AgriCos e-Newsletter
ISSN: 2582-7049
AgriCos e-Newsletter
Open Access Multidisciplinary Monthly Online Magazine
Volume: 04 Issue: 10 October 2023 Article No: 34

Rice-Based Beverage: An Important Agro-Based Product and Its Indispensable Significance in *Nocte* Community of Arunachal Pradesh, India

Chamin Chimyang[1] and Dawa Dolma Bhutia[2]

[1]Department of Genetics and Plant Breeding, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh

[2]Department of Mycology and Plant Pathology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh

SUMMARY

The land of dawn lit mountain or otherwise popularly known as Arunachal Pradesh is the home of various tribal groups; one of such tribes is the *Nocte* tribe that predominantly resides in *Tirap* district of the state. In the absence of script, the art of making rice-based beverage has been passed down from generations to generation only via oral lore. This and also change in lifestyle of the tribe may have brought variation in the preparation of such beverage but nevertheless the essence of it remains the same. In this article, the ingredients required along with beliefs attached to it in its preparation, its effect on human health and how it plays a major role in *Nocte* culture and society has been discussed.

INTRODUCTION

Arunachal Pradesh, which is otherwise also called as the 'Land of the rising Sun' is located at the eastern most part of the whole of North-east India. It can be geographically pointed out at 26.28°N and 29.30°N latitude and 91.20°E and 97.30°E longitude. The land is the house for about 26 major tribes and more than hundred sub-tribes; of which *Nocte* is one of the major tribes (Arunachal Pradesh - Wikipedia). From time immemorial, Nocte tribe had inhabited *Tirap* district of Arunachal Pradesh. The district expands to an area of 1,170 Km^2 and has an elevation of 200 m towards Northwest to 4000 m towards *Patkai* hills (*Tirap* district-Wikipedia).

Like any other tribe of the state, agriculture is the main activity and every festival revolves around agriculture. Rice is the main crop for this community. Apart from rice, other important crops are millets and maize in cereals; ginger, colocasia, greater and lesser yam, tapioca, turmeric, coriander, chilies, cowpea, cluster beans, chives, spring onion in horticultural crop; tea, coffee, black pepper in plantation crops; perilla seeds in oil seed crop; and bamboo and *toko* as agroforestry.

Historically, through folklore, it is said, that prior to rice, millets were one of the major food sources of this community since, rice used to be an expensive commodity at that period. The most common millet found in this region is the foxtail millet and proso millet which is grown in *jhum* lands in the month of January under mixed cultivation with other vegetable crops. The ashes of *jhum* land provides a good source of nutrient to the sprouting seeds in the form of potash. Both the millet crops are harvested in the month June in which the tribe usually celebrate a festival in the name of good harvest.

There are various types of beverages prepared by this community, but the main beverage is prepared from rice and tapioca which are fermented using yeast inoculation. It is said that, in earlier days, rice beer, was solely made of foxtail millets. But with the increase in availability and supply of rice, with increase in buying capacity of the people, millets have been partially replaced; additionally, it is said that rice mixed with foxtail millet improved the taste of rice beer. While proso millet still remained as the main media for yeast inoculation.

Cops involved in the preparation of rice beer

Rice

Rice is a major crop of *Nocte* belt. It is mainly grown under two ecological conditions. Upland rice, which is grown under mixed cultivation system with other vegetable crops in slash and burn or *jhum* lands at the end of March or in first week of April at the onset of pre-monsoon. Rice seeds are usually directly broadcasted and light hoeing is done to cover the seeds using hoe to protect it from birds. It is completely rainfed and is harvested in the month of September.

Water logged rice cultivation (WRC), as the name indicates, on the other hand is cultivated in low lying areas; mainly near a water source and is partially rainfed. Small channels are dug to irrigate the fields and rice plants are allowed to be semi- submerged. Nurseries are prepared in the month of May. Transplanting is carried

out from June-August. The ripened rice seeds are harvested panicle-wise in the months of November to early December which are threshed and stored for consumption. The panicles which will be used as source of seed for the next season is usually wrapped in polythene sheets and is hanged upside down via panicle.

Both coarse and sticky rice can be used for beverage preparation, however, coarse grain is used since sticky rice are largely consumed as food source.

Millets

Upland rice cultivation in jhum land

A Waterlogged Rice Cultivation

What are Millets?

Millets are small seeded, round-shaped cereals which belongs from *Poaceae* family, are also known as coarse cereals, apart from maize (*Zea mays*), sorghum (*Sorghum bicolor*), barley (*Hordeum vulgare*) and oats (*Avena sativa*). Among millets, the most prevalently cultivated types are pearl millet (*Pennisetun glaucum*), followed by foxtail millet (*Setaria indica*), proso millet (*Panicum miliaceum*), finger millet (*Eleusine coracana*). The other types of millets are Kodo millet (*Paspalum setaceum*), little millet (*Panicum sumatrrense*), barnyard millet (*Echinochloa utilis*). They are classified as major and minor millets based on the global cultivation and utilization.

Millets are one of the most drought tolerant crop. Additionally, they have resistance to pests and diseases, productivity under drought condition as compared to major cereals. And because of such benefits, millets are now gaining specific attention as both source of food and better potential in the manufacturing of bio-ethanol and biofilms (Saleh *et al*., 2013).

Benefits of Millets as a source of food

- Millets have higher nutritive value as compared to major cereals.
- Good source of essential amino acids, except for two, i.e., lysine and threonine, but will have high methionine content.
- It is said to be rich source of phytochemicals and micronutrients.
- Have health benefits such as preventing cancer and cardiovascular diseases, tumor reduction incidence, lowers blood pressure and risk of heart disease, lowers cholesterol and rate of fat absorption, prevent gastritis and supplies gastrointestinal bulk.

Preparation of Rice Beer

The technique of preparation of rice beer is passed down from generations after generations and thereby does

Finger millet grown in jhum land

Proso millet grown in jhum land

not have specific and well-defined approach in its preparation and is yet to be standardized. But a rough outline is provided below for its preparation which might be slightly different from place to place.

Preparation of rice beer can be divided into two separate methods:

- Use of proso millet as yeast inoculating media to prepare yeast cake
- Inoculation of yeast into cooked mixture of rice and foxtail millet

In the first step, proso millet is pounded well into powder and is made into small round doughs. The doughs are mixed with previously inoculated dried yeast cake or starter culture as a source of inoculation. A small amount of grounded ginger is then smeared or inserted in the middle of the dough and is allowed to dry into cakes which are known as *bichie* in local dialects. Bichie is said to be a rich source of yeasts, molds and lactic acid bacteria (LAB). The specific reason behind why ginger sap is smeared is unknown. There is an interesting notion, behind the preparation of these yeast cakes. The cakes are distinguished as male and females. In every batch of yeast cake prepared, it consists of a single male which is having a shallow pressed mark in the middle and the rest are considered as females. It is believed that the male dough cannot be further sub culture into yeast cakes and represent the leader, while the female dough is used for further yeast inoculation when required. The dough is dried and stored for further use. The yeast that is mainly involved in the process of fermentation is *Saccharomyces cerevisiae* (Fuloria *et al*., 2022).

Bichie or yeast cake prepared out of Proso millet; the center represents the male yeast cake and the rest, circling are females

Mainly two products are obtained after inoculation of yeast powder. *Khamnyong*, is the white semi-solid substance having slight slurry consistency that is obtained after fermentation and consist of the major portion of rice beer; while *jumin* is a yellow crystal liquid obtained from the former. The process of making of rice beer is illustrated below:

- Rice along with millet is cooked and which is then spread over large polythene sheets
- When the mixture is cooled down, yeast powder is inoculated thoroughly and which is then stored in large containers. During the process of storing a cane basket is inserted in the middle, so that all the jumin seeps from khamnyong into the basket.
- Additionally, random layers of yeast powder are smeared while storing and pressed lightly and is finally covered by leaves.
- The container is stored in dark and cool place in isolation

Product- Khamnyong (White solid) and jumin (Yellow Liquid)

During the process of fermentation, care is taken to not bring any sour food product into the kitchen such as lemons or other fruits. It is believed that it will spoil the process of fermentation. After 3-4 days, a sweet smell erupts from the containers which signifies the initial process of fermentation. The initial rice beer taste sweeter as compared to those rice beer stored for months. Jumin is heated and is sieved and are stored in bottle for consumption.

According to a study conducted on Vietnamese rice-based alcoholic beverage, during the process of fermentation, there was increase in the rate of glucose content at three days initially and as the fermentation process proceeds, the glucose is reported to be used up towards the end and it is at this stage in which the content of ethanol increases gradually. It is reported that, the formation of organic acids provides the flavor and further increases the shelf life by decreasing the pH which then interferes with LAB growth. The alcoholic content ranges from 9.41 to 14.82% as per in some studies (Fuloria *et al*., 2022).

The rice-based beverage is an important part of Nocte culture; not only does it has cultural significance but it is said to contain prebiotics and probiotics which is known as synbiotics that can potentially influence the gut microbiota. Probiotics can be defined as adequate number of live microbes that can confers health benefits to the host. It is regarded as the nutraceutical treatment strategies for the control and prevention of a variety of chronic disorders related to digestive and immunological health. Meanwhile, prebiotics can be defined as a non-digestible component of food which provides nutritional support to gut microbes, that helps in their proliferation and ameliorate health for both human and animals. In some research, it has been said that gut microbes regulate mental health and the state of mind. A mild consumption of such fermented beverage, seems to give relaxation and imparts good therapeutic values as it helps in tackling anxiety, stress and depression and upliftment of overall mood (Fuloria *et al*., 2022).

Rice based beverages also plays important upliftment in economic status of women in the community. Since the former plays an important role in socio-religious events and are in high demand during the time of festive events for direct consumption or as gifts. Large demands are placed during *Chalo-Loku*, the main harvesting festival of all the *Nocte* community during the month of November.

CONCLUSION

Rice-based beverage is an important part in social activity which is a gift of agriculture. Due to absence of script, the knowledge of processing of rice beer has been passed down only via oral lore from generations to generations. Thereby, it may vary from household to household. The former might also be one of the reasons why the processing is not standardized. Though, rice-based beverages hold its own benefits, but heavy consumption of such brings along its own demerits. Therefore, care is to be taken to draw a boundary as to where the line slides from health benefits to health issues.

REFERENCES

Fuloria, S., Mehta, J., Talukdar, M. P., Sekar, M., Gan, S. H., Subramaniyan, V., and Fuloria, N. K. (2022). Synbiotic Effects of Fermented Rice on Human Health and Wellness: A natural beverage that boosts immunity. *Frontiers in Microbiology*, *13*, 950913.

https://r.search.yahoo.com/_ylt=Awr98qJkKPBkUX4DOwFXNyoA;_ylu=Y29sbwNncTEEcG9zAzEEdnRpZAMEc2VjA3Ny/RV=2/RE=1693489380/RO=10/RU=https%3a%2f%2fen.wikipedia.org%2fwiki%2fArunachal_Pradesh/RK=2/RS=G5I0COyWJxyjq7_6lKe1N3LiJM4-

https://r.search.yahoo.com/_ylt=AwrOu0zoKPBkcHgD5RVXNyoA;_ylu=Y29sbwNncTEEcG9zAzEEdnRpZAMEc2VjA3Ny/RV=2/RE=1693489512/RO=10/RU=https%3a%2f%2fen.wikipedia.org%2fwiki%2fTirap_district/RK=2/RS=SA4YL6fXSYKvDs.pnEMOZLhMLkE-

Saleh, A. S., Zhang, Q., Chen, J., and Shen, Q. (2013). Millet grains: nutritional quality, processing, and potential health benefits. *Comprehensive reviews in food science and food safety*, *12*(3), 281-295.