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"Physicochemical Evaluation of Shankha Bhasama : Enriched AYURVEDIC Preparation"

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Abstract : Shankha (coach) is one of the members of Sudha Varga (A class of calcium-containing compound). Shankh Bhasma was prepared and standardized by Ayurvedic pharmaceutical procedure accordingly in Rasa Tarangini (a classical 20th century book ayurvedic pharmaceutical medicine).Metal composition and heavy metal limits were determined using Inductively coupled plasma optical Emission spectrometry [ICPOES]. This study revealed the rearrangement of aragonite crystals into calcite from by grinding, triturate with aloe vera juice, and incineration under controlled condition. Shankha is one of the calcium-enriched animal origin material used in Ayurvedic practice in the from of bhasma. The classical pharamcitical processings i.e shodhana and marana of shankha as elaborated in ayurvedic texts were implemented in the present study. Shankh Bhasma is a popular Ayurvedic formulation which is used in hyperacidity. Indigestion, ulcerractive,dyspepsia nad other peptic disorers. Shankha bhasma is widely used in the treatment of gastroesophageal reflux disease [GERD] patients. Marine by products like conches, pearls, mother of pearal shell, corals and so forth have been used by traditional Ayurvedic practitioners for centuries.

***Key Words*: Shankha(Coach), Shankha bhasma, Shodhana, Marana, Aragonite etc.**

1.INTRODUCTION

Shankh bhasma is a popular Ayurvedic formulation indicated for acidity and indigestion. [1,2] Recent studies have implicated the production of free radicals and lipid peroxidation in the development of ulcers. [3] Shankha Bhasma basically contains inorganic substances such as carbohydrates of calcium. Substance such as carbohydrates of calcium, Iron, Magnesium and calcium oxide, It is used for indigestion, Flatulence, abdominal pain, vomiting bleaching, diarrhea, bleaching and gastritis. ANC value of shank bhasma was calculated by Rosset-rice test ANC is a measurement of the overall buffering capacity again acidification for a solution. [4,5] Bhasma is a Ayurvedic metallic/ mineral treated with herbal juice nad exposed for certain quantum of heat as per puta system of Ayurveda, which it self is well known in indian subcontinent since vedic lore. [6,7] Moreovere shankha Bhasma provides a good supplementation of calcium as property supplementation of calcium as property manufactured Bhasma contains 61.36% of calcium in the from of CaCO3. [8] Which was the first antacid to be used. [9] On the basis of size conch can be divided into two varieties, big size. Conch and small size conch. The big size conch and small size conch. The big one measures 8-10" in length and 6-7" in breath, weight around 2.5 kg small size conch is generally 4' in length and 2-3" in breath[10] Shankha bhasma is used in disease like Amlapitta, Grahni, and Ajirna, Visha. [11] Shankha bhasma is a good source of calcium as property manufactured bhasma contains calcium in the from of calcium carbonate According to the classis of Ayurveda, shankha Laghu Guna, sheetal veerya etc had been widely used in the treatment of Amlapitta. Shankha bhasma is commonly prepared

from conch shell which is mentioned in several Ayurvedic literatures. [12] Conch (shankha) prepared as conch shell ash,known in Ayurveic literature as shankha Bhasma, is traditinolly used in Ayurvedic to treat many ailments. [13] Gastoesophageal reflux disese [GERD] is term used to describe symptoms of varying severity with or without endoscopially determined mucosal damaged and histological changes resulting from episodes of gastroesophageal reflux. The most common symptoms is heartburn, but acid regurgitation is also frequently seen. [14,15] Conch shell (shankha) is the hard calcareous shell of large predatory sea snails species. According to Rasatarangini, two types of shankha are mentioned: Dextrotated (Dakshinavarta) and Levotreated (vamavarta). Vamavarta is very common and hence is therapeutically usefull for preparing Ayurvedic medicines. [16] Rasa shastra, an integral part of Ayurveda, deals with the drugs of mineral origin, and details their varieties, characteristics, processing techniques, properties , therapeutic uses, possibilities of developing adverse effect and their management, etc. in acomprehesive way. [17] Animal product and by product are also an integral part of Ayurvedic pharmaceutics. Marine by products like conches, pearls, mother of pearl shells and corals have been used in Ayurvedic medicine for centuries.[18]

Bhasma and their ingredient:

2.Preparation of Trivanga Bhasma:

The preparation of trivanga bhasma involves two step, sodhana and marana process. In shodhana, naga [lead], Vang [tin] amd yasad [zinc] [26 g each] was detoxifixed by adding madhuka thailo. The compounds were then triturated with small amount of herbal powder such as ash wagandha sathavari, Yastimadhu, and tintrivik using a khalvam till a homogenous paste was formed. The obtained mixture was powdered i.e subjected to marana process, and transferred to an earthen crucible covered with a lid and sealed with sealing clay finally it was kept for calcintion [40 cow dung cake used to prepare 250 g of formulation]. The mixture is blended with kumara swars (Aloe vera juice) to from a cake. The cake on drying obtained yellow colour which is trivanga bhasma. [19]

2.1.Prepartion of Bhasma:

2.1.1.Procedure

The name Bhasma is generally applied to metallic and non-matallic substance that are subjected to the process of in cineration and reduction into ash [Table]. Here it is applied to the scientific basis for ayurvedic therapies metals minerals, and animal product that are by special process, calcinated in closed crucible in pits with cow dung cakes (puttam). [20]

Bhasma	**Ingredient**
Shankh bhasma	Shankh.
Abhrak bhasma	Mica
Halthiana bhasma	Charcoal of elephant tusk.
Jasada Bhasma	Zinc oxide.
Loah bhasma	Iron oxide.
Mandura Bhasma	Iron oxide.
Mayrapicha Bhasma	Ash of peacock feather.
Mukta Bhasma	Oxide of pearl.
Nag Bhasma	Lead.
Parade Bhasma	Mercury compound.

Steps used to prepare Bhasma:

1. **Shodhna:**

   In Ayurvedic, purification is called shodhana is the process through which the external and internal impurities of metal and minerals are removed.

   The following process are involved-

1. Elimination of harmful matter from the drug.
2. Modification of undesirable physical properties of drug.
3. Conversion of some of the characteristics of the drug different stage.
4. Enhancement of the therapeutic action.

2. **Marana:**

   Marana is basically a burning process or calcination. [21]

FIG. 1: PHARMACEUTICAL PROCESSING OF SHANKHA BHASMA


J-SIL
1000 ml

3.Evolution test-

3.1.Physiochemical analysis-

1. **pH-** Acidic/ alkaline nature of the substance can be determined by Ph, and in

this present study, the nature of conch ash was more basic [12:8] than raw conch shell [9:05].

2. **Loss on drying-** Loss on drying/ moisture content of conch ash was 0,45% detected by this method.
3. **Total ash-** Total ash value indicate that the quantity of non volatile inorganic material present in the drug. Ash value involves oxidation of component. It gives a percentage of inorganic constistuents of the sample. Total ash value of conch ash was 37.29%.
4. **Acid insoluble ash-** A/A value of the sample was the amount of ash insoluble in dilute Hcl. Acid insoluble ash of conch ash the present study was 0.96% which is within an acceptable limit of pharmaceutical standradization of indian medicine [PSIM].
5. **Water soluble ash-** WSA value of the sample is the amount of ash soluble in water. Water soluble ash of shankha Bhasma in the present study is 3.02%.[22]
6. **Qualitative and Quantitative analysis-** The qualitative analysis indicated that calcium was persent in conch Ash.[23]
7. **Partical size-** The screening of grain size analysis of conch ash was done by seaving through four different number of sieves. The degree of fineness of a powder is differentiated and express by thee particle size of the aperture of mesh of the sieve by which they pass.

Particle size detection of conch Ash by sieving:-

Percentage of conch ash particle pass through the siev	Mesh No.
100	20
100	40
99.58	80
96.19	100

3.2.Standardization techniques-

A. Primary test-

1) **Floting test-** If as small quantity of bhasma is sprinkled on water surface it should float on the surface.

2) **Fineness test-** On rubbing a small quantity of the sample between the finger it should enter into the lines on the fingers.

3) **Loss of metallic luster-** When visually examined preferably in presence of sunlight no metallic luster should be observed.

4) **Loss of metallic state-** This involves heating of very thin sliver sheet [600 nm] thickness along with a small quantity of bhasma to red hot for about 5 min. After cooling the sheet to room temperature, no trace of this sample should permanently stick to the silver sheet indicating no alloy formation take

place, thus confirming the metal has totally transformed into bhasma, it oxide from.[24]

B. Microbiological evalution-

The various microbiological evolution includes total viable aerobic count, total entero bacteriaceae and total fungi count, test for specific pathogen- E.coli salmonella spp: S. aureus, pseudomonas aeruginosa.[25].

C. Analytical evolution- The various modern analytical evalution include atomic absorption spectroscopy [AAS], Atomic force microscopy [AFM],X-ray Difraction[XRD]X-ray fluorescence[XRF], X-ray photo electron microscopy, Scanning electron microscopy[SEM], Transmission electron microscopy [TEM], Eniray Dispersive X-ray Analysis [EDAX] Infrared spectroscopy [IR], Inductivity coupled plasma-optical Emulssion spectroscopy [ICP-OES], FT-IR nad thermal uravimetric analysis [TGA].[26,27]

Analytical instrument and their purpose of analysis.

Sr no.	Instrument	Purpose
1	EDX-SEM	Chemical nature, size and morphology of particles;
2	TEM.AFM	Particle size, Size distribution.
3	EPMA	Distribution of individual element.
4	XRD	Phase analysis
5	XRF,PIXE analysis	Bulv chemical analysis after moving pellets.
6	ESCA	Electronic nature and oxidation state of metal.
7	Single crystal XRD	To confirm exact molecular structure of crystalline intermediate or product.
8	Extraction and chromatography	To extract out organic matter if any
9	HPLC,NMR,IR,MALDI and ESI-MS	Characterization of oraganic matter.
10	AAS or Ion chromatography.	Anion and cation analysis.

4.**Materials and Methods-** In the present review, all the formulation are reviewed from bharat bhaishayaj Ratnakar. Formlation that described, collected volume wise from five different volume of Bharat Bheshaja Ratnakar and again categorized according to its dosage from.[28]

5.Formulation containing shankha bhasma

Sr, no	Name of formulation	Dosage forms	Therapeutic Indication
1	Agnimukho rasa	Vati	Indigestion, pain Reguragition of abdomen.
2	Agnisandipano rasa	Vati	Loss of appetite indigestion, Acidity pain.
3	Lishiradi chuma	Churna	Bleeding, Disorder, Tubeculosis.
4	Duitiya kulathyadygm Ghruta	Ghruta	Heart disese, Gastro intestinal disorder, cough, fever.
5	Kapard Rasa	Vati	Diabetes.
6	Kasasanhara bhairava	Vati	Cough could, Loss of taste, loss of strength, skin disorder.
7	khadiradl	Vati	Mouth disorder.
8	Guduchyadi modak	Modak	Bloeding disorder urinary stone, Diabetes, White discharge
9	Gulmam debhasinho rasa	Vati	Fever, Anemia,Trust,bleeding, loss of appetite
10	Grahanigajendra vatika	Vati	Gastrointestinal pain, Fever, Pain, Acidity jaundice, Itching, Skin disorder.
11	Nishadi Lepa.	Lepa	Breast disorder
12	Nilakantha Rasa	Vati	Fever, Cough, Could
13	Palngyandi Gutika	Vati	Eye disorder.
14	Rakthasutashekhar Rasa	Vati	Diabetes and fever
15	Tritiya shankhadi Lepa	Lepa	Tumor, Lipoma.

6.Characterization of coach using modern Analytica technicque.

1. X-ray diffraction.
2. Scanning electron microscopy (SEM0 Analysis.
3. Praticle size analysis.
4. Thermogravimetric analysis (TGA).
5. Fourier transform Infra red (FTIR) Analysis.
6. Inductively coupled plasma optical Emmision spectrometry (ICPOCS).

7.Result & Discussion-

Shankha Bhasma is one of the important medicines used in various Ayurvedic Formulations. The characteristics of molluscs are descrbed as outer horny layer, a median prismatic layer of lime salts and an inner pearly nacreous layer. It is greatly variable in shape, structure and colour, forming an outstanding external feature in animal. [29] In the formulation of conch Ash various views, Methods are mentioned in the Ayurvedic text. In this study, liquid media for shodhan (purification) by steam baking was sesbania bispinosa due to the later described reason. A clinical study performed to evaluate the role of conch Ash in the treatment of Gastroesophageal reflux disorder (GERD) reveals thet conch shell purified by sesbania bispinosa. [30] In Marana (Incineration) Aloe vera is prevalent media for wet levigation of conch and other sudha verga material Aloe vera has silicate, and other elements in tace amount could iinterfere with the formation citrate, and none of the studies was performed by taking sesbania juice as media for wet levigation so far in this kind of research. Shankha is sold without cleaning, hence it was washed after soaking in hot water. This helps to remove the physical impurities like sand deposits further any sour liquid is recommended for complete purification of conches. [31] Fresh aloe vera pulp used for trituration had moisturate not less than 98% w/w, Ph 4.25-5, specific gravity

1.0040-10060 glcc and viscosity from 2-4 mp as reported earlier[32, 33] Thus, aloe veraa fresh juice helped to wet grind the calcium carobante particles smoothly, bind them easily during pellets formation and got dried in a short duration without leaving substantial inorganic residue after incineration. Most importantly modern pharmaceutical industry has been using biopolymers like chitosan alginate or k-carrageenan. [34] Shankha vati was prepared by method mentioned in rasatantrasara. An appropriate processing sequence was strictly followed and changes observed during each pharmaceutical steps were noted. Acetone treated and without acetone treated shankh bhasma and its results are shown. There is no any zone of inhibition shown after 18 hrs incubation at 37 degree Celsius were as levofloxacin and amikacin have shown zone of inhibition as control antibiotics so we can say shankha bhasma have not found any antimicrobial properties. Consequently it can be pointed that there is no effect of shankh bhasma on colitis and wound relate disease. But, in this present work, shank Bhasma shows positive effect on C. elegans in egg lying. However, Some Bhasma show effective on bacterial infection disease, reported by another research group. [35,36] Shankhabhasma (coach shell is a good calcium supplement. Shankh's outer epithelium contains aragonite which forms chambers. These chambers hold and bound to the crystals of aragonite, giving the shankha's shell it's stiffness. It's chemical constituents are carbonates of calcium, iron, Magnesium sulphate, phosphate and chloride. [37] Purified shankhabhasma has promising cytoprotective and anti-secretory action and that may be due to its oxidative stress negative action in gastric tissue. [38] In one of the study shankha- bhasma showed dose dependent reduction of ulcer index in indomenthacin treated rats as well as in rats subjected to cold restraint stress, when compared to control. [39] Deplication activity- shankha bhasma containing Lomashatan kalpa is used to remove unwanted hair from the body. A pilot study was conducted on 10 patients. Number of hairs, hair length and thickness were reduced significantly. No adverse effect was noticed on the skin. [40]

8.Conclusion-

Processed shankha (conch shell) is used frequently in the from of shanka Bhasma. In Ayurvedik medicine , which is very effective in ailment like hyperacidity, GERD, ulcerative, colitis , depilaction etc. Proper preparation of bhasma (in term of media, temperature, time and number of repitation of procedure) is mandatory for the desired pharmacological action as there is evidence that derivation of standered pharmaceutical procedure result in production of less potent medicines and expected pharmaceutical procedure result in production of less potent medicines and excepted clinical research is not achieved. Conch bhasma main ingredient used many ayurvedic formulation shankha bhasma is very useful for gastrointestinal disorder and it is recommended for many related disorder such as Amlapitta, Grahani, Udarashula, Parinamshula and Atisara etc. shankha bhasma acts as antacid, antispasmodic anti inflammatory and anti-diarrheal agent thus relieves symptoms related to the GERD.

In classic of rasshastra, shankha comes under sudha varga. In a composite pharmaceutical process of bhasma niraman, shankha renovates to more biocompatible bhasma from and hence causes direct enrichmen of its bioavilability purified shankha bhasma has promising cytoprotective and anti-secretary action and that may be due to its oxidative stess negating action in gastric tissue shankha bhasma preparation includes two major steps such as shodhana and marana. It is essential to follow all the procedures as per our classical texts for getting a good quality of bhasma. These procedures assist a reduction in the particle size which facilities better absorption and assimilation of the bhasma into the human physiological system and enhance the therapeutic utility of the drug.

Natural marine resouces like conch when processed meticulously as per the Ayurvedic classical texts can be transformed to calcite from of calcium carbonate. Incinerated conch being one of the important therapeutic agent in Ayurveda, if not prepared appropriately may not show desired clinical effect. The monograph thus developed may be helpful for quality control.

9.REFERENCES

1. The Ayurvedic formulary of india., Govt. of india, Ministry of Health and family planning, Dept. of Health., 2nd ed., vol,l,1978,192.
2. The united state pharmacopoeia, 22nd Edn., Mack publishing co., Easton,1990,1624.
3. Gutteridge Mc. Lipid peroxidation and antioxidant promoters of tissue damage. Clin chem 1995;41:1819-29.
4. Richa A., Kadam HM, Kdam ss, Paradakar AR; studies on shankha bhasma-1. Antacid activity evalution of shankha bhasma; Indian Journal of pharmaceutical science; 1997;59:254-256.
5. Rossett NE, Rice J. An in vitro evalution of efficacy of the more frequently used antacid with particular attention to tabalets. Gastoenterology.1954;24:490.
6. Pandith S, Sur TK, Juna U, Bhattacharya D and Debnath PK, Antiulcer effect of shankha journal of pharmacology,32(2000)378-80.
7. Bhaishajya Ratnavali. Shastri RD, editor, 18th edition Varanasi: Chowkam bhasma shritasamstana.(2005).
8. Dr. chandeep pharmaceutic O-analytical standardization of shankha bhasma W.S.R to puta, Department of Rasashastra and Bhaishajya kaplana, uttarakhand Ayurveda University, Rishikul campus, Haridwar.2015.
9. Apoorva bhatt role praval pistibhasma on hyperacidity-2003.
10. Reddy KRC. Rasa shastra, chaukhambha Sanskrit Bhawan, Varanasi, 2007;529-533.
11. Sharama sadanand, Rasa taringini, shankha divigyaniyo Taranga, 12/21.Delhi;Motilal Banarast Das, delhi,11 edition,2009;288.
12. Reddy KRC, Ocean of Ayurvedic pharmaceutics. 1st end. Chaukhabha Sanskrit Bhawan:Varanasi:2007'
13. Wikipedia shank. [(accessed on 10 september 2018)]; Available online : https://en.Wikipwdia.org/wiki/shankh.
14. Spechler SJ. Epidemiology and natural history of gastro-oesophageal reflux disease. Digestion.1992;51:24-9[pubmed] [google scholar].
15. Joelsson B, Johnsson F. Heartburn- the acid test. Gut. 1989;30:1523-5 [PMC free article] [pubmed] [google scholar].
16. Mookherjee B: Rasjalanidhi (ocean of Indian chemistry, medicine and Alchemy0, Srigokul Mudranalaya, Varanasi, Edition 2nd, part 2, 1984:220.
17. Galib, Barve M, Mashru M, Jagatap C, Patgiri BJ, prajapati pk, Therapeutic potentials of metals in ancient India ; a review through charkha samhita. J Ayurveda Integr, med. 2011:2;55-63.

18. Chavan, S., Tayade, S., Gupta, V., Deshmukh V., and Sardeshmukh, S(2018). Pharmaceutical standardization and physiochemical characterization of Traditional Ayurvedic marine Drug: Incinerated conch shell (shankh bhasma).Marine drug, 16(11), 450.
19. Pandit S, Biswas TK, Debnath PK, saha AV, Chowdhury U, shoe BP, sen S nad mukhrijee B [1999], J Ethnophamacol 65:149-156.
20. Frawley D, Lad V. Delhi, India: motilal Banarsidass publishcr pvt, ltd ; lggu, Tha Yoga of herbs; P560 (google scholar)
21. Uthed,Moshy- year bookInc ; 1994,Mosbis Medical, Nursing and Allied Health Dictionaey; P. 243 (googal scholar).
22. Annonymous.(1987) pharmacopeia standards for Ayurveda formulation central council for research in Ayurveda and siddha , New Delhi , 1st edition 488-496.
23. Annonymous (1987). Pharmacopeial standard for ayurvedic formulatin, central council for rescarcha in Ayurveda and Siddha, New Delhi, 1st edition-53.
24. Shudaldev mohaptra, physic chemical characterization of ayurvedic bhasma [shankh bhasma] an in approach to standardization, International Journal of Ayurveda Research/,2010,82-83.
25. Arun sudha, standardization of metal-based Herbal medicine American Journal of infectious Diseases 5(3), 2009, 193-199.
26. Kaloiselvan, Quality assessment of different marketed brand of Dasamoolaristm an Ayurvedic formulation. International Journal of Ayurveda Reserch |/(1), 2010, 10-11.
27. Arvind kumar sharma, A rapid and simple scheme for standardization of poly Herbal drugs, Indian Journal of green pharmacy, 2010, 134-135.
28. Shah Nagindas C, Bharat Bheshajya Ratnakar, volume I to volume B. Jain published pvt Ltd. New Delhi 2nd edition, 1999.
29. Anonymous. The weath of india-A Dicitionary of indian raw materials and Industrial product, Raw Materials L-m. 1st end. Volume VI council for scientific and Industrial Research publications Delhi, India: 1962.pp. 397-406 [goggle scholar].
30. Rande, M., and chary, D.L. (2013). Comparison of two purification product of shankha bhasma: A prospective randomized control trial. Journal of natural science, biology, and Medicine, 4(1), 160.
31. Borkar S.B. saarth Rasachndanshu. 3rd ed. Shree Gajanan Book Depto; Mumbai, India: 1983.P.68.[Google scholar].
32. Chanegara v.k .,varshney A.K. Aloe vera L.processing and product: A review Int .J.Med .Aromatic plant. 2013; 3: 492-506[Google scholar].
33. Tambe R., Kulkarni M., Aney J.A., Gilani I.formulation and evaluation of aloe vera gels.J.pharm. Res.2009;2:1588-1590.[Google scholar].
34. Diaz-Dosque M.,Arandae.,Darder M.,Retuert J.,Yazdani-pedram M.,Arias J.L.,Ruiz – HitzkyE use of biopolymers as Oriented supports for the stabilization of different polymers of bio-minerlized calcium carbonate with complex shape.J.cryst .Growth.2008;310:5331-5340.doi:10.1016/J.j crysgro. 2008.08.057.[Google scholar].
35. Singh RK, Kumar S, Aman AK, kumars ,karim SM and Karm,study on physical properties of Ayurvedic Tamra Bhasma as Nanomedicine ,of Ayurveda and integrative medicine ,(2017) 1-6.
36. Tambekar DH and Dahikar SB Screening antibacterial activity of some bhasma against enteric pathogens. Recent Research in Science and Technology 2(2010) 59-62.
37. Damoder vachaly Dharmesh, Das Arun Kumar., A chemical, pharmacological and therapeutical overview of shankha, shukti and varatika, PIJAR, 2016;(I):26-32.
38. Sur T.K., Pandit s.,sens., Bhattacharyya D. and Debnath P.K., Anti-ulcer activity of Shankha Bhasma, Exploratory Animal and medical Research, 2013; 3(1): 48-56.
39. S.Pandit S.,Sur T.K., jana U., Bhattacharyya D., Debnath P.K. antiulcer effect of shankha bhasma in Rats: A preliminary study, Indian Journal of pharmacology 2000; 32: 378-380.
40. Chondicar shailaja, more manjusha, To study the effect of the mineral compound as hair removal. International Journal of ayurvedic and herbal medicine July-Aug. 2015; 5(4): 1853-1860.