



Original Research

Pharmaceutico-Analytical study of Karnasravahara Arka

*Sunil Mandal, **Govinda Sharma K and ***Archana Pagad

*PG scholar, **Associate professor ***Assistant professor

Department of Rasashastra and Bhaishajya Kalpana

Sri Dharmasthala Manjunatheshwara College of Ayurveda & Hospital, Hassan, Karnataka, India

Corresponding Author: Dr. Sunil Mandal (drsunilman123@gmail.com)

Access this article on online: www.japs.co.in

Published by International Academy of Ayurveda-Physicians (IAAP), 7HB, Gandhinagar, Jamangar-361 002

Date of submission: 01-01-2019; Date of Revision: 12-01-2019; Date of Acceptance: 28-022019

Abstract:

Arka Kalpana is included one among the Panchavidha Kashaya Kalpana in Arka Prakasha. Karnasravahara Arka was prepared adopting the standard procedures wherein 60% of yield was obtained which is in line with descriptions of authoritative books. It was clear transparent liquid with characteristic odor and taste of the ingredients Amra, Jambu, Vata and Madhuka. Its pH was 3.53 with specific gravity of 1.34 and total solid substances- 0.1. The organoleptic and physicochemical properties of Karnasravahara Arka generated in this work can be considered as preliminary standards for the formulation.

Key Words: Karnasravahara Arka, Pharmaceutico-analysis

Introduction:

Arkakalpana is one of the unique formulations, which is described as superior among the Panchavidha Kashaya Kalpana¹. The word Arka is derived from "Ru-gatau". Gati means Gyan, Gaman and prapti. Where the knowledge of the contents of the dravya or formulation is first thing (i.e. Gyan), then the motion is given to the contents through water (i.e. Gaman) and finally required active contents is obtained (i.e. Prapti). Arka contains the complete aspects of its manufacturing process by root word "Ru-Gatau."² The method by which the volatile oil and active principle of the drug are collected is called as "Arka Kalpana"³ and the compound prepared through this procedure is called Arka⁴.

Karnasrava is disease mentioned by Acharya Sushruta under twenty eight Karnaroga,⁵ one of the most common complaint encountered in clinical practice of ENT. Karnasrava signifies discharge from ear⁶. In Arka Prakasha an Arka prepared from leaves of Amra (*Mangifera indica*), Jambu (*Syzygium cumini*), Madhuka (*Madhuka indica*) and Vata (*Ficus bengalensis* L.) is mentioned as Karnasravahara Arka. In this work an attempt is made to develop standard operative procedures of preparation of Karnasravahara Arka and to analyses a few parameters related with its quality control.

Materials and Methods

The study was conducted in two phases. First phase was to prepare The Karnasravahara Arka and the second phase involved its analysis.

I. Pharmaceutical Study: The Raw drugs were leaves of Madhuka, Jambu, Amra and Vata which were collected from herbal garden of the college.

Method of Preparation: 15 gm leaves of each drugs were taken and cleaned, dried, cut and crushed in Khalva Yantra and mixed 600 ml of distilled water and kept one hour for soaking.

Then it was transferred into Arka Yantra. Temperature was maintained around 90°C till boiling starts. Then it was decreased up to 70°C. The vapors were condensed and collected in a receiver. In the beginning, the vapor consists of only stem and may not contain therapeutically essential substance thus few first drops were discarded. The last portion also may not contain therapeutically essential substance which was also discarded. It took around 5 hours to collect 60% of total water contents⁷.

II. Analytical study

A. Organoleptic Properties: The Arka was colorless, mixed scented odor dominated of Amra and Jambu and it was palatable product with slightly Kashaya (astringent) taste.

B. Physico-chemical parameters

a) Determination of pH:

The pH is a measure of the hydrogen-ion activity which is important from the standpoint of stability or physiological suitability⁸. The pH was measured by using pH meter as per instruction given in instrument.

b) Determination of Specific Gravity: The specific gravity of the Arka was measured by using pycnometer as per standard method

c) Determination of Refractive index:

The refractive index of the Arka was measured by using Abbes refractometer.

d) Determination of Total Solid Substance: Total solids were measured by using refractometer.

Result

The final distillate obtained was 360 ml which was 1/3rd of the total liquid content. Organoleptic and Physicochemical characters of Karnasravahara Arka are presented in Table-1 and Table-2 .

Table-1
Organoleptic Findings on Karnasravahara Arka

Organoleptic parameters	Karnasravahara Arka
Colour	Transparent/clear
Odour	Mild Amra-jambadi odour
Consistency	Liquid
Taste	Kashaya

Table-2
Physicochemical Parameters of Karnasravahara Arka

Physicochemical parameters	Karnasravahara Arka
pH	3.53
Specific gravity	1.0006
Refractive index	1.34
Total solid substances	0.1

Discussion

The present research work was planned with an aim to establish standard operating procedure for Karnasravahara Arka. It is to be noticed that the modern distillation apparatus follows the same principles as Arka-Yantra described in classics. The process was done on mild temperature to ensure proper boiling of the contents and dissolution of maximum active principles. The experiment was carried out till 1/3rd of the liquid content present in the mixture was obtained in the form of distillate. The present preparation took Sa-Ardha-Yaama to complete.⁹

The initial temperature of heating mantle was set at 90°C after boiling it was decreased up to 70°C because due to high temperature the raw drugs which kept in RB flask may come in neck of the condenser and may not contain clear Arka.

The leaves of all four ingredients taken¹⁰ was 60 gm and water was added 600 ml (10 times) and total final yield of Arka was 360 ml. Thus 60% or 1/3rd of the total liquid content as per general rule of Arka Kalpana was obtained.

The final product was clear transparent liquid with characteristic odour and taste of the ingredients Amra, Jambu, Vata and Madhuka. These observations meet the requirement of Prashasta Arka Lakshana.¹¹

The pH of distillate Arka was between 3 and 5 indicating the acidic nature of the Arka. May be this acidic nature is due to the presence of different phyto-constituents such as protobasic acid and phosphoric acid present in leaves of Amra and Jambu. The absorption, efficacy, irritability etc will depend on the pH value of the medicine. If the medicine is very acidic or very alkaline it will cause irritation to the tissues.¹²

Specific gravity is an important parameter for analyzing Arka which indicates the presence of solutes in a solvent. The presence of dissolved substances in the samples changes the value of specific gravity.¹² Here the solvent is water and the solutes refer to the extracted active principle of these

four leaves. The specific gravity of the solution is viscous like water.

The consistency of the media and solutes present in the media brings the difference in the refractive index since the Arka is water-like and there is no difference between the solutes and solvents the refractive index of distilled Arka is around 1.33.

Total solid is a measure of the suspended and dissolved solids in water. Here the TSS of obtained Arka was 0.1 indicating that the Arka has less solids substances.

The phytoconstituents present in leaf of Vata (*Ficus bengalensis* L.) are alkaloids, carbohydrates, glycosides, terpenoids, saponins, phenols, xanthoproteic, flavonoids, tannins showed the anti-inflammatory activity of methanolic extract of leaf and antibacterial activity against *Bacillus cerus* and *Pseudomonas aeruginosa*.¹³

Amra (*Mangifera indica*) is an important source of many pharmacologically and medicinally important chemicals such as mangiferin, mangiferonic acid, essential oil (humulene), elemene, ocimene, linalool, nerol and extract of leaf of mangifera indica shown antibacterial activity against *Bacillus subtilis*, *Staphylococcus albus*, *vibrio cholera*.¹⁴

The methanolic extracts of Madhuka (*Madhuca indica*) leaf has shown anti-microbial activity.¹⁵ It is due to presence of chemical constituents like carbohydrates, flavonoids, tannins and proteins which was confirmed by physicochemical studies.¹⁶

Jambu (*Syzygium cumini*) is a popular traditional medicinal plant in India. One study was intended to evaluate the anti-inflammatory activity of

Both ethyl acetate and methanol extracts of Jambu (*Syzygium cumini*) exhibited significant anti-inflammatory activity.¹⁷ Another study showed that the extract of syzygium cumini leaf has a significant antimicrobial activity against the *Staphylo aureus* and *E. coli*.¹⁸ In *Syzygium cumini* different types of phytoconstituents such as acylated, flavonol, glycosides, quercetin, myricetin, myricetin 3-0-4-

acetyl- 1- rhamnopyranoside, triterpenoids, esterase, galloyl carboxylase and tannin are present.¹⁹

Due to all the above mentioned properties of the ingredients of Karana-Srava-Hara-Arka, it may be very useful in treating the common bacterial infection of the ear. Further Arka Kalpana can be prepared in a small area easily with few set of instruments and can be used in the form of drops, therefore it is recommended to conduct the clinical trials for evaluating the efficacy in treating the infections of the ear (Puya Karna Srava).

Conclusion

Karnasravahara Arka can be effortlessly prepared as its ingredients i.e. leaves of Vata, Amra, Jambu and Madhuka are freely available in abundant as a natural habitat.

Pharmacological properties and phytoconstituents of these four drugs are supportive in their suggestive action on karnasrava.

60% of yield can be obtained in this formulation which is in line with descriptions of authoritative books.

Karnasravahara Arka prepared by following standard procedures is clear transparent liquid with characteristic odour and taste of the ingredients Amra, Jambu, Vata and Madhuka.

Its pH is 3.53 with specific gravity 1.34 and total solid substances- 0.1

The organoleptic and physicochemical properties of Karnasravahara Arka generated in this work can be considered as preliminary standards for the formulation.



Fig 1 Amra



Fig 2 Vata



Fig 3 Madhuka



Fig 4 Jambu



Fig 5 Crushed leaves



Fig 6 Adding of water



Fig 7 Distillation apparatus

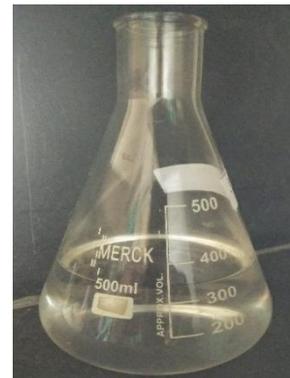


Fig 8 distilled arka

Plate 1: Preparation of karnasravahara Arka

References

1. Ravana, Indradeva Tripathy. Arkaprakasha, 2nd ed. Varanasi: Chaukhambha Sanskrit Series; 2006. P. 8-9
2. U Rahul., Hussain Gazala., and Ganti Y Basavaraj., (2014). Pharmaceutical review of Arka kalpana. International Ayurvedic Medical Journal, 2 (6), 1114-1120.
3. Angadi Ravindra, A text book of Bhaishajya Kalpana, Varanasi: Chaukhambha Surbharati Prakashan; 2017 p.
4. Deva Kanta Radha Raja, Shabda Kalpadrum. 3rd ed. Varanasi: Chaukhambha Sanskrit Series; 1967, p. 42
5. Acharya Yadavaji Trikamji., editor. Nibandhasangraha Commentary of Sree Dalhanacarya. 7th ed. 3-5. Vol. 20. Varanasi:Chaukhamba Orientalia; 2002. Sushruta, Sushruta Samhita, Uttara Tantra.
6. Bhargava KB. A short textbook of ENT. Diseases. P.L. Dhingra –Diseases of Ear, Nose & Throat. John Jacob Ballenger- Diseases of Nose, Throat & Ear.
7. Government of india, Ayurvedic Formulary of India, 1st ed. New Delhi: the controller of publications civil Lines; 2000.
8. Honwad V. Sudheendra, A handbook of Standardization of Ayurvedic Formulations, Varanasi; Chowkhamba orientalia:2012, p 102.
9. Dr. Indradeva Tripathi. Arkaprakash (Hindi teeka and notes) 1/85; 3rd ed. Varanasi; Chowkhamba krishnadas academy;2011.p. 17
10. Dr. Indradeva Tripathi. Arkaprakash (Hindi teeka and notes) 1/85; 3rd ed. Varanasi; Chowkhamba krishnadas academy;2011.p. 85
11. Dr. Indradeva Tripathi. Arkaprakash (Hindi teeka and notes) 1/85; 3rd ed. Varanasi; Chowkhamba krishnadas academy;2011.p. 16
12. Narayan Bavalatti, Manjusharajagopala. A Phytochemical study on the Poly herbal Ayurvedic Eye Drop. RGUHS Journal of AYUSH Sciences 2012; 28-31
13. Hafiz Abdul Khaliq, A review of pharmacognostic, physicochemical, phytochemical and pharmacological studies on Ficus bengalensis L. Journal of scientific and innovative Research 2017; 6(4): 151-163
14. K. A. Shah et al, Pharmacognosy review of Mangifera indica. Journal of PMC.2010; 4(7): 42-48.
15. D. Sai Koteswara Sarma et al, Phytochemical and antimicrobial activity of Whole plant of Madhuka indica. International Journal of Research in pharmacy and chemistry 2013; 3(1): 2231-2781
16. Pushpendra K. Patel et al , Madhuca indica: A review of its medicinal property, International journal of Pharmaceutical Sciences and Research 2012;3 (5): 942-950
17. Jain A et al, Anti- inflammatory activity of Syzigium Cumini leaves, International journal of phytomedicine 2010;2: 124-126
18. Mohammed Imran, Antibacterial activity of Syzigium cumini leaf extracts against multidrug resistant pathogenic bacteria, Journal of Applied Pharmaceutical Science 2017;7(3):168-174
19. Muniappan Ayyanar et al, Syzigium cumini (L.) Skeels: A review of its phytochemical constituents and traditional uses, Asian pacific Journal of tropical medicine 2012;2(3): 240-246

Cite this article as: Sunil Mandal, Govinda Sharma K and Archana Pagad (2019): Pharmaceutico-Analytical study of Karnasravahara Arka. Journal of Ayurveda Physicians and Surgeons, April 2019 Volume 6 (2): 21-24.