

A REVIEW ON SANDHANA KALPANA

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ABSTRACT

Sandhana Kalpana (Biomedical fermentation) has been described in Charaka Samhita, Sushrut Samhita as also in other classical texts from thereon. Sandhan Kalpana has been divided into two types Madya vargiya Sandhan (Alcoholic Fermentation) and Amla vargiya Sandhan (Acidic Fermentation). Madya vargiya Sandhan Kalpana consists of Asava, Arishta, Seedhu, Sura, Maireya, Madhvasav, Madya and Varuni. Amla vargiya Sandhan consists of Shukta, Chukra, Tooshodak, Souveerak, Dhanyamla-Kanji-Arnaal and Sandaki. But nowadays, Sandhan Kalpana has been limited to the use of Asava-Arishta in the clinical practice. A thorough review of all the Sandhan Kalpana is being done in this paper as an effort to establish the difficulties and shortcomings in the manufacturing process of formulations other than Asava-Arishtas and solutions to overcome those hence making it possible to accommodate them in the daily clinical practice wherever applicable.

KEYWORDS: Sandhana, Asava, Arishta, Kanji, Madya

INTRODUCTION

To be able to utilize the properties of alcohol which are fast acting, and fast assimilating probably formed the base of evolving *Sandhan Kalpana* by our *Acharyas*. *Acharya Sharangdhar* has said that as *Asava-arishta* contain minute quantities of alcohol they act as a medicine.¹ '*Sandhana kalpana*' is a unique form in which acidic and alcoholic fermented formulations are prepared. In order to manufacture these medicines, liquid basic drugs (juices or decoctions) are kept for fermentation as indicated in the classic texts. In this process, self-generated (in these dosage forms) ethyl alcohol is produced by in-source material used in pharmaceutical procedure, and is not added from outside.

Here, ethyl alcohol is not the only product yielded but is a part of many other organic compounds; further, alcohol/acetic acid (as per desired indications) is formulated and extraction of active principles of the herbal drugs is done.² Owing to these properties, these formulations carry the active principles of other herbal ingredients along with them and the resultant effect is achieved faster than many other formulations. When these formulations become sour they are known as *shukta-chukradi amla vargiya sandhan kalpana*. To understand the manufacturing process, the difficulties in the process and to find a solution to them is necessary to facilitate the

use of these less popular yet potent formulations.

MATERIALS AND METHODS

Method of Preparation

Many preparations have been mentioned in the classical texts from *Charak Samhita* onwards but the method of preparation was highlighted for the first time in *Sharangdhar Samhita*. A base liquid (maybe water, expressed juice or a decoction) is taken in a vessel, fermenting agent (*Dhatki pushpaor kinva* i.e. sediments containing mould or yeast, etc.), sweetening agents (jaggery, honey, etc.) is added to it and the mixture is packed for a specific period of time (15-30 days or till the signs of completion are seen). The resultant liquid is an alcoholic/acidic fermented liquid.³ In places where the quantity of the liquid, the quantity of fermenting agent, etc is not mentioned *Acharya Sharangdhar* mentioned certain specifications to be followed. 10 litres of liquid, 4 kg of jaggery, 2kgs honey, 1 kg of the mentioned *prakshep dravya* should be added.⁴

However, even after this, many difficulties in the process might have been experienced to resolve which *Yadavji Tirkamji Acharya* mentioned to apply a layer of *mansi*, *marich* and *loha* (*Bhasma*) to the vessel or carry out *dhoopan* process of the vessel to clean it properly. This was probably done to avoid growth of fungi, etc which might be promoted due to organisms present in the water used to clean the vessel. Once the fermented liquid is seen to have attained *jaata-rasa* (Confirmatory test), it is to be filtered through a clean cloth and stored.⁵ These guidelines helped resolve shortcomings in the process of making *Asav-*

arishtas but the difficulties in the process of other Kalpas remained.

Madya Vargiya Sandhan Kalpana⁶ (Alcoholic Preparations)

1. Asava- A cold infusion, expressed juice or plain water is taken in an earthen vessel along with jaggery, honey, sugar, etc and other herbal ingredients as also fermenting agents, this vessel is sealed shut and kept still in a neutral environment. Once fully ready, filter it and store it in glass containers. This is called '*Asava*'.⁷ It increases mental strength, physical strength, appetizer, reduces insomnia, improves taste and stimulates happiness. It also has the properties of the herbal ingredients added to it (raw or liquid form) during fermentation.⁸

2. Arishta- Instead of cold infusion etc, decoction of herbal ingredients is used and the same procedure is followed. *Arishta* is stronger than *asava* because of the different *samskaras* (processes) involved. It acts as an appetizer, *kapha-vaat naashak*, *pittarodhak*, mild laxative etc. It also useful in *shosha*, *arsha*, *grahani*, *paandu* and *jwara*. As also in *Adhmaan*, *Udara rog*, *Ajerna* and *Shool*.⁹ It is easier to digest as compare to *Asava* and has the properties of the herbal ingredients used in its preparation.

3. Seedhu- The fermentation when carried out using cooked sugarcane juice and other such sweet liquids it is called *pakva rasa seedhu* and when made using uncooked sugarcane juice etc. is called as *sheetrasa seedhu*.¹⁰ However, the proportion to which the sugarcane juice should be cooked is not mentioned in the classical texts and needs to be studied ahead accordingly. *Pakva rasa seedhu* enhances the voice, the strength and the skin tone of a person. It is *vaat-piitakar*

and a laxative. It is useful in *medo roga*, *shopha*, *arsha*, *udar rog*, *snehaj vikaras* and other *kaphaj vyadhees*. As opposed to this *Sheetarasa seedhu* has less properties and is very good in *lekhan karma*.¹¹

4.Sura- Barley, wheat and rice are cooked and then added for fermentation by the same method. Once ready, *Sura* is obtained by distillation of the filtered liquid.¹² Details of the method as to the quantity of wheat, barley or rice is not mentioned in the classical texts. It is useful in *kasa*, *arsha*, *grahani*, and *mutraghat*. It is also *vaat-naashak*. It is useful to increase lactation, physical strength, blood and appetite.¹³ It also increases *meda* and *kapha* in the body. It is useful in *shotha*, *gulma*, and *mutrakruchcha*.¹⁴

5.Prasanna-The clear liquid formed in the upper layer of *Sura* is called as '*Prasanna*'.¹⁵ This layer should probably be obtained by gently pouring it out of the vessel after it has been kept still so as to settle the sediments. It is *chhardi nashak* (anti-emetic), *rochak* (improves taste), it relieves heartache and pain in abdomen. It is *kapha-vaat naashak*. It is also useful in *arsha* (haemorrhoids), *aanaha* (tensed abdomen) and *vibandha* (constipation).¹⁶

6. Kadambari- This liquid is denser as compared to *prasanna*.¹⁷ There is no other specific property mentioned in the classics and hence it remains lost in transition.

7. Jagala- The dense portion below *Kadambari* is called as '*Jagal*'.¹⁸ It contains less concentration of alcohol. This is probably the filtrate remaining along with the sediments. It is *Graahi* (holds), *ushna* (hot), *paktaa* (helps in digestion), *ruksha* (dry). It quenches thirst, increases *kapha*,

reduces *vaata* and has *Hridya* properties. It is useful in *pravaahika* (loose sticky stools), *aatop* (abdominal distension), *arsha*, and *kshay* (cachexial state).¹⁹

8. Medak- This layer forms below *jagal*. It is even denser than the one above it and contains minute concentration of alcohol. The properties are same as *jagal*.²⁰

9. Vakkas- The lowermost layer in the vessel is called as '*Vakkas*'. This layer doesn't contain alcohol. This is used as a *Surabeej* (fermenting agent) for the next preparations.²¹

10. Maireyak- When *Asava* and *Sura* are mixed in equal quantities and then fermentation is carried out. The resultant product is called '*Maireyak*'. It is *teekshna* and *guru gunatmak*. It is *kashay-madhur rasatmak*. It reduces *vaata*. It is useful in *arsha*, *kaphaj rog*, *gulma*, *krumi*, *medorog*, causes a severe state of inebriation.²²

11. Varuni- The juice obtained from the trees of palm and date is collected in a vessel, it undergoes fermentation by itself and in 2-3 days and this resultant product is called *varuni*.²³ It is obtained using '*Varuni Yantra*' and hence it is known as *Varuni*. Its properties are as same as *Sura*. It is useful in *peenas*, *aadhman* (distended abdomen) and *shool*.²⁴

12. Kohal- *Saktu* (Roasted wheat and Roasted rice) when used in the process of fermentation, the resultant product is called '*Kohal*'.²⁵ It is *tridoshkrut* and *bhedan guna yukta*, *avrushya* and *mukhapriya*.²⁶

13. Madya- It has properties like *amla rasatmak*, *ruchikar*, *agnideepak*, *bhedak*, *kaphavaatahar*, *hrudya*, *bastivishodhana*, *laghu*, *vidahi*, *ushna*, *teekshna*, *indriya bodhan*, *vikasi* and *srushta vinmutra*

kaarakam. It is usually made from grapes and dates.²⁷

Amla Vargiya Sandhan Kalpana (Acidic Formulations)

1. Shukta- *Kanda, Moola, Phala, etc.* are mixed with *sneha, lavana, haridra* and *sarshap tail* and other spices are mixed together, taken in a vessel containing water which is then sealed for a few days. The resultant product is called as '*Shukta*'.²⁸ It is *raktapittakara, chedan* and digests all the food that is eaten, *vaiswarya*, increases the digestive power, *kapha, paandu, krumi nashak, laghu, teekshna* and *ushna, mootral, hrudya* and *kapha-hara*, its *vipak* is *katu* and also improves taste.²⁹

2. Chukra- The alcoholic preparation which is kept beyond the time period of its fermentation lose their alcoholic properties are kept for fermentation again to form an acidic preparation called as '*Chukra*'.³⁰

3. Tushodak- The coverings of white lentils are taken in a vessel, same qty. of barley is added along with four times water and boiled to half. This mixture is then kept in an earthen vessel and kept for fermentation like *kanji*. After 8 days, this mixture is filtered and is ready to use. This filtered liquid is called as '*tushodak*'. It has properties of *deepan* and *hrudya*. It is *paandu* and *krumi naashak*.³¹

4. Souveerak- When the same process is followed with plain barley (without the external covering) the resultant product is called as '*Souveerak*.' It is *bhedan guna yukta*. It is useful in *grahani* and *arsha*.³²

5. Dhanyamla-Kanji-Arnaal- Horse gram and *Shaali Dhanya* (a specific quality of rice) are cooked in four times water and filtered. The liquid obtained is kept for fermentation

and the sour liquid obtained after this process is called as *Kanji*.³³ The time required for fermentation has not been mentioned. However, there is mention of keeping it till it turns sour. There is also one mention of keeping it for fermentation for 7 days.³⁴ It has properties like *laghu* and *jeevanam* (rejuvenating), *daaha naashak* (reduces burning sensation) upon external use, it reduces *vaata, kapha* and *trishna* upon its internal use, *mukhavairasya* (improves taste), *daurgandhya* (reduces mouth odour) and *mala naashak* (destroys impurities), *shushkata* (dryness) and *klam* (tiredness) *naashak*. It is *agnipradeepak* and is used in *asthapana basti*.³⁵

6. Sandaki- Pieces of raddish, mustard, turmeric, rock salt, asafoetida, black pepper, cumin seeds are all taken in an earthen vessel and water is added to it. This mixture is then kept still in the sealed vessel at a neutral place for 7 days. The liquid obtained after filtering this mixture is called as *Sandaki*. It improves taste, is heavy to digest and vitiates *pitta* and *kapha*.³⁶

Siddhi Lakshana (Signs to identify completion of process)³⁷

1. When heard putting one's ear to the vessel from outside, there is no sound audible.

2. All the *prakshep dravya* has settled at the bottom of the vessel.

3. When a burning matchstick is introduced in the vessel, it keeps burning.

4. The desired smell, colour and taste are attained by the liquid.

5. When a small sample is taken in a glass test tube, it should be clear, if there are any particles present, the process is considered as incomplete, the vessel is to be sealed and

allowed to undergo completion of the fermentation process.

DISCUSSION

An effort has been made to review the method of preparation and the properties of the *sandhan kalpas* in this paper. Through this review it can be seen that the procedure to make *asav-arishta* has been described in great detail in all the classical texts whereas the method of preparation of others like *varuni*, *sura* and other *amla vargiya sandhan kalpas* has not been described in similar details like the material of the vessel to be used the quantity of fermenting agent to be added, the temperature of the surroundings, etc. The method of preparation of *kanji* maybe followed for the *amla vargiya* formulations and a thorough analytical study is required to be done for the same. Also, with certain *yukti* and *yojana*, the procedure described in the title '*Anukta maan arishteshu*' can be used to prepare the *madya vargiya* formulations. The properties of the formulations that have been mentioned can be used in daily clinical practice like for eg. *Sura* can be used for in '*Stanya kshay*' in lactating mothers who have low milk production, *Seedhu* can be used in people who speak a lot for its property of being *swarya*, *Shukta* can be used in *krumi vikar*, *mutra vaha srotas* related *vyadhis* and other *kaphaj vyadhees*, *Kanji* can be used in *vaata kaphaj vikaras*, as also in *mukhadaurgandhya*, *klam*, etc. it can also be used in the form of *asthapan basti*. Hence, it was essential to review the properties which were done successfully in this paper.

CONCLUSION

Probable solutions for the shortcomings have been discussed. The properties reviewed in the paper can be applied for the use of these formulations in the clinical practice successfully. If focussed upon properly, a new horizon can be opened up in the field of fast acting medicines other than *Bhasmas* and other *Rasaushadhis* and newer treatment modalities can be applied for the treatment of chronic diseases.

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