Indian Journal of Traditional Knowledge
Vol.11 (1), January 2012, pp 190-193

Chhang - A barley based alcoholic beverage of Ladakh, India

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Received 08.07.09; revised 04.02.10

Chhang is one of the important and indispensable barley based alcoholic beverage prepared and consumed by the people of Ladakh for centuries. *Chhang* forms a part of sociocultural life and no social activities is complete without the beverage. It quenches thirst, gives energy and provides nutrition. *Kholak* made of *chhang* and barley flour is a preferred food of shepherds. Steps involve in *chhang* preparation includes cleaning and boiling of barley grains, cooling, addition of starter culture, fermentation, filtration and blending. The beverage was analysed for alcohol content, *p*H and titrable acidity using standard analytical methods. Results showed that the fermented beverage contains 5-7% alcohol, *p*H 3.6 to 3.8, acidity 0.55 to 0.65%.

Keywords: Alcoholic, Beverage, *Chhang*, Ladakh

IPC Int. Cl.[8]: C12 G, A47 G, A23B 9/00, A21D 2/00

Ladakh region is characterized by extreme climatic condition and short growing season. Traditionally few crops are grown in the region and wheat and barley forms the staple food of the people. Due to isolation of the region and growing of limited number of crops, people have developed food processing technologies from locally available substrate, largely governed by the ethnic preference, agroclimatic conditions, sociocultural ethos and religion. Among the ethnic beverage of the region, *chhang* is one of the important and indispensable barley based alcoholic beverage prepared and consumed by the people for centuries. *Chhang* forms a part of sociocultural life of the people of Ladakh and no social activity is complete without the beverage. Marriage proposal involves offering of *chhang* by the maternal uncle of the to be groom to the family members of the suitable match. Acceptance of the *chhang* signifies consent for the proposal. On the day of marriage ceremony, family members and marriage party are welcome by the villagers and family of the to be bride with earthen pot or *chapskan*, traditional brass container, filled with *chhang*. The guests are served the beverage and *chhanglu*, special song on *chhang*, are being sung during the ceremony. On birth of child, relatives and neighbours brings *chhang* to the family along with barley flour, butter and a scarf tied to a stick in a basket known as *tsi-lu*. This signifies good wishes and blessing to the new born. *Chhang* also signify a gesture of welcome. Ladies in traditional dresses with flower decorated *chapskan* filled with *chhang* in their hand stands in row to welcome *Rinpochey* (head *lamas*), king and important guests. This practice is still being followed in Ladakh to welcome head lamas and important guests. No farm operation is done without the beverage. It quenches thirst, gives energy and provides nutrition. *Kholak* made of *chhang* and barley flour is a preferred food of shepherds.

Despite the importance of *chhang* in sociocultural life of the people, entry of new brands of alcoholic drinks poses threat to the traditional beverage. Young *Ladakhis* exposed to the life of modern sophistication prefer branded alcoholic and non-alcoholic beverage due to easy availability, taste and product uniformity. The traditional method is undergoing changes due to availability of alternate vessels and air tight containers used for preparation of the beverage. The time tested method of *chhang* preparation needs to be preserve to maintain cultural identity of the people of Ladakh. This paper is an attempt to document the traditional method of *chhang* preparation as practiced in Ladakh.

Study site

Ladakh region is situated in trans-Himalaya and comprises of Leh and Kargil district. Leh district is situated between 32°N to 36°N latitude and 75°E to

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80°E longitude at an altitude ranging from 2900 - 5900 m amsl. Area measuring 45,110 km^2 having 116 villages is divided into 6 blocks[1]. The present study has been conducted in Leh and Khaltsi block of the district.

Methodology

Elderly and experienced villagers in Leh and Khalsi block of Leh district were selected on account of their rich experience in preparation of *chhang*. Rapport building process has been established by communicating with the villagers in local dialect, frequent visits and staying in the village for several days. Data pertaining to the study were collected by combination of discussion, on-spot observation and laboratory studies of samples.

Real time temperature record of ambient and beverage preparation process condition was recorded every one hour interval using datalogging thermometer (*DiGi-Sense*® ThermoLogR Thermistor Thermometer, Cole-Parmer, U.S.). *p*H was measured with a Microprocessor based pH system (Model 1012, ESICI, India). Alcohol content was determined by colorimetry method[2] using UV/VIS spectrophotometer (model T80+, PG Instruments Ltd, Germany). Titrable acidity was determined by standard method[3].

Results and discussion

A step wise traditional method of *chhang* preparation (Fig. 1) is as follows:

(a) Cleaning and boiling of barley grains

Impurities are manually removed from the barley grains. Presence of dried peas is believed to hinder taste of *chhang* and hence completely removed. Cleaned grains are boiled in a large vessel. The grain quantity is measured in terms of *bho* (Fig. 2), a wooden mug shaped container. One *bho* contains 1 to 2 kg of grains depending on the size. On an average 5 kg of grains and 10 L of water is used for the boiling process. Once the content starts boiling, the fire is kept low towards the end till the grains imbibe the whole water.

(b) Cooling

The boiled grains locally known as *lhums* is spread on a canvas known as *khol-char* made of weaven Yak's fur (Fig. 3). The whole content is mixed with a goat or sheep's scapula at regular interval till the temperature drops to 28°C to 32°C. The end point of cooling process is checked by touching the *lhums* on cheek.

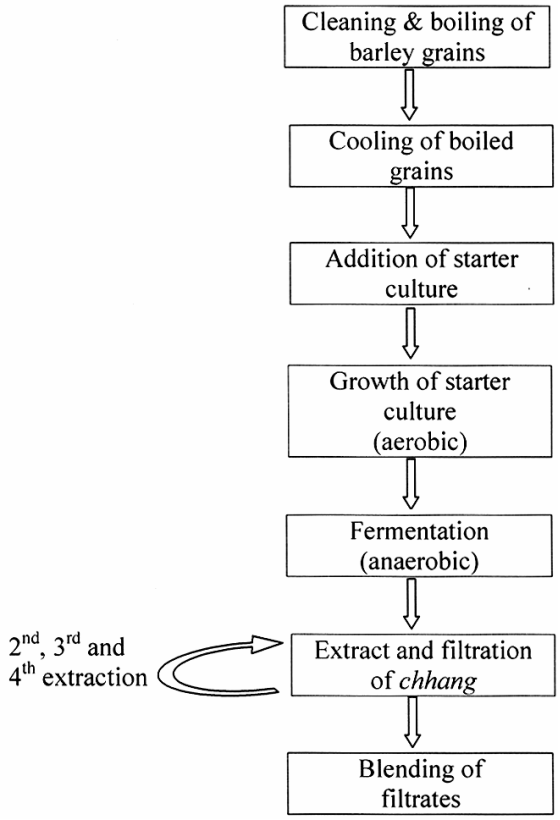

Fig. 1— Flow chart of traditional method of *chhang* preparation

(c) Adding starter culture

On cooling the boiled grains, locally available starter culture in form of tablets known as *phabs* (Fig. 4) weighing 1.3 - 1.7 gm each is added to the content. The tablets are ground to fine powder and mixed with boiled grains. Generally, 3 tablets are sufficient for 5 kg grains during summer while upto 7 tablets are needed during winter. The number of starter culture tablets used also depends on quality of the culture. After mixing the starter culture the inoculated grains are transferred into a cloth bag known as *chhang-sgey* and placed in a heap of wheat or barley straw. A large flat stone weighing 2 - 4 kg is placed on top of the straw heap to increase the temperature around the content in the bag. Usually it takes 2 days for the starter culture to grow during summer and 5 days during winter. The end point for growth of starter culture is checked by a combination of fermentation smell and wetness of the grains. In case of severe winter when starter culture takes longer time to grow, a heated handful size spherical stone known as *chhang-rdo* is placed in the middle of the contents in the bag and kept for additional 1 day. The temperature of the stone and its placement is an art

and depending on experience and mastery in the art, the taste of *chhang* either improves or deteriorates. It is believed that placing an iron object on top of the bag generally improves taste of the beverage.

(d) Fermentation

After 2 to 3 days of growth of the starter culture, the content from the bag is transferred into an earthen pot locally known as *rZa-ma* (Fig. 5). The mouth of the pot is closed with a spherical stone wrapped in clean cloth and made air tight with ash clay. The pot is placed in the heap of straw or kept at ambient condition usually for 7 days depending on the ambient temperature. The 7^{th} day duration is termed as *chhang-zak* or *lhums-zak* meaning that the *chhang* should be ready within this period. Depending on the temperature, the duration ranges from 3 days in summer to 10 days in winter. In case strong beverage with high alcohol content is required, the duration is further extended.

(e) Extraction and filtration

After completing the fermentation process, the content is taken out of the pot and transferred into a wooden drum known as *zem* (Fig. 6). Water is added till the fermented content gets submerged. After 2 - 5 hrs, the first filtrate is taken out from the hole made at the lower portion the wooden drum. It is sieved through *tsagma*, sieve made from straw. The filtrate is termed as *machu* meaning concentrate or *tang-po* meaning first. After first filtrate is taken out of the drum, water is again added till the fermented grains get submerged. The filtrate is again taken after 2 - 5 hrs and it is termed *nyis-pa* meaning second. The process continued and the third and fourth filtrates termed *sum-pa* and *gyi-pa*, respectively are taken. The alcohol content of the first filtrate is highest and reduces in subsequent steps. Based on taste and alcoholic content of each filtrate, a blend is made by mixing the filtrates. The beverage is filled in a *chapskan* (Fig. 7) and served. The final

Figs. 2-7— *Bho*: wooden mug shaped container for measuring grains; (3) Spreading of boiled grains on *khol-char*, canvas made of Yak's fur; (4) *Phaps*: starter culture in form of tablet; (5) *rZa-ma*: earthen pot used for fermentation; (6)*Zem*: wooden drum for extraction and filtration of *chhang*; (7)*chapskan*: brass vessel for serving *chhang*

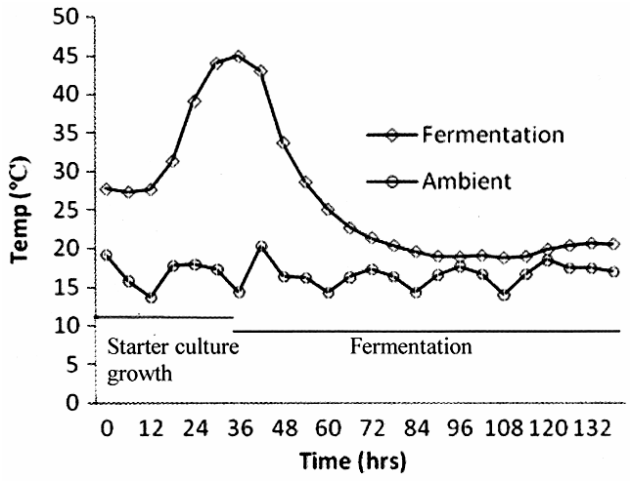

Fig. 8—Change in temperature during growth of starter culture and during fermentation

blended product contains 5 to 7% alcohol, *p*H 3.6 - 3.8 and acidity 0.55 - 0.65%.

In case large quantity of the beverage is not required at a time, 1 to 2 kg of fermented grains is taken in batches from the earthen pot and closed again. To the small quantity of fermented grains, water is added in a vessel till it is submerged. After one day the liquid part is used as the beverage. In case of urgency, small amount of fermented grains is crushed in water and the suspension product known as *boza* is directly consumed. After completion of the filtration process, the by-product called *sBang-ma* is either fed to the animal or dried to make flour for household consumption.

Temperature, *p*H, acidity and alcohol content during fermentation process

Changes in temperature during growth of starter culture and fermentation are illustrated in Fig. 8. The temperature of the content increased after addition of the starter culture. The temperature remains upto 30°C higher than that of ambient temperature during growth of starter culture while during fermentation the temperature drops gradually and remains 4-6°C above ambient.

The initial *p*H and titrable acidity of the boiled grains were 6.5 and 0.64%, respectively. After growth of the starter culture, a slight increase in titratable acidity (0.68%) was observed. There was a rapid decrease in the *p*H and increase in acidity in the course of the fermentation. The *p*H of the content after fermentation was 4.03 while the titratable acidity was 0.73%. The alcohol content, *p*H and titrable acidity of filtrates are shown in Table 1. The first filtrate contains highest alcohol content and decreasing trend in alcohol content, *p*H and acidity was observed in subsequent filtrates.

Table 1— Alcohol content, *p*H and titrable acidity of filtrates

Filtrates	Alcohol content (%)	*p*H	Acidity (%)
1st	6.729	3.9	0.675
2nd	5.145	3.82	0.524
3rd	4.354	3.77	0.457
Blended	5.770	3.79	0.576

Conclusion

Chhang is an indispensable alcoholic beverage in Ladakh and no social activity is complete without it. Traditional method of alcoholic beverage production from barley is a well established process practiced in Ladakh since centuries. The beverage contains 5 to 7% alcohol content, *p*H 3.6 - 3.8 and acidity 0.55 - 0.65%. Entry of branded alcoholic beverage in the region poses threat to the traditional beverage and there is a need to preserve this art and pass on to the younger generation.

Acknowledgement

We would like to thank the elderly and experienced villagers of Leh and Khalsi block for sharing knowledge and information on the subject. Thanks to Sebi (Thiksey), Khangpasoma (Matho), and Kyatpapa (Nurla) families for permission to take samples and temperature data during *chhang* preparation in their houses.

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