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# An Insightful Review on *Sandhana Kalpana*

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## ABSTRACT

*Ayurveda* is an ancient medicine system. Over the course time, *Ayurvedic* treatments have evolved and changed. *Rasashastra Evam Bhaishajya Kalpana* is the branch of *Ayurveda* that deals with the preparation of medicines with herbs, minerals and metals. *Sandhana Kalpana* is one of the simplest but unique dosage forms which are widely used since ages. It is mainly used for health promotion and treatment of numerous diseases. *Sandhana Kalpana* includes every preparation that results out from the fermentation process. In *Ayurveda*, *Dhataki Pushpa*, *Madhukpushpa*, *Surabeej* and yeast are commonly used as *Sandhana Dravya* for fermentation process. Primarily, *Sandhana Kalpana* is divided into two types i.e., *Madya Kalpana* and *Shukta Kalpana*. *Madya Kalpana* are said to be alcoholic preparation where as *Shukta Kalpana* referred to acidic preparation. *Sandhana Kalpana* is used in wide range of diseases. *Sandhana Kalpana* are having nutritional value can be used even in children, lactating mothers and old age patients also. *Asavarishta* have a unique place among all the *Sandhana Kalpana*. They are mostly used among all *Sandhana Kalpana* due to their quick absorption, high efficacy, easy to prepare, easy to handle, easy to store and also easily palatable for patients. *Sandhana* preparations contain self-generated alcohol which acts as self preservatives having prolonged shelf life. The purpose of this article is to go through all the terminology of *Sandhana Kalpana* and to know more about therapeutic range of all these *Kalpana* so that they can be used therapeutically more in daily practice.

**Key words:** *Dhataki Pushpa*, *Madya Kalpana*, *Shukta Kalpana*, *Asavarishta*

## INTRODUCTION

*Ayurveda* deals with treatment of disease at the root cause, its prevention and cure. *Ayurveda* also helps in maintaining health and betterment of life. *Rasashastra evam Bhaishajya Kalpana* is a significant branch of *Ayurveda* where medicinal preparation takes place. To treat the disease or to be healthy, many herbal, mineral or herbo-mineral preparations are used.

*Bhaishajya Kalpana* mainly deals with herbal drugs. There are many different type of formulations among which *Sandhana Kalpana* is one of the unique and efficient *Kalpana*.

*Sandhana Kalpana* is a unique dosage form which include every preparation that comes out of fermentation process. *Asavarishta* having had a unique place among all *Sandhana Kalpana*. It is a self-generated alcohol which facilitates longer shelf life, provides comparatively faster absorption, enhanced therapeutic efficacy and potency. It is also used as *Anupana* for various other medicines.

Alcohol and carbon dioxide are produced during fermentation process due to chemical changes. Sweetening agent like sugar is reduced and converted to alcohol. Active ingredients of herbs are extracted and alcohol and acetic acid are prepared. There are several references of similar type of fermented preparation in ancient period which with the course of time evolved as a *Sandhana Kalpana*.

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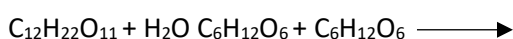
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### Definition of Sandhana Kalpana

The process of fermentation carried out is *Sandhana*. *Sandhana* word literally means union, combination or restoring. *Sandhana* is a process in which liquid preparation like juices/decoction either along with medicines or food materials kept for long duration for the onset of fermentation process.<sup>[1]</sup>

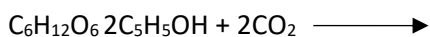
The word fermentation is derived from the latin word 'ferver' means to boil. Fermentation is an anaerobic, enzymatic metabolic process which brings about chemical changes by transforming complex organic compounds into simpler and nutritious compounds. The fermentation is the incomplete oxidation of sugar into ethanol and carbon dioxide in the absence of oxygen brought about the enzymes invertase and zymase secreted by yeast cells.<sup>[2]</sup> This fermentation process facilitates the chemical and biochemical reactions with breakage and reunion of the bonds in the preparation to form a new compound.

In the first phase, sugar gets converted into glucose and fructose-



Sugar Water Yeast Glucose Fructose

The second phase includes conversion of fructose into ethanol and carbon dioxide.



Fructose Zymase Ethanol Carbon Dioxide

### History

*Sandhana Kalpana* have detailed description in Indian history. The *Sandhana Kalpana* is described with various names during *Vedic* period or in *Samhita* period.

**Rig Veda:** *Soma Rasa* is a sweet liquid prepared by fermentation is mentioned in 9<sup>th</sup> *Mandala* of *Rig Vedic* text. Other than *Somarasa*, *Sura* and other alcoholic preparation were also described in *Rig Veda*. *Somrasa* was used as offering to God whereas *Sura* was prepared for human consumption. At that time, Curd was also widely used.

**Kautilya Arthshastra:** Separate chapters about *Sura* is mentioned. Some of fermented preparations are found like *Medaka*, *Maireys*, *Prasana*, *Asava*, *Arishta*, *Madhu*.

**Atharva Veda:** It clarify that the *Madya* utilized for treatment is known as *Arishta* and its preparation method is called *Abhishava Prakriya*.

**Yajur Veda:** It comprises numerous citations describing various *Ahara Kalpana* including *Sandhana Kalpana*.

**Charaka Samhita:** 84 *Asava* are described in *Sutrasthana* and various *Asavarishta* are described in *Chikitsa Sthana*. *Sura* is mentioned as the best *Shramhara Dravya* in *Agraha Dravya*.

**Sushruta Samhita:** 21 *Asavarishta* and 46 *Madya* preparations are described. The addition of botanical ash to *Asavarishta* components can be attributed to *Sushruta Samhita*.

**Ashtang Sangraha & Ashtang Hridaya:** Use of *Dhataki Pushpa* for preparation of *Sandhana Kalpana* was mentioned. *Draksha*, *Ikshu*, *Makshika*, *Shali Vrihi* are mainly used for preparation of *Madya* and *Sandhana Kalpana*.

**Kashyapa Samhita:** *Abhishava* is mentioned as seventh fundamental *Kalpana*. *Abhishava* is a synonym of *Sandhana Kalpana*.

**Sharangdhar Samhita:** This *Samhita* described *Asavarishta* in detail. Definition, guidelines of preparation and precautions of *Sandhana Kalpana* is mentioned in this text. Various *Asav* and *Arishta* and their method of preparation are described in detail.

**Bhaishajya Ratnavali:** The text provides information about *Sandhana* formulation in a better way. Other than *Asav-Arishta*, *Chukra*, *Sura*, *Shukta* and *Kanji* is also mentioned.

### Classification

The preparations prepared by fermentation process are mainly of two types i.e., *Madhya Kalpana* and *Shukta Kalpana*.

The *Madya Kalpana* includes *Asava*, *Arishta*, *Sura* & *Suraasav*. *Sura Kalpa* is further divided into *Sura*, *Seedhu*, *Varuni*, *Mridveeka*. *Prasanna*, *Kadambari*,

*Medaka, Jagala, Sura-Bija* are types of *Sura* whereas *Seedhu* is of two types i.e., *Pakwa* and *Apakwa*. *Shukta Kalpana* is further classified into- *Madhu Shukta* and *Amla Shukta*. *Amla Shukta* includes *Shukta, Kanji, Tushodaka, Sauveera*.

#### **Madya Kalpana (Alcoholic preparation)**

*Madya* is the alcoholic end product of *Sandhana Kalpana*. *Madya* is intoxicating drink which numbs the mind, brings in *Madakata* and *Tamoguna* causes derangement of mind.<sup>[3]</sup> *Madya* is generally *Amla, Ruchikara, Agnideepak Malabhedaka, Kapha Vata Shamak* and always *Pittakaraka*. Fermentation period of *Madya Kalpana* is more than 15 days to even up to 6 months.

**Asava:** An alcoholic preparation which is prepared by fermentation of *Apakwa Aushadha* is termed as *Asava*.<sup>[4]</sup> It is usually prepared with *Sheet Virya Dravya*. It is comparatively less potent and mainly used in pediatric cases exceptions are *Kumaryaasava, Drakshaasav, Lodhraasav* etc. It enhances taste, lowers sleeplessness, increases physical strength and promotes happiness.

**Arishta:** An alcohol made from fermentation of *Pakwaushadha* is called *Arishta*.<sup>[5]</sup> It is prepared by making decoction of drugs. It is mainly prepared with *Ushna Virya Dravya*. It is highly potent and generally used in adults and old age patients. Exception is *Takraarishta*. It acts as appetizer, *Pittarodhaka, Kapha Vata Nashak*, laxative and helpful in *Grahni, Pandu Shosha, Arsha, Jwara, Grahni* etc.

**Sura:** The fermented alcohol is prepared by cooked grains like rice.<sup>[6]</sup> It is heavy and promotes strength and used in *Kasa Arsha Grahani, Mutraghata, Gulma, Shotha* etc.

**Prasanna:** The clear supernatant fluid of *Sura* is known as *Prasanna*. It is thin upper layer of *Sura*. It is *Ruchikar, Chardi Nashak* and used in *Anaah Arsh Gulma* etc.

**Kadambari:** Slightly thicker layer than *Prasanna* is referred as *Kadambari*. It helps in digestion and useful in *Anaah, Shoola*. It is laxative in nature

**Jagal:** It is lower and thicker layer to *Kadambari*. It is useful in *Shosha, Arsha, Grahni*. It has *Ruksha, Ushna Pachan Balya, Ruchikar* etc. properties

**Medak:** It is comparatively thicker layer and is semisolid type of layer. It is *Madhur, Balya, Sheeta* and having *Stambhana* properties

**Sura Beeja:** Also called as '*Vakkasa*' or '*Kinva*' is a residue found after filtration. It is solid rice part at the base of vessel.

**Suraasava:** When equal amount of *Sura* and *Asava* are fermented in same *Sandhana Patra* the preparation formed is known as *Suraasava*.

**Maireya:** It is prepared by again fermenting a mixture of equal amount *Sura* and *Asava*. It is sweet in taste and hard for digestion. It is useful in *Arsh, Gulm Krimi* etc.

**Seedhu:** The fermentation of *Ikshu Ras* is known as *Seedhu*. When *Ikshu Ras* or juice of *Madhur Dravya* fermented without boiling is called *Apakwaseedhu* or *Sheetrasa* when fermentation is carried out with boiling of *Ikshu Ras*, it is referred as *Pakwarasseedhu*. It acts as appetizer, having laxative property. It promotes *Swar Varna* and useful in *Shotha, Arsha Udarroga* etc.

**Varuni:** The alcoholic preparation prepared from fermentation of fruit juices like *Kharjura, Tala*. It is lighter to *Sura*. It is useful in *Shwasa Kasa, Peenas Aadhman* and *Shoola*.

#### **Sukta Kalpana (Acidic preparation)<sup>[7]</sup>**

*Sukta* is preparation, prepared by processing rhizomes, roots or fruits along with fat and salt. It is *Laghu Ushna, Teekshna* and helps indigestion. It causes *Raktapitta* but useful in *Pandu Krimi*. Fermentation media here are mainly carbohydrates and period of fermentation is usually within 15 days.

**Kanji:** This is a sour liquid prepared with fermentation of *Manda* of half boiled *Kulmasha, Dhanya* and other drugs like *Shunthi, Haridra, Jeera* etc. It acts as appetizer, alleviates *Vata* and *Kapha*. It is useful in *Chardi, Jwara, Daha* etc.

**Tushoadaka:** When *Yava* is coarsely powdered and mixed with suitable amount of water and kept for fermentation without any precooking. The liquid obtained is known as *Tushoadaka*. It is *Deepana, Hrudya*, and useful in *Pandu, Krimi, Grahani, Arsh* etc.

**Sauveera:** When fermentation of boiled *Yava* after removing its external covering is carried out. It is digestive, purgative and useful in *Udavarta*, *Asthi Shola* *Grahani Arsha* etc.

**Sandaki:** It is prepared by fermentation of leaves of *Mulaka*, *Sharshapa*, *Saindhava Lavana* etc. with eight times of water.

**Chukra:** When fermented liquor gets spoiled and loses its sweetness but become sour is known as *Chukra*.

### General method of preparation

**Essential ingredients** - *Kwatha Dravya*, *Drava Dravya*, *Prakshepa Dravya*, *Sandhana Dravya*, *Madhur Dravya*.

If the quantity of ingredient for fermentation is not specified, one *Drona* (16 L approx.) of *Drava Dravyas* and one *Tula* (5 kg) of *Jaggery* should be taken. The quantity of honey should be half that of *jaggery* whereas *Prakshepa Dravya* should be added one tenth of the quantity of *Drava Dravyas*.

### Procedure

Inert *Sandhana Patra* is taken. *Dhupan* of *Patra* is carried out before using. Decoction or other liquid preparation specified has to be prepared and sweetening agent has to be dissolved in medium. Mixture may be filtered once after dissolving the sweetening agent to get rid of impurities present in it. After this *Sandhana Dravya* like yeast or *Dhataki Pushpa* is added and stirred well. *Prakshepa Dravya* are added in the end which adds flavor to the formulation.

The *Patra* is kept undisturbed by temporary closing the mouth of *Patra*. Later, onset of fermentation is observed within 3-5 days. After onset of fermentation *Sandhibandhan* is done and *Patra* is kept undisturbed until signs of completion of fermentation is observed (usually after 15-30days).

Later they are stored in a clean airtight container and labelling is done. The shelf life of *Asav Aarishta* is said to be 10 years.

### Signs of onset and completion of fermentation<sup>[9]</sup>

SN	Onset of fermentation	Completion of fermentation
1.	Floating of <i>prakshepa dravya</i> over the liquid	<i>Prakshepa Dravya</i> will settle down.

2.	Hissing sound is present	Hissing sound is absent.
3.	Mild alcoholic odor and taste.	Strong alcoholic odor and taste.
4.	Effervescence	No effervescence.
5.	Burning candle is put off.	Burning candle continues to burn.
6.	Lime water turns milky white.	Test is negative. No change in lime water

### DISCUSSION

*Sandhana Kalpana* is one of the simplest but unique dosage forms which are widely used since ages. In ancient times, *Sandhana Patra* was placed in *Dhanya* to maintain uniform temperature throughout the process. *Dhataki Pushpa* is commonly used as *Sandhana Dravya*. It is mentioned as *Sandhana Dravya* by *Acharya Vagbhatta*. Other than *Dhataki Pushpa*, *Madhukapushpa*, *Surabeeja* and yeast are commonly used to initiate fermentation. *Prakshepa Dravya* are used as flavoring agent having various therapeutic properties too. *Sandhana Kalpana* is used in various conditions but can be also used for external use for e.g., *Takraarishta* also used for *Shirodhara* in various conditions. *Asava* are comparatively less potent having less than 12% alcohol can be used in pediatric conditions as well whereas *Arishta* are highly potent having 12%-15% alcohol and is used in wider range of disease. In *Asavarishta*, microbial transformation helps in initiating the process of generating alcohol to extract the therapeutic attributes of group of natural ingredients to provide safe, potent and easy to administer liquid form with prolonged shelf life. The shelf life of *Sandhana Kalpana* is said to be retained for many years but according to the latest amendment to drug and cosmetics act the shelf life of *Sandhana Kalpana* is described to be 10 years.<sup>[10]</sup> It has the best shelf life among all the dosage form. The dosage of *Asavarishta* is mentioned as 1 *Pala* (48ml) as per classical text but in daily practice it mainly depends upon the patient and the disease but generally, the dosage given is 15-30ml with equal amount of luke warm water twice a day in adults after meal. *Asava* can

be prescribed before meal depending upon the condition.

## CONCLUSION

Ayurveda has described many different dosage forms which were used in ancient times. *Sandhana Kalpana* which was normally used in ancient time still has the magnificent results even in today's era. They are widely used in various conditions of nervous system, circulatory system, respiratory system, digestive system, excretory system, urinary system, reproductive system, immune system, infections etc. They can be given in combinations too. *Sandhana Kalpana* are having nutritional value can be given even in children, lactating mothers and old age patients also. They can be used in routine clinical practice as they are easy to prepare, easy to handle, easy to store and also palatable for patients. They are having longer shelf life without using any kind of modern preservatives. *Kanji, Takra, Sidhu Rasa* and *Varuni* are used in routine diet as nutritive drink and to prevent and cure disease. The duration of fermentation ranges from 7 days to 180 days with different formulations. As per classics, *Vasant* and *Sharad Ritu* are said to be the best for preparation of *Sandhana Kalpana*. But nowadays, for medicinal purpose *Sandhana Kalpana* is carried out throughout year by providing the necessary environment to the large vessels. The fermented product is well standardized since *Samhita* period. *Aacharya Charaka* has mentioned three stages of *Madya*<sup>[11]</sup> as well but also mentioned the several *Asavarishta* in various diseases which shows the significant knowledge of precise use of alcoholic preparations and therapeutic range of these preparations even at that time. There are many *Kalpana* in *Sandhana Kalpana* which shows the tremendous results as well but unfortunately nowadays *Sandhana Kalpana* has been limited to the use of *Asavarishta* only. The rest *Kalpanas* are somewhere fading away in daily practice. Therefore, to

understand the efficacy and therapeutic use of all *Kalpana* completely there are a lot of scope for researchers as well.

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