



Pharmaceutical Preparation of Arka Lavan and Assessment for Its Analytical Study

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: *Arka* is commonly found plant in India. It is mostly used for religious purpose in India. In *Ayurved*, it has in used for various medical preparation. One of such preparation is *Arka Lavan*.

Aim: Pharmaceutico-analytical study of *Arka lavan* & evaluation for Antimicrobial study

Materials: The raw materials *Arka patra* will be collected from the medicinal plant garden, of Mahatma Gandhi Ayurved College, Hospital & research centre, Salod (H), wardha. *The arka patra* will be authenticated by Dravyaguna department. The another raw material is *Saindhava Lavan* will be procured from *Dattatraya Ayurved Rasashala* and will be authenticated by *Rasashastra & Bhaishajya kalpana* Department *Arka lavan* will be prepared as per the reference. The prepared *Arka lavan* will be analyzed.

Observation and Results: The *Arka patra lavan* will be assessed for organoleptic, physicochemical and TLC parameters

Conclusion: The pharmaceutical & analytical study of *Arka lava* will provide the standard parameters.

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Keywords: *Arka lavan*; organoleptic; physicochemical; TLC analysis.

1. INTRODUCTION

Rasashastra & Bhaishajya Kalpana is one of the branches of *Ayurveda*, which deals with herbo-mineral, metal, poisons & gems [1]. Ayurvedic pharmacopoeias are very rich and consist of preparation of all categories of medicines ranging from simple extracted plant juices to the most complex herbo-mineral preparations [2]. In *Ayurveda* the five basic preparations are mentioned which includes *swaras* (Juices), *kalka* (paste), *kwath* (decoction), *hima* (cold infusion) & *phanta* (hot infusion) [3]. As per the need the different formulations are developed from the basic *kalpanas*. The different dosage forms are developed to accomplish the palatability, shelf life, quality enhancement and minimization of the dose [4]. *Lavan* is a group of minerals, which are salty in nature [5]. Under *Bhaishajya Kalpana Lavan* is the name of formulations prepared in which *Lavan* is a main ingredient. *Arka lavan* is a formulation useful in *Udar Vikar* (Gastrointestinal diseases). *Arka lavan* is a simple formulation indicated in *Udar shool* [6].

Arka i.e. *Calotropis gigantean* is having medicinal properties in *Ayurveda* and used to treat different ailments. *C. gigantean* is reported as an analgesic, anti-inflammatory, hepatoprotective. It is also having antimicrobial potential [7].

Rock salt is a mineral with so much health benefits. It contains minerals like calcium and magnesium. It helps in healthy metabolism, which results in improvement of systemic functions in the body. It improves appetite, relieves flatulence and facilitates as a laxative [8].

The combination of *C. gigantean* & Rock salt with the process of heating in a much prescribed manner is providing the formulation *Arka lavan* which is very useful in treating the diseases related to digestive system.

In this study an effort will be taken to establish Standard operating process related to pharmaceutical preparation & establishment of Analytical parameters of *Arka lavan*. This primary study can be directional for further study on this formulation.

2. MATERIALS AND METHODS

Study type: Pharmaceutical and Analytical

Study duration: 6 months

Criteria for observation: Analytical observation

Study Centre: *Dattatraya Ayurved Rasashala*, Mahatma Gandhi Ayurved College, Hospital & Research centre, Salod (H.), Wardha.

Pharmaceutical study: Pharmaceutical preparation of *Arka Lavan* will be prepared. It will be done by following steps.

2.1 Procurement and Authentication of Raw materials

1. *Rock salt* will be procured from Shri Shaila Agency, Nagpur and will be authenticated by the Department of *Rasashashtra* (MGACH & RC).
2. *C. gigantean* will be collected from medicinal plants garden (MGACH & RC), and primarily Authenticated by *Dravyaguna* Department.

Pharmaceutical study: Pharmaceutical preparation of *Arka lavan* will be as per reference from text book [9]. Three batches of the *Arka Lavan* will be prepared.

Freshly collected leaves of *C. gigantean* will be washed and cleaned with potable water. The leaves will be weighed. The *Saindhav lavan* (Rock salt) will be taken and crushed by using mortar and pestle. The Rock salt will be weighed and will be taken in required quantity. The earthen vessels with wide mouth resembling like saucer (*sarava*) will be taken. The leaves of *C. gigantean* will be arranged in such a manner that the leaf will be at the bottom and the crushed Rock salt will be spread on the leaf, another leaf will cover the Rock salt. The leaves and rock salt will be arranged in this manner. The base layer and the upper layer should be of leaf of *C. gigantean*. Another *sarava* will be taken and should be placed over previous one. Mouth of both the *sarava* will be closed properly with the help of Fuller's earth and muslin cloth up to the thickness of 1 Angula. The closed *sarav – samputa* (union of two earthen saucers's closed with Fuller's earth and muslin cloth) will be dried properly. This *sarav –samputa* will be subjected for *Mahaputa*. (It is a unit of heat produced by igniting 1500 cow dung cakes). For this unit of heat underground pit will be prepared which will be 3'x3'x3'in length, breadth & depth. Out of 1500 cow dung cakes 1000 cakes will be placed

at the bottom of the pit and the properly closed *sarava samputa* will be placed on that, 500 cow dung cakes will be placed over it. The arrangement will be like that the *sarava samputa* will be covered from all the sides with cow dung cakes. The cow dung cakes will be ignited, the heat will be given till all the cow dung cakes burnt into ash. After self cooling the ash of cow dung cakes from the pit will be removed. The *sarava samputa* will be removed from the pit. The upper covering from the *sarava samputa* will be removed and the inner charred material will be collected. The material inside the *sarav samput* will be collected and crushed and triturated in mortar and pestle. The material will be stored in air tight glass container. The same process will be repeated three times to obtain three batches. All the three batches will be assessed on analytical parameters.

2.2 Study Parameters [10]

Analytical study: The analytical study will be performed under following heads.

- **Specifications** –
 - a. Colour
 - b. Odour
 - c. Taste
 - d. Touch

Physico-Chemical Analysis

- Loss on drying at 105⁰C
- Ash value analysis – Total ash, Water soluble ash ,Acid- insoluble ash

- pH(10% aqueous extract)
- Extractive values – (water soluble extract and alcohol soluble extract)
- Bulk and Tap density
- TLC

Specifications – under this parameter color, odor, touch and taste will be assessed by using organoleptic parameters. This evaluation done by using sensory organs.

2.3 Physico-Chemical Analysis

Loss on drying at 105⁰C – The assessment will be done by using Hot air oven. The water drying off from the drug will be measured from this parameter. The drug 5 gm accurately weighed will be taken in the tarred petri dish and placed in hot air oven at 105⁰C for 5 hrs. The petri dish will be placed in desiccator. The drying and weighing the petri dish with raw material will be continued at one hour interval until difference between two successive weights, it should not be more than 0.01 gm. The difference between initial weight and the weight after 5 hrs will be calculated, to obtain the moisture content.

Ash value anlysis – The ash value represents the in inorganic salts which remains adhere along with the drug after incineration. Under this three types of ash will be measured which are, Total Ash, water soluble ash and Acid insoluble ash.

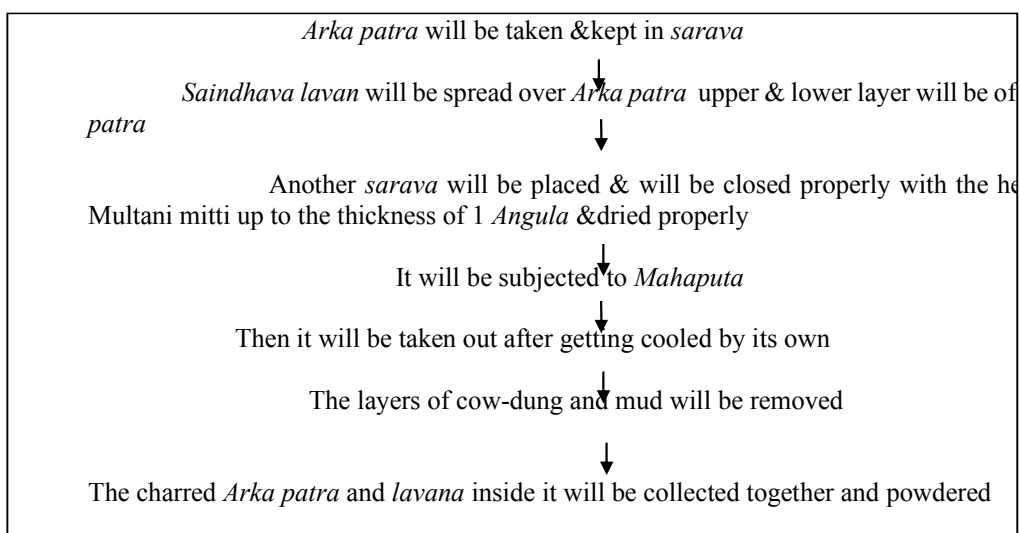


Chart 1. Pharmaceutical preparation of Arka lavana

For Total ash determination 2 gms of accurately weighed drug will be taken in tarred silica crucibles with lids. The crucible with lids will be placed in Muffle furnace at 450°C for 5 hours or more till ash will be obtained. The percentage of ash will be calculated with reference to air dried drug. The water soluble ash will be determined by boiling the total ash with 25 ml of water for 5 minutes. The insoluble ash will be collected on Whatman's filter paper. The filter paper will be placed in tared crucible for 15 minutes at 450°C. The difference between total ash and water insoluble ash will represent the water soluble ash. For the determination of Acid insoluble ash, the water insoluble ash obtained will be boiled with 25 ml of dilute hydrochloric acid, the insoluble matter will be collected in Whatman's filter paper. The insoluble material will be washed with water and will be ignited for half an hour and will be placed in desecrator and will be weighed. The process will be repeated till constant weight obtained. The percentage of acid insoluble ash will be calculated.

Extractive values -Water soluble and alcohol soluble extractive values will be obtained by using distilled water and alcohol to know about the chemical diversity of the drug. For assessment of water soluble extract, 5 gm of the accurately weighed drug will be taken in a closed flask which is already contains 100ml distilled water. The flask will be closed by aluminium foil for 24 hrs, intermediate shaking will be done. After, 24 hrs the solution will be filtered. Supernatant 25 ml solution will be taken in tarred petri dish and will be dried at 105°C. The percentage of water soluble extractive will be calculated with reference to the air dried drug. The same process will be repeated for assessment of alcohol soluble extract.

pH (10% aqueous extract)- The 10% aqueous extract of drug will be used for pH determination of the drug. The calibrated digital pH meter will be used for pH determination.

Bulk and Tap density- Bulk density and tapped density of the drug was evaluated by using the tapping and without tapping the powder. The calculation will be done accordingly.

Thin Layer Chromatography will be performed for qualitative estimation of the obtained formulation. The methanolic extract of base drug, which is leaves of *C. gigantean* will be used for comparing with obtained formulation.

3. OBSERVATION AND RESULTS

All the three batches of *Arka lavan* prepared will be assessed on different parameters during pharamaceutical study and organoleptic and physicochemical analysis will be done. The mean value will be calculated. Results will be established as per the observations obtained.

4. DISCUSSION

Herbal medicines are having demand throughout the word. But, they should not withstand in lack of quality assurance [11]. The quality control and quality assurance are the main parameters to be checked for getting better therapeutic results of ayurvedic medicine [12]. While pharmaceutical preparation the quality and quantity of raw material plays important role [13]. The application of heat and the duration are significant factors in ayurvedic pharmaceuticals [14]. However, standard operating process related to *Arka lavan* will be established. The obtained product will be assessed for organoleptic characters, which include color, odor, touch and taste.

The physicochemical analysis of *Arka Lavan* will be done which includes loss on drying at 105 degree centigrade; tap and bulk will be performed as per API. Ash value analysis will be carried out as per the reference from API by which silica particles can be assessed [15]. Similarly TLC will be performed for qualitative assessment of raw material and final product [16].

5. CONCLUSION

Depending upon the observations and result the standard parameters can be concluded. By HPTLC the finger printing and qualitative and quantitative analysis of final formulation will be done. This will provide the evidence to the further researchers.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Rajput DS, Gokarn R, Jagtap CY, Galib R, Patgiri BJ, Prajapati PK. Critical Review of Rasaratna Samuccaya: A Comprehensive Treatise of Indian Alchemy. *Ancient science of life*. 2016;36(1):12
2. Elakkiya M. *Pre Clinical study of Herbo Mineral Drug KATTUVAI MATHIRAI for its Anti-diarrhoeal, Anti-pyretic and Anti-spasmodic activities* (Doctoral dissertation, Government Siddha Medical College, Palayamkottai).
3. Mehkarkar DD, Rathi B, Wanjari A, Rajput DS. Pharmaceutico-analytical standardization of Devdarvyadi Churnakriya (Processed powder). *Journal of Research in Traditional Medicine*. 2017; 3(3):64-71.
4. Gokarn R, Rajput D, Wanjari A, Rathi B, Kharabe PM. Drug Dosage Modification and Standardization of Balachaturbhadra Syrup. *Journal of Indian System of Medicine*. 2016;4(1):15.
5. Mooss LN. Salt in Ayurveda I. *Ancient science of life*. 1987;6(4):217.
6. Sharma S. *Rasatarangini*. Mitra; 1924.
7. Rani R, Sharma D, Chaturvedi M, Yadav JP. Phytochemical analysis, antibacterial and antioxidant activity of *Calotropis procera* and *Calotropis gigantea*. *The Natural Products Journal*. 2019;9(1):47-60.
8. Sarker A, Ghosh A, Sarker K, Basu D, Sen DJ. Halite; the rock salt: Enormous health benefits. *World Journal of Pharmaceutical Research*. 2016;5(12):407-16.
9. Angadi R.A text book of Bhaishajya kalpana; 2011
10. Wanjari AS, Magar S, Chapalgaokar S, Chouragade NB, Wanjari DS. Evaluation and Standardization of Herbal Formulation. *Research Journal of Pharmacognosy and Phytochemistry*. 2016;8(3):133.
11. Wanjari AS, Wanjari DS. An Overview on Herbal Medicine. *Research Journal of Pharmacognosy and Phytochemistry*. 2019;11(1):14-7.
12. Shinde VM, Dhalwal K, Potdar M, Mahadik KR. Application of quality control principles to herbal drugs. *International Journal of Phytomedicine*. 2009;1(1).
13. Mukherjee PK, Harwansh RK, Bahadur S, Banerjee S, Kar A, Chanda J, Biswas S, Ahmmed SM, Katiyar CK. Development of Ayurveda–tradition to trend. *Journal of ethnopharmacology*. 2017;197:10-24.
14. Morelezo Nikan. Healthcare System Sentinel Event Incidence, Prevalence, and Solution Analysis. *International Journal of Respiratory Care*. 2020;16(1):11–13.
15. Atews Irama. A Cross-Sectional Study of Medication Error Impact on Population Quality of Life. *International Journal of Respiratory Care*. 2020;16(1):14–17.
16. Gokarn R, Rajput D, Wanjari A, Rathi B. Pharmaceutical Standardization of Shatavari Granules. *Journal of Indian System of Medicine*. 2015;3(2):60.

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