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SOPHISTICATED INSTRUMENTAL ANALYSIS OF KARPOORA SILASATHU PARPAM FOR GALL BLADDER STONE

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ABSTRACT

In ancient siddha terms Pithapaikal is a solid crystal deposit that forms in gallbladder which is a pear shaped organ that stores bile salts until they are needed to help digest fatty foods. The prevalence of cholelithiasis in Asian countries is approximately 10%, while in Africans, the rate is less than 5%. An association between increasing age and increased prevalence of gallstones has been shown in many epidemiological studies. Pregnancy also has been detected as a major risk factor for cholelithiasis. Decreased gall bladder motility during the third trimester of pregnancy favours the growth of stones in pregnant women. The prevalence of cholelithiasis is variable and has been reported as 2 – 29% in India with differences in interstate and inter-regions. In India, higher prevalence of gallstones has been reported in north compared to south Indians by the previous studies. Cholelithiasis needs both preventive and curative therapy. Based on this literature background, Karpura Silasathu Parpam is effective in Cholelithiasis condition. In this article, Instrumental analysis of Karpura Silasathu Parpam is analysed.

KEYWORDS: Pithapaikal, Instrumental analysis, Karpura Silasathu Parpam, SEM, FT-IR.

INTRODUCTION

Cholelithiasis is a hardened deposit within the fluid in the gall bladder, a small organ under the liver. Gallstones are hardened deposits of digestive fluid. It can vary in size and number and may or may not cause symptoms. People may experience Pain in the back or upper-right abdomen and can be severe, indigestion, nausea or vomiting, abdominal cramping from gallstones or discomfort. Gallstones occur when there is an imbalance in the chemical constituents of bile that results in precipitation of one or more of the components why this occurs is unclear, although certain risk factors are known.

Gallstones are seen in all age groups, but the incidence increases with age. Other risk factor include pregnancy, rapid weight loss (such as after obesity surgery) parental nutrition, loss of the bile salts (terminal ileitis or after ileal resection) and diabetes via the metabolic syndrome.

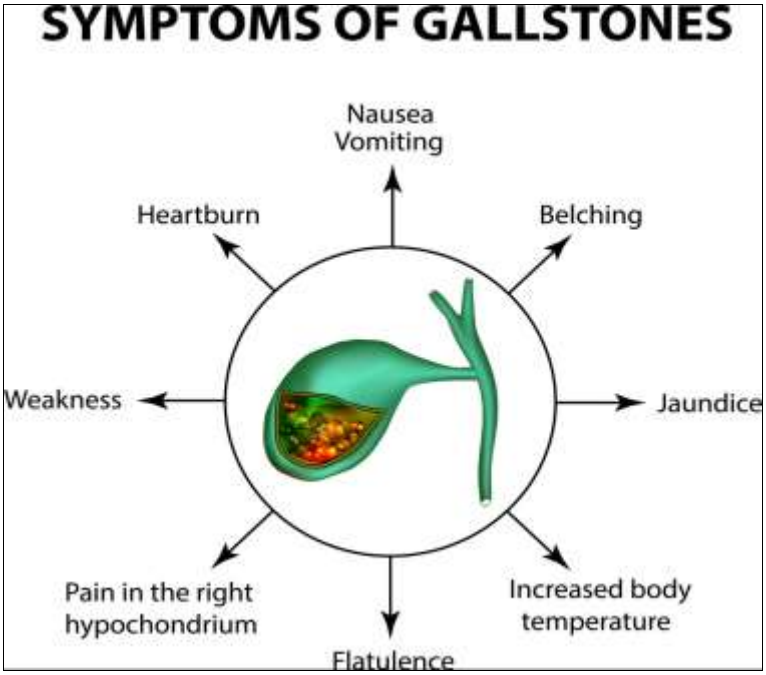
The prevalence of cholelithiasis is variable and has been reported as 2 – 29% in India with differences in interstate and inter-regions. In India, higher prevalence of gallstones has been reported in north compared to south Indians by the previous studies. Cholelithiasis needs both preventive and curative therapy. Siddha literature claims a few herbo-mineral preparations that are useful in the treatment of gall bladder stones; still many formulations need to be explored for their pharmacological actions.

COMMON SIGNS AND SYMPTOMS

Gall Stone disease may be thought of as having the following four stages;

1. Lithogenic state, in which conditions favour gallstone formation.
2. Asymptomatic gallstones
3. Asymptomatic gallstones, characterizedepisodes of biliary colic.
4. Complicated cholelithiasis.

Symptoms & Complication results from effects occurring within the gall bladder or from stones that escape the gall bladder to lodge in the CBD.



Co-morbid Conditions

- Chronic disease, ideal resection or other disease of item decrease bile salt reabsorption &increase the risk of gall stone formation.
- This is due in general to deceased eternal stimulation of the gall bladder with resultant biliary stasis & stone formation.
- Other illness on states that predispose to the gall stone formation include burns, use of total parenteral nutrition, paralysis, ICU care & major trauma.

Primary Kutram affected

The above disease is associated with Azhal Kutram.

Secondary Kutram affected

Vali kutram and Iya Kutram are affected as secondary kutram.

Confirmation of Diagnosis

Imaging modalities that may be useful include the following,

- Abdominal radiography – used primarily to exclude other causes of abdominal pain (e.g.: Intestinal obstruction).
- Endoscopic Ultrasonography (EUS)- An accurate & relatively non-invasive means of identifying stones in the distal CBD.
- Ultrasonography – The procedure of chose in suspected gall bladder on biliary decease.

MATERIALS AND METHODS

Selection of the drug

The Herbo mineral formulation of Karpura Silasathu Parpam was taken as a trial drug. It has been taken from the Siddha literature "The Pharmacopoeia of Siddha Research Medicines", Page No-21 indicated for Cholelithiasis.

Drug Profile

Drug Name : KARPURA SILASATHU PARPAM

Dosage : 5 to 10 grains (325-650mg) BD

Adjuvant : Cow's butter or Honey or other suitable Adjuvant.

Indication : Burning micturition, burning of stomach, gonorrhoea, burning of the body, feet and hands, all other pitha disease, fever, urethritis, gastritis, stricture urethra, biliousness and hepatic and gall bladder diseases.

Ingredients of the Karpura Silasathu Parpam

- KARPURA SILASATHU(Asphalt): 1 Veesai (1.4 kg)
- TENDER COCONUT WATER(cocos nucifera): As required
- KOVAI LEAVES (Coccinia indica) : As required

Karpura Silasathu

Tender Coconut

Kovai leaves

KARPURA SILASATHU

Vernacular Names

Sanskrit - Silajit, Silaras.

English -Asphalt, Mineral pitch, Jew‟s pitch.

Hindi -Silajita.

Gujarati -Silajita.

Maharashtra - Silajita.

Kannadam -Silajita.

Bengali -Silajita.

Arab -Hajar -ul-musa.

Persia -Momiai, Faqurul yahud.

Sources

Ejected out of rocks during hot weather in the lower Himalayas, Vindhya and other mountain tracts and Nepal where iron abounds, naturally flowing out from between the fissures in the rock.

Alum earth of Nepal which is sold in Calcutta as white shilajit is quite a different substance from the shilajit used in the Hindu Meteria Medica. A product called "Momia" resembling silajit, is obtained from some of the mountain in Arabia and Persia.(chopra).

A white stone resembling alum –crystallised foliated gypsum.It is a bazaar drug and is supposed to be available in places frequented with mist. It is probably Ammonia, Iron alum(being conjoined with peroxide of iron) known as Silajit or Alum earth of the Nepal.

Silajit available at Katmand (Nepal) is the best and most efficacious.In may and june, owing to the strong heat of the sun, shilajitu exudes from mountains like the Himalayas, the Vindhya chains etc. It may also be obtained from decomposition of vegetable matter on the earth.

Varieties And Characters

There are two varieties of Silajit.

1. Gomuthra silajit

Which is dark sticky and has a bitter taste and of a smell resembling cow‟s urine.

2. Karpoora silajit

Which occurs in white plates and has a camphar smell.

Silajit is of bitter taste and of a smell resembling cow‟s urine. This is known as Gomoothra silajit. On igniting, it leaves a large quantity of ash consisting of Lime, Magnesia, Silica and oxides of Iron.

Four varaties of silajit are described by the ancient Hindu writers,

i. The gold silajit which is red.
ii. The silver silajit which is white.
iii. The copper silajit which is blue coloured.

iv. The iorn silajit which is blackish brown.

Blue and Red Silajit are not found commonly.

Organoleptic Character And Action

- Taste - sweet
- Potence - coldness
- Bio-transformation - sweet

Actions

- Diuretic
- Lithnotriptic
- Respiiratory stimulant
- Disinfectant
- Expectorant
- Locally antiseptic
- Anodyne
- Paraticide
- Anti phlogistic
- Intestinal Antiseptic
- Alterative
- Tonic
- Slightly Laxative
- Chalaogue

METHOD OF PURIFICATION

Each raw drugs are purified as per the classical siddha literature Sarakkukalin Suthi Muraigal and Gunapadam Mooligai and Thathu Jeevam.

METHOD OF PREPARATION

Karpura silasathu one veesai is taken, purified by keeping it immeresed in ilaneer (tender coconut water) for 1 or 2 days, boiled, washed with water and dried. Without boiling also, it may be washed.

Next, the silasathu pieces are enclosed with the rubbed paste of kovai leaves about 1/2 to one inch thickness, dried and are subjected to incineration with about 300 vartties. On being cooled the next day, they are taken out and weighed.

Next, the same parpam is rubbed with the juice of kovai leaves for 1 or 2 days, villais are made, dried, kavasam is made to these villais with the rubbed paste of kovai leaves and open putam is applied as before. On being cooled the parpam villais are secured weighed, powdered and bottled up.

INSTRUMENTAL ANALYSIS

- SEM Analysis -Scanning electron microscopy
- FT-IR Analysis – Fourier Transform Infrared Spectrography

Alkanes, Aldehyde, Amine, Alkenes, Alkanes, Ester, ether, Alkyne.

K.S.Parpam

Materials and Methods of FTIR

FT-IR is an important and more advanced technique to identify the functional group. The spectrum that appears denotes the molecular absorption and transmission. It forms the molecular fingerprint of the sample. Like the finger print there is no two unique molecular structures producing the same infrared spectrum. It is recorded as the wavenumber and the peaks seen in the spectrum indicates the amount of material present**.**

Details regarding the FT-IR analysis

The Perkine Elmer Spectrum One Fourier Transform Infrared (FTIR)Spectrometer was used to derive the FTIR Spectrum of IK drug placed in Potassium Bromide (KBr) discs with scan rate of 5 scan per minute at the resolution 4cm-1in the wave number 4000-500 were recorded the FT-IR Spectrum under standered condition. FT-IR Spectra were used to determinethe presence of the functional groups and bands in the drug (nane to be added). The recorded spectrum shows in figures. The standered table of FT-IR is given in Table -1.

IR table http://www.chem.ucla.edu/~bacher/General/30BL/IR/ir.html

last updated: Friday, March 9, 2001

Infrared Spectroscopy Table

Functional Group	Frequency (cm-1)	intensity
water OH Stretch	3700-3100	strong
alcohol OH stretch	3600-3200	strong
carboxylic acid OH stretch	3600-2500	strong
N-H stretch	3500-3350	strong
≡C–I stretch	~3300	strong
=C-H stretch	3100-3000	weak
-C-H stretch	2950-2840	weak
-C-H aldehydic	2900-2800	variable
stretch	~2250	strong
C≡C stretch	2260-2100	variable
C=O aldehyde	1740-1720	strong
C=O anhydride	1840-1800, 1780-1740	weak, strong
C=O ester	1750-1720	strong
C=O ketone	1745-1715	strong
C=O amide	1700-1500	strong
C=C alkene	1680-1600	weak
C=C aromatic	1600-1400	weak
CH_2 bend	1480-1440	medium
CH_3 bend	1465-1440, 1390-1365	medium
C-O-C stretch	1250-1050 several	strong
C-OH stretch	1200-1020	strong
NO_2 stretch	1600-1500 and 1400-1300	strong
C-F	1400-1000	strong
C-Cl	800-600	strong
C-Br	750-500	strong
C-I	~500	strong

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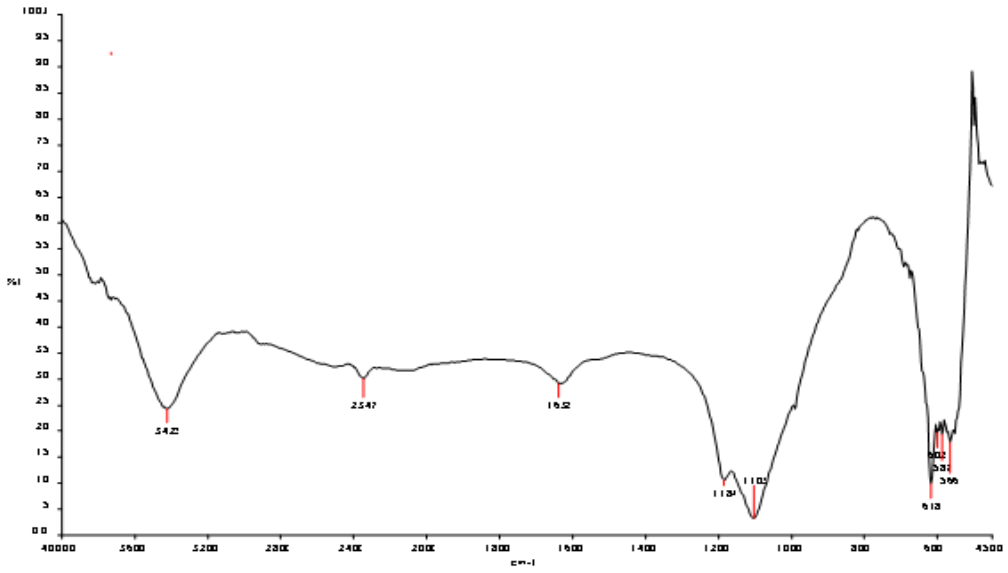


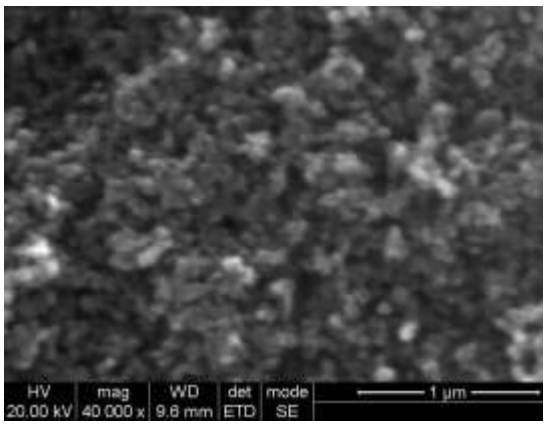
SEM morphology study of Karpoora Silasathu Parpam

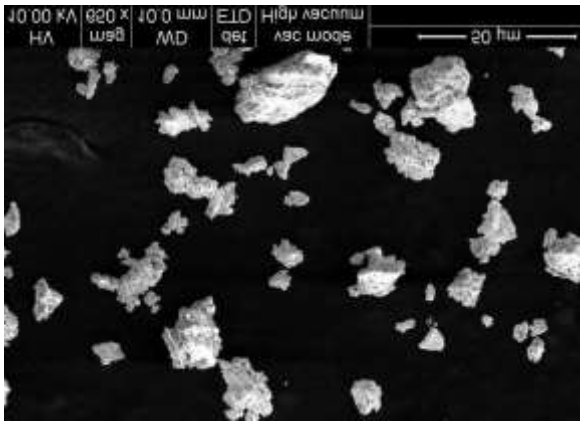
The morphology and elemental composition of the KSP sample can be determined by Environmental SEM (FEI Quanta). A representative portion of each sample must be sprinkled onto a double side carbon tape and mounted on aluminium stubs, in order to get a higher quality secondary electron image for SEM examination.

DISCUSSION OF SEM

Although the particle sizes of different batches showed similarity, it seems that these particles are aggregates of much smaller particles. When dispersed in an aqueous medium, these preparations form a negatively charged hydrophobic particle suspension. This hydrophobicity gives these particles a tendency to aggregate together to form larger particles. Therefore, the comparatively larger size may be due to the agglomeration of the particles by repeated cycles of calcinations involved in preparation. Particles with a high positive surface charge like chitosan are usually attracted by the intestinal mucosa which helps in increasing the intestinal absorption of the encapsulated drug. However, the strong electrostatic interaction between the positively charged particles and the negatively charged glycocalix may slow down the progression and penetration of these particles towards the epithelial cell surface reducing their uptake. Also it has been shown that non-ionized particles have a greater affinity for M cells than for ionized particles and positively charged particles.

It has been reported that micron particles exhibited a size dependent uptake from the intestine, and its passage via the mesentery lymph supply and lymph nodes to the liver with significant absorption for particles less than 1 micron. Therefore, uptake of KSP with a particle size of less than 1 micron through the intestine can be expected.





CONCLUSION

Micron Particles exist in KSP medicine.

Nano emulsions can be synthesized, as there are abundant use of Oils.

Nutraceuticals available in the KSP can be explored to higher level.

If achieved, can be used for higher absorption, less toxicity and cost efficacy.

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