

A PHARMACEUTICO –ANALYTICAL STUDY OF TRIKATU GUTIKA

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ABSTRACT

Ayurveda considered as the science of life. The ultimate aim of *Ayurveda* is to promote and maintain the health of every human being. *Ayurveda* have the special branch which deals with the preparation of formulations. *Panchavidha Kashaya Kalpana* i.e *Swarasa, Kalka, Kwatha, Hima* and *phanta* was described by legend scholar Charaka first time in scientific manner. Sarangadhar Samhita has mentioned “*Gutika Kalpana*” as an individual entity in the 7th chapter of *Madhyam Khanda*. *Trikatu gutika* is a classical Ayurvedic herbal formulation mentioned in a classical *Bhavaprakasha uttatarardha* in *prameha pidaka adhyaya*. The objective of the study is physico-chemical analysis of *Trikatu Gutika* which contains *triphala, trikatu, gokshura, guggulu*. The analytical study of *Gutika* is performed with the following parameters: physico-chemical parameters i.e. colour, taste, Ph, TLC etc. *Trikatu Gutika* is prepared according to the classical text. The present study is made to evaluate the pharmaceutical and analytical study.

KEYWORDS: *Gutika, Trikatu Gutika, analytical study, analytical study.*

INTRODUCTION

Ayurveda is very much rich in its pharmaceutical aspects since the Samhita period. The Pancha Kashaya Kalpana i.e. Swarasa, Kalka, Srita, Sita and Phant was described by legend scholar Charaka first time in scientific manner¹. These Pancha Kashaya Kalpana are the base of all Ayurvedic formulations. Crude drugs are rarely administered in Ayurveda. Various formulations ranging from simple distillates (Arka), decoctions (Kwatha), linctus (Leha, Avaleha) and powders (churna) to elaborate pharmaceutical preparations like pills of different sizes (vati, gutika, modaka), medicated oils (taila and ghrita) and alcoholic preparations (Asavarishtha) etc.

are available. The Gutika Kalpana the solid medicament in the form of rolled preparation is undoubtedly centuries old. A lot of formulations of Gutika Kalpana are mentioned in the classics. Easy administration of the drugs, better palatability as well as the better accuracy of dosages forms make it unique formulation. Gutikakalpana is the outcome of Kalka kalpana. When powder of herbal drugs, Bhasma of Sudha, Rasoparasa, Sadharana rasa etc. are added in guggulu, guda (jaggery), Sharkara (sugar) or Madhu (honey) etc. and triturated with the addition of any liquid like Swarasa, Kwatha etc. and rolled in round masses are called the Gutika. Later on due to importance of this kalpana,

Sharangadhara in Sharangadhara Samhita² has mentioned “Gutika Kalpana” as an individual entity in the 7th chapter of Madhyama Khanda.

MATERIALS AND METHODS

Aushadhi yoga:

List of Drugs of Trikatu Gutika³:

Drug Name	Botanical Name	Family	Part Used	Qty
Haritaki	<i>Terminalia chebula</i> Retz.	Combretaceae	Fruit	1 part
Bibhitaki	<i>Terminalia bellerica</i> Roxb	Combretaceae	Fruit	1 part
Amlaki	<i>Emblica officinalis</i> Gaertn.	Euphorbiaceae	Fruit	1 part
Sunthi	<i>Zingiber officinale</i> Roxb.	Scitaminae	Rizome	1 part
Pippali	<i>Piper longum</i> Linn	Piperaceae	Fruit	1 part
Marica	<i>Piper nigrum</i> Linn	Piperaceae	Fruit	1 part
Gokshura	<i>Tribulus terrestris</i> Linn	Zygophyllaceae	Fruit	Q.S
Guggulu	<i>Commiphora wightii</i> (Arn) Bhand.	Burseraceae	Resin	1 part

METHODOLOGY

Centre of study: Ramakrishna Ayurveda Medical College Hospital and Research Center

Study design: Pharmaceutical study.

Source of data:

Literary Source: all the relevant information from classical Texts, Modern Texts, internet, journals etc. were reviewed and the data was collected.

Pharmaceutical Source: raw materials were collected from a genuine source and careened. The formulation selected for the present study *Trikatu Gutika* was prepared in the Teaching pharmacy, P.G. studies,

AIM AND OBJECTIVE

The aim of the study is to carry out the pharmaceutical study and the physico-chemical analysis of trikatu.

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Pharmaceutical Study: pharmaceutical study deals with proper identification, selection, processing of raw drugs and preparation of *Trikatu Gutika*. It is very important aspect of any research work which assures the quality and safety of preparation and increase the efficacy of prepared drug. Raw materials were screened and collected. Preparation of *Trikatu Gutika* was done as per the Classical Text *Bhavaprakasha (Uttarardha) Prameha Pidaka Adhyaya*.

Method of preparation:

i) Trikatu churna nirmana

ii) Triphala churna nirmana

iii) Guggulu shodhana

iv) Gokshura kwatha preparation.

Triphala churna, Trikatu churna and Sodhita Guggulu was taken in equal quantity, required amount of Gokshura

Kwatha was added, triturated then pounded well, gutika was prepared.

ANALYTICAL STUDY

Parameters:

PH value, Loss on drying at 105⁰ C, Total ash, Hardness test, Disintegration time, TLC, Solubility

Organoleptic Characterization:

Colour	Odour	Touch	Taste	Consistency	Nature of fracture
Drark brown	Faint	Rough	Palatable	Uneven	Rough powder

Drug review:

The word drug comes from the French word “Drouge” which literally means a dry herb. In Ayurveda, Bhesaja or Dravya or Drug has been given an utmost importance as it was been mentioned as a part of chikitshachatuspada. TrikatuGutika mentioned in Bhavaprakasha Uttardha has been chosen for the study.

Ayurvedic Properties

Drug	Rasa	Guna	Virya	Vipaka	Karma
Haritaki ⁴	Madhura, amla, katu, tikta, kashaya	Laghu Ruksha	Ushan	Madhura	Chakshushya, dipana, hridya, medhya, sarvadoshprashamana, rasayana, anulomana.
Bibhitaki ⁵	Kashaya	Ruksha Laghu	Ushna	Madhura	Chakshushya, keshya, kaphapittajit, bhedaka, kriminashaka, Kasahara.
Amalaka ⁶	Madhura, amla, katu, tikta, Kashaya.	Laghu, Ruksha	Shita	Madhura	Tridoshahara, rasayana, vrishya, chakshushya
Sunthi ⁷	Katu	Laghu Snigdha	Ushan	Madhura	Vata-kaphahara, ashmadoshahara dipana, hridya, anulomana.
Pippali ⁸	Madhura, katu, tikta.	Laghu Snigdha	Anusan	Madhura	Dipana, hridya, kaphahara, ruchya, tridoshahara, vatahara, vrishya, rasayana, rechana.
Maricha ⁹	Katu ,tikta	ruksha, tiksha	Ushna	Katu	Sleshmahara, dipana, medohara, pittakara, ruchya, kaphavatajit, vatahara, chedana, jantunasanam, chedi, hridroga, vataroga.
Gokshura ¹⁰	Madhura	Guru	Shita	Madhura	Brimhana, vatanut,

		Snigdha			vrishya, ashmarihara, vastisodhana.
Guggulu ¹¹	Kashaya Katu Tikta	Sara Laghu Visada	Ushna	Katu	Balya, rasayana, varnya, vatabalasajit, bhagnasandhanakrit, medohara.

Observation and result:

Dravya	Weight of raw materials in gm	Weight of vastra galitha churna in gm	Loss in gram	Observation
Haritaki	200	190.21	8.95	Colour: Golden yellow Taste: Astringent, sweetish Odour: Slightly aromatic Touch: Fine powder
Bibhitaki	200	189.16	9.79	Colour: Yellow Taste: Sweet & astringent Odour: Aromatic Touch: Fine powder
Amalaki	200	191.05	10.84	Colour: Yellowish brown Taste: Sour, astringent Odour: Faint Touch: Smooth
Sunthi	200	187.20	128.	Colour: Greyish brown Taste: Pungent Odour: Characteristic aromatic Touch: Coarse powder
Pippali	200	191.10	8.9	Colour: Dull dark brown to black Taste: Bitter Odour: Characteristic aromatic Touch: Coarse powder
Marich	200	193.32	6.68	Colour: Brown blackish Taste: Pungent Odour: Pungent Touch: Fine powder

Characteristic of Triphala Churna:

Colour : Burly wood
Taste : No specific
Texture : Powder
Odour : No specific

Characteristic of Trikatu Churna:

Colour : Yellowish green
Taste : Pungent
Texture : Powder
Odour : Aromatic

Characteristic of Gokshura Coarse powder:

Colour : Greyish brown
Taste : Slightly astringent, bitter
Texture : Coarse powder
Odour : Slightly aromatic

Characteristic of Sodhita Guggulu:

Colour : Dark brown
Taste : Tikta, kashaya
Consistency : Hard

Odour :Guggulu specific

-pH of the sample Trikatu Gutika (10mg/ml)

RESULTS:

Ashuddha Guggulu: 600gms

Triphala Kwatha: 2400gms

Shuddha Guggulu obtained: 610 gms

A laboratory study of the preparation Trikatu Gutika was conducted to standardize the preparation. The prepared Gutika was given for analytical study in Skanda Life Sciences Private Limited, Bangaluru, Karnataka

Loss on drying:

Sample	Initial weight	Final weight	% of moisture
Trikatu Gutika	2.14	1.97	7.94

is 3.76.

Hardness Test:

Hardness in Kg	3.4+0.5
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Acid insoluble Ash:

Sample	Weight of ash in gm	Weight of acid in-soluble ash in gm	% acid in-soluble ash
Trkatu Gutika	0.54	0.018	3.33

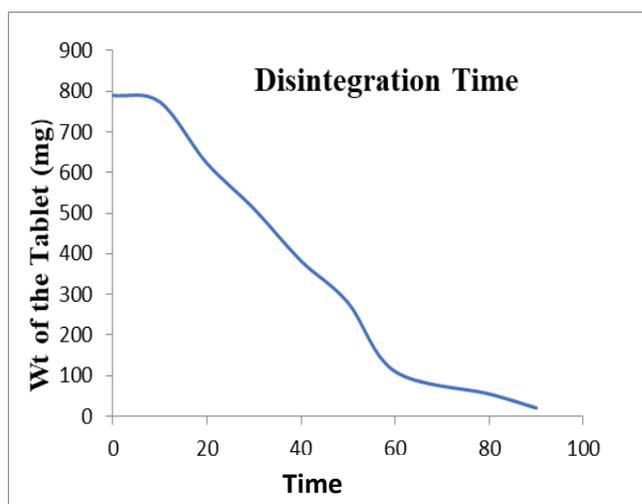
Total Ash Value:

Sample	Weight of the sample in gm	Weight of the ash in gm	% total ash value
Trikatu Gutika	5	0.362	7.24

Disintegration time

Disintegration time of Trikatugutika was 90 mins with 2.5% left over.

Time (min)	Wt. of the tablet (mg)
0	791.1
10	775.2
20	624.2
30	511.9
40	383.3
50	280.3
60	110.2
80	54.7
90	20.2



Graph 1: Graph showing the disintegration of tablet w r t time in mins

Sample	TLC Band at 254 nm	Retention Factor	TLC Profile characteristics		
			366 nm	254nm	Visible light
<i>Trikatugutika</i>	1	0.95	-	Blue	-
		1	-	Blue	-

• TLC

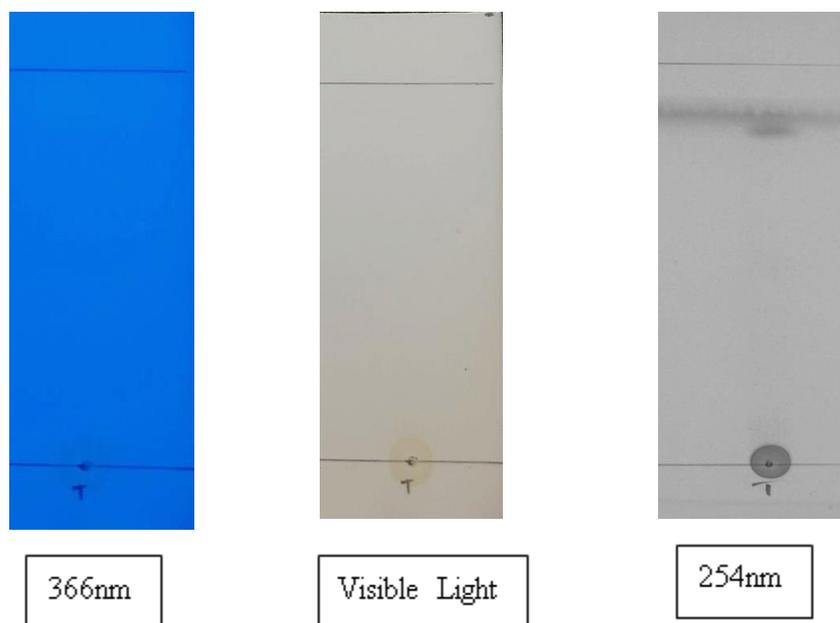


Fig 1: TLC chromatogram for *Trikatu gutikaat* at 366nm, visible light and 254nm

DISCUSSION

Kalpana may be defined as the particular processing of any drug to extract the desired pharmacologically active ingredient of ingredients of desired potency in a particular Dosage form. In Vedic literature various Ahara Kalpanas and Aushadha Kalpanas have been mentioned. But their detailed and systematic description is available first time

in Charaka Samhita. Since Samhita period there are five fundamental Kalpanas of Ayurvedic pharmacy. Each remedy described in any Ayurvedic classics has been prepared by the use of one or more of these basic Kalpanas. Panchavidha means five categories i.e. Swarasa, Kalka, Kwatha or Shruta, Hima or Sita and Phanta. Thus Panchavidha Kashaya Kalpana means five modes of processing of drugs or five types

of extractions. Panchavidha Kashaya Kalpana should be made according the strength and nature of the disease and patients as well. In modern pharmaceutical science, method of type of preparation is selected depending upon the physico-chemical properties of the crude drugs and main motto of the method adopted for a particular preparation of any drug has to extract the maximum pharmaceutically active ingredients of the crude drug. The nature of pharmaceutically active ingredients is an important factor in deciding the method of preparation. In case of herbal drugs. The active ingredients maybe in their natural soup, wooden or fibrous portion or in water soluble contents at different temperatures etc. These pharmaceutically active ingredients in extractives must be pharmacologically active, so as to make use them (extractives) for therapeutic purpose, which is the only aim of both these; pharmaceutical chemistry and pharmacology. The main emphasis of Ayurvedic Acharyas seems to extract the pharmacologically active ingredients. Their fundamental and deep knowledge regarding the same has been confirmed by the indications of different dosage forms of the same drug in different diseases. In Indian system of medicine all pharmaceutical treatment has been denoted by a single term samskara. According to Charaka, Samskara is the process that may bring out some radical changes in the substance by replacing their natural properties totally or partially into anewone, or by intensifying or moderating their qualities. These changes are brought about by mixing with water, application of heat, clarification, churning or emulsification, placing, timing flavoring,

impregnation, duration and best selection etc. In the present study Pharmaceutical preparation is Gutika (Trikatu Gutika). Scince Samhita Period. Ayurveda is very much rich in its pharmaceutical preparations targeting specific doses palatability drug metabolism etc. Crude drugs are rarely administered in Ayurveda. Various formulations ranging from simple distillates (Arka), decoctions (Kwatha), linctus (Leha, Avaleha) and powders (churna) to elaborate pharmaceutical preparations like pills of different sizes (vati,gutika,modaka), medicated oils (taila and ghrita) and alcoholic preparations (Asavarishtha) etc. are available. The Gutika Kalpana the solid medicament in the form of rolled preparation is undoubtly centuries old. Easy administration of the drugs, better palatability as well as the better accuracy of dosages forms make it unique formulation. Gutikakalpana is the outcome of Kalka kalpana. When powder of herbal drugs, Bhasma of Sudha, Rasoparasa, Sadharana rasa etc. are added in guggulu, guda (jaggery), Sharkara (sugar) or Madhu (honey) etc. and triturated with the addition of any liquid like Swarasa, Kwatha etc. and rolled in round masses are called the Gutika. Gutika, Vati, Modaka,Vatika, Pindi, Guda and Varti are the names used in Sharangadhara Samhita for the Gutika Kalpana, on the basis of shape, dose, route of administration etc. Preparation of *Trikatu Gutika* was done as per the Classical text *Bhavaprakasha (uttarardha) Prameha Pidaka Adhyaya*. Fine powder was prepared for further process of Bhavana and Gutika Nirmana. The Colour of the churna was Dark brown and odour was of characteristic Trikatu odour with katu tikta taste suggests

organoleptic characters are intact of Trikatu Churna. Churna Kalpana is aimed at reducing the size of the drug, augmenting the surface area for better absorption and reaction, and for uniform mixing of the ingredients. Fine powder was prepared for further process of Bhavana and Gutika Nirmana. The Colour of the churna was Burlywood and odour was of characteristic Triphala odour with Amla, Kashaya, Tikta taste suggests organoleptic characters are intact of Triphala Churna. The physical impurities like stone, wood, bark particles etc. was cleaned manually which gives a better raw material. Raw guggulu was triturated using khalva yantra to make it small and uniform pieces. Then was placed over a piece of cotton cloth which was later tied with thread to loosely wrap the guggulu to form a pottali like pouch. The pottali was supported by a stainless-steel rod and hanged into extraction vessel containing Triphala kwath. The temperature was maintained between 70-100-degree centegrade to facilitate solubilization of guggulu in sodhana media. This process was continued approximately 2-3 hrs, until guggulu melted. During the process the pottali was pressed so that the guggulu easily comes out from the pottali. When the guggulu was completely dissolved, the pottali was removed from the media. Then it was subjected to further heating on madhyamagni to obtain thick viscous mass. The concentrated guggulu was poured into shallow stainless-steel tray smeared with cow ghee into thin layers and dried under the sun. The dried mass was carefully collected as suddha guggulu and was stored in a sterile airtight glass container. After sodhana the colour was dark brown, tikta

Kashaya in taste, guggulu specific odour. Importance of soaking: Drug mixture *Gokshura* was soaked in stainless-steel container with 8 parts of tap water for 12 hours. A drug in the dry state is porous due to Shrinkage, and the pores contain air that must be displaced as the solvent enters into the pores and penetrates into the cells. The process will depend on the character of the drug. The cell walls consist basically of cellulose molecules these are known as micelle and in fresh material are surrounded by a film of water. When the drug is dried, this film is lost and move together to form a continuous membrane. When the dry drug is moistened the reverse occurs & themicelle take up a liquid film and tissue swell. The amount of swelling is variable being greatest with liquids when hydroxyl groups form a great part of the molecule. Thus, water causes considerable swelling. So, it is very much necessary that Yavakuta i.e. dry drug should be dipped into water for sometimes. The heat applied for the preparation of Kwatha should be Mridu i.e. around 100°C. This can be understood in other way that most of the alkaloids and other substances get deteriorate at high temperature. According to other Acharyas at the elevated temperature there are chances of Dagdhata, Pichchilita etc. Equal quantity of Triphala churna, Trikatu churna Sodhita guggulu was taken in khalvayantra and triturated it well. Then quantity sufficient gokshura kwath was added and triturated it well. When the mass is properly ground and is in a condition to be made into gutika, the mixture was rolled in between the thumb and finger. Pills are allowed to dry, after that was transferred into an airtight container.

CONCLUSION

The therapeutic efficacy is depending on the quality of ingredients used for the medicine preparation. So, any plant or formulation which is used medicinally requires detail study prior to its use. In this study, according to the classical textual standard operative procedure mentioned in classic Trikatu Gutika was prepared. The raw drugs were identified and authenticated before using preparation.

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