

REVIEW PAPER

Present Status and Future Prospects of Traditional Fermented Beverages of Himachal Pradesh, India

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ABSTRACT

Alcoholic beverages form an important component of culture and traditions of many civilizations for thousands of years. The people in tribal and rural areas of Himachal Pradesh still practice the preparation of many traditional fermented beverages that form an important component of their socio-cultural life. *Chhang, sura, chakti, kinnauri, chulli*, etc. are some popular beverages that are quite unique in terms of raw material and the fermentation process. Despite of immense social, economic and medicinal importance as described by the local consumers, most of these beverages are prepared at home scale, limiting their popularity to particular region only. Commercialization of these products with scientific interventions for improvement in quality and methods of production may help in bringing these beverages from household confines to population at large. This will provide an opportunity to the locals to generate a tradable commodity and income generation.

Keywords: Income, civilizations, rural areas, beverages, *Chhang, sura, chakti, kinnauri, chulli*

Human civilizations have been practicing the method for production of fermented foods and beverages for many centuries, even before the microbes were discovered and before the term fermentation was coined. Traditionally, fermented beverages have been a part of many cultures for thousands of years and still form an important component of the traditional knowledge in some human communities. There are reports of consumption of these beverages since pre-Vedic times in India and specific reference to their consumption was mentioned in Ramayana (300-750 BC). Indigenous fermented products form an important part of human diet in all the continents and Asians are considered as the pioneers in the development of indigenous fermentations. In India, Himalayan states have their unique ethnic fermented

foods and beverages (Savitri and Bhalla, 2007). Himachal Pradesh is a state with diversity in climate and geographical conditions. In Tribal and rural areas of Lahaul & Spiti, Kinnaur and Kullu districts of Himachal, many fermented beverages are produced and consumed. A number of cereal (rice/barley), fruit (grapes/wild apricot/apple), jaggery and millet-based indigenously made fermented beverages are popular among the people of these areas of Himachal Pradesh. Most of these traditionally fermented beverages in tribal and rural areas of Himachal are prepared by using '*phab*' as traditional inocula except '*sura*' which is a product of natural fermentation (Thakur, 2013).

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TRADITIONAL ALCOHOLIC BEVERAGES OF HIMACHAL PRADESH

Most cultures throughout the world have traditionally consumed some form of alcoholic beverages for thousands of years, and local specialty alcoholic beverages still account for the majority of all those that exist. A variety of traditionally fermented alcoholic beverages are produced and consumed in tribal and rural areas of Himachal Pradesh by indigenous people (Thakur et al. 2004; Joshi et al. 2012; Kumari et al. 2015). Fruits (apple, pear, grapes, apricot), medicinal herbs and local cereals (*ragi*, barley, wheat and rice) are available in plenty in these regions. These beverages can be classified into various types such as cereal based, millet based, fruit based and distilled on the basis of use of raw material and distillation process. The traditionally fermented alcoholic beverages of Himachal Pradesh are quite unique in terms of both starting material and the process of fermentation from those made throughout the country and the rest of the world.

Traditional fermented beverages of Himachal are mostly based on locally available raw materials such as rice, barley (locally called *Jau*), jaggery, *ragi*, apple, wild apricot (*chulli*) and grapes. The traditional starter '*phab*' is generally used as source of fermenting microorganisms. Some of the very popular beverages are *chhang*, *sura*, *lugri*, *angoori*, *daru*, *chulli*, *ark*, *chakti* etc (Table 1).

Cereal based alcoholic beverages

Among the cereal based alcoholic beverages, *chhang* prepared from barley (*nechhang* or *jauchhang*) and rice (*drechhang*), *lugri* and *chakti* are popular undistilled beverages (Fig. 1 a, b, c). *Chhang* is a turbid, acidic and an alcoholic beverage prepared by solid-state fermentation of cooked rice/barley with the traditional inoculum called '*phab*' (Thakur et al. 2004; Kanwar et al. 2011). The solid material formed before filtration of *chhang* is called *lum* and can be consumed as such. In most of the tribal districts of Himachal Pradesh, all social activities require provision and consumption of appreciable quantities of alcoholic beverages. *Chhang* is consumed mainly during winter months,

as it is believed to provide protection against cold. *Arak*, *sura* or *ara* are the distilled beverages made by fermentation followed by distillation of *chhang* (Fig. 1 g) and have a higher quantity of alcohol. The distilled form of *chhang* is also called as *daru* in some parts of the state. However, similar beverage made from a mixture of Barley, apple, *chulli* (apricot) and pear called as *ark* or *arais* very popular in Kinnaur district of Himachal Pradesh and is prepared especially during traditional festivals (Thakur et al. 2004). *Chakti* or *jhol* is a jiggery based traditional fermented beverage prepared and consumed in rural areas of Shimla, Kullu and other regions of Himachal Pradesh. *Babool* wood locally called as *kikar* (*Acacia niletica*) is added to give appealing taste and aroma to *chakti*.

Millet based alcoholic beverages

Sura is a unique product of natural fermentation prepared by using finger millet (*Eleusine coracana*). It is mainly produced in lug valley of Kullu district of Himachal Pradesh (Fig 1 f). This beverage is peculiar in the fact that no specific inoculum is used for its preparation. It is fermented in two stages in first primary stage, natural fermentation takes place and during secondary fermentation, *dhehli* the traditional inoculum with various bioactive herbal components is added (Thakur, 2013; Thakur et al. 2015; Joshi et al. 2015).

Fruit based alcoholic beverages

Apart from cereal based alcoholic beverages, a wide variety of fruit based beverages are also prepared in Himachal Pradesh. *Kinnauri/angoori* is an alcoholic beverages prepared by the fermentation of red and white varieties of grapes that are cultivated in Kinnaur district of Himachal Pradesh. This is one of the very popular traditional beverages consumed during the local festivals and marriage ceremonies by the tribal people of Kinnaur. *Chulli*, is a popular fruit-based alcoholic beverage, indigenous to the tribal district of Kinnaur commonly made from wild apricots (Thakur et al. 2004). *Rak* is another fruit based fermented beverage made from fermentation of mixture of dried apple, *chulli*, barley, pear and jaggery is also consumed in Kinnaur. It is also known

by other names like *phasur* and *raakt* in Kinnaur district. This is one of the popular alcoholic beverages prepared in the rural areas especially for entertaining guests during local festivals and marriage ceremonies in Kinnaur (Kumari *et al.* 2015). *Ghanti* made from fermented must of apple and apricot is also prepared and consumed by the people in Kinnaur district of Himachal Pradesh.

ROLE OF FERMENTATION

Fermentation has been shown to improve the nutritional value of grains such as wheat and rice,

basically by increasing the content of the essential amino acids viz., lysine, methionine and tryptophan. In case of *chhang* and *sura*, fermentation resulted in a significant increase in B vitamin and essential amino acid levels (Thakur *et al.* 2004). The shelf-life of different products is also increased by fermentation that is attributed to the production of different metabolites by fermenting microorganisms which inhibit the growth and activities of harmful microorganisms. In addition, fermented foods and beverages contain beneficial microorganisms that can help in maintaining a healthy gut.



Fig. 1: Plates showing (a) Unfiltered rice *chhang* (also called *lum*), (b) filtered rice *chhang*, (c) unfiltered barley *chhang* (*lum*), (d) *dheeli* preparation practiced by villagers in lug valley, Kullu district (e) dried *dheeli*, (f) *sura*, (g) distillation in progress, (h) traditional vessels *chhapkian* and (i) *batig* used to serve *chhang*

TRADITIONAL INOCULUM USED IN FERMENTATION

Traditional fermentations generally utilize mixed cultures (yeast and bacterial) and lead to nutrient enhancement as well as alcohol production. Most of the beverages of Himachal Pradesh are produced by using solid state fermentation, in which substrate is allowed to ferment either naturally or by adding traditional starter. In the preparation of all the traditional fermented beverages except *sura*, 'phab' is the inoculum used for fermentation. It is a traditional starter having consortium of different microorganisms which mainly consisted of lactic acid bacteria, yeasts and moulds. *Dhehli* is the starter used in the fermentation of *sura* which is prepared by the elderly people of the Kullu valley during the *Bhadpadra* month i.e. rainy season (Fig. 1 d, e). It is a bioactive mixture of 36 different herbs and roasted barley flour (*sattu*) made in the shape of bricks, which imparts additional flavor to the beverage (Thakur et al. 2015a).

Pediococcus pentosaceus, *Enterococcus faecium* and *Lactobacillus plantarum* are the main lactic acid bacteria identified in both *phab* and *dhehli*. Among the yeasts *Saccharomyces cerevisiae*, *Saccharomyces fibuligera* were the major yeasts present in these starters (Thakur et al. 2015b,). Among the moulds, the species of *Aspergillus*, *Mucor* and *Rhizopus* were commonly found (Thakur, 2013).

CULTURAL SIGNIFICANCE OF TRADITIONAL BEVERAGES

Alcoholic beverages have played an important role in spiritual and cultural life of people in rural districts of Himachal Pradesh. Most of the traditional beverages prepared by the local people are generally associated either with festivals or with the seasons. For example, *chhang* is considered essential to solemnize the marriage ceremony of *Lahaulis* where it is sprinkled on guests as *shagun* (traditional custom) and served in special traditional vessels called *chapkian* and *batig* (Fig. 1 h, i). It is also offered to deities and exchanged as an important gift during local festivals like *phagli* and *halda* in Lahaul and has also been incorporated as an important component of any religious activities (Savitri and Bhalla, 2007). Another traditional beverage, *sura* is prepared during special local festivals like *seori sajja* and marriage ceremonies of locals of *lug* valley in Kullu district.

SCOPE OF TRADITIONAL ALCOHOLIC BEVERAGES

Some advantages of traditional fermentations are that they are labor-intensive, integrated into village customs and manners, familiar, utilize locally produced raw materials, inexpensive, have better potential. Many of the traditional alcoholic beverages of the tribal and rural belts of the Himachal Pradesh

Table 1: List of popular traditional fermented beverages of Himachal Pradesh

Fermented beverages	Substrate used	Starter used	Area
Cereal and millet based			
Chhang	Rice/Barley	Phab	Lahaul Spiti, Kullu and Kinnaur
<i>Sura</i>	Millet flour	Natural fermentation and <i>dhehli</i> as additive	Kullu (<i>lug</i> valley)
Fruit based			
Angoori/Kinnauri	Grapes	<i>Phab</i>	Kinnaur
<i>Chulli</i>	Wild apricot	<i>Phab</i>	Kinnaur
<i>Arak/lara</i>	Apple, pear, barley, etc., <i>Chhang</i>	<i>Phab</i> / distilled	Kinnaur, Lahaul Spiti
<i>Rak/phasur/raakt</i>	Wild almond, apple	<i>Phab</i>	Kinnaur
Others			
Chakti/jhol	Jaggery (<i>gur</i>)	<i>Phab</i>	Shimla, Kullu
<i>Daru</i>	<i>Chhang</i>	Distilled	All over Himachal

are made at home scale only by the rural folks and is little known in outside world. These traditional beverages especially, *chhang* and *sura* are widely believed by the local people to be of immense social, economic and medicinal importance to its consumers. A concerted effort should therefore, be made to improve the quality and production techniques of these indigenous exotic beverages so that the large scale production for export outside the tribal and rural belts could be done. This may offer a reliable and effective way for small-scale farmers to provide opportunities to generate a tradable commodity and contribute to income generation.

CHALLENGES AHEAD

Though there are a number of traditional fermented beverages that are prepared and consumed in Himachal Pradesh, yet their popularity is limited to areas where they are produced. In spite of the nutritional benefits along with use as alcohol source these have not reached general population for commercial exploitation. Limited scientific explorations have been carried out. Much effort is still needed to put these on scientific lines. In addition, many people, especially the younger members of society, are continuously migrating to the cities looking for job opportunities and better facilities. Along with a declining rural population, many traditional lifestyles and related traditional knowledge are also disappearing. This depopulation has adversely affected the time tested traditional technologies for preparation of fermented foods and beverages. Our indigenous traditional knowledge will disappear before it could be validated and improved on the scientific criteria if we ignore it. Documentation and characterization has been done to some extent by some groups but improvement of inoculum on scientific lines is needed to prevent spoilage of these fermented beverages for commercialization.

Future prospects of traditional fermented beverages of Himachal Pradesh

Traditional alcoholic beverages are important component of socio-cultural life of the people in Himachal Pradesh. Most of the traditional

alcoholic beverages prepared in different districts of Himachal are made on household level by the women. Throughout the world, fermented products are gaining importance as functional foods due to increased awareness of such products among the common man. So there is a need to provide scientific base for commercialization of these traditionally fermented beverages and improvement by quality addition. Further research should be directed towards developing defined inoculums geared toward maximizing desirable quality attributes in these beverages and minimizing any undesirable attributes. Intentional incorporation of beneficial or probiotic microorganisms into fermented products will further improve the overall quality of these products with desirable health benefits. In addition, manipulation of environmental factors and choice of good raw material for fermentation may help in improving the quality and quantity of fermented beverages. These improvements if implemented can bring these from household confines to population at large. Beverages with predictable and consistent quality thus, can be produced on a large scale that will further help in revenue and employment generation. Developments in the fields of industrial microbiology and biotechnology can further facilitate transforming home scale art of preparation of fermented products into small to medium industry and lead to a more standardized product with unique characteristics and improved quality along with better storage properties and enhanced nutrition value.

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