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Research Article

KANJI: AN AYURVEDIC FERMENTATIVE PREPARATION

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ABSTRACT
Kanji – A unique Ayurvedic fermentative preparation was prepared as per the textual reference Rasayanasara which is mainly indicated for the Shodhana (purification) of Metals and also for various mercurial processing. But Kanji by this reference is rarely prepared and used. Hence, the pharmaceutical and preliminary physico-chemical findings of this Kanji are reported in this paper. The fermentation process started on 7th day and completed on 31st day. The prepared Kanji was golden brown colored like honey, with pleasant odour and characteristic sour taste. It was highly acidic in nature with a pH value of 2.91. The total solids in it were calculated to be 19.26% and specific gravity was noted to be 1.039. The alcohol percentage as expected was zero and there was no fungus growth seen at any stages of fermentation.
Key words: Kanji, sour gruel, fermentation.

INTRODUCTION

The beauty of Ayurveda lies in the fact that it increases both the quality and the quantity of life. The main aim of Ayurveda is to maintain the health of a healthy person and to cure the diseased one. It has many tools to accomplish this aim with some being preventive like Dinacharya (Daily regime), Rutucharya (seasonal regime), etc and some being the curative tools in which medicines are included. Kanji is one such unique Ayurvedic medicine which comes under Sandhana Kalpana (Fermentative products). Sandhana Kalpas are mainly classified as Madya Kalpa (Alcolohic preparations) and Shukta Kalpa (Acidic preparations). Preparations like Asava and Arishtas comes under Madya Kalpa and Kanji comes under Shukta Kalpa. Kanji is usually prepared by fermenting incompletely boiled Masha dhanya (Phaseolus mungo Linn) with gruel prepared out of Rakta shali (Oryza sativum) and is routinely used for various purposes. Kanji prepared by Dhanya is said to be Jeevaniya (nourishing), Daha nashana (relieve burning sensation), Vata Kapha hara (alleviate Vata and Kapha), Trushna hara (relieves thirst) etc when used internally[1]. But the Kanji as explained in the Paribhasha prakarana of the text Rasayanasara, said to be specific for dhatu shodhana (purification of metals) and other Mercurial processings[2], is rarely prepared and used. Hence, Kanji was prepared as per Rasayanasara text and its pharmaceutical and physico – chemical findings are highlighted in this paper.

MATERIALS AND METHODS

The methodology can be divided into two steps as a) collection and authentication of raw drugs b) fermentation process.

a) All the ingredients were collected from the Dept. of Rasashastra and Bhaishajya kalpana, KLEU Shri BMKAM, Belgaum, Karnataka and were authenticated by the relevant subject experts. A new earthen pot of 8 litre capacity was purchased and was carefully washed with water and dried. Then preconditioning of the pot was done by fumigating it with Maricha (Piper nigrum), Chandana (Santalum album) and Trikatu churna (Powder of Zingiber officinale, Piper nigrum and Piper longum). After fumigation, the inner surface was anointed with a layer of Sarshapa taila (seed oil of Brassica campestris).

The details of all the ingredients used to prepare Kanji as per the reference Rasayanasara is listed in the Table 1.

Preparation of Kulattha kwatha[3]:

Initially 480 g of kulattha was weighed accurately by using digital weighing machine and taken in a wide mouthed steel vessel after pounding. Water was added in the ratio of 1:8 i.e. 3840 ml water was added to kulattha. A mark was made on the vessel exactly at 960 ml (1/4th). The vessel was kept on mandagni till the liquid reduced to 1/4th. After cooling, 960 ml was filtered and kept. pH of the kulattha kwatha was 5.41

Preparation of Odana[4]:

We need 480 g of odana i.e. cooked rice. So, initially 250 g of Shashtika Shali was weighed accurately using digital weighing machine and 5 parts of water i.e. 1250 ml was added to it in a stainless steel vessel. It was then kept on mandagni for cooking. After the rice was cooked properly, 480 g was taken and kept for cooling.

Shodhana of Hingu[5]:

We need 5 g of Shuddha Hingu. So initially 10 g of Hingu was taken and powdered. Then 150 ml of Ghrta (clarified butter) was taken in a pan along with Hingu and fried on mandagni. After cooling, 5 gm of fried Hingu was taken.

Preparation of Masha chakrikas:

Initially 120 g of Masha flour was weighed accurately. Adding little quantity of water and Sarshapa taila, Masha paste was prepared. Then Sarshapa taila (50 ml) was taken in a frying pan and kept on mandagni. Then Masha paste was fried in the hot Sarshapa taila and thus Masha chakrikas were prepared.

b) Once all the necessary things were prepared and drugs were made into fine powder (vastragalita), the pre treated pot was taken and 4800 ml of water was put into it slowly. Then 960 ml of Kulattha kwatha was added followed by Odana weighing 480 g. The fried Masha chakrikas were then put into the pot along with the powder of all the other dry ingredients and stirred well for proper mixing. The mouth of the pot was closed tightly and kept undisturbed for the proper fermentation.

Observations and results

The observations made during the formation of Kanji are tabulated in Table 2. Fermentation was completed on 24th day and the pH was 3.21 but it was kept for one more week and on 31st day when the pH was 2.91 it was removed and filtered. Temperature maintained was 24°C. The prepared Kanji (Figure 1) was golden yellow colored with pleasant odour and characteristic sour taste. The Kanji when subjected to various preliminary analyses showed that the total solids in it were 19.26%, reducing sugars were 2%, and specific gravity was noted to be 1.039. The alcohol percentage as expected was zero and even starch was absent. There was no fungus growth seen at any stage of fermentation.

DISCUSSION AND CONCLUSION

Many easy methods of Kanji preparation are explained in the texts and kanji prepared by such methods are being used internally as well as for samanya shodhana of Metals. But none of those references suggest that it can be used for samanya shodhana of metals. The peculiar method of preparing kanji which is specifically indicated for Dhatu shodhana was found in Rasayanasara text. The phalashruti (properties) of this Kanji includes "Dhatu shodhini" and Parada swedana. Hence we can infer that Dhatu here means metals only and the kanji prepared by this method should be used for the Samanya shodhana of Metals. During the samanya shodhana of metals, the metals are heated/liquified and dipped/poured into Taila (oil), Takra (butter milk), Gomutra (cow's urine), Kanji (gruel) and Kulattha kwatha (decoction of Dolichus biflorus) for seven times in each liquid media which makes the metal brittle and devoid of some physical impurities. During this procedure Kanji, which is highly acidic media plays an important role in breaking down the hard mantle of the metals and making them brittle and thus making them suitable for the further processes. As the reference directly suggests it to be used for the shodhana of metals, it is quite obvious that we should prepare this kanji and use for the same. But in practice this is rarely done. Hence this pharmaceutical study was done and preliminary testing was noted.

The shloka says Kanji will be prepared in 7 days, but it took 31 days in our study to complete fermentation and reach the pH of 2.91. This is because the fermentation process is affected by the temperature and seasonal variations. According to ancient classics minimum time limit is of 7 days and maximum is 6 months. In usual practice 7-10 days are enough in the hot tropical climate and the long period of 30 days is allowed in the cool temperate climate where biological activity is at its low.

The zero value of alcohol percentage of the prepared kanji confirms the acidic fermentation along with the high value of pH. The process in which Guda (Jaggery), Madhu (Honey) and Sharkara (sugar candy) etc were utilized as the nutritional source for fermentation, are generally termed as Madya Sandhan (alcoholic) and the end product of this process is alcoholic in nature, while other processes which utilize only Dhanya (cereals) as the source material are termed as Shukta Sandhan (acidic). Kanji may be considered as a result of acetic fermentation which must be carried out in the absence of air. Acetic acid producing bacteria produce acetic acid which reduces the pH (ie increases the acidity) to a level that prevents the growth of food poisoning organisms[6].

Kanji has its indication in many conditions in Ayurveda but when it comes for Dhatu shodhana, the Kanji prepared by this method seems to be appropriate as it serves the purpose of samanya shodhana of metals.

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Figure 1: Kanji

Table 1: Details of ingredients used in Kanji

Ingredient	Latin name	Part used	Quantity taken (g)
Rajika	*Brassica juncea* Hook	Seeds	240
Saindhava	Rock salt	--	480
Kulattha	*Dolichus biflorus* Linn	Seeds	480
Odana	--	Cooked rice	480
Haridra	*Curcuma longa* Linn	Rhizome	120
Vamsha	*Bambusa arundinaceae* Willd	Leaves	120
Shunthi	*Zingiber officinale*	Rhizome	60
Jeera	*Cuminum cyminum* Linn	Fruits	60
Hingu	*Ferula northax* Bioss	Resin	5
Jala	H_2O	Water	4800
Sarshapa taila	*Brassica campestris* Linn	Seed oil	Q.S.
Masha	*Phaseolus mungo* Linn	Seeds	120

Table 2: Observations during Kanji Nirmana

Day	Colour	Taste	Smell	pH	Ingredients	Bubbles	Flame test
4	Haridravat	Salty	Pleasant	6.0	Floating	--	--
7	Haridravat	Salty	Sour ++	5.0	Floating	small +	--
14	Haridravat	Salty but tasty	Sour +++	4.0	Floating	big ++	Flame was turned off
24	Haridravat	Sour	Sour +++	3.21	Sunken	No bubbles, No effervescence	Flame continued to burn
31	Haridravat	Sour ++	Sour +++	2.91	Sunken	Nil	Flame continued to burn