectroscopy of the sample (W_2



SHIMADZU

	Peak	Intensity	Corr. Int	Base (H)	Base (L)	Area	Corr. Are
1	661.61	83.08	0.221	663.53	630.74	2.409	0.06
2	711.76	54.156	34.769	723.33	673.18	7.055	3.773
3	873.78	59.712	11.304	916.22	848.71	15.743	1.987
4	1417.73	46.933	1.012	1421.58	1406.15	4.945	0.044
5	1705.13	60.328	0.297	1710.92	1703.2	1.661	0
6	1799.65	61.389	4.474	1820.86	1786.14	6.778	0.485
7	2341.66	83.712	2.081	2349.38	2333.94	1.116	0.088
8	2360.95	80.451	8.209	2405.31	2349.38	2.857	0.565
9	2511.4	78.339	16.888	2656.07	2432.32	10.587	5.86
10	2874.03	86.5	6.327	2924.18	2852.81	3.016	1.05
11	2982.05	87.917	6.218	3007.12	2924.18	3.198	1.273
12	3535.64	86.038	0.263	3539.49	3533.71	0.374	0.004

Comment;
27 march 15 W3

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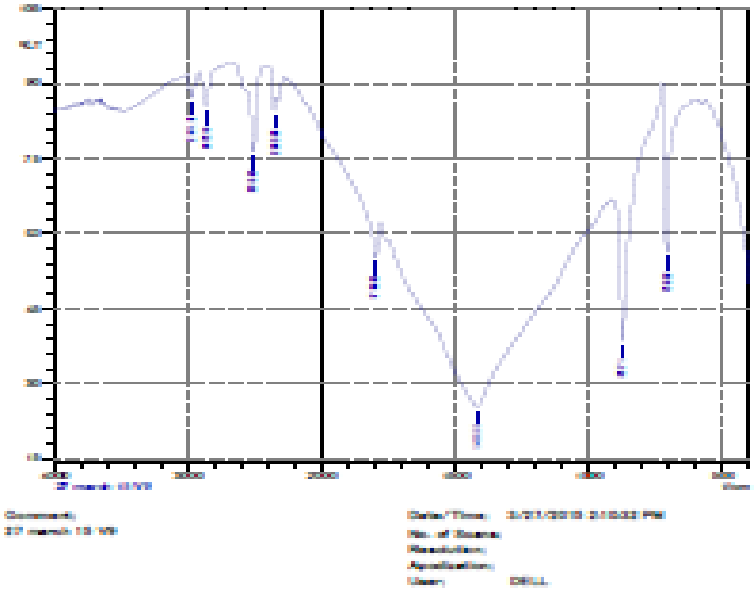
Apodization; Happ-Genzel
User; DELL

Infrared spectroscopy of the sample (W_3)

Infrared spectroscopy of the sample (L_4)



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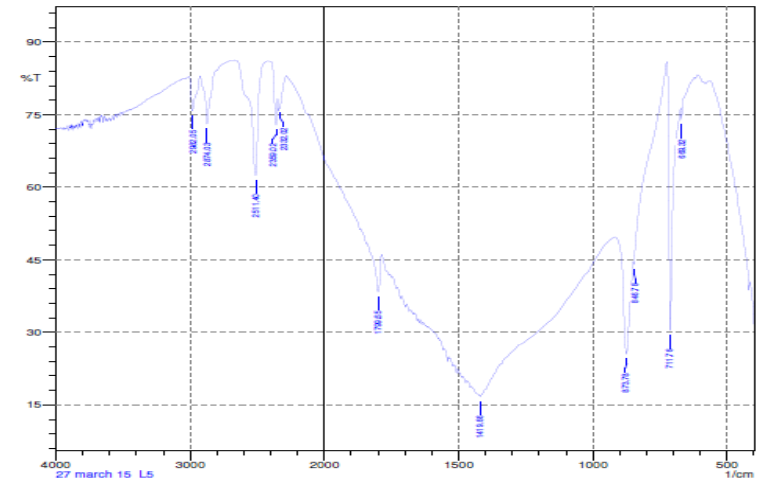

SHIMADZU

	Peak	Intensity	Corr. Int	Base (H)	Base (L)	Area	Corr. Are
1	669.32	73.971	2.916	673.18	621.1	5.102	-0.082
2	711.76	30.384	53.096	725.26	673.18	10.847	6.093
3	846.78	43.978	1.887	850.64	725.26	22.91	-3.199
4	873.78	25.545	20.797	918.15	850.64	27.919	5.828
5	1419.66	16.716	0.834	1427.37	1402.3	19.138	0.305
6	1799.65	38.336	8.286	1842.08	1788.07	19.309	1.737
7	2332.02	76.332	0.374	2333.94	2283.79	4.854	-0.089
8	2359.02	72.893	6.594	2413.03	2349.38	5.792	0.338
9	2511.4	62.454	23.687	2659.93	2420.74	24.47	8.999
10	2874.03	73.134	6.757	2926.11	2850.88	7.97	0.978
11	2982.05	75.786	7.157	3007.12	2926.11	8.061	1.492

Comment;
27 march 15 L5

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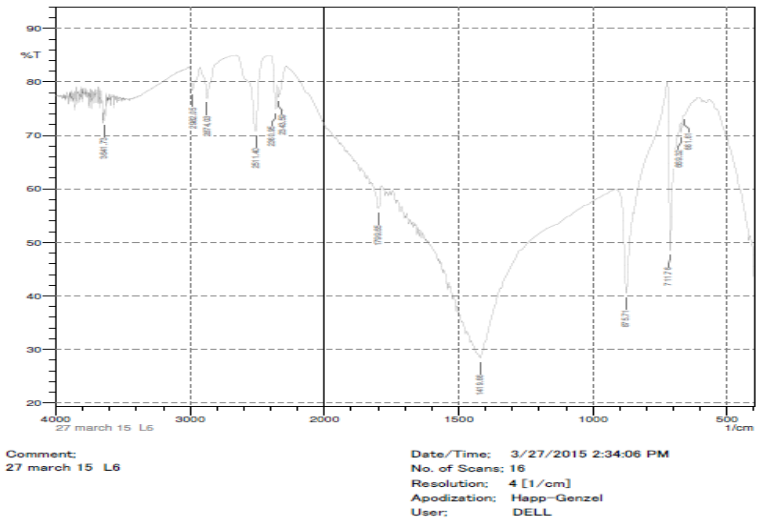
User; DELL

Infrared spectroscopy of the sample (L_5)



SHIMADZU

	Peak	Intensity	Corr. Int	Base (H)	Base (L)	Area	Corr. Are
1	661.61	73.669	0.172	663.53	630.74	4.133	0.026
2	669.32	70.434	2.499	673.18	663.53	1.365	0.05
3	711.76	48.437	29.851	723.33	673.18	9.268	3.331
4	875.71	40.519	16.81	914.29	850.64	17.985	2.806
5	1419.66	28.42	3.011	1435.09	1365.65	34.356	1.427
6	1799.65	56.375	4.421	1822.79	1788.07	8.033	0.546
7	2343.59	77.12	1.743	2349.38	2333.94	1.688	0.078
8	2360.95	74.918	5.784	2401.46	2349.38	4.945	0.5
9	2511.4	70.803	14.132	2659.93	2424.6	22.079	5.401
10	2874.03	76.88	3.833	2926.11	2852.81	7.135	0.544
11	2982.05	78.429	4.384	3009.05	2926.11	7.717	0.914
12	3641.73	72.734	1.718	3645.58	3632.08	1.782	0.064

Comment;
27 march 15 L6

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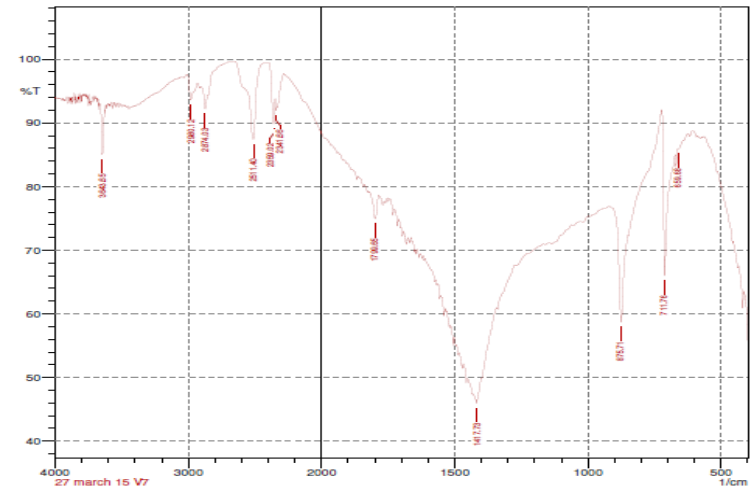
Apodization: Happ-Genzel
User: DELL

Infrared spectroscopy sample (L_6)



SHIMADZU

	Peak	Intensity	Corr. Int	Base (H)	Base (L)	Area	Corr. Are
1	659.68	85.914	0.256	663.53	642.32	1.343	0.017
2	711.76	65.992	24.464	723.33	673.18	5.018	2.356
3	875.71	58.72	15.513	908.5	850.64	9.271	1.869
4	1417.73	45.981	2.686	1433.16	1400.37	10.612	0.373
5	1799.65	74.919	3.943	1820.86	1786.14	3.912	0.343
6	2341.66	91.889	1.376	2347.45	2333.94	0.464	0.049
7	2359.02	89.843	5.271	2397.6	2347.45	1.177	0.42
8	2511.4	87.396	12.101	2652.21	2432.32	4.438	3.986
9	2874.03	92.224	2.706	2906.82	2852.81	1.422	0.235
10	2980.12	93.573	3.558	3007.12	2929.97	1.62	0.572
11	3643.65	84.97	6.065	3651.37	3628.22	1.292	0.378

Comment;
27 march 15 V7

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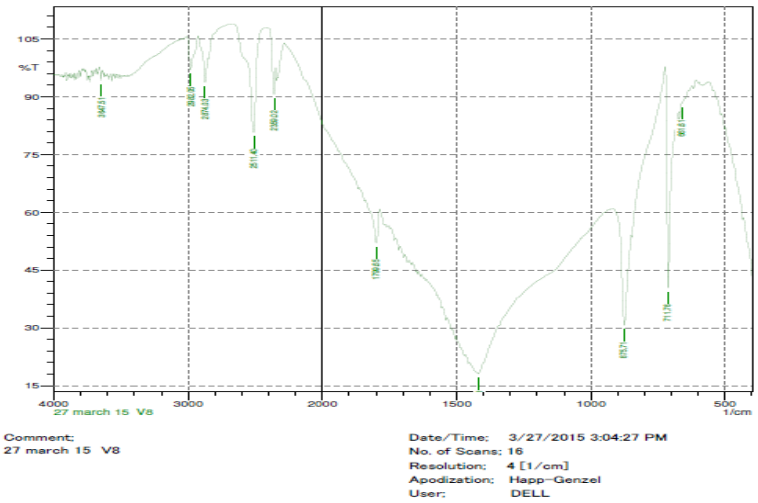
Infrared spectroscopy sample (V_7)



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27 march 15 V8

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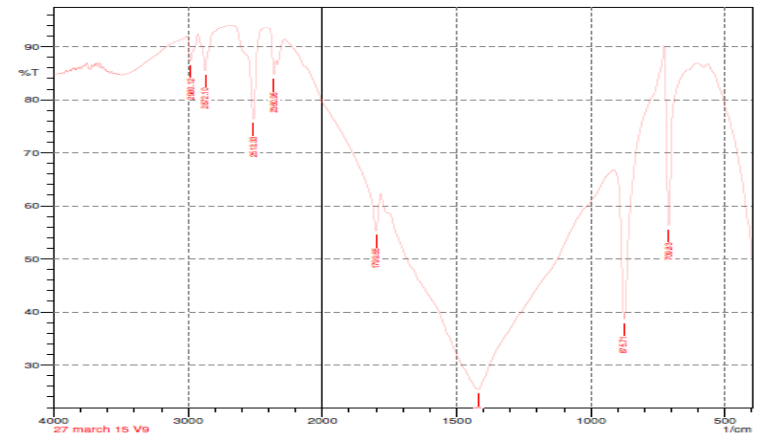
No. of Scans: 16
Resolution: 4 [1/cm]
Apodization: Happ–Genzel
User: DELL

SHIMADZU

	Peak	Intensity	Corr. Int	Base (H)	Base (L)	Area	Corr. Are
1	661.61	88.225	0.213	663.53	651.96	0.603	0.008
2	711.76	40.395	54.75	723.33	673.18	7.17	5.312
3	875.71	30.728	25.883	920.08	850.64	22.05	5.342
4	1417.73	18.081	3.017	1452.45	1400.37	37.132	1.933
5	1799.65	52.018	8.84	1826.65	1786.14	9.863	1.128
6	2359.02	90.631	8.838	2409.17	2347.45	-0.208	0.471
7	2511.4	80.728	27.449	2659.93	2432.32	0.306	8.209
8	2874.03	93.718	8.074	2926.11	2850.88	0.009	0.931
9	2982.05	96.986	8.717	3007.12	2926.11	-0.527	1.433
10	3647.51	94.168	3.039	3662.94	3637.87	0.398	0.101

Infrared spectroscopy sample (V_8)



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27 march 15 V9

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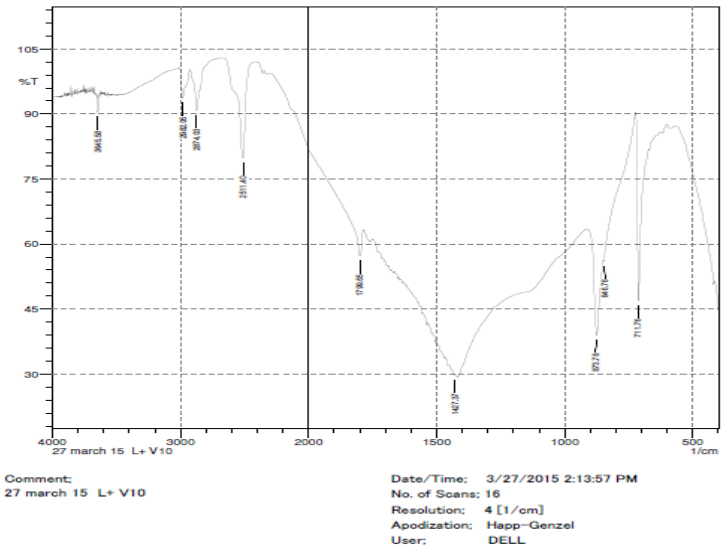
No. of Scans:
Resolution:
Apodization:
User: DELL

SHIMADZU

	Peak	Intensity	Corr. Int	Base (H)	Base (L)	Area	Corr. Are
1	709.83	56.255	33.078	727.19	638.46	9.56	4.592
2	875.71	38.629	33.239	916.22	727.19	31.143	10.399
3	1419.66	25.382	3.273	1442.8	916.22	185.164	-11.014
4	1799.65	55.254	8.06	2283.79	1782.29	52.787	-8.476
5	2360.95	84.669	4.576	2395.67	2345.52	2.559	0.355
6	2513.33	76.361	17.352	2855.71	2424.6	12.289	5.555
7	2872.1	85.44	7.311	2926.11	2733.22	7.744	1.722
8	2980.12	87.272	4.851	3009.05	2926.11	3.852	0.917

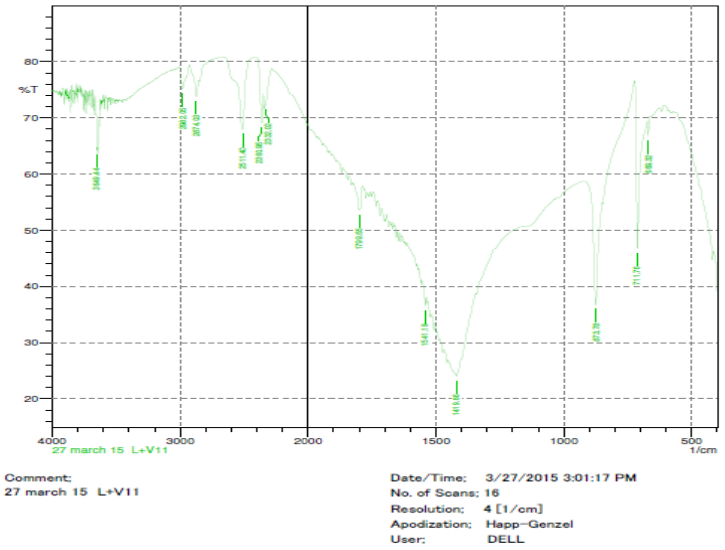
Infrared spectroscopy sample (V_9)



SHIMADZU

	Peak	Intensity	Corr. Int	Base (H)	Base (L)	Area	Corr. Are
1	711.76	46.913	41.508	723.33	673.18	7.575	4.295
2	846.78	55.93	1.428	850.64	723.33	17.556	-1.105
3	873.78	38.974	19.964	914.29	850.64	17.891	3.682
4	1427.37	29.738	0.11	1433.16	1425.44	4.046	0.005
5	1799.65	57.172	7.153	2289.58	1786.14	43.212	-7.418
6	2511.4	79.786	22.598	2667.64	2418.82	4.678	7.342
7	2874.03	90.746	6.294	2924.18	2850.88	1.441	0.759
8	2982.05	93.614	6.973	3009.05	2924.18	1.018	1.202
9	3645.58	90.352	4.252	3651.37	3630.15	0.742	0.24

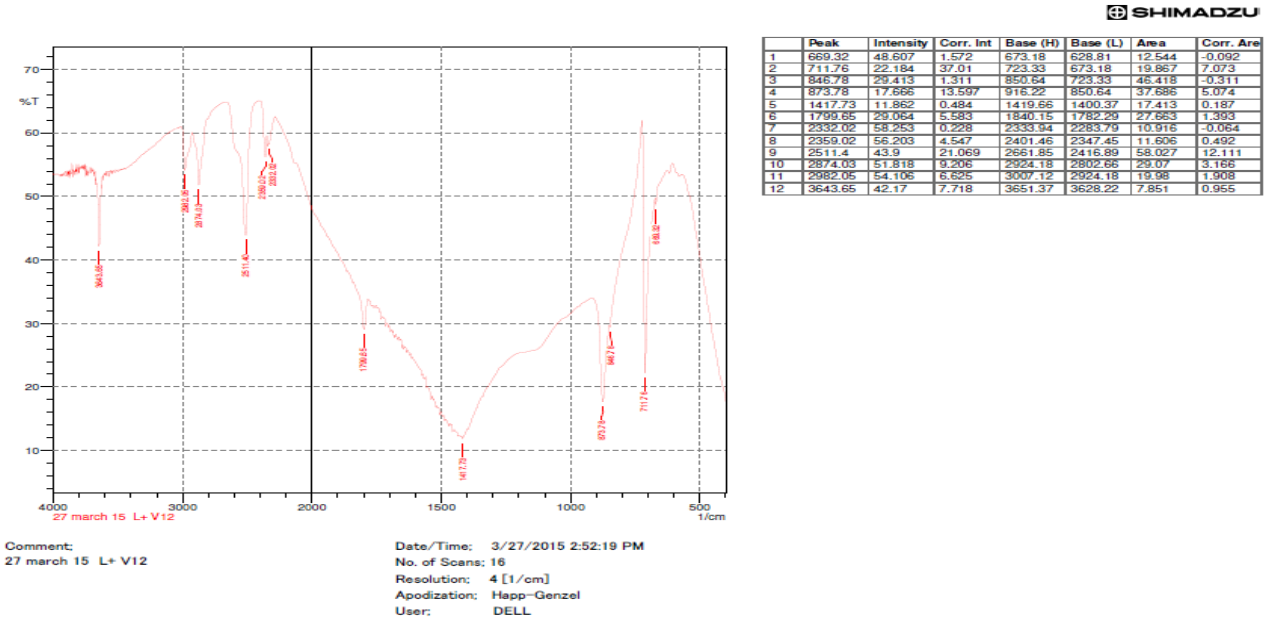
Infrared spectroscopy sample ($L+V_{10}$)



SHIMADZU

	Peak	Intensity	Corr. Int	Base (H)	Base (L)	Area	Corr. Are
1	669.32	66.696	3.122	673.18	663.53	1.57	0.07
2	711.76	46.743	28.256	723.33	673.18	9.951	3.089
3	873.78	36.748	19.507	918.15	850.64	19.908	3.331
4	1419.66	24.018	1.922	1427.37	1365.65	33.956	1.077
5	1541.18	36.452	2.372	1552.75	1537.32	6.359	0.131
6	1799.65	53.564	4.504	1822.79	1788.07	8.752	0.574
7	2332.02	72.247	0.385	2333.94	2283.79	5.005	-0.105
8	2360.95	69.031	6.939	2393.74	2349.38	5.688	0.757
9	2511.4	67.918	12.759	2650.28	2443.89	24.184	4.979
10	2874.03	73.785	3.724	2926.11	2852.81	8.469	0.59
11	2982.05	75.081	4.163	3009.05	2926.11	9.274	0.919
12	3649.44	64.258	2.042	3655.23	3647.51	1.342	0.036

Infrared spectroscopy sample ($L+V_{11}$)



	Peak	Intensity	Corr. Int	Base (H)	Base (L)	Area	Corr. Are
1	669.32	48.607	1.572	673.18	628.81	12.544	-0.092
2	711.76	22.184	37.01	723.33	673.18	19.867	7.073
3	846.78	29.413	1.311	850.64	723.33	46.418	-0.311
4	873.78	17.666	13.597	916.22	850.64	37.686	5.074
5	1417.73	11.862	0.484	1419.66	1400.37	17.413	0.187
6	1799.85	29.064	5.583	1840.15	1782.29	27.683	1.393
7	2332.02	58.253	0.228	2333.94	2283.79	10.916	-0.064
8	2359.02	56.203	4.547	2401.46	2347.45	11.606	0.492
9	2511.4	43.9	21.069	2661.85	2416.89	58.027	12.111
10	2874.03	51.818	9.206	2924.18	2802.66	29.07	3.166
11	2982.05	54.106	6.625	3007.12	2924.18	19.98	1.908
12	3643.65	42.17	7.718	3651.37	3628.22	7.851	0.955

Infrared spectroscopy sample ($L+V_{12}$)

Test have been performed for the twelve samples of shankha bhasma in LPU on date 27/03/2015.

4.5.17 Particle size determination methods [94, 95]

The particle size of a pharmaceutical substance is maintained in order to get optical biological activity.

4.5.17.1 Method to estimate particle size these are [96]

1. By using optical microscopy
2. By using sieving

4.5.17.2 Optical microscopy: - Particle size in which in the range of 0.2- 100 micro meters can be measured by this method. In which the size is shown as d_p(projected diameter) which represented the diameter of a sphere having the same area as the symmetric particle when observed under microscope.

Method: - Eye piece of the microscope is fitted with a micrometre. This is calibrated with stage micrometre. Take a powder slide and observed under microscope. The size of the particle is estimated with the help of eye piece.

4.5.17.3 Sieving: - Particle having range 50- 1500 micrometere are estimated by this method. In this method the size is expressed as d_{sieve} which described the diameter of a sphere that

passed sthrough the sieve aperture as the symmetric particle. This method useful in development of a tablet and capsules forms. Mostly fifteen percent powder passed in 100 # size. Sieves are made up from wire cloth with square meshes, woven from wire of brans, bronze and stainless steel.

Method: - The sieves are arranged in a nest with coarsest at the top. Sample is placed on the top sieve. This sieve set in fixed to the mechanical shaker and shaken for specific period of time. The weight of retained sieve is weighted. It is expressed in term of arithmetic mean of the two sieves.

4.6 Qualitative test for calcium and carbonate [97]

4.6.1 Procedure for calcium presence:-Took a sample solution in a test tube and treated with ammonium oxalate solution. A white coloured precipitate was obtained which is soluble in hydrochloric acid and insoluble in acetic acid. This indicates the presence of calcium.

4.6.2 Procedure for carbonate presence:-Took a small amount of the sample and with dilute acid, produced an effervescence due to release of carbon dioxide which is produced white precipitate in calcium hydroxide solution, this shown the presence of carbonate in it.

4.7 Acid neutralizing capacity [98]

4.7.1 Procedure for Acid neutralizing capacity:-The neutralization capacity of Shankha Bhasma was determined in terms of requirement of 0.5 N sodium hydroxide to neutralize 1gm. Shankha Bhasma

Accurately weighed 100 mg Shankha Bhasma was taken and dissolved in 10 ml of 3 N HCL. The solution was titrated with 0.5 N NaOH using phenolphthalein as indicator. A blank was also performed by titrating 10 ml of the 3 N HCl (solution used for dissolving the sample) with 0.5 N NaOH. The difference between the two readings gives the amount of 0.5 N NaOH required for neutralizing 100 mg Shankha Bhasma.

4.8 Complexometric Titrations [92, 93]:-These types of titrations are those in which a complexing agent is used to estimate polyvalent ions.

4.8.1 Procedure for complexometric titration:-Took a weighted amount of drug in conical flask and added 45ml distilled water, ammonia solution, drop of conc. sulphuric acid and adjust pH 10, add solochrome black as indicator. Then titrate with EDTA starting point is red wine observed then end point turned into green.

Fig. 4.1 Asudha shankhanabhi

Fig. 4.2 Pottali Nirman

Fig. 4.3 Fresh Nimbu fruit

Fig. 4.4 Ghrit Kumari plant

Fig. 4.5 Nimbu Sawarasa

Fig. 4.6 Ghrit kumari Sawarasa

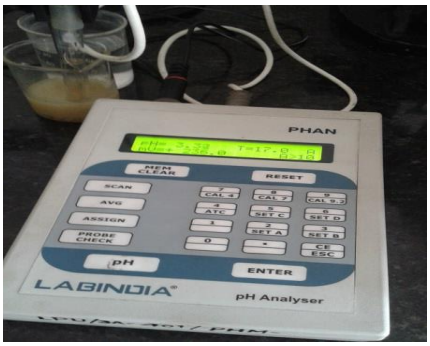


Fig.4.7 pH of Nimbu sawarasa

Fig. 4.8 Dola yantra

Fig.4. 9 Shudh shankhanabhi

Fig.4.10 Saravaputikarana

Fig.4.11Sandhibandhana process

Fig.4.12Drying of saravasamputa

Fig. 4.13 Saravasamputikarana

Fig. 4.14 Puta Samanskara

Fig. 4.15 After sarwangsheetikara

Fig. 4.16 Bhavana process

Fig. 4.17 Drying of chackrika

Fig. 4.18 Chackrika after puta

Fig. 4.19 White Shankh Bhasma

Fig.4.20 Bulk density

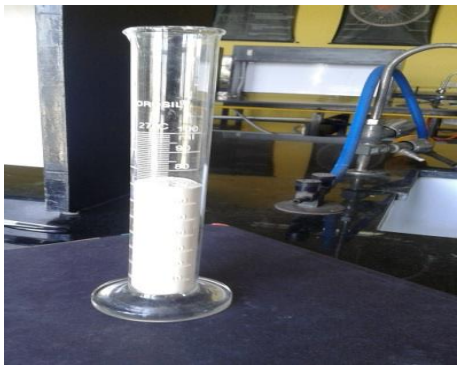


Fig. 4.21 Tap density

Fig.4.22 Angle of repose

Fig.4.23 Measurement of radius

Fig. 4.24 Red wine colour

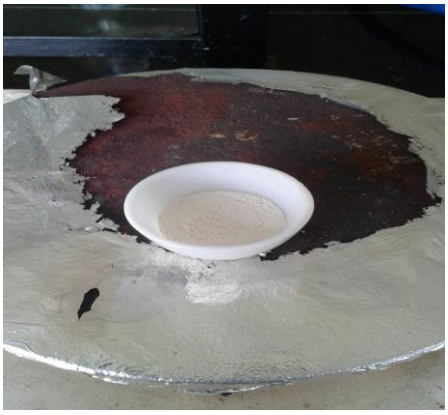


Fig.4.25 Nirdhoom

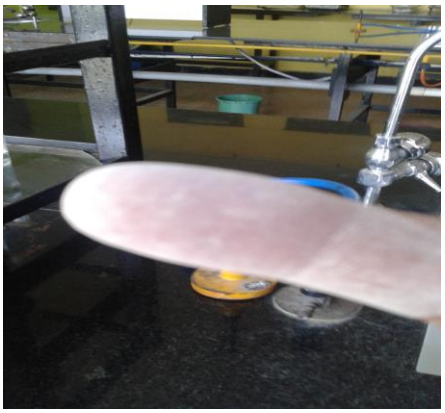


Fig.4.26 Rekhapurnatavam

Fig.4.27 Sukshamatavam

Fig. 4.28 Viseshvaranatavam

Fig.4.29 Ash value process

Fig.4.30 Pink colour in (A. N. Tit)

CHAPTETR - 5

RESULT AND DISCUSSION

5.1 Pharmacognostic study of Shankhanabhi

5.1.1 Macroscopic study of Shankhanabhi

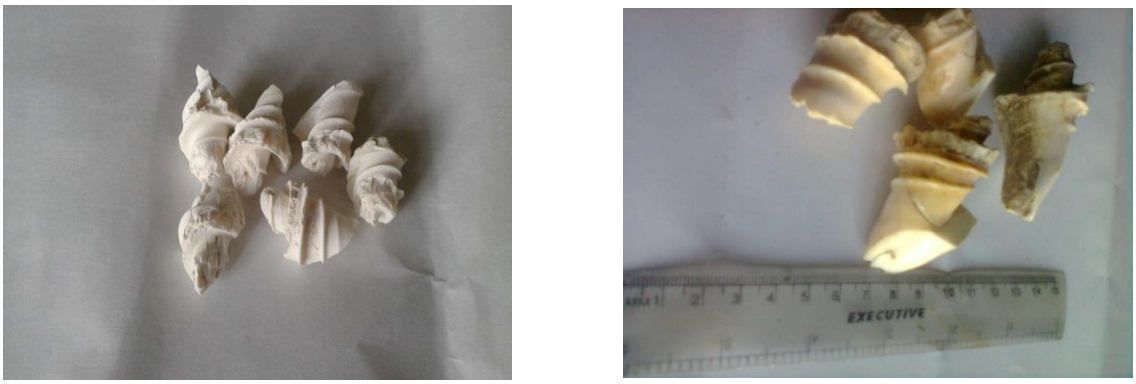


Fig. 5.1: Depicting the external part of the Shankhanabhi

Table 5.1: Depicting the macroscopic characters of the Shankhanabhi

Sr. no.	Characters	Shankhanabhi
1	Colour	Off white
2	Odour	Odourless
3	Taste	Characteristic
4	Size	Coiled shell
5	Shape	Massive

5.1 Observation for Nimbu sawarasa (Lemon juice):

Table 5.2: Details depicting the observation for Nimbu sawrasa and kumari(Aloevera)

Sr.no.	Colour		State		Quantity		pH
	Initial	Final	Initial	Final	Taken (kg)	Obtained (ml)	
1	White	Light yellow	Fresh(Fruit)	Liquid	8kg	4.200 ml	3.32
2	White	Light yellow	Fresh	Viscous(Liquid)	500gm	300ml	6.80

The table show that the colour of the sawarasa and pH of swarasa is obtained acidic in nature.

5.2 Observation for Shankhanabhi Shodhan

Table 5.3: Details depicting the observation for the Shankhanabhi before and after purification

Sr.no.	Shankhanabhi	Colour		Weight		Form	
		Initial(R)	Final(P)	Initial(R)	Final(P)	Initial(R)	Final(P)
1	Jalandhar	Puff white	Shining with white	1.300gm	1.120 gm	Solid	Solid

Here R = Raw drug P = Purified drug. The weight of the sample is decrease due to the soluble property of the impurities i.e. sandy material etc.

Table 5.4: Specifying the time period and shodhana process for Shankhanabhi

Sr.no.	Drug	Place	Shodhana Dravya	Process	Starting Date	End Date
1	Shankhnabhi	Jalandhar	Nimbu Swarasa	Swedna	05/02/15	05/02/15

The above table show that Shankhanabhi is procured from local market Jalandhar and the principle of the shodhana process is use the sample i.e. Swedana. The process specifies complete dipping the pottali in the shodhana media i.e. Nimbu sawarasa after washing with hot water Shankhanabhi now softer and whitish in form. The date of performing the experiment is mentioned.

5.3 Observation for Nimbu sawrasa, Water, Kumari sawrasa and Nimbu+ Kumari sawrasa

Table 5.5: Detail depicting volume of Nimbu, Water, Kumari and Kumari+ Nimbu sawrasa used for Bhavana sanakara

Sr.no.	After puta	Vol.(ml) Nimbu Sawarasa	Vol.(ml) Kumari Sawarasa	Vol.(ml) Water	Vol.(ml) L+A	Colour (L)	(K)	Vol.used in(ml) Bhavana
1	First	300	250	300	300	Light Yellow	Creamish Yellow	120 for twelve(s)
2	Second	250	250	250	250	Light Yellow	Creamish Yellow	20.34for twelve(s)

Shankhanabhi is subject to bhavana with nimbu sawarasa, water, kumari sawarasa and kumari sawarasa+ nimbu sawarasa for increasing the potency of the drug, and variation of the bhavana dravya use is observed, the maximum and minimum quantity of the bhavana dravya consumed due to bond deformation of the drug before and after puta.

5.4: Observation for Puta Samansakara for twelve samples

Table 5.6: Depicting the Puta Samansakara

No. of Puta	Temperature (^oC) Gajaputa	Weight of Shankhanabhi (g)		SAMPLE		
		Before Puta	After Puta	1	2	3
1st	800 above	120	85	Batch-1	Batch-1	Batch-1
2nd	800 above	85	55.20			
1st	800 above	120	80	Batch -2	Batch -2	Batch -2
2nd	800 above	80	62.1			
1st	800 above	120	70	Batch -3	Batch -3	Batch -3
2nd	800 above	70	55			
1st	800 above	120	79.2	Batch -4	Batch -4	Batch -4
2nd	800 above	79..2	56.8			

The puta samansakara that was performed show that the decreased in weight due to the calcinations of the organic content and water. The colour changed after every puta of shankhanabhi form whitish to greyish white and finally coloured observed white.

5.5: Observation for physicochemical study of Shankha Bhasma

Table 5.7: Depicting the physicochemical parameter for Shankha Bhasma

Sr. No.	Parameter (%)	Sample											
		Water			Lemon			Aloevera			Aloevera+Lemon		
		1	2	3	4	5	6	7	8	9	10	11	12
1	F.M (w/w)	-	-	-	-	-	-	-	-	-	-	-	-
2	L.O.D. (w/w)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
3	T.A. (w/w)	43.5	40.5	43.5	44	46.5	42.5	42.5	44	47.5	42	44	43
4	A.I.A. (w/w)	41	39.5	41.5	42	44.5	41	40.5	42	44.5	40	42	40.5
5	A.S.E. (w/v)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
6	W.S.E. (w/v)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6

Maximum % of T.A. was found in sample second bhavana with nimbu sawarasa and minimum % of T.A. was found in sample four.

% minimum on the bases of A.I.A. sample 1st was found bhavana with water and maximum % of A.I.A. found in sample three.

5.6. Observation for qualitative test for calcium and carbonate

Table 5.8 Depicting the qualitative test for calcium and carbonate

Sr.no.	Drug used	Reagent used	Result
1	Shankha Bhasma	Ammonium oxalate, hydrochloric acid and acetic acid	+
2	Shankha Bhasma	Dilute acid and calcium hydroxide	+

5.7 Observation for calcium content in Shankha Bhasma

Table 5.9 Depicting the Calcium content (%) twelve Samples of Shankha Bhasma

Sr.no.	Sample	B_1	B_2	B_3	Mean
1	1(W_1)	54.40	56.80	56.20	55.80
2	2(L)	54.20	55.25	55.10	54.85
3	3(A)	55.21	56.40	56.89	56.17
4	4(A+L)	59.20	58.89	58.98	59.03

Here (B) Batch no. W=Bhavana with water L= Lemon A= Alovera A+L= Alovera +Lemon

Maximum % of calcium was found in samples no. four have high concentrations of calcium content and minimum % of calcium content found in sample no. two.

5.7 Observation for Acid Neutralization for Shankha Bhasma

Table 5.10 Depicting the Acid Neutralization by Shankha Bhasma

Sr.no.	Sample	B_1	B_2	B_3	Mean
1	1(W_1)	1.41	1.48	1.47	1.45
2	2(L)	1.39	1.49	1.59	1.49
3	3(A)	0.96	0.94	0.96	0.95
4	4(A+L)	0.15	0.15	0.16	0.15

Here (B) Batch no. W=Bhavana with water L= Lemon A= Alovera A+L= Alovera +Lemon

The maximum % of acid neutralization of shankha bhasma was found in second sample and minimum % of acid neutralization of bhasma found in sample no. four

5.9 Observation for particle size determination using microscopic method

Table 5.11 Depicting the size of Shankha Bhasma in Micro meter

Sr.no.	Sample	B_1	B_2	B_3	Mean
1	1(W_1)	26.04	26.89	26.49	26.47
2	2(L)	26.69	26.79	26.10	26.53
3	3(A)	26.39	26.08	26.13	26.20
4	4(A+L)	26.42	26.22	26.39	26.35

Here (B) Batch no. W=Bhavana with water L= Lemon A= Alovera A+L= Alovera +Lemon

The maximum % of particle size of shankha bhasma found in sample no.second and minimum % of particle size was found in sample no. third.

5.10 Observation for Ayurvedic Parameter for all samples of Shankha Bhasma

Table 5.12Depicting the Ayurvedic Parameter for Shankha Bhasma

Sr.no.	Ayurvedic Parameter	B_1	B_2	B_3
1	Rekhapurnatavam	Complied	Complied	Complied
2	Nirdhoomatva	Complied	Complied	Complied
3	Slakshnatavam	Complied	Complied	Complied
4	Sukhsutavam	Complied	Complied	Complied
5	Visheshvrana	Complied	Complied	Complied
6	Gatarastavam	Complied	Complied	Complied
7	Avami	Complied	Complied	Complied
8	Amla	Complied	Complied	Complied

The Ayurvedic classical parameters performed for the shankha bhasma for twelve samples and they were complied with parameters.

5.11 Observation for IR data for all samples of shankha Bhasma

Table 5.13 Depicting the IR Frequency for the samples of shankha Bhasma

Sr.no.	Sample	B_1 (Frequency)	B_2 (Frequency)	B_3 (Frequency)
1	W_1	865, 900, 1450, 3220,715,877, 1430,1785,2530, 945,970,653,1100 1210, 1625,3400 962,1030,1083 3230,670,855.950. 1005,1160,2980	865, 900, 1450, 3220,715,877, 1430,1785,2530, 945,970,653,1100 1210, 1625,3400 962,1030,1083 3230,670,855.950. 1005,1160,2980	865, 900, 1450, 3220,715,877, 1430,1785,2530, 945,970,653,1100 1210, 1625,3400 962,1030,1083 3230,670,855.950. 1005,1160,2980
2	L	865, 900, 1450, 3220,715,877, 1430,1785,2530, 945,970,653,1100 1210, 1625,3400 962,1030,1083 3230,670,855.950. 1005,1160,2980	865, 900, 1450, 3220,715,877, 1430,1785,2530, 945,970,653,1100 1210, 1625,3400 962,1030,1083 3230,670,855.950. 1005,1160,2980	865, 900, 1450, 3220,715,877, 1430,1785,2530, 945,970,653,1100 1210, 1625,3400 962,1030,1083 3230,670,855.950. 1005,1160,2980
3	V	865, 900, 1450, 3220,715,877, 1430,1785,2530, 945,970,653,1100 1210, 1625,3400 962,1030,1083 3230,670,855.950. 1005,1160,2980	865, 900, 1450, 3220,715,877, 1430,1785,2530, 945,970,653,1100 1210, 1625,3400 962,1030,1083 3230,670,855.950. 1005,1160,2980	865, 900, 1450, 3220,715,877, 1430,1785,2530, 945,970,653,1100 1210, 1625,3400 962,1030,1083 3230,670,855.950. 1005,1160,2980
4	L+V	865, 900, 1450, 3220,715,877, 1430,1785,2530, 945,970,653,1100 1210, 1625,3400 962,1030,1083 3230,670,855.950. 1005,1160,2980	865, 900, 1450, 3220,715,877, 1430,1785,2530, 945,970,653,1100 1210, 1625,3400 962,1030,1083 3230,670,855.950. 1005,1160,2980	865, 900, 1450, 3220,715,877, 1430,1785,2530, 945,970,653,1100 1210, 1625,3400 962,1030,1083 3230,670,855.950. 1005,1160,2980

The IR data reveals that the major peaks of the samples are have been found the same in all

sample same for the standard compound. This reveals that the samples are highly containing calcium carbonate, magnesium carbonate, calcium sulphate calcium chloride carbonate of iron and calcium phosphate. It means the samples are highly containing calcium content.

5.12 Observation for % of distribution in sieving method of particle size

Table 5.14 Depicting the particle size using sieving method

Sr.no.	Sample	B_1	B_2	B_3	Mean
1	W_1	57.32	57.30	57.39	57.34
2	L	54.48	54.78	53.69	54.32
3	V	55.56	55.50	55.51	55.53
4	L+V	53.26	53.36	53.20	53.28

The above table show the maximum % of particle size distributions in micro meters present in sample 3rd, minimum % of particle size distribution present in sample 4th.

CHAPTER- 6

SUMMARY AND CONCLUSION

Shankha is kept under Sudha varga widely used in amlapitta, ajirana, agnimandha and grahi as per references found. The structural design of the research study was based on Shankha Bhasma is prepared with four different bhavana dravya in three batches of each and selected the best one batch after performing and comparisons between ayurvedic & analytical parameter. Shankha Bhasma was prepared as per classical method prescribed in Rasatrangini only bhavana dravya are changed. To understand the changes occurring the structurally as well as to validate the scientific reason behind using the shodhana and marana dravya.

After the successful preparation, the product had to be standardization to provide a platform comparative study. Shankha bhasma is used in amlapitta diseases the samples are selected on the bases of percentage of calcium content present in maximum percentage in Kumari + Nimbu sawarasa with sample and minimum percentage in second sample. Then on the bases of T.A. percentage in maximum is present in second sample, Minimum percentage of T.A. present in fourth sample and on the bases of percentage of maximum A.I.A. present in 3rd sample, minimum percentage of A.I.A. present in 1st sample.

On the bases of percentage of particle size the maximum concentration present in 2nd sample, minimum percentage present in 3rd sample, then the bases of the acid neutralization percentage of Shankha bhasma the maximum concentration present in second sample, minimum percentage of acid neutralization concentration present in fourth sample. Bhasma of the sample was made by using gajaputa, then bhasma standardization with classical and modern analytical method. The colour of the in house sample was fewer variations due to heating pattern. Bhasma involves the formation of oxides. Now to analyse functional group using IR analysis of the samples were done which revealed that the in house sample shows initial peak and was highly pure.

Thus based on ayurvedic concept and modern instrument techniques it is concluded that the bhasma prepared in house was analysed on the bases of calcium content, T.A. %, A.I.A. % and % of acid neutralization. These all proves the relevancy of the study and the sample can no doubt be used for medicinal purpose and will produce the optimum therapeutic efficacy.

CHAPTER - 7

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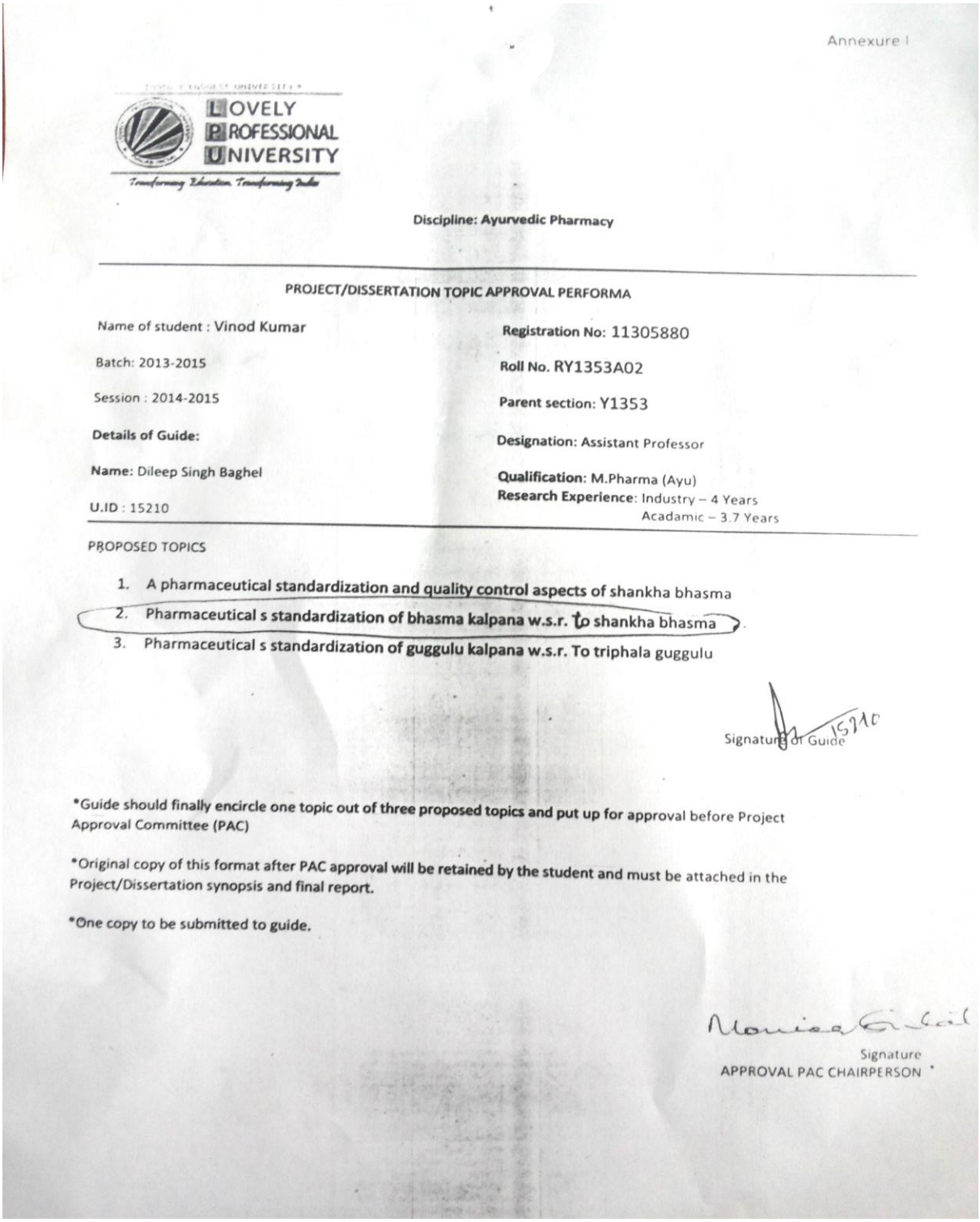
CHAPTER- 8

APPENDICES

8.1 Project/ Dissertation Topic Approval Performa.

8.2 Certificate of authentication of raw drug.

8.1 Project/ Dissertation Topic Approval Performa.



Annexure I

LOVELY PROFESSIONAL UNIVERSITY
Transforming Education Transforming India

Discipline: Ayurvedic Pharmacy

PROJECT/DISSERTATION TOPIC APPROVAL PERFORMA

Name of student : Vinod Kumar

Registration No: 11305880

Batch: 2013-2015

Roll No. RY1353A02

Session : 2014-2015

Parent section: Y1353

Details of Guide:

Designation: Assistant Professor

Name: Dileep Singh Baghel

Qualification: M.Pharma (Ayu)

U.ID : 15210

Research Experience: Industry – 4 Years
Acadamic – 3.7 Years

PROPOSED TOPICS

1. A pharmaceutical standardization and quality control aspects of shankha bhasma
2. Pharmaceutical s standardization of bhasma kalpana w.s.r. to shankha bhasma
3. Pharmaceutical s standardization of guggulu kalpana w.s.r. To triphala guggulu

Signature of Guide 15210

*Guide should finally encircle one topic out of three proposed topics and put up for approval before Project Approval Committee (PAC)

*Original copy of this format after PAC approval will be retained by the student and must be attached in the Project/Dissertation synopsis and final report.

*One copy to be submitted to guide.

Signature
APPROVAL PAC CHAIRPERSON

8.2 Certificate of authentication of raw drug.

CIN No.- U24233PB2008PTC032243

HERBHEAL
CARE BY NATURE

Herbal Health Research Consortium Pvt. Ltd.
(A GOVT. OF INDIA SPONSORED & PB. GOVT. ASSISTED AYUSH CLUSTER PROJECT)
Works at : Village Khyala Khurd, Ram Tirth Road, Amritsar
Ph.: 01858-262025, Fax.: 01858- 262026 E-mail: herbheal@ymail.com
Corrs. Add: 277, East Mohan Nagar, Amritsar - 143006

Form No 50 **Lic no. Ay-D1-Pb-2014/124**

CERTIFICATE OF ANALYSIS

(The Drugs and Cosmetics Act 1940 and the Rules Thereunder)

Sample	**Shankh Nabhi**	Report no.	**HHRC/TP/01/15/061**
Supplied by	Mr. Vinod Kumar	Your ref.	LPU/LFAMS/EC/001
Mfd by	-	Ref. date	22/01/2015
Submitted by	Mr. Vinod Kumar	Batch no.	-
Batch size	-	Mfg Lic no.	-
D/M	-	Date of receipt	22/01/2015
D/E	-	Sample quantity	-

RESULTS OF ANALYSIS

Sr. No.	TESTS	RESULTS
1.	Calcium estimation	39.60%
2.	Colour	Off white
3.	Form	Carbonate
4.	Lustre	Dull
5.	Odour	Odourless
6.	Structure	Massive
7.	Transparency	Opaque
8.	Touch	Hard, Sharp

Remarks: This is to certify that given sample conforms to be Shankh Nabhi.

Date: 27/01/15

Chemist Incharge

"End of report"

qc_herbheal@ymail.com

Note:
1. Sample(s) not drawn by us unless otherwise stated.
2. Total liability of this laboratory is limited to the invoiced amount. Sample consumed during test.
3. Test certificate in full or parts shall not be used for promotional or publicity purpose.
4. The sample will be destroyed after one month of the date of issued test report, unless otherwise specified.