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PANCHAPALLAVA KVATHA AND ITS MODIFICATION INTO ARKA AND ITS PRELIMINARY ANALYTICAL STUDY

SHARMA M¹, RAKSHITHA D² AND HUSSAIN³

^{1,2}PG Scholar, ³Associate Professor, Department of Rasashastra and Bhaishajya Kalpana
Sri Dharmasthala Manjunatheshwara College of Ayurveda & Hospital, Hassan, Karnataka, India

*Corresponding Author: Mandvi Sharma: E Mail: mandvi1997@gmail.com

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ABSTRACT

Introduction: Ayurveda pharmaceutics deals with designing of formulations. Formulations for various diseases are mentioned in treatises of Ayurveda. Many dosage forms can be modified keeping in mind the palatability, shelf life and other factors. Oral health hygiene has its own importance in health and is a common problem. Panchapallava kvatha is a formulation mentioned in Chakradutta for gargling in condition of mukhadourgandhya.

Materials and methods: The ingredients of panchapallava are patola, nimba, jambu, amra and jati. The need to modify the kvatha into arka is owed to the increased shelf life of arka in comparison to kvatha and also arka is more palatable than kvatha. Panchapallava arka was prepared with the same ingredients to have better shelf life and patient compliant.

The Physico- chemical analysis of Panchapallava kvatha and arka namely pH, viscosity, refractive index, specific gravity were carried out that can be taken as preliminary standards.

Keywords: Panchapallava kvatha, Panchapallava arka, arka, oral health

INTRODUCTION

Oral health and hygiene has attained utmost priority in day-to-day life because of exposure to many predisposing factors. Halitosis is a common problem faced by

many people due to various reasons like poor oral hygiene, metabolic disorder, GERD and habits like smoking, tobacco chewing and alcohol consumption etc. [1]. Panchapallava

kvatha mentioned by Acharaya Chakradutta includes patola, nimba, jambu, amra and jati which are considered as shrestha (best) for mukhadhavana (mouthwash) [2]. Kvatha is one among Panchavidha kashaya kalpana in Ayurveda pharmaceuticals but the shelf life of kvatha is 24 hours and if it is kept for longer time fungal contamination will occur which makes it difficult to use it on daily basis [3]. Hence modification of kvatha into arka is an appropriate preference as the shelf life of arka is a year [4]. The arka is having slight turbidity and colourless according to the nature of the drugs used and having smell of the predominant drug [5]. In Arka Prakasha, Panchavidha kashaya kalpana are mentioned as kalka (paste), churna (powder), rasa (juice), taila (oil) and arka (distillate) [6]. Arka kalpana has gained more importance than other kalpana because it is having more potency, less dose, more shelf life, easy absorption, quick action and patient compliance. It is opinions that arka have

more potency in comparison to other kalpanas [7]. Due to these reasons, arka is very popular now a day.

MATERIAL AND METHODS

Pharmaceutical study

Kvatha is the filtered liquid obtained by boiling 1part of crushed leaves of the drug with 8 parts of water and reducing it to 1/4th part [8].

Panchapallava arka was prepared by 1:10 (drug: water) ratio using distillation apparatus. Leaves of Panchapallava was crushed in mortar and pestle (Khalva yantra) and put into distillation apparatus (Arka yantra) with 10 parts of water and subjected to heat to obtain the Panchapallava arka.

Ingredients:

Patola (*Trichosanthes dioica*)

Nimba (*Azadirachta indica*)

Jambu (*Syzygium cumini*)

Amra (*Mangifera indica*)

Jati (*Jasminum officinale*)

Table 1: Ingredients with properties [9]

Sl. No.	Dravya	Rasa	Guna	Virya	Vipaka	Karma	Doshagnata
1.	Patola	Tikta (Bitter)	Laghu (Light) Ruksha (Dry)	Ushna (Hot)	Katu (Pungent)	Vranashodaka (wound cleansing) Vranaropaka (wound healing)	Tridoshashamaka (pacifies all the three dosha)
2.	Nimba	Tikta (Bitter) Kashaya (Astringent)	Laghu (Light)	Sheeta (Cold)	Katu (Pungent)	Rochana (improves taste), Grahi (absorbent), Krimighna (anti-microbial), Chakshusya (beneficial to eyes)	Kaphapittashamaka (alleviates kapaha and pitta dosha)
3.	Jambu	Kashaya	Laghu	Sheeta	Katu	Chardinigrahana	Kaphapittahara

		(Astringent) Madhura (Sweet) Amla (Sour)	(Light) Ruksha (Dry)	(Cold)	(Pungent)	(controls vomiting)	(alleviates kapaha and pitta dosha)
4.	Amra	Kashaya (Astringent)	Laghu (Light) Ruksha(Dry)	Sheeta (Cold)	Katu (Pungent)	Raktrodhaka (stops bleeding), Vranaropaka(wound healing)	Kaphapittashamaka (alleviates kapaha and pitta dosha)
5.	Jati	Tikta (Bitter) Kashaya (Astringent)	Laghu (Light) Snighdha (Unctuous) Mridu (Soft)	Ushna (Hot)	Katu (Pungent)	Mukharoganasaka (destroys oral diseases), gives strength to teeth,vranashodaka (wound cleansing), Vranaropaka(wound healing)	Tridoshashamaka (pacifies all the three dosha)

Method of Preparation: Leaves of panchapallava were collected from the herbal garden of SDM College of Ayurveda, Hassan.

Preparation of Kvatha:

Patola	– 10g
Nimba	– 10g
Jambu	– 10g
Amra	– 10g
Jati	– 10g
Water	– 400 ml

Fresh leaves of above mentioned quantity of Panchapallava were taken and washed with tap water. Leaves were crushed into small pieces and kept in a vessel. Added 8 times of water and kept it on medium flame to extract medicinal properties until it reduced to 1/4th i.e., 100ml. Then kvatha was collected by filtering with koral cloth.

Preparation of Arka:

Patola	–8g
Nimba	– 8g
Jambu	– 8g
Amra	– 8g
Jati	– 8g
Water	– 400 ml

Fresh leaves of Panchapallava were taken and crushed. Then crushed leaves were transferred in round bottom flask and 400ml water was added. Then distillation apparatus (Arka yantra) was set and heating was started initially with 60° Celsius temperature. When it started boiling the temperature was reduced to 40° Celsius. Then temperature was maintained between 30° - 40° Celsius. Initial few drops of panchapallava arka were discarded because it contains only steam and may not contain the essential principles of drugs¹⁰. Then 40% of distillate was collected to avoid charring of the drugs.



Fig 1 : Patola

Fig 2 : Nimba

Fig 3 : Jati



Fig 4: Jambu

Fig 5: Amra

Fig 5: Boiling
of kvathaFig 6: Panchapallava
arkaFig 7: Distillation
apparatusFig 8: Panchapallava
arka

Analytical Study:

The Physico - chemical parameters and organoleptic characters of Panchapallava kvatha and arka assessed include colour, odour, taste, appearance, pH, viscosity, specific gravity and refractive index.

Determination of pH

a. Preparation of buffer solutions: Standard buffer solution: Dissolved one tablet of pH 4, 7 and 9.2 in 100 ml of distilled water.

b. Determination of pH: 1 ml of sample was taken and made up to 10 ml with distilled water, stirred well and filtered. The filtrate was used for the experiment. Instrument was

switched on. 30 minutes time was given for warming pH meter.

The pH 4 solution was first introduced and the pH adjusted by using the knob to 4.02 for room temperature 30°C. The pH 7 solution was introduced and the pH meter adjusted to 7 by using the knob. Introduced the pH 9.2 solution and checked the pH reading without adjusting the knob. Then the sample solution was introduced and reading was noted. Repeated the test for four times and the average reading were taken as result.

The pH was noted by pH meter; first pH was noted for acidic and basic buffer solutions then for kvatha and arka.

Specific gravity

Cleaned a specific gravity bottle by shaking with acetone and then with ether. Dried the bottle and noted the weight. The sample solution was cooled at room temperature. Carefully filled the specific gravity bottle with the test liquid, inserted the stopper and removed the surplus liquid. Weight was noted. The procedure was repeated using distilled water in place of sample solution.

Specific gravity was calculated by empty pycnometer (W_1), pycnometer with distilled water (W_2), pycnometer with sample (W_3).

Viscosity

The given sample was filled in a U tube Viscometer in accordance with the expected viscosity of the liquid so that the fluid level stands within 0.2 mm of the filling mark of the viscometer when the capillary is vertical and the specified temperature is attained by the test liquid. The liquid was sucked or blown to the specified height of the viscometer and the time taken for the sample to pass the two marks was measured. Viscosity was measured using the formula

$$\eta_1 = \rho_1 t_1 \times \eta_2 / \rho_2 t_2$$

η_1 – Viscosity of sample

η_2 - Viscosity of water

t_1 and t_2 - Time taken for the sample and water to pass the meniscus

ρ_1 and ρ_2 – Density of sample and water

For viscosity with the help of pycnometer density of water and sample was calculated and then viscosity was determined.

Refractive index

Placed a drop of water on the prism and adjusted the drive knob in such a way that the boundary line intersects the separatrix exactly at the centre. Reading was noted. Distilled water has a refractive index of 1.3325 at 25⁰Celsius. The difference the reading and 1.3325 gives the error of the instrument. If the reading is less than 1.3325, the error is minus, then the correction is plus; if the reading is more, the error is plus and the correction is minus. Refractive index of oil is determined using one drop of the sample. The correction if any should be applied to the measured reading to get the accurate refractive index. Refractive index of the test samples were measured at 28⁰ Celsius.

OBSERVATION AND RESULTS:

Table 2: Observation of Pharmaceutical study

Sl. No.	Observation	Panchapallava kvatha	Panchapallava arka
1.	Quantity of raw leaves	50g	40g
2.	Quantity of water	400ml	400ml
3.	Proportion	1:8	1:8
4.	Date of preparation	5/8/2021	22/6/2021

Table 3: Organoleptic characters of Panchapallava kvatha and arka

Sl. No.	Parameters	Panchapallava kvatha	Panchapallava arka
1.	Colour	Brownish	Transparent
2.	Odour	Pungent	Not specific
3.	Taste	Bitter	Not specific

Table 4: Physico- chemical parameters of Panchapallava kvatha and arka

Sl. No.	Parameters	Panchapallava kvatha	Panchapallava arka
1.	pH	5.75	5.68
2.	Viscosity	0.0091	0.0166
3.	Specific gravity	1.0027	0.999
4.	Refractive index	2	0.2

DISCUSSION

Panchapallava kvatha mentioned in Chakradutta is said to be best for mouth wash. Both kvatha and arka were prepared in 1:8 and 1:10 ratio respectively. Eight parts of water for kvatha was taken as the drugs are soft in nature. Kvatha was prepared in medium flame and arka at 40° C temperature to facilitate the extraction of active principles.

pH of Panchapallava kvatha was 5.75 and Panchapallava arka was 5.68 which are acidic in nature. The acidic pH is because of the nature of the dravya. Viscosity of kvatha was 0.0091 and arka was 0.0166. Specific gravity of kvatha was 1.0027 and arka was 0.999. In both the preparations water is used as a media to extract the water soluble active constituents; hence the specific gravity is nearer to water. Refractive index for kvatha was 2 as in decoctions there will be suspended solid particles and in arka it was 0.2 as it is a distillate.

CONCLUSION

Panchapallava kvatha and arka both preparations were carried out as mentioned in treatise of Ayurveda pharmaceuticals. Physico-chemical parameters such as organoleptic characters, pH, viscosity, specific gravity and refractive index were assessed to check the variations. There was slight difference in the analytical parameters of both the forms.

Modification of kvatha into arka is a desired requisite as arka has longer shelf life in comparison to kvatha. Also, arka as a mouth wash is more palatable and patient compatible. The analytical parameters can be taken as preliminary standards for Panchapallava arka and kvatha.

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