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Pharmaceutical & Analytical Standardization Of SHANKHA DRAVA

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Abstract

Ayurveda is a traditional medicinal system of Indian sub- continent followed by centuries together by the people of India. Rasa shastra is the latrochemistry of Ayurveda which deals with the formulations containing herbals, metals & minerals. Various Kalpanas like Kharaliya Kalpana, Parpati Kalpana, Pottali Kalpana, Dravaka Kalpana etc are mentioned in Classical text of Rasa Shastra. Shankha Drava is one such Dravaka Kalpana which one mentioned in our classics. It is a liquid preparation obtained by processing of Lavana (salt) and Ksharas (alkaline materials) by distillation process. In this era of globalization it is the need of time to explore the scientific bases of procedures and medicaments of Ayurveda. The primary responsibility of the Ayurveda fraternity is to establish the scientific information regarding the preparation of the medications.

Keywords: Dravaka Kalpana, distillation process, Lavana, Kshara

Introduction

"Dravaka'' means the one that causes to liquefy or melt [(1)]. Dravakas are unique preparation of Lavana & Ksharas by Tiryaka patina yantra (distillation apparatus) process with or without addition of fluids [(2)]. The reference of Drava was first introduced in Rudramalaya Tantra as Agni Drava prepared by using Amla Rasa Dravyas [(3).] Shankha Drava is a liquid dosage form and a unique classical formulation found in some Ayurvedic classics of Rasa Shastra such as Rasa Yoga Sagara (14 Yogas) [(4),] Bhaishajya Ratnavali (03 Yogas) [(5)] and in Rasa Tarangini (03 Nirjala Shankha Drava & 01 Sajala Shankha Drava) [(6).] Among those of the Shankha Drava mentioned in classical text book Rasa Tarangini (Prathama) [(7)] reference was selected for the pharmaceutical & analytical study. It contains eleven ingredients such as Shuddha shankha churna (*Conch shell Powder*), Tankana (*borax*), Sphatika (*potash alum*), Yava kshara (*potassium carbonate*), Svarji kshara (*sodium bicarbonate*), Navasaadara (*ammonium chloride*), Saindhava lavana (*Rock salt*), Samudra lavana

(*sodium chloride*), Vida lavana (*black salt*), Souvarchala lavana (*unaqua sodium chloride*), and Romaka lavana (*lake salt*) [8]. It is indicated in agnimandya (anorexia), visuchika (pricking pain in abdomen), grahani (sprue), mutrakrichcha (dysuria), gulma (abdominal tumors), plihodara (splenic disorders), udararoga (abdominal disorders), ashtavidha shoola, arsha roga (hemorrhoids), udara krimi (intestinal worms), and all types of 'chardi roga' (vomiting) [9].

Materials and Methods

Genuine and authenticated raw drugs Sshankha, Tankana, Sphatika, Svarji kshara, Navasaadara, Saindhava lavana, Samudra lavana, Vida lavana, Souvarchala lavana and Rromaka lavana were procured from Gola Dinanath (Local market of Varanasi) except Yava kshara was procured from Ayurverdhanam pharmaceuticals, Chhatarpur, Madhya Pradesh and authenticated by the experts of Department of Rasa Shastra & Bhaishajya Kalpana, Faculty of Ayurveda, IMS, BHU, Varanasi.

All the pharmaceutical procedure of Shankha Drava like shodhana of selected ingredients (Shankha shodhana, Tankana shodhana, Sphatika shodhana, and Navasaadara shodhana) were done step by step as per the classical guidelines, with proper care in practical laboratory of Department of Rasa Shastra and Bhaishajya Kalpana and finally three sample of Shankha Drava was prepared.

Table 1: Wt loss during the Pharmaceutical Procedure (Shodhana of Shankha Drava dravya) with Reference

S. No.	Name of Drugs	Weight of Drugs		Net Loss	Reference
		Before Shodhana	After Shodhana		
1.	Shankha[10]	100 gm	98.98gm	01.02gm	RT 12/6-7
2.	Tankana[11]	100 gm	85.00gm	15.00gm	RT 13/77-78
3.	Sphatika[12]	100 gm	78.00gm	22.00gm	Ay P 2/258
4.	Navasadara[13]	100 gm	95.00gm	05.00gm	RT 14/3-4

Preparation of Shankha Drava -

The above mentioned eleven ingredients are taken in equal quantity (27 gram each) and ground to fine powder separately; they were mixed manually in equal proportion with slight addition of water to obtain homogenous mixture and kept in round flask container of distillation apparatus and heated with heating mantle. During the whole procedure temperature was gradually increasing and maintained at 70ºC. After 2 hours vapors were formed, moved upward and gone through condenser. In condenser, vapors converted in to liquid form and collected in collecting vessel.

Initially raw materials were grey in colour, changed in to yellow colour after melted and finally converted in to brown colour. After 2 hours at 50ºC vapors was coming out and move upwards, vapors condensed in to condenser and changed in to liquid stage and collected in to collecting vessels. During whole processing a peculiar smell was observed and after completion of procedure, the smoke like appearance remained in round bottom flask for another half an hour.

The total yield of Shankha Drava obtained out of 300gms of raw material was 81 to 85ml in total duration of 6:00 hours to 6:30 hours. On repeating the procedure for several times with same quantity of raw material the average yield was 8-10%.Thus it can be inferred that the average yield doesn't exceeds 10%.

Table 2 – Showing details of different samples of Shankha Drava.

Observations	Sample I	Sample II	Sample III
Quantity of Raw Materials	300 gms	300 gms	300 gms
Before processing	Gray in colour & solid stage, Homogenous mixture	Gray in colour & solid stage, Homogenous mixture	Gray in colour & solid stage, Homogenous mixture
During processing	Homogenous mixture was melted; vapors were coming out after 2.5 hr and condensing into liquid, gray colour changed into yellow.	Homogenous mixture was melted; vapors were coming out after 2.5 hr and condensing into liquid, gray colour changed into yellow.	Homogenous mixture was melted; vapors were coming out after 2.5 hr and condensing into liquid, gray colour changed into yellow.
After processing	Colour of raw material was changed into brown colour and solid in stage, Colourless Drava was procured in liquid stage with pungent smell.	Colour of raw material was changed into brown colour and solid in stage, Colourless Drava was procured in liquid stage with pungent smell.	Colour of raw material was changed into brown colour and solid in stage, Colourless Drava was procured in liquid stage with pungent smell.
Temperature	Whole raw material was kept at 70ºC	Whole raw material was kept at 70ºC	Whole raw material was kept at 70ºC
Total duration	6:30 hr	6 hr	6 hr
Quantity of Shankha Drava	85 ml	81 ml	81 ml
Percentage yield	28%	27%	27%

Analytical Methods

Organoleptic analysis: Organoleptic analysis is an important tool to study the specific characters of samples of Shankha drava, which involves the smell, taste and colour confirm the quality of Shankha Drava samples.

Physicochemical analysis: Physicochemical analysis of samples of Shankha Drava were carried out by following the standard methods for determination of pH, specific gravity at 25^0C, total solid content, total ash and refractive index.

Table-3 Organoleptic analysis of Shankha Drava Samples

Organoleptic Test	**Sample I**	**Sample II**	**Sample III**
Smell	Pungent	Pungent	Pungent
Taste	Saline	Saline	Saline
Colour	Colourless	Colourless	Colourless

Table-4 Physicochemical analysis of Shankha Drava Samples

Physicochemical Test	**Sample I**	**Sample II**	**Sample III**
pH	7.85	8.03	8.03
Specific gravity at 25^0C	1.0026834	1.0044723	1.0044723
Total solid content	0.02gm	0.05gm	0.05gm
Total ash	0.03gm	0.04gm	0.04gm
Refractive index	1.346	1.342	1.342

Discussion-

Ayurvedic pharmaceutics having its own basic principles for making of ayurvedic dosage form. Under the concept of samskara, various processes are explained for manufacturing the different dosage form by using a variety of processes like heating, washing, churning, drying etc [15-22]. Several advancements are being observed in the last decade regarding development of metal or mineral based drugs [23-34].

In this study, the main emphasis was to standardize the pharmaceutical process of Shankha drava and evaluate the final yield of Shankha drava.

The identification and authenticity of the raw drugs that are being used is the main obstacle we are facing here. It is challenging to select the real sample when there are numerous counterfeit versions of the same drug accessible on the market. Using the assistance of classical literature, the opinions of various pharmacies,

raw drug sellers, traditional classical vaidyas, and the knowledgeable senior teaching staff of Rasa Shastra and Bhaishajya Kalpana, bottlenecks in the process of drug identification and verification were removed.

Shodhana is one of the important processes of Rasa Shastra which is responsible for the remove of unwanted substances and also adding some medicinal properties by using selective shodhana media. Different shodhana media is used for the purification of different materials as per classical references.

All the ingredients of Shankha Drava are converted into coarse powder form with the help of khalva yantra and filtering in sieve size no. 44, mixed manually to obtain homogenous mixture. This mixture of Shankha Drava is carried out in distillation apparatus of round bottom flask and kept over heating mantle and add 10 ml of water to initiate the process for providing moisture. Hence if no moisture (water) present in the mixture, there is no reaction can be found between the drugs to get distilled and the Shankha drava is not obtained. So in order to obtain the Shankha drava, distilled water is used with homogenous mixture and finally Shankha Drava preparation is successfully obtained. A peculiar smell of Shankha Drava is observed, during the vapors starts to coming out and is colourless (watery appearance) with pungent smell. The yield obtained of Shankha Drava sample I, II and III are 25%, 27% and 27% respectively.

The probable mode of action of Drava is possible because of the Ushna Virya, Tikshna Guna, Deepana, Pachana and Shoolaghna properties of its ingredients. Shankha Drava, an alkaline preparation, its main ingredients are Kshara which is alkaline in nature [(14).] Sodium bicarbonate and potassium bicarbonate are the main ingredients present in Svarji Kshara and Yava Kshara respectively. Shankha Drava helps in subsidizing the Annadrava shoola and Udara shoola due the presence of sodium bicarbonate and potassium bicarbonate.

Conclusion

Shankha Drava is a distilled preparation; mainly it is prepared with Lavana and Kshara Dravyas and indicated in gastrointestinal disorders as it possesses the properties like deepana, pachana and grahi. Its nature being alkaline and action over the acidic environment of gastrointestinal tract can be further supported. Therefore, this is the need for an hour to carry out research on experimental and clinical ground to establish its therapeutic utility.

References

1. Kantha DR, Shabda Kalpa Druma, 1st ed. Delhi, India: Naga Publishers; 2002.p.118.
2. Anonymous. Ayurvedic Formulary of India, 2nd ed. Part 1. New Delhi, India: Government of India: Ministry of Health and Family Welfare; 2000.p.159.
3. Dwivedi VN, Bharatiya Bhaishajya Kalpana Vijnana, 1st ed. Varanasi, India; Chaukhambha Krishnadas Academy; 2006,p.317.
4. Sharma S, Sakaradi Rasa, In: Rasayoga Sagara. Vol 2, Varanasi, India: Chaukhambha Krishnadas Academy; 2011.p.418-22.
5. Mishra SN, Siddiprada Hindi commentary on Bhaishajya Ratnavali, 1st ed. Varanasi, India; Chaukhambha Surbharati Prakashan; Plihayakritirogadhikara, 41/170-174, 2015.p.760.
6. Sharma S, Rasatarangini, In: Shastry K, editor. 11th ed. New Delhi, India: Motilal Banarasidas; 2004,12/35-55,p.290-293.
7. Sharma S, Rasatarangini, In: Shastry K, editor. 11th ed. New Delhi, India: Motilal Banarasidas; 2009,12/35-39,p.290-291.
8. Sharma S, Rasatarangini, In: Shastry K, editor. 11th ed. New Delhi, India: Motilal Banarasidas; 2004,12/35-55,p.290-293.
9. Sharma S, Rasatarangini, In: Shastry K, editor. 11th ed. New Delhi, India: Motilal Banarasidas; 2004,12/40-42,p.291.
10. Sharma S, Rasatarangini, In: Shastry K, editor. 11th ed. New Delhi, India: Motilal Banarasidas; 2004,12/6-7,p.285-286.
11. Sharma S, Rasatarangini, In: Shastry K, editor. 11th ed. New Delhi, India: Motilal Banarasidas; 2004,13/77-78,p.318.
12. Sharma Mishra G, Ayurveda Prakash, In: Sharma S, editor. Varanasi, India: Chaukhambha Bharati Academy; 2007, 2/258, p.322.
13. Sharma S, Rasatarangini, In: Shastry K, editor. 11th ed. New Delhi, India: Motilal Banarasidas; 2004,14/3-4,p.326.
14. Jibkate BR, Rathi BJ, Wanjari AS, Rajput DS. Critical review on pharmaceutical prospects of acid formulations described in Ayurveda classics with respect to Dravak Kalpas, Journal of Indian System of Medicine.2019 Jan1;7(1):33.
15. Sharma R, Amin H, Prajapati PK. Validation of standard manufacturing procedure of Guḍūcī sattva (aqueous extract of Tinospora cordifolia (Willd.) Miers) and its tablets. Ancient science of life. 2013 Jul;33(1):27.
16. Sharma R, Galib R, Prajapati PK. Validation of standard manufacturing procedure of Guduchi Ghana [dried aqueous extract of Tinospora cordifolia (Willd.) Miers] and its tablets. Ayurpharm Int J Ayurveda Allied Sci. 2013;2(7):224-32.
17. Sharma R, Hazra J, Prajapati PK. Nanophytomedicines: A novel approach to improve drug delivery and pharmacokinetics of herbal medicine. Bio Bull. 2017;3(1):132-5.
18. Prajapati PK, Sharma R, Amrutia A, Patgiri BJ. Physicochemical screening and shelf life evaluation of

Kuṅkumādi Ghṛta prepared using Kesara and Nāgakesara. Ancient Science of Life. 2017 Jan;36(3):129.
19. Sharma R, Kakodkar P, Kabra A, Prajapati PK. Golden ager Chyawanprash with meager evidential base from human clinical trials. Evidence-Based Complementary and Alternative Medicine. 2022 May 16;2022:1-6.
20. Kakodkar P, Sharma R, Dubewar AP. Classical vs commercial: Is the'efficacy'of chyawanprash lost when tradition is replaced by modernization?. Journal of Ayurveda and Integrative Medicine. 2021 Oct;12(4):751.
21. Sharma R, Hazra J, Prajapati PK. Knowledge and awareness of pharmacovigilance among ayurveda physicians in Himachal Pradesh. Ancient science of life. 2017 Apr;36(4):234.
22. Sharma R, Galib R, Prajapati PK. Good pharmacovigilance practice: Accountability of Ayurvedic pharmaceutical companies. Ancient science of life. 2017 Jan;36(3):167.
23. Chouke PB, Shrirame T, Potbhare AK, Mondal A, Chaudhary AR, Mondal S, Thakare SR, Nepovimova E, Valis M, Kuca K, Sharma R. Bioinspired metal/metal oxide nanoparticles: A road map to potential applications. Materials Today Advances. 2022 Dec 1;16:100314.
24. Chaudhary P, Sharma R, Rawat S, Janmeda P. Antipyretic medicinal plants, phytocompounds, and green nanoparticles: an updated review. Current Pharmaceutical Biotechnology. 2023 Jan 1;24(1):23-49.
25. Rhaman MM, Islam MR, Akash S, Mim M, Nepovimova E, Valis M, Kuca K, Sharma R. Exploring the role of nanomedicines for the therapeutic approach of central nervous system dysfunction: At a glance. Frontiers in Cell and Developmental Biology. 2022 Sep 2;10:989471.
26. Rahman MM, Ahmed L, Anika F, Riya AA, Kali SK, Rauf A, Sharma R. Bioinorganic Nanoparticles for the Remediation of Environmental Pollution: Critical Appraisal and Potential Avenues. Bioinorganic Chemistry and Applications. 2023 Apr 10;2023.
27. Yerpude ST, Potbhare AK, Bhilkar P, Rai AR, Singh RP, Abdala AA, Adhikari R, Sharma R, Chaudhary RG. Biomedical,clinical and environmental applications of platinum-based nanohybrids: An updated review. Environ Res. 2023 Aug 15;231(Pt 2):116148. doi: 10.1016/j.envres.2023.116148. Epub 2023 May 19. PMID: 37211181.
28. Ali MK, Javaid S, Afzal H, Zafar I, Fayyaz K, Ain QU, Rather MA, Hossain MJ, Rashid S, Khan KA, Sharma R. Exploring the multifunctional roles of quantum dots for unlocking the future of biology and medicine. Environ Res. 2023 Jun 7;232:116290. doi: 10.1016/j.envres.2023.116290. Epub ahead of print. PMID: 37295589.
29. Tamboli QY, Patange SM, Mohanta YK, Sharma R, Zakde KR. Green synthesis of cobalt ferrite nanoparticles: an emerging material for environmental and biomedical applications. Journal of Nanomaterials. 2023 Feb 6;2023.
30. Sharma R, Bedarkar P, Timalsina D, Chaudhary A, Prajapati PK. Bhavana, an ayurvedic pharmaceutical method and a versatile drug delivery platform to prepare potentiated micro-nano-sized drugs: core concept and its current relevance. Bioinorganic Chemistry and Applications. 2022 Apr 29;2022.
31. Sharma R, Prajapati PK. Nanotechnology in medicine: Leads from Ayurveda. J Pharm Bioallied Sci. 2016 Jan 1;8(1):80-1.
32. Sharma R, Prajapati PK. Predictive, preventive and personalized medicine: leads from ayurvedic concept of Prakriti (human constitution). Current Pharmacology Reports. 2020 Dec;6(6):441-50.
33. Sharma R, Pk P. Diet and lifestyle guidelines for diabetes: Evidence based ayurvedic perspective. Romanian J Diab Nutr Metabol Dis. 2014;21(4): 335–346.
34. Raina K, Kumari R, Thakur P, Sharma R, Singh R, Thakur A, Anand V, Sharma R, Chaudhary A. Mechanistic role and potential of Ayurvedic herbs as anti-aging therapies. Drug Metab Pers Ther. 2023 Jun 1. doi: 10.1515/dmdi-2023-0024. Epub ahead of print. PMID: 37254529.