

## PHARMACEUTICAL STUDY OF SHANKHADRAVARASA: A SOLVANT OF CONCH SHELL.

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### ABSTRACT

**Background:** *Shankhadravarasa* is an Ayurvedic formulation indicated in the treatment of *Gulma* (Lump in the abdomen), *Udar* (Ascites), *Pleeha* (Splenomegaly) and is a potent digestive. *Shankhadravarasa* literally means a herbo-mineral preparation which is efficient in dissolving / liquefying a conch shell. **Objectives:** The present study is attempted to prepare *Shankhadravarasa* as per the classical reference and the yield is studied for its properties along with its effect on conch shell. **Method:** The raw drugs are procured from market, transferred to required form and subjected to heat in *Nadi Yantra*. Distilled liquid is collected as *Shankhadravarasa*. The *Shankhadravarasa* is subjected to organoleptic characteristic tests. **Results:** P<sup>H</sup> and its effect on conch shell are observed. Collection of *Shankhadravarasa* is seen in collecting pot which is 90ml in quantity obtained from 504gm of raw drugs. **Conclusion:** This is a yellow, corrosive, sour liquid having 1.8 P<sup>H</sup>. A piece of conch shell is dipped in it; the conch shell gets completely dissolved. It should be studied further for its properties as *Deepan* (Appetizer) and *Pachan* (Digestive) and efficacy in diseases like *Gulma*, *Udar*, *Pleeha* etc.

**Keywords:** *Ayurveda*, *Rasshastra*, *Shankhadravarasa*, P<sup>H</sup>, Ayurvedic Acid, *Nadiyantra*

### INTRODUCTION

*Rasshastra* as an important branch of *Ayurveda* developed in the medieval and early modern period in India. In this period, the use of minerals and metals became more popular and development of many dosage forms, formulations took place. *Shankhadravarasa* is one among such preparations. The literal meaning of the *Shankhadravarasa* is that which liquefies/dissolves the *Shankha* (Conch shell). *Shankha* is hard calcareous structure of animal origin (snail) which mainly contains carbonate of calcium, Iron, Magnesium, Sul-

phate, Phosphate and Chloride. *Drava* means to liquefy and *Rasa* suggests formulation, hence the formulation which liquefies the hard shell is *Shankhadravarasa*. About fourteen different formulations are compiled in *Rasyogsagar* text written by Vd Pandit Hariprapanna Sharma. The formulations give details regarding standard operative procedure during preparation and also mention various therapeutic uses of the formulation *Shankhadravarasa*. The literature shows the various ingredients have been used in the

preparation of *Shankhadravrasa* but the method of preparation is distillation. The *Shakhdravarasa* is indicated in diseases like *Gulma*, *Pleeha*, *Udarroga*, *Ashtavidhshool*, *Ajirna*, *Mandagni*. Despite this, no sufficient data is available for preparation of *Shankhadravrasa*. So here is an attempt to study the preparation and analysis of *Shakhdravarasa* following the literature and interpret the observations and results.

**Materials and Methods:** - The literature review is done to decide the standard operative procedure for

the preparation of *Shankhadravrasa*. After thorough study of the available literature regarding the *Shankhadravrasa*, the formulation given by text Vaidyavilas written by Raghunathpandit was adopted for the preparation of *Shankhadravrasa*. The quotation of the formulation is compiled in text *Rasyogsagar*.<sup>1</sup> All the material used in the preparation was procured from the local market and authentication is done by the experts.

**Table 1:** Ingredients used for the preparation of *Shankhadravrasa*

Number	Drug name	Chemical/Botanical Name	Quantity/Part
1	<i>Sphatika</i>	Alum	48 gm.
2	<i>Saidhava</i>	Rock salt	48 gm.
3	<i>Navasadar</i>	Ammonium Chloride	96 gm.
4	<i>Suryakshar</i>	Potassium nitrate	192 gm.
5	<i>Kasis</i>	Ferrous Sulphate	24 gm.
6	<i>Yavakshar</i>	Alkali preparation of Barley	96 gm.

**Equipments:** The preparation of *Shankhadravrasa* is done by distillation method hence for the preparation specially designed apparatus *Arka Yantra (Nadi Yantra)* is used.<sup>2</sup>

**Process:** All the mentioned ingredients in Table No.1 are weighed and coarsely powdered separately. All the powdered material then mixed thoroughly and added into the earthen pot which is layered with mudded cloth previously, the lid with rubber tube is placed over the pot. *Sandhibandhana* (closure of joints) is done at the edges of lid and pot opening by closing

tightly with mudded cloth. The whole apparatus is then kept aside for drying the *Sandhibandhana*.

After drying properly the whole apparatus is kept on gas stove carefully and medium heat is given for 3 hours. After 40 minutes of heating fumes started coming out from the attached rubber tube. The fumes then collected in the glass beaker which was kept in water filled pot. The fumes get liquefied due to condensation. After completion of heating process a yellowish liquid from the beaker is obtained and stored in glass bottle with rubber cork carefully.

**Chronological Photographs:-**

**A. Photographs of Ingredients**

**Figure 1 Sphatika**



**Figure 2 Saindhav**



**Figure 3 Navasadar**



**Figure 4 suryakshara**



**Figure 5 Kasis**



**Figure 6 Yavkshara**



**B. Photographs of preparation and collection of Shankhadravrasa**

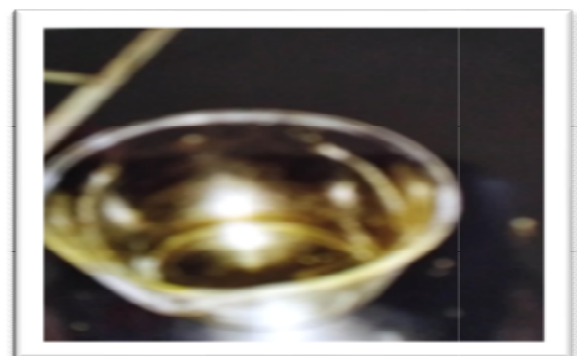
**Figure 7 All drugs mixed and kept in pot.**



**Figure 8 Nadi Yantra during process**



**Figure 9 Collected Shakhdravarasa**



**Figure 10 Stored Shakhdravarasa**



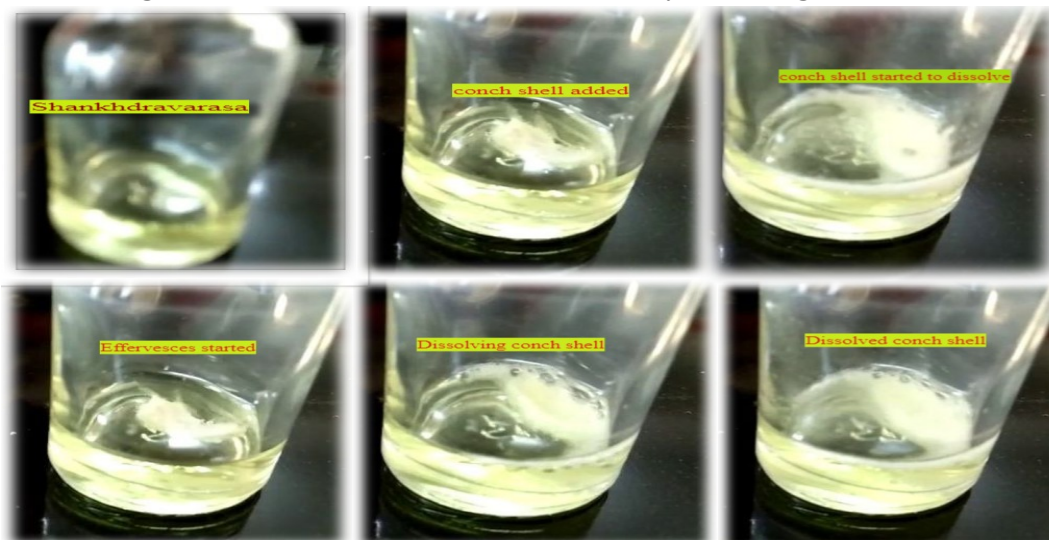
**Analytical study:-**

Physical analysis is done with organoleptic characters like color, smell, taste and  $P^H$  of liquid. A piece of conch shell is added to the liquid to check its liquefying property.

$P^H$  of *Shankhdravrasa*: For the  $P^H$  calculation digital  $P^H$  meter is used. 1ml of *Shankhdravrasa* is placed in digital  $P^H$  meter. The steady reading obtained after 1 minute is noted. The procedure is repeated for three times with proper cleaning of instrument each time.  $P^H$  of the liquid is noted with  $P^H$  paper also.

**Confirmation test for liquefying property of**

*Shankhadravrasa*: The texts which have mentioned the procedure of preparation *Shankhadravrasa* also mentioned the confirmation of it. The liquid which is obtained as final product of the preparation liquefies the conch shell, cowry or auspicious stones. This confirmation was done with a piece of conch shell. A small piece of conch shell about 1 gm. in weight was added to 2 ml of *Shankhadravrasa* and changes in it were observed.

**Figure 11 Shankhadravrasa confirmation by dissolving conch shell**

**Observations & Results:** The changes observed during the preparation of *Shankhadravrasa* are as follows:

1. The fumes from the rubber tubes started to appear after heating the material for about 40-45 minutes,
2. The initial fumes were low, but at the middle fumes appear strongly and gradually diminished and there were no fumes in last 45 minutes.
3. The color of the fumes was yellowish.
4. Strong acidic smell during the procedure experienced in the surrounding area.
5. Complete dissolution of conch shell took place in 1 min after adding it to the *Shankhadravrasa*.

**Table 2:** Results of analytical study

Sl. No	Parameter	Observation
1	Color	Yellowish
2	Smell	Strong acidic
3	Taste	Sour
4	P <sup>H</sup> ( Digital P <sup>H</sup> Meter)	1.8
5	P <sup>H</sup> (P <sup>H</sup> paper)	Between 1-2
6	Quantity obtained	90 ml

## DISCUSSION

About fourteen different formulations are found in different texts which are compiled in the text *Rasayogsagar*.<sup>3</sup>

**Table 3:** List of formulations of *Shankhadravrasa* with the ingredients

Sl. No.	Formulation	Ingredients
1	<i>Shankhadrava Prathama</i>	<i>Kshara of Arka, Snuhi, Til, Ashwatha, Chinch, Apamarga, Chitraka, Sajjikshara, Tankana, Samudraphena, Godanti, Kasis, Suryakshara, Panchalavana, Amlarasa</i>
2	<i>Shankhadrava Dvitiya</i>	<i>Spatika, Saindhava, Yavkshara, Navsadar, Suryakshar, Kasis</i>
3	<i>Shankhadrava Tritiya</i>	<i>Spatika, Navasadar, Sajjikshar, Shudha Gandhaka</i>

4	<i>Shankhadrava Chaturtha</i>	<i>Samudraphena, Yavkshar, Suryakshara, Navasadar, Sphatika, Saindhav, Souvarchal, Kasis</i>
5	<i>Shankhadrava Panchama</i>	<i>Panchlavana, Tuttha, Kharpar, Sphatika, Navasadar, Kasis, Suhaga, Sajjikshara, Yavkshara, Suryakshara</i>
6	<i>Shankhadrava Shasthama</i>	<i>Vishanti Vruksha Kshara( Ksharpradhana Vruksha), Panchlavana, Navsadar, Yavkshara, Chanadrumkshara, Tankana. Tutha, Manashila, Hartal. Gandhaka, Sajjikshara, Shilajatu, Kasis. Mutravarga, Gruhadhum, Bhukshara</i>
7	<i>Shankhadrava Saptama</i>	<i>Dwadashja Vruksha Kashara, Panchalavana, Kasis, Tankana, Gandhaka, Sajjikshara, Sphatika, Navasadar, Amlavarga, Mutravarga</i>
8	<i>Shankhadrava Asthama</i>	<i>Parad, Hingula, Hartal, Kasis, Romaka lavana, Vatsanabha, Tuttha, Manashila, Sphatika, Navasadar, Tankana, Panchalavana, Dwadash vruksha Kshara, Jambirphal Satva,</i>
9	<i>Shankhadrava Navama</i>	<i>Kshara of Snuhi, Arka, Chinch, Ashwatha, Apamarga, Suhaga, Yavkshara, Sajjikshara, Panchalavana, Hingu, Hartal, Souveeranjana, Navsadar, Somal, Godanti, Sonamukhi, Gandhaka, Parad, Vatsanabha, Shankha, Shankhanabhi, Sudha, Manashila, Kasis, Amlavetasa, Amlavarga</i>
10	<i>Shankhadrava Dashama</i>	<i>Somal, Yavkshara, Sajjikshara, tankana, Sphatika, Panchlavana, Suryakshara, Navsadar</i>
11	<i>Shankhadrava Ekadashama</i>	<i>Kshara of snuhi, satala, chinch, palasha, kadali, til, apamarga, kaparda, shankha, Parad, panchalavana, Gandhaka, Sphatika, Suryakshara, Kasis, Navsadar</i>
12	<i>Shankhadrava Dwadashama</i>	<i>Shankha, Yavkshara, Sajjikshara, Suhaga, Panchlavana, Sphatika, Navsadar</i>
13	<i>Shankhadrava Trayodashama</i>	<i>Suvarnamakshika, Kansyamakshika, Roupyamakshika, Rasanjana, Samudraphena, Sajjiksara, Sambharlavana, Suhaga, Navasadar, Sphatika, Yavkshara, Shudha Kasis, Hartal, Manashila</i>
14	<i>Shankhadrava Chaturdashama</i>	<i>Kshara of Vasa, Chitraka, Apamarga, Chinch, Kushmanda, Snuhi, Talpuspa, Punarnava, Vetas, Yavksara, Sphatika, Navasadar, Saindghav, Tankana, Kasis, Mrudarshringa, Samudraphena, Darumoch</i>

After literature search, it is observed that all the formulations contain the ingredients having characteristics of *Lavana* (salts) and *Ksharas* (Alkalis). The quantity of *Lavana* and *Kshara* differs in different formulations. Hence it is decided to select the formulation considering the availability of the drugs and minimum ingredients mentioned in the formula. The

formula given by Vaidyavilas compiled in Rasyogsagar as *Shankhadrava dwitiya* is selected for the pharmaceutical study of the *Shankhadravasa*. The formula contains only six ingredients for the preparation while other references are with more ingredients in it. This selection of formula plays an important role in making pharmaceutical study easy and focused.

**Table.4:** Details of selected formulation of *Shankhadravasa*

Sl. No.	Name of ingredient	Description	Therapeutic uses
1	<i>Sphatika</i> (Alum)	White, crystalline, transparent, sour in taste, dissolves in water	<i>Vrana-ropana, grahi, lekshana, keshya, danta dardhyakara, Vishaghna, raktasrava rodhaka<sup>4</sup></i>
2	<i>Saindhava Lavan</i> (Rock salt)	Whitish and pinkish crystal, salty in taste, dissolves completely in water	<i>Tridoshashaman, Hridya, deepana, rochana, Netrya, vrishya, Mruduvirya<sup>5</sup></i>

3	<i>Navsadar</i> (Ammonium chloride)	Strong smell of ammonia, crystalline, salty and sour in taste, Dissolves in water and water becomes cold after reaction	<i>Tridoshahara, deepan, pachana, loha dravaka, phlihaprashamana</i> , <sup>6</sup>
4	<i>Suryakshara</i> (potassium Nitrate)	Crystalline white, moderately soluble, sour taste	<i>Asmari, Mutrakricha, Agnimandya, Pandu, Pramehahar, Vidagdaajirnanashana</i> <sup>7</sup>
5	<i>Kasis</i> ( Ferrous sulphate)	Green crystalline, on heating becomes white	<i>Keshya, netrya, shleshmahara, vishahara, balya, rajah pravartaka, raktasanjanana</i> <sup>8</sup>
6	<i>Yavkshara</i>	White amorphous in nature, salt and sour in taste	<i>Gulmaphliha har, Udarshool, Kantharoghara, Amlapittahar</i> <sup>9</sup>

Preparation of *Shankhadravrasa* is carried out by following Distillation, so it can be included under *Arka Kalpana*. The formulation not contains conch shell but it is capable of dissolving it so the name *Drava* is given. Even though *Damaru yantra* is explained in the formulation a modification is done instead of inverted pot a lid is placed over the lower pot and drilled a hole in it. A rubber tube is inserted and *Sandhibandhana* is done, another end of tube is inserted in collecting pot which is placed in water vessel. This modification facilitated proper collection of fumes and condensation to obtain *Shankhadravrasa* in liquid form. No liquid or *Amla rasa* is added in this formulation like other formulations. Classically *Badariindhana* (Wood of *Badar*) is used as heat pattern so medium heat is given for three hours using gas stove. During the procedure yellowish fumes emerged out with strong acidic smell which further converted into yellowish liquid. The yield obtained of *Shankhadravrasa* is 17.85%. Strong smell and P<sup>H</sup> suggests the nature of *Shankhadravrasa* as acidic and corrosive. The classical confirmative test also suggests the nature of *Shankhadravrasa* as acidic and corrosive as effervesces appear on addition of conch shell piece into the *Shankhadravrasa* and get completely dissolved in it. Due to this, proper safety measures needed to be followed. This is also explained by the term *Dantasparshavivarjita* (should not touch the teeth) while consumption.

The *Amla rasa* (sour in taste) is *Rochana* (reduces tastelessness), *Deepana* (stimulate appetite), *Pachana* (improves digestion). *Amla rasa* strengthen the sense organs, promote strength and alleviate *Vata*. Here

strong acidic nature (*Amla Rasa* of the formulation) probably helping in the treatment of *Ajirna, Gulma, Pleeha. Udarshool* as *Agnimandya* is the main cause of this diseases.<sup>10</sup>

## CONCLUSION

*Shankhadravrasa* is exclusive preparation. The formulation used in this study gives outcomes with minimum raw drugs hence this reference is useful in preparation of *Shankhadravrasa* in large quantity also. *Shankhadravrasa* is yellowish liquid with strong smell and acidic P<sup>H</sup> with corrosive nature so it must be used in diluted form only and with utmost care. Through available literature review it is observed that it is used in various disorders like *Gulma, Udarshool, Udar, Mutrakrichha, Ashmari*. It should be studied further for its properties as *Deepan* (Appetizer) and *Pachan* (Digestive) and mode of action in diseases like *Udar, Pleeha, Ashmari*.

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