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## The traditional fermented foods of meiteis of Manipur, India: A case study

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### Abstract

The following chapter provides information about the fermented foods and beverages of the indigenous people of Manipur along with its sociocultural importance. The different types of fermented foods and beverages were surveyed using questionnaire and documented. It is observed that the indigenous Meiteis of Manipur have their traditional fermented foods in every household and used in a daily basis as an indispensable component and many were used in many rituals. A total of six major different types of most commonly used fermented foods were found to be used by the Manipuris, Meiteis in particular. Standardization of the processing method, analysis of the nutritional aspects and packaging with the accurate labeling of these fermented foods, would help in expanding the market and increase the economy of the state.

**Keywords:** ngari; hentak; soibum; soidon; hawaijar; yu and atingba

### Introduction

Preparation of beverage shows bubbling and foaming, looking like boiling hence the Latin word "fermentation" meaning, "to boil", was assigned. Hesseltine and Wang (1979) <sup>[1]</sup> noted that "Probably the first fermentation was discovered accidentally when salt was incorporated with the food material, and the salt selected certain harmless microorganisms that fermented the product to give a nutritious and acceptable food". Fermented foods are better than raw food from which they are made by creating novel and potentially health-promoting compounds in foods while removing those with negative health potential (Marco *et al.*, 2017) <sup>[2]</sup>. Fermentation not only makes the end product more digestible, it can also improve flavor, texture, appearance, aroma, synthesize vitamins (including B-12, which is difficult to get in vegetarian diets), destroy or mask undesirable or beany flavors, reduce/eliminate carbohydrates believed to cause flatulence, decrease the required cooking time, increase storage life, transform what might otherwise be agricultural wastes into tasty and nutritious human foods, and replenish intestinal microflora (Shurtleff and Aoyagi, 2004) <sup>[3]</sup>. Though food is the life supporting material, food habit and fermented foods, in particular, informs about the identity of an ethnic group. The Meiteis of Manipur also consumes various types of homemade fermented foods and beverages. The traditional art of fermentation exists in households which were handed down to generations through daily practices guided by elderly members of the families. The indigenous fermented food is prepared using different raw materials and friendly micro-organisms as the starter, sold at local markets for local consumption. Fermentation is not only becoming indispensable from traditional ceremonies, rituals, rites, festivities, celebrations but also increases food varieties (Ayam *et al.*, 2012) <sup>[4]</sup>. It is one of the post-harvest management methods for value addition while reducing the post-harvest losses (Soibam *et al.*, 2017) <sup>[5]</sup>.

### Methodology

Using questionnaire, the survey on fermented foods and beverages of the indigenous Meiteis of Manipur were conducted at local practitioners, aged persons, markets and vendors and documented.

### Result and Discussion

The following are the six different types of fermented foods found to be used by the Meiteis of Manipur on daily basis as an indispensable kitchen component in every household and often used in many rituals.

#### Fish-based fermented foods

##### Ngari and its preparation

Ngari is the most important product among other fermented foods for the Meiteis. The daily meal of Meiteis is never completed without ngari, either in the form of hot chutney

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(Ironba, ametpa, kangsoi, singju etc.) or as an ingredient in most of the daily cuisines. Freshwater fish species viz. *Puntius sophore* and *Tenuulosa ilisha* locally called “Phabou nga” and “Ilisha” respectively are used in the preparation of “ngari”. These fishes are imported from Lakhimpur, Assam, and Bangladesh and fermented by traditional ways in and around Imphal and surrounding areas. Sorting (removing of unwanted living and nonliving materials like other undesired fishes, snails, weeds, fibres, etc.), cleaning thoroughly with water in porous bamboo baskets, locally called “*polang*”, drained overnight and properly sun-dried. The dried “phabou nga” after spreading on gunny bags is covered with other gunny bags and stamped and pounded with a typical long handled pounding hammer locally called (*Droomboos/Tamper*) to crush or soften the head and bones for quicker and better fermentation. The crushed and soften dried fish is filled tightly in the pots without any air spaces by pressing hard by initially by leg pressing followed with pressing using wooden pestle/mallet, locally called “*shuk*” in a pot locally called “*ngari-chafu*”. Skilled labours are used for this purpose. *Ngari-chafu* is a thick earthen pot tightly netted with thick strong iron wires on outer wall for strengthening the pots,

with a few to repeated coating of the inner walls with mustard oil to create an anaerobic environment inside the chamber and to avoid/lower wall absorption during fermentation. New pots, require 8-10 times oil coating with an interval of 1 to 2 weeks, while the single coating is sufficient in old pots, for quality fermentation. Around 45-50 kg per pot is packed tightly and sealed airtight with polythene sheet, fish scales, oil slurry, and finally by smearing with mud/sand and cow dung slurry and stored by stacking in proper order in dark at room temperature to allow fermentation to occur naturally. The fermentation is completed in 3 to 6 months and matured in 12 months, producing a characteristic aroma. The fermented fish is ready to eat from the third month onwards, however, the taste is best from the 12<sup>th</sup> month. It is a rich source of proteins and use as an ingredient in many local traditional healing practices and is also sold in local markets (Fig. 1 (A), (B), (C) (D)). The fermented fishes are consumed in all northeast states of India, also in neighboring countries like Myanmar (Burmah, 1876 <sup>[6]</sup> & Titcomb, 1880 <sup>[7]</sup>; Thailand (Tanasupawat *et al.*, 1998) <sup>[8]</sup>; Indonesia (Aryanta, 2000) <sup>[9]</sup> etc.



**Fig 1:** (A & B) Photo showing Ngari in the Ngari Chafu, (C & D) Middle-aged woman Selling Ngari in the Imphal Khwairamband Bazaar

### Hentak and its preparation

*Hentak* (Fig. 2) is a traditionally fermented paste made out of specific local fish species viz. *Puntius sophore* (Phabou nga), *Esomus danricus* (Ngasang), *Amblypharyngodon mola* (Mukanga), *Puntius manipurensis* (Ngakha); *Colisa fasciatus* = *Trichogaster fasciata* (Ngapemma). During the indigenous preparation of *hentak*, hand-sorting is done as the first step with the removal of some of the frequently occurring fish species viz. *Clarias batrachus* (Ngakra), *Mystus bleekeri* (Ngasep), *Ctenopharyngodon idella* (Napichabi), *Hypophthalmichthys molitrix* (Silver fish), *Trichogaster lalius* (Tombema/Phetin), *Labeo gonius* (Mirgal), *Labeo*

*rohita* (Rou), *Monopterus albus* (Ngaprum), *Oreochromis mossambicus* (Tunghanbi), *Osteobrama belangeri* (Pengba), *Pangia pangia* (Nganap) *Wallago attu* (Sareng), *Parambassis ranga* (Ngamhai), *Raiamas bola* (Ngawa), *Anabas testudineus* (Ukabi), *Channa orientalis* (Ngamu), *Glossogobius giuris* (Nylon ngamu), *Lepidocephalichthys guntea* (Ngakijou), *Cyprinus carpio* (Puklaobi), *Catla catla* (Catala), *Bangaqa dero* *Bangaqa dero* (khabak) (ENVIS, 2018) <sup>[10]</sup>, *Barilius barila* (Ngawa), *Bagarius bagarius* (Ngaril), *Channa orientalis* (Khabak), *Heteropterus fossilis* (Ngachik), *Tenuulosa ilisha* (Ilisha), *Lepidocephalus irrorata* (Nganap nakupi), *Garra sp.* (Nunga), *Schistura sp.*



(Ngatup), *Eutropiichthys vacha* (Ngahei) etc. In the second step the fishes are thoroughly washed, drained and sun-dried. It is then pounded in the wooden mortar (*Sumban* in Manipuri) using wooden pastel/malate (*Suk* in Manipuri) to powder. The slices of washed petioles of wild *Alocasia macrorrhiza* (*Hongu* in Manipuri) or *Colocasia esculenta* (*Lampal* in Manipuri) can be pounded/crushed together thoroughly with the powdered fishes to form a well-homogenized paste. The paste is then rolled in rounded/spherical/elliptical shapes, sealed airtight and stored in earthen pots and allow to ferment for at least two weeks. The crushing can be repeated at regular intervals for better homogenization to increase the storage time. During post-pregnancy, every Meitei women consume *hentak* as an alternative to *ngari* for better health and quick recovery. However, *hentak* made out of *Colisa fasciatus* = *Trichogaster fasciata* (Ngapemma) or added *A. macrorrhiza* (*Hongu* in Manipuri) are not consumed during post-pregnancy. Onion can also be used as an alternative to *Alocasia macrorrhiza* (*Hongu* in Manipuri) or *Colocasia esculenta* in making the *hentak*, however, its use reduces the storage time. *Hentak* can be cooked as the main ingredient or as a component of curry. It can also be consumed directly either by roasting, steaming and by making hot chili-chutney.



Fig 2. Photo showing *Hentak* Selling in the Women market (Eema keithel), Imphal, Manipur

### Bamboo-based fermented product

#### Soibum and its preparation

*Soibum* is a traditional fermented food, exclusively produced from any of these young bamboo shoots viz. *Dendrocalamus hamiltonii* (Wanap/ Unap/ Pecha in Manipuri), *D. sikkimensis*, *D. giganteus* (Maribop in Manipuri), *Melocana bambusoide* (Moubi/Muli in Manipuri), *Bambusa tulda* (Utang in Manipuri), *B. vulgaris*, *B. balcooa* and *B. pallia* (Ching Saneibi in Manipuri). It is consumed as one of the desired and important food items in Manipur and Meiteis in particular and neighboring states since time immemorial. In one of the traditional method (Kwatha/Noney type), batch-wise, solid-state fermentation for 6 months to a year of the finely sliced young, soft bamboo shoots is carried out by pressing and packing airtight in the traditionally designed bamboo chambers (having perforations at the bottom for draining acidic extracts release during fermentation) and lining the chamber with leaves/polythene sheets. In another fed-batch fermentation method (Andro type) finely sliced young bamboo shoots are partially packed in the backed earthen pots. Fresh bamboo slices are added when the volume decreases due to starting of the fermentation. Slight pressing is done for every addition of fresh slices. The process is repeated till the pot is filled and fermentation is allowed for 6-12 months. Unlike in Kwatha/Noney type in Andro type, the fermentation extract is not drained. In both the types, aging is very important and the

quality of the *soibum* increases with longer incubation. Completely fermented *Soibum* could be stored even up to one year before marketing. The immature stage of the above fermentation is called *Soijin* and the completely fermented one as *Soibum* and is sold in local markets (Fig. 3 (A), (B), (C) & (D)). The fermented bamboo shoot is also consumed in other Asian countries like Taiwan (Chen *et al.*, 2010) [11].



Fig 3: (A & B). Photo showing *Soibum* selling in the Ima Keithel, Khwairamband Bazaar, Imphal. (D & E) showing poor packaging of *soibum* in polythene bags

#### Soidon and its Preparation

Contrary to *soibum* and *soijin*, *soidon* is prepared from the young apical shoots of *Teinostachyum wightii* (Nath). Traditionally, *soidon* is prepared by filing the sliced and chopped apical shoots of the bamboo in backed earthen pots with Milky fermented soup of previous batch (1:1 dilution) using it as the starter for fermentation. Fermentation extract is not removed allowing submerged fermentation for up to about a week. Pieces of *Garcinia pendunculata* (Heibung) fruit is added as an acidifier and rice washed water (Chinghii @ 1:10) to improve the quality and colour of the *soidon*. The milky extract of the fermentation shows acute poisoning to animals due to cyanogenic glycosides. The toxicity might be transformed during fermentation. The best quality *soidon* is produced from the Bishnupur village, Manipur. It is sold in markets and vendors (Fig. 4).



Fig 4: (A) *Soidon* sold in women's market (Eema Keithel), (B) enlarged

#### Vegetable-based fermented foods

##### Hawaijar and its Preparation

The fermented soybean locally known as "*hawaijar*" is

another popular food for Manipuris. In traditional preparation, medium and more preferably the small-sized soybean seeds are boiled and washed with hot water when fully cooked then packed tightly in a small bamboo basket having a lid (in Manipuri *ngarubak*). The basket, while packing is lined with a few layers of *Ficus hispida* (*Ashee heibong*) rarely by the banana plant, leaves as an alternative. The basket is then covered by gunny bags and buried in the paddy or kept near kitchen kiln/stove for maintaining an ambient temperature for fermentation. (Fig. 5). The palatable stage of the fermented soybean is noticed within 4 to 5 days of incubation. Characteristic ammoniacal odour and mucilage fiber production are the indicators of good quality *hawaijar*.



**Fig 5:** Hawaijar preparation, (A) boiled and hot-water washed soybean wrapped in *Ficus hispida* leaves. (B) Packing in Bamboo basket (*ngarubak*) for incubation

## Fermented beverages

### *Yu and Atingba Preparation*

In Manipur, the womenfolk of Sekmai (popularly known as Awang Sekmai) prepare three different types of fermented beverage from rice viz. "Pukyu", "Waiy", and "Leiyu". The first two are prepared for rare occasions during religious and ceremonial rites like "Lai Haraoba", and only the "Leiyu" is prepared for general consumption or commercial purposes. It is the only one brewed by a process of distillation and popularly also known as "Yu" with a higher alcohol content than the other two varieties which are used as mild beverage like beer. Preparation of good quality *Yu* requires two main ingredients viz. i) unpolished rice and ii) locally prepared starter known as *hamei*. Unpolished rice, soaked overnight in water is collected in a bamboo basket (in Manipuri called "thumok") and dried and crushed into fine powder. Dried pieces of *Albizia mycophylla* ("yangli" in Manipuri) soaked in water are mixed with the rice powder and form thick, flat, (4 – 6) cm diameter x (0.5 – 1) cm thickness rounded doughs called *hameis* (Fig. 6 (A, B)). They are sundried for 4 - 5 days depending on the weather conditions, spreading without overlapping over the flat and broad baskets with straw/paddy husks lining and covered by cloths. When dry, it is further dried by exposing in the direct sunshine. While preparing *hamei*, a taboo is observed not to touch any fruit so as not to spoil the whole preparation. Distillation of Alcoholic Rice Beverage is locally known as *Yu thongba* (Fig. 6 (C)). Distillation usually takes 4 days during summer (March to September), and 5 days during winter (October to February) which may be due to faster fermentation at higher summer temperature.



**Fig 6:** Rice beverage preparation; (A) & (B) Preparation of traditional starter ("*hamei*" in Manipuri); (C) Distilling the rice liquor; (D) Crude Fermentation extract (*Atingba*); (E & F) *Yu* of Sekmai, Phayenand and Andro

Distillation usually starts in the morning by properly cooking the unpolished rice in a pot locally known as *chaphu*. The cooked rice is known as *chak* and the preparation of it is known as *chak thongba*. The cooked rice or *chak* is then poured out in a big bamboo basket locally known as *chak sangbai* and washed thoroughly with water known as *chak chamba* contrary to the olden days, where people did not wash, instead, spread on a big mat till the rice is cooled down properly. The older method, however, was not proper and slower in the fermentation of the *chak*. So, people of Sekmai abandoned altogether nowadays the old method. Still, in some villages in Manipur like Phayeng and Andro, older method is still continuing. Dried and powdered *hamei* (30 gm) is mixed with the *chak* (10 kg) and transferred into a basket (or an aluminum tin), inner wall of which is lined with leaves of *Butea monosperma* (*khangra* tree in Manipuri) or *Alocasia macrorrhiza* (*Hongoo*) or *Datura mettel* (*Sangoi Hidak angouba*). This process of transferring the mixture inside the basket is known as *luthup chanba*. The basket/tin is then placed above a tub. The whole process is completed on the morning of the first day. On the 2nd day (during summer), from the mixture known as (*khajee houdaba*) which have started solid state fermentation (SSF) upon proper fermentation, the mixture now known as (*khajee houba*) start realizing fluid (known as *khari*) in droplets and are collected in the tub. The properly fermented mixture (*khajee houba*) in the morning of the 3rd day (during winter) start releasing *khari*. The quantity of *khari* released is less in the early stages of fermentation than the final stages. Proper fermentation of the mixture determines the quality and quantity of the *Yu* which depends on the quality of *hamei* rather than the incubation period. The properly fermented *khajee* along with the *khari* released



during fermentation will be transferred to another large container and further mixed with water @ 1:1. The process is known as *khajee khunba* performed in the evening of the 2<sup>nd</sup> day during summer and in the morning of the 3<sup>rd</sup> day in winter. The mixture is then allowed to undergo further submerged fermentation for another 2 – 3 days. The submerged mixture is heated on flame and allow the alcohol to evaporate which is condensed by the above pot containing cold water acting as condenser locally called *Yukok*). The distillate dripping down due to condensation is collected in to a pot through an opening connected to a pipe. The fermented beverage is called *Atingba* (Fig. 6D) and distilled clear liquor is called *Yu* (Fig. 6 (E) & (F)). From the mixture upon heating, distillate is collected thrice per day following continuous distillation. The first collected one is the strongest known as "*Machin*" followed by the later collected ones. Meiteis use *Machin* for quick healing of the stitching wounds of an episiotomy (a small cut to the perineum) common in first-time vaginal births or of stitches during childbirth by cesarean.

### Conclusion

Fermented foods of Meiteis of Manipur prepared traditionally at the household levels are the unique example of food processing skills handed down through generations of practice. A lot of harvested crops, cereals and even fish foods could be processed at low cost for daily use or for commercialization. However, the recent changes like the use of polyethylene bags of sheets instead of plant leaves, baskets during the processing show the lack of scientific knowledge as plastics could have allergic/toxic effects on human health. Due to huge domestic demand for certain fermented items e.g. *ngari*, use of urea to speed up the fermentation process becomes evident. There is a need for intensive collaborative research for the improvement efforts of fermented food production technology by reducing health risk. Many have reported on positive effects of fermented foods on various aspects of human health and diseases through different mechanisms (Sarangthem & Singh, 2003) <sup>[12]</sup>. Identifying of novel compounds would help in the welfare of the people. Understanding of microbes may help in shortening the fermentation duration without the use of toxic chemicals like urea. Increase production in a shorter time would help available the foods to the poor section who constitute the larger population. Proper packaging with standard leveling is as well required for a larger marketing possibility.

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