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Guda Kalpana (Jaggery Confections) : A Synoptic Overview

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ABSTRACT

The Ayurvedic system of medicine has described various herbal formulations in the treatment of diseases, which plays an important role in modern health care and curing various ailments or diseases. *Bhaishajya Kalpana* is an integral part of Ayurveda which deals with the processing methods of drugs and their various dosage forms. *Guda Kalpana* [Jaggery Confection] is one among secondary formulation prepared with *Guda*. Reference of *Gudapaka Kalpana* was first time mentioned in *Chakradatta*. The preparations with more quantity of *Guda* are known as *Guda Kalpana*. This formulation can be prepared in 2 ways: *Agni Siddha* and *Anagni Siddha*. Few examples of *Guda Kalpana* are *Kalyanaka Guda* and *Shatavari Guda* etc. The '*Guda Paka Kalpana*' can be either in '*Avaleha*' [Confections] form or '*Khanda*' [Granules] form, but mostly they are present in the form of bigger pills (*Modaka*). The confirmative tests of *Guda Kalpana* are almost similar to that of *Avaleha* such as *Tantumavam*, *Apsumajjanam* etc. These formulations are advised to dissolve in mouth itself, as they are intend to provide better drug absorption through the oral cavity. *Gudapaka Kalpana* can be broadly included under confectionery dosage form which has strong potential to overcome compliance problems. In the present review an effort is made to compile all the information related to *Guda Kalpana* including its definition, various references, examples, etc. As *Guda* is one among the best sweetening agent, and good binding agent, *Guda Kalpana* and its formulations have better palatability and longer shelf life than any other Ayurvedic dosage form.

Key words: Ayurveda, Guda, Kalpana, Gudapaka, Avaleha.

INTRODUCTION

Traditional/Ayurveda medicines are gaining increasing popularity worldwide for the treatment of various diseases in recent times. Even there is a growing interest in research on Ayurvedic science.^[1]

Bhaishajya Kalpana is an integral part of Ayurveda which deals with the processing methods of drugs and

their various dosage forms. The basic processing methods of *Bhaishajya Kalpana* through which a drug is converted into medicinal form according to the requirement are known as *Panchvidha Kashaya Kalpana* [Fundamental Preparations]. The main purpose behind these basic *Kalpanas* is to extract the pharmacologically active principle. Due to certain limitations of these basic *Kalpanas* such as non-availability of crude drugs all the time, very short shelf-life, inconvenient taste and high dose etc. *Upakalpanas* or derived preparation came into existence such as *Churna* [Fine Powder], *Vati* [Tablets], *Sneha* [Medicated Oil/ Ghee], *Avaleha* [Confections] and *Gudapaka* [Jaggery Confections] etc.^[2] In Indian Pharmacopoeia we find '*Guda kalpana*' specially mentioned. Those Jaggery Confections preparations with *Guda* [Jaggery] as prominent or major ingredient are brought under heading of *Guda Kalpana*. *Guda* is one among the best sweetening agent and also has good binding capacity.^[3]

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AIMS AND OBJECTIVES

To review the *Gudapaka Kalpana* and its interpretation through classical texts.

METHODOLOGY

As it is review, data is collected through classical texts and online database.

Gudapaka definition

Guda or *Sharkara* [Sugar] or *Guggulu* [Commiphora Mukul] processed on fire till it attends the *Avaleha* consistency and then added with particular *Churnas* and mould it into *Vati* form.^[4]

The preparations in which *Guda* used as main ingredient is included under *Gudapaka Kalpana*. *Guda* is having excellent binding capacity with appreciable nutrient benefits. Two types of *Guda Kalpana* can be made with or without processing in fire [*Agni Siddha* and *Anagni Siddha*]. In *Agni Siddha*, heating in fire is involved whereas in *Anagni Siddha*, *Oushadha Dravyas* pounded and mixed well with *Guda* which act as binding agent.^[5]

General Method of Preparation

The *Kashaya*, *Swarasa* [Juice] or any other liquid preparation should be prepared as per classical reference and it should be taken in a clean bigger vessel and placed over mild fire. Specified quantity of '*Guda*' should be dissolved in it. After complete dissolution of '*Guda*' the blend may be filtered once to get rid of physical impurities present in it. The filtrate should be taken in a wide mouthed clean stainless steel vessel and boil it over mild fire and reduce it to 2 to 3 thread consistency. Later the vessel should be taken out of fire and fine powder of medicinal drugs should be added little by little and stirred well to a homogeneous mixture. Honey should be added after the preparation is fully cool and it is packed in dry airtight wide mouthed containers and preserved.

The '*Guda Paka Kalpana*' can be either in '*Avaleha*' form or in the form of '*Khanda*' [Granules]. However, majority of the '*Guda Paka Kalpana*' are presented in the form of bigger pills.^[6]

Paka Lakshana [Confirmatory Tests] According to different Authors^[7]

Table 1: Paka Lakshana According to different Authors.

SN	Authors	Siddhi Lakshana
1.	<i>Charaka</i>	<i>Tantumtvam</i> [thread appearances] <i>Patitenasheeryatvam</i> [non spreading when put in water]
2.	<i>Vagbhata</i>	<i>Tantumtvam</i> [thread appearances] <i>Apsumajjanam</i> [sink in water] <i>Na Saranam</i> [non spreading]
3.	<i>Sharangadhara</i>	<i>Tantumtvam</i> [stringes] <i>Sthiratvam</i> [firm] <i>Peeditemudra</i> [finger prints] <i>Gandhavarnarasodbhava</i> [odour, colour, taste]
4.	<i>Chakradatta and Vaidhyak Paribhasha Pradip</i>	<i>DarviPralepa</i> [stick to ladle] <i>Tantulibhavet</i> [threads] <i>Kshipto Na Plavate</i> [non spreading] <i>Kshiptastunischala</i> [motile] <i>Patitastu Na Sheeryatae</i> [non spreading] <i>Sukhamarda</i> [soft to roll] <i>Sukhasparsha</i> [soft to touch] <i>PiditeBhajate Mudra</i> [finger prints] <i>Gandha varna rasanvita</i> [odour, colour, taste]
5.	<i>Govinda Das Sen</i>	<i>Sukhamarda</i> [soft to roll]

		<i>Khara Sparsha</i> [hard to touch]
		<i>Peedito Bhajte Mudra</i> [finger prints]

Dosage

One *Karsha* [12 gm] of *Gudapaka Kalpana* can be administered daily along with *Godugdha* [Milk], *Jala* [Water], or any liquid preparations. It can store for 1 year in suitable, dry, airtight, wide mouthed containers.^[8]

Agni Siddha Guda Kalpana

The formulations are prepared by using general method of preparation of *Guda Kalpana* which includes use of fire is called as *Agni Siddha Guda Kalpana*. Few examples of *Agni Siddha Guda Kalpana* are mention in table no. 2.

Table 2: Examples of Agni Siddha Guda Kalpana.

SN	Formulation	Contents	Indications
1.	<i>Shatavari Guda</i> ^[9]	<i>Shatavari Mula Rasa, Ikshu Rasa, Ghruta, Madhuka, Ushira, Chandana, Madhupushpaka, Syonaka, Trijata, Jeerak, Kustumbura, Krsna, Dhatri, Kushta, Padmaka, Ela</i>	<i>Kushta, Prameha, Raktapitta, Halimaka</i>
2.	<i>Kalyanaka Guda</i> ^[10]	<i>Vidanga, Pippalimūla, Haritaki, Vibhitaki, Amalaki, Dhanyaka, Citraka, Marica, Indrayava, Ajaj, Pippali, Gajapippali, Ajamoda (Dipyaka), Saindhava Lavana, Sauvarcala Lavana, Vida Lavana, Audbhida Lavana, Samudra Lavana, Tilataila, Trivrt Curna, Amalaki Phalarasa, Guda (Jaggery)</i>	<i>Kushta, Arsha, Kamala, Gulma, Prameha, Udar, Bhagandar, Grahani, Pandu</i>
3.	<i>Manibhadra Guda</i> ^[11]	<i>Vidangasāra, Amalaki, Haritaki, Trivat (Kumbha), Guda</i>	<i>Kustha, Switra, Swasa,</i>

			<i>Kasa, Udararoga, Arśa, Prameha, Pliha, Granthiruja, Jantu, Gulma.</i>
4.	<i>Gudapippali</i> ^[12]	<i>Guda, Pippali, Suddha Hingu, Sunthi, Maria, Pippali, Saindhava Lavana, Citrakamula, Vida Lavana, Yavakṣāra, Ksāra, Apāmārga, Talapuspa, Kokilaksa, Ciñcākṣāra, Samudraphena, Snuhi Kṣāra</i>	<i>Pliha Jwara</i>
5.	<i>Rajarasayana</i> ^[13]	<i>Chitrak Kashaya, Guduchi Swaras, Amalaki Swaras, Haritaki Kashya, Dashamula Kashaya, Guda, Madhu, Twak, Patra, Ela, Maricha, Sunti, Pippali, Yavakshara.</i>	<i>Pinas</i>
6.	<i>Bahushala Guda</i> ^[14]	<i>Indraravuni, Musta, Sunti, Danti, Haritaki, Trivruta, Nishotha, Kachora, Vidanga, Guksura, Chitraka, Surana, Vrudhadaru, Bhallataka, Guda, Chitrak, Trivruta, Danti</i>	<i>Arsha, Gulma, Udar, Amavata, Pratishyaya, Grahani, Kshyaya, Pinas, Pandu, Prameha</i>
7.	<i>Dashamula Guda</i> ^[15]	<i>Dashamula, Chitraka, Dantimula, jala, Guda, Trivruta, Pippali</i>	<i>Arsha, Ajirna, Pandu</i>
8.	<i>Bhallatak Guda</i> ^[16]	<i>Bhallatak, Guda, Haritaki, Amlaki, Bibhitaki, Sunti, Pippali, Marich, Ajwain, Musta, Saindhav, Dalchini, Ela, Tejapatra, nagakeshar</i>	<i>Arsha, Kushta, Kamala, Prameha, Gulma, Pandu, Kasa, Krumi,</i>

9.	Marichadi Gutika ^[17]	Marich, Pippali, Yavakshara, Dadim, Guda	Kasa,
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Anagni Siddha Guda Kalpana

Formulations which are prepared by using *Guda* without fire and only mixing are done then it is called as *Anagni Siddha Guda Kalpana*. These are mainly advised to hold in the mouth and allow dissolving slowly in mouth itself and then consuming it. Few examples are mentioned in table no. 3

Table 3: Examples of Anagni Siddha Guda Kalpana

SN	Formulation	Contents	Indications
1.	Gudadi Gutika ^[18]	Guda, Sunti, Haritaki, Musta	Shwasa, Kasa
2.	Vrudhadaru Modaka ^[19]	Vrudhadaru, Bhallatak, Sunti	Arsha,
3.	Gudaabhaya ^[20]	Guda Abhaya	Arsha
4.	Sagudakana Abhaya ^[21]	Guda, Pippali, Haritaki	Arsha

Quality control tests for Gudapaka

Analytical study is an essential measurement for ensuring the quality control of the final product. Quality control parameters are necessary to establish safety, efficacy of the product. The parameters used for analysis are organoleptic characters and physico-chemical parameters. Any change in raw material and method of preparation can cause variation in these parameters. Following are the analytical parameters for *Guda Kalpana*.

1. Organoleptic characters
2. Loss on drying at 105°C
3. Total ash/Acid insoluble ash
4. pH value
5. Specific gravity at 25°C
6. Total solid content
7. Alcohol soluble extractive

8. Water soluble extractive
9. Fat content
10. Total, reducing & non-reducing sugars
11. TLC/HPTLC
12. Test for specific pathogens
13. Pesticide residue
14. Test for heavy toxic metals
15. Microbial contamination
16. Shelf life

DISCUSSION

Bhaishajya Kalpana is the branch of *Ayurveda*, wherein standard raw drugs are transferred into a potent medicine. In this branch there are basically two types of formulations i.e., Primary formulations and Secondary formulations. The Secondary formulations include the preparations like *Avaleha Kalpana*, *Guda Kalpana*, *Sneha Kalpana* etc.^[22]

Guda Kalpanas are specially mentioned in *Ayurvedic Pharmacopoeia*. The preparations with more quantity of jaggery are known as *Guda Kalpana*.^[23]

Sweet substances (*Guda*) play crucial role in *Guda Kalpana* as they impart palatability and preservation.^[24] Also *Guda* has the properties like *Ruchikaram*, *Pathyam* [Wholesome Diet], *Agnideepanam* [Appetizers], *Mutralam* [Diuretics] and *Mala Sudhikaram*, *Hrudayahitham* [good for Heart], *Swadhishtam* [Tasty], *Pushtikaram*, *Rasayanam* [Rejuvenate], *Laghu* [Light], *Snigdham* [Soft], *Vrushyam* [Aphrodisiac], *Prameha-Haram* [Cures Diabetics], *Pandu* [Anemia], *Santapa and Vatapittaharam*^[25] which make the formulation more potent and efficient by adding all these properties in final product.

Avaleha or *Lehya* is a semi-solid preparation of drugs, prepared with addition of jaggery, sugar or sugarcandy and boiled with prescribed drug juice or decoction. They are also known as *Modaka*, *Guda*, *Khanda*, *Rasayana*, *Leha* etc.^[26]

Avaleha and *Guda Paka Kalpana* are similar only the difference is the sweetening agent. In *Guda Paka* the name itself suggest that it contains *Guda*, where as in *Avaleha* it may be *Guda*, *Sharkara*, or *Sita*.^[18] *Gudapaka* are prepared by two methods *Agni Siddha* and *Anagni Siddha*. *Anagni Siddha* advised to dissolve in mouth itself, as they are intend to provide better drug absorption through the oral cavity. The oral transmucosal route has significant potential for drug delivery both systemically and locally. The oral mucosa contains stratified squamous epithelia, which is similar to the skin. The absence of keratinized mucosa and presence of salivary glands maintains the moisture, making the oral mucosa more permeable and absorptive than the skin. The oral cavity is a highly-hydrated environment that facilitates drug dissolution and the small surface area of the oral membrane is also beneficial for sustained drug delivery of medicines like *Gudaadi Vatika*, *Marichadi Gutika*, etc. Oral absorption can also overcome hepatic first-pass metabolism and improve the bioavailability. Prolonged slow release in the oral cavity may also provide a biopharmaceutical benefit by preventing immediate dose availability and extending the duration of drug exposure.

Confectionery [sweet goods] dose forms have a long history of use in therapeutic applications, yet there is no great presence on such dose forms in the open literature. The use of patient-friendly dose forms can increase compliance relative to traditional dose forms where difficulties in swallowing may prohibit the use of tablets and capsules in particular.

The ingredients of Confectioneries can be broadly classified into two – Essential ingredients and Optional ingredients. The Essential Ingredients include sugar and water. The optional ingredients include 1. Sweetening agents such as cane jaggery, palm jaggery, palm sugar, raw sugar, etc.^[27] So *Gudapaka Kalpana* can be broadly included under confectionery dosage form. In *Ayurveda*, reference of *Gudapaka kalpana* was mentioned first time in *Chakradatta*, *Arsha chikitsa*. *Guda* is main ingredient so will have better palatability than any other *Ayurvedic* dosage form.^[28]

CONCLUSION

Gudapaka Kalpana is one of the common dosage form which has been employed in various disorders and is gaining popularity due to its easily availability of raw drugs, easy preparation, easy administration, palatability and longer shelf life. As its mode of administration is easy and palatable, it can be included under the aegis of nutraceuticals in Ayurveda, due to its medicinal properties as well as nutritional values. But it must be not being compared with functional food or dietary supplement. The combination of medicinal drug along with jaggery, sugar, honey, ghee, oil, milk etc. are able to fulfils the all needs of Nutraceutical. Present study is carried out to review on *Guda Kalpana* and its importance, with this we can conclude that if *Guda Kalpana* prepared with standard operative procedure will show good efficacy, further it should be clinically proved.

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