



Research Article

PREPARATION AND PHYSICO CHEMICAL ANALYSIS OF ARKA LAVAN

Sreekutty P.V^{1*}, Shrinidhi R², Shubha P. U³, Suchithra N. Prabhu⁴, Chaithra S. Hebbar⁵

*1 Post Graduate Scholar, ²Associate Professor, ³Assistant Professor, ⁴Senior Research Officer, ⁵Professor and Head, Department of P.G. Studies in Agada Tantra, Sri Dharmasthala Manjunatheswara College of Ayurveda, Udupi, Karnataka, India.

Article info

Article History:

Received: 28-09-2023

Accepted: 16-10-2023

Published: 10-11-2023

KEYWORDS:

Arka, *Calotropis procera*, *Saindhava lavana*, Rock salt, *Putra*, *Arka lavan*, *Yakrit Pleeha Rogas*.

ABSTRACT

Lavana kalpanas are prepared by using predominantly *Lavanas* and herbs with *Putagni samskara*. *Arka lavana* is a herbo mineral preparation mentioned in *Rasa Tarangini*, *Bhaishajya Ratnavali* etc. It is indicated for *Yakrit Pleeha Rogas* along with water or butter milk as *Anupana*. The ingredients of this preparation are *Arka patra* (leaves of *Calotropis procera*) and *Saindhava lavana* (rock salt) in equal parts. Standardization is an essential part for proving therapeutic efficacy of a preparation. In this study *Arka lavana* has prepared according to the traditional method mentioned in textual reference from *Rasa Tarangini* ie; by *Putra Paka* method. The analytical study of this preparation was carried out including organoleptic and physicochemical parameters. The pharmaceutical procedure as well as Analytical results can be considered as a reference for further studies.

INTRODUCTION

Lavana Kalpas are the pharmaceutical preparations in which main constituents are *Saindhava lavana* and ash of drugs that are obtained after giving appropriate '*Putra*'^[1]. The inherent properties of *Lavana* are best utilised for therapeutic benefits through specialised procedure. It is modified from its primitive dosage forms so as to improve its efficacy, palatibility, shelf life as well as to reduce dose. *Lavana* has the ability to penetrate quickly to minute channels and here the process of *Agni Samkara* done in this process enriches the therapeutic potential of both *Lavana* and medicinal drug. *Arka Lavana* is one among *Lavana Kalpana* which has been described in *Rasa Tarangini*^[2], *Bhaishajya Ratnavali*^[3], *Vangasena*^[4], *Chakradutta*^[5], *Gada Nigraha*^[6] etc.

Ingredients^[7]

- *Arka patra*
- *Saindhava Lavana*

Review on Ingredients

Arka Patra^[8]

Latin Name: *Calotropis procera*

Family: *Asclepiadaceae*

Types: *Swetha Arka* and *Rakta Arka*

Guna: *Swedanopaga*, *Bhedaniya*, *Vamanopaga*, *Abhobhagahara*, *Arkadi*

Rasa: *Katu*, *Tikta*

Guna: *Laghu*, *Rooksha*, *Tikshna*

Virya: *Ushna*

Vipaka: *Katu*

Doshagnata: *Kapha vata shamaka*

Karma: *Vatahara*, *Dipana*, *Krimighna*, *Vranahara*, *Vishaghna*, *Bhedana*

Saindhava Lavana^[9]

Saindhava lavana is included in *Thri lavana*, *Pancha lavana* and *Shad lavana*. *Visaghna* property of *Saindhava lavana* is mentioned in *Rasa Ratna Samucchaya*.

Latin name: Sodium chloride

Rasa: *Madhura*, *Lavana*

Guna: *Laghu*, *Snighda*, *Vishyandi*, *Sukshma*

Veerya: *Sheeta*

Dosakarma: *Tridoshashamaka*

Pharmacological action: *Deepana*, *Pachana*, *Rochana*, *Chakhushya*, *Avidahi*, *Vrushya*, *Hrudya*

Access this article online	
Quick Response Code	
	https://doi.org/10.47070/ijapr.v11i10.2961
Published by Mahadev Publications (Regd.) publication licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0)	

Review on *Arka Lavana*^[10]Table 1: Details about *Arka Lavana* From all References

Classical text	Putra	Indication	Matra	Anupana	Reference
Rasatarangini	Gajaputa	Yakrit roga Pleeha roga Udara roga Malabedhana	½ Masha	Koshna jala, Mastu	R.T 4/77
Bhaishajya Ratnavali	Gajaputa	Pleeha roga Udara rogas, Gulma	4 – 8 Ratti	Mastu	B.R 41/31
Gadanigraha	Andardhooma method	Pleeha roga Udara roga	-	Mastu	GN Kalpa 706
Chakradatta	Andardhooma method	Gulma Pleeha roga Yakrit roga	1 Masha	Mastu	CD 37/43
Ayurveda Sara Sangraha	Gajaputa	Pleeha yakrit vridhi Gulma, Udara, Ajirna, Mandagni Panduroga Badhakoshta	1-2 Masha	Koshna jala Gomutra	ASS
Vangasen	-	Pleeha roga	-	Mastu	VS Kalpa 139

Indication^[11]

- Gulma
- Udara roga
- Plihodara
- Yakridodara

Dose: 1gm

Anupana

- Water
- Butter milk

MATERIALS AND METHODS

Ingredients

- *Arka Patra* (*Calotropis procera*)
- *Saindhava Lavana*

Equipments

- Sharava
- Clay (Multani mitti)
- Cloth

- Thermocouple
- Upala (Cow dung cakes)
- Khalvyantra
- Lighter
- Weighing machine

Pharmaceutical Study

Collection, identification and Authentication of Raw Drugs

- Fresh leaves of *Arka patra* was collected from nearby area.
- *Saindhava lavana* was procured from an authorized raw drug shop, Udupi.

Preparation of *Arka lavana*^[12]

Formulation was prepared as per the classical method as per Rasa Tarangini and following guidelines in Ayurvedic Pharmacopoeia off India (API).

Table 2: Ingredients and its quantity used for preparation of *Arka Lavana*

Ingredients	Latin Name	Quantity
<i>Arka patra</i>	<i>Calotropis procera</i>	150 gm
<i>Saindhava lavana</i>	Rock salt	150 gm

Table 3: Size and weight of cow dung cakes

Parameters	Size and weight
Total weight of cow dung cakes	14 kg
Average weight of cow dung	28 gm
Average diameter of cow dung	10 cm
Average thickness of cow dung	1 cm
Average circumference of cow dung	31 cm

- Freshly collected leaves of *Arka patra* was washed with water, dried and weighed.
- *Saindhava lavana* was powdered well using *Khalva yantra*.
- *Arka patra* and *Saindhava lavana* is placed in *Sharava* in sandwich pattern keeping *Arka patra* in upper and lower layers.
- Another *Sharava* placed over it and sealed with seven layers of cloth smeared with multani mitti (clay), keeping it to dry over night.
- Next day morning it was subjected for *Putra* in a pit measuring, 58.5cm in depth and breadth.
- In the pit, *Sharava* is placed in such a way that it covers 300 *Vanopalas* below and 200 above.
- The *Vanopalas* were ignited and temperature pattern was noticed using thermocouple.
- The *Sharava* was taken out of pit in the next day morning after self cooling.
- *Sharava* was opened by removing the covering and final product is obtained.
- It was observed that the final product was completely burnt and it was grinded in to fine powder using *Khalva yantra*.
- The product was sieved and stored in dry glass container.

Precautions

- The *Sharava* used for the procedure should be clean, without any cracks
- *Patra samskara* has to be done before starting procedure to avoid breakage of *Sharava*.
- *Vanopala* should be properly dried to maintain required temperature
- Temperature pattern has to be monitored regularly
- After self cooling, *Sharava* has to be opened carefully to avoid falling of foreign particles or ashes in to final product.

Result

- Initial quantity of *Arka patra* -150 gm
- Initial quantity of *Saindhava lavana* - 150gm
- Final quantity of *Arka lavana* -140 gm

Analytical Study

- Analytical study was carried out in SDM Centre for Research and Allied Science, Udupi.

Parameters assessed for *Arka lavana*

- Organoleptic characters
- Loss of drying, total ash, acid insoluble ash, water soluble ash, alcohol soluble extractive, water soluble extractive, particle size by powder microscopy, bulk density, tapped bulk density, angle of repose, Hausners ratio, compressibility index, scale of flow ability.

OBSERVATION AND RESULTS

Figure 1: Preparation of *Arka lavan*



Arka Patra



Saindhava lavana



Arka patra layered in Sharava



Saindhava layered in Sharava



Arka patra and Saindhava layered in Sharava



Cloth dipped in *Multani mitti*



Sharava enclosed with *Matkapada*



Sharava dried over night



Vanopalas used for puta



Vanopalas arranged in pit



Sharava placed over Vanopalas



Sharava was covered with Vanopalas



Vanopalas were ignited



Vanopalas were ignited completely



Sharava opened



Product obtained



Obtained product grinded



Final product

Table 4: Temperature readings and time recordings during preparation

Observation	Detail
Initial Temperature	22°C
Maximum temperature attained	782°C
500°C+ Temperature	Maintained for 3 hr
Total time required for Puta	12 hrs

Figure 2: Graphical Representation of Temperature Pattern

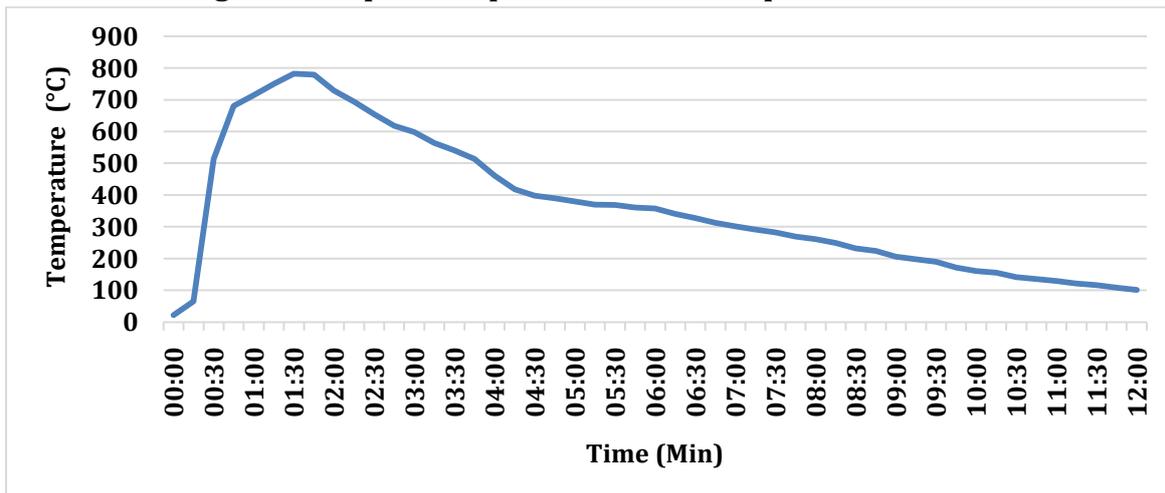


Table 5: Organoleptic characters of *Arka lavana*

Parameters	Results
Color	Black
Odour	Suity
Taste	Salty

Table 6: Results of standardization parameters for *Arka lavana*

Parameter	Results n = 3 %w/w
	<i>Arka lavana</i>
Loss on drying	83.15±0.02
Total Ash	97.66±0.33
Acid Insoluble Ash	1.29±0.01
Water soluble Ash	91.25±0.00
Alcohol soluble extractive value	2.79±0.01
Water soluble extractive value	100±0.00
Particle size (µm)	22
pH	9.7

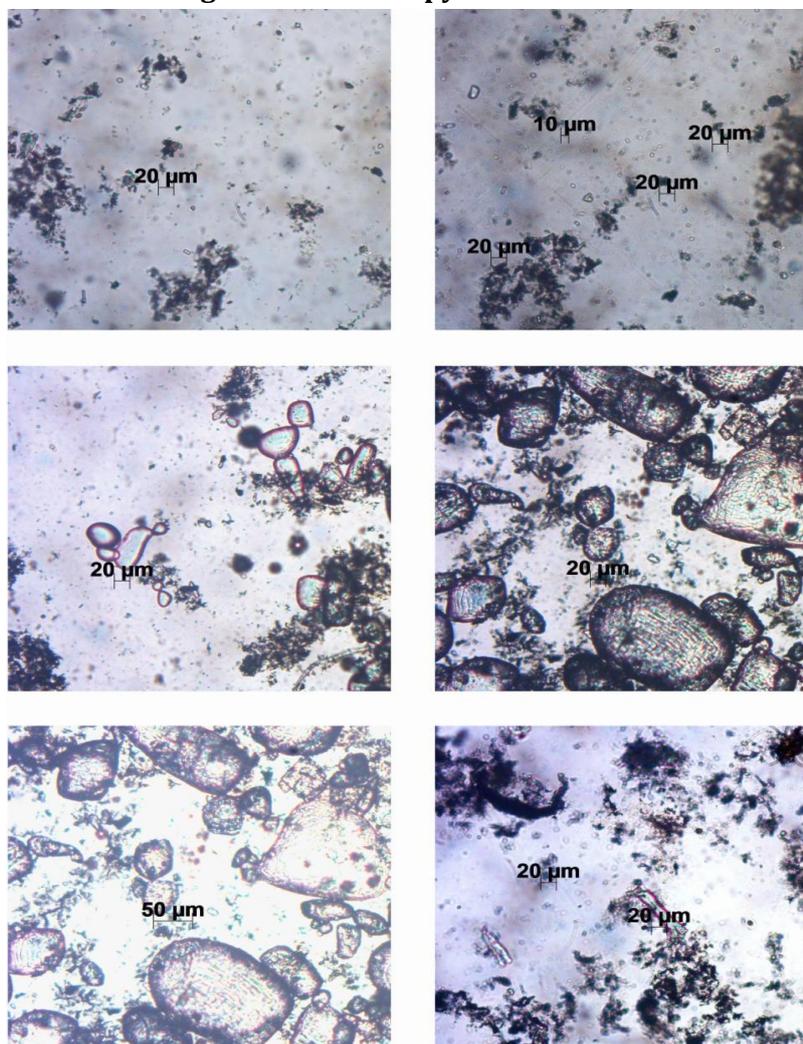
Figure 3: Microscopy of *Arka lavana*

Table 7: Flow property of granules

Parameter	Arka lavana
Angle of repose	48
Bulk density	0.63
Tapped bulk density	0.87
Hausners ratio	1.38
Carr's index	27.58

DISCUSSION

Nowadays there is a renewed interest towards Ayurvedic drugs, where everything that is green is considered as medicinal and that produce no side effects, another factor that emphasizes the attention is the incidence of harmful effect of synthetic drugs which are regarded as harmful to human beings and environment. Pharmacognostic studies ensure plant identity, lays down standardization parameters which will help and prevents adulterations. Such studies will help in authentication of the plants and ensures reproducible quality of herbal products which will lead to safety and efficacy of natural products. Hence pharmacognostic studies are one of the authentic methods for identification of biological sources and their standardization. Documentation and identification of biological sources is important for their, authentication, standardization and utilization.

Arka lavana was prepared according to the reference mentioned in *Rasa tarangini*. *Sharava Samputa* was done to obtain the product. *Sharava* taken for the preparation should be shallow and their margin must be regular so that two *Sharavas* should fit evenly on applying clay smeared cloth. It must be dried overnight before subjecting to *Putra*. *Arka lavana* is prepared by *Gaja putra* where the source of heat is *Vanopala* i.e.; cow dung cakes. In this study, preparation was done by using 10kg *Vanopalas* and the temperature pattern was noted with thermocouple during the whole preparation.

Analytical study helps in standardizing the drug. Here authenticated raw drugs were taken and formulation was prepared. Later the product was subjected to analytical parameters. The total ash, water soluble ash and acid insoluble ash contents have been widely used as one of the indices to illustrate the quality as well as purity of the medicine. The ash value is related to the inorganic material in the drug. The actual value depends upon the three factors, firstly the inorganic material naturally present in the drug, secondly addition by the processes and thirdly upon possible subsequent contaminations. The total ash method is designed to measure the total amount of materials remaining after the ignition. This includes both physiological ash which is derived from the drug itself and non physiological ash which may be the residue of the media used during the procedure.

Acid insoluble ash is the residue obtained after boiling the total ash with dilute hydrochloric acid, and igniting the remaining insoluble matter. This measures the amount of silica present as sand. Water soluble ash is the difference in the weight between the total ash and the residue after the treatment of total ash with water.

The loss of drying of the sample was found to be 83.15 ± 0.02 indicating moisture content is more. Since it is a *Lavana* preparation the sample seems to absorb moisture fastly on exposing to air. The total ash value of *Arka lavana* sample was which indicates the presence of 97.66 ± 0.33 which indicates the inorganic material present in the drug which denotes its quality and purity. It also indicates the complete burning of the product. The acid insoluble ash value was less indicating the absence of siliceous content in the sample. This implies the quality of raw drugs. Water soluble ash was 91.25 ± 0.00 which implies the sample is highly soluble in water and it will be easy for the absorption in the body. Water soluble extractive value is 100 ± 0.00 which denotes complete solubility in water. Particle size (μm) seems to be 22 where the absorption of the drug makes easier. The pH of the sample was 9.7 which is highly alkaline. The angle of repose was 48 which suggest the product having poor flow properties. The bulk density was 0.63 and tap density was 0.87. There was not much difference between these two. Hence the Hausner's ration was found to be 1.38 indicates its poor free flow property. The Carr's index was found to be 27.58.

Analysis of Action

Arka Patra possess *Katu Rasa* and *Katu Vipaka* which acts as *Agnivardhaka*, *Tikta Rasa* exhibits *Deepana Pachana Karma*, *Ushna Virya* helps to pacify *Kapha Vata Dosha*. *Saindhava Lavana* possesses *Lavana Rasa* which shows both *Deepana* and *Pachana Karma*. *Deepana Karma* helps to normalise *Agni* whereas *Pachana Karma* strengthens *Jatharagni* to do *Amapachana*. So, by virtue of these properties, the compound formulation helps in stimulating *Jatharagni* as well as *Dhathwagni* by expelling vitiated *Dosha* Also, *Arka Patra* shows *Sara*, *Bhedhana*, *Tiksha guna*, *Shophahara*, *Vranahara*, *Vishaghna* and *Kaphavatashamak Karma* which helps to treat *Gulma*, *Yakrit*, *Pleeha* and *Udara Roga*. *Saindhava Lavana*

owing to its *Sukshma* property supports this formulation to easily penetrate into the minute channels of *Srotas* and enhance its absorption.

CONCLUSION

Lavana Kalpas are the pharmaceutical preparations in which main constituents are *Saindhava lavana* & *Bhasma* of drugs that are obtained after giving appropriate '*Puti*'. The inherent properties of *Lavana* are best utilized for therapeutic benefits through specialized procedure. It is modified from its primitive dosage forms so as to improve its efficacy, palatibility, shelf life as well as to reduce dose. *Lavana* has the ability to penetrate quickly to minute channels and here the process of *Agni Samkara* done in this process enriches the therapeutic potential of both *Lavana* and medicinal drug.

REFERENCES

1. Acharya Siddhinandan Mishra, Bhaishajya kalapana Vigyan, Lavana kalpa, Chaukhambha Surbharti Prakashan, Varanasi, edition 2018: p.206-207
2. Rasatragini, Pt. Shastri Kashinath, Ksharvisheshadi Vigyaniya, Motilal Banarsidas, Delhi, 11th edition 14/131-136; 1979. p.350-351
3. Bhaishajyaratnavali, Commentator Kaviraj Shastri Ambikadutta, Chaukhamba Sanskrit Sansthan, Varanasi, 5th edition, 41/31; p.544.
4. Vangasen Samhita, Commentator Rajiv kumar Rai, Prachya Prakashan, Varanasi, Edition 2010
5. Chakradatta of Shri Chakrapanidatta, Commentator Shri Tripathi J, Chaukhamba Sanskrit Series Office, Varanasi, Udarachikitsa Adhyaya, Verse 43;1983. p.304.
6. Shri Vaidya Sodhala, Gadanigraha, Commentator Sri Indradeva Tripathi, Chaukhamba Sanskrit Sansthan, Varanasi, Reprint 2012; part 1
7. Angadi R.A. Textbook of Bhaishajya Kalpana vijnana. 1st ed. Varanasi Chaukhamba Surbharati Prakashan; 2011. p.1-3.
8. Sharma PV, Dravyaguna Vigyan, Chaukhamba Bharti Academy, Varanasi, Reprint 2001; Vol 2: 433-436.
9. Rasatarangini, Pt. Shastri Kashinath, Motilal Banarasidas, Delhi, 11th edition, 141/116-120, p.347-348.
10. Chandankhede Aditi Vasudeorao et al. A review on pharmacological action of Arka lavana: the formulation of Upavisha arka. J Pharm Sci Innov. 2021;10(1):17-22. <http://dx.doi.org/10.7897/2277-4572.101198>
11. Bhaishajyaratnavali, Commentator Kaviraj Shastri Ambikadutta, Chaukhamba Sanskrit Sansthan, Varanasi, 5th edition, 41/31.
12. The Ayurvedic Pharmacopoeia of India. The controller of publications civil lines. New Delhi. 1st edition, Reprint, 2001; Part 2 (vol-1): p 103

Cite this article as:

Sreekutty P.V., Shrinidhi R., Shubha P. U., Suchithra N. Prabhu, Chaithra S. Hebbar. Preparation and Physico Chemical Analysis of Arka Lavan. International Journal of Ayurveda and Pharma Research. 2023;11(10):79-85.

<https://doi.org/10.47070/ijapr.v11i10.2961>

Source of support: Nil, Conflict of interest: None Declared

*Address for correspondence

Dr. Sreekutty P.V.

Post Graduate Scholar
Department of P.G. Studies in
Agada Tantra,
Sri Dharmasthala
Manjunatheswara College of
Ayurveda, Udipi.

Email:

sreekuttysibiraj@gmail.com

Mobile: 9605223394

Disclaimer: IJAPR is solely owned by Mahadev Publications - dedicated to publish quality research, while every effort has been taken to verify the accuracy of the content published in our Journal. IJAPR cannot accept any responsibility or liability for the articles content which are published. The views expressed in articles by our contributing authors are not necessarily those of IJAPR editor or editorial board members.