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A Study on Indigenous Fermented Foods of Manipur, India

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A B S T R A C T

The present study was planned to assess the nutritional status and consumption pattern of fermented foods among local people of Manipur. From the survey the most commonly consumed foods fermented fish (Ngari) and fermented bamboo shoot (Soibum) were screen out and further organoleptic microbial and storage studies were carried out in the selected products. From the present study, it was revealed that 53 % of the respondents were having poor knowledge, 34% were in average knowledge and 13 % of the respondents were in good knowledge. Likewise attitude of the respondents based on preserving were in 21 % in poor state, 50 % were in average and 29 % of the respondents were in good state. After completion of survey based on the result the two fermented products were selected for further study. Across over storage products were evaluated for thrice the sensory qualities by a semi- trained panel consisting of 15 members The quality parameters such as the taste, colour, appearance, texture, flour, crispiness and its overall acceptability of the samples by using 9 point hedonic testing scale to find out the acceptability of the products. Out of the four formulations the S4 shown highest scores for all sensory attributes in terms of colour (9), appearance (9), taste (9), texture (9), flavor (9), consistency (9), and overall acceptability (9). Isolation and morphological characterization of the microorganism present in across storage of fermented food products were also performed it shows that among 5 samples NA of fermented fish, $NA10^{-4}$ and $NA\ 10^{-5}$, were found to be gram negative. Likewise among 5 samples NA of fermented bamboo shoot, $NA10^{-3}$, $NA\ 10^{-4}$ and $NA\ 10^{-5}$ were found to be gram negative. Again from 5 samples of PDA of fermented fish, $PDA\ 10^{-1}$, $PDA10^{-2}$, $PDA10^{-3,}$ were found as yeast and fungi and remaining samples there was no growth. Similarly among 5 samples PDA of fermented bamboo shoot, $PDA10^{-1}$, $PDA10^{-2}$ was found to be yeast remaining were no growths. It can be concluded from the study that the people of Manipur prefer fermented food in their daily diet, though knowledge and attitude about preservation and storage of fermented food was very poor. Hence a study was done on storage stability of selected fermented products and found that it can be stored till 3 months without affecting the taste as well as no microbial load.

Introduction

Fermentation is one of the oldest forms of food technology in the Indian Subcontinent (Deka, 2012) and is reported to enhance the nutritional quality of any product by enhancing the amount of vitamins and protein solubility (Sohliya *et al.*, 2009). Indigenous fermented foods have been prepared and consumed for thousands of years, and are strongly linked to culture, traditions and reveal the intellectual richness

of indigenous people of the country in terms of their ability to prepare microbial products for varied purposes in addition to food and beverages (Sekar and Mariappan, 2007). Ngari, a fermented fish product of Manipuri is the valuable endowment to the people of Manipur since from many decades and gave immense values. It is produced by age-old practice of yearlong natural fermentation and used as an appetizer and flavor enhancer in different food preparations due to its excellent organoleptic properties (Jeyaram *et al.,* 2009). Phoubu, a sun dried, non-salted dry form of a fish species Puntius sophore is used for the preparation of ngari dish (Jeyaram *et al*, 2009). During the fermentation of Ngari, the fish (Puntius sophore) is rubbed with salt, dried in the sun for 3–4 days, pressed tightly in an earthen pot, sealed airtight and then stored at room temperature for 4–6 months (Thapa 2002).

In Manipur, a state located in the north eastern part of India, bamboo shoot is consumed as fresh or fermented form, locally called Soibum (Jeyaram *et al.,* 2009). The two traditional preparations, namely the *Kwatha* and *Andro* types, have high market demand and are produced by the ethnic communities of the Chandel and Imphal-East districts of Manipur (Jeyaram *et al.,* 2009). Bamboo is well known to the people of Manipur because of its multipurpose economic uses and because it is associated with legends (P. K. Singh *et al.,* 1996). Soibum is the traditional fermented bamboo shoot product of Manipur which has a typical sour-acidic flavour and taste. It is mostly used for cooking with mustard oil, potatoes and spices for making curry. Since the local people of Manipur extensively use fermented foods in their daily diet, the present study A study on indigenous fermented food products of Manipur has been to assess the nutritional status and consumption pattern of local people of Manipur and further organoleptic microbial and storage studies were carried out in fermented fish (Ngari) and fermented bamboo shoot (Soibum).

Materials and Methods

For this study, the respondents were selected 100 respondents purposively from the local people of Manipur under the age of 18-76. However these products are mainly prepared in villages, apart from this Kakching, Sangaiprou, Utlou, Sekmai, Bisnupur, were selected to accomplish the goal. The study was done by interview technique based using standard questionnaires. Data was collected on socio-demographic information, knowledge and attitude of respondents. The product immediately after preparation was brought to the laboratory of Food, Nutrition and Dietetics Department, College of Assam down town University to study the microbial analysis, storage stability and sensory evaluation of selected fermented foods of Manipur. The organoleptic test was carried out at regular interval of time.

Results and Discussion

The present study aimed to assess the socio demographic information among the local people of Manipur. A total of 100 respondents were taken under the age group of 18-76 years. From the present study it was revealed that out of 100 respondents 47 % were male and 53% were female. Out of the total respondents enrolled in the study 6% of the people were unmarried, 94% were married.46% were 8-10 pass, 35 % were 11-12 pass, 19 % were graduation. The family size of the respondents were mostly nuclear consisting of people that is 41% (4-5 members), 48% belonged to(6-7 members), 11 % consist of(8-10 members). About the purpose of food preservation, 22 % of the respondents were conceiving preserve food

for flavor, 42% for shelf life and 26% for enrich nutrients. During fermentation of fish 100% of the respondents were using earthen pot and correspondingly 100% of the respondents were using bamboo plank chamber. Regarding knowledge of fermentation female has more knowledge as compare to male that is 66% of the respondents for female and 34 % of the respondents for male. 56% of the respondents were visualize that these products can be taken freely, 12 % of the respondents were not having any idea about these products. While consuming these products 100% of the respondents were not obtaining any faith or believe. And 11% of the respondents were using new practical method for fermentation of these products but as long as 89 % of the respondents were not. For preserving these products 6 % of the respondents were believe that the producer/seller of fermented products were using any chemical while manufacturing, 57% of the respondents were not and 37% of the respondents were not getting any suggestion of fermented fish. About preserving these fermented fish, 78% of the respondents were not affirm that there was a specific season, 22 % were not having any clue. Likewise for fermented bamboo shoots, 66% of the respondents were not affirm that there is a specific season, 34 % were not having any concept. Although 37 % of the respondents were believed that fermented fish and fermented bamboo shoots are providing health benefits while consuming,18 % of the respondents were not and 45 % of the respondents were not having any idea. From the survey it was found that 23 % of the respondents were getting knowledge from traditional heritage and 77 % of the respondents from others. Lastly from the present study of KA (knowledge and attitude) score, it provides questionnaire based on knowledge and attitude and perform after study which was done before the research in relation with the topic of traditional knowledge of fermented foods and revealed that 53 % of the respondents were having poor knowledge, 34% of the respondents were in average knowledge and 13 % of the respondents were in good knowledge. Likewise attitude of the respondents based on preserving were in 21 % in poor state, 50 % of the respondents were in average and 29 % of the respondents were in good state. After completion of survey based on the result the two fermented products were selected for further study. Across over storage products were evaluated for thrice the sensory qualities by a semi- trained panel consisting of 15 members The quality parameters such as the taste, colour, appearance, texture, flour, crispiness and its overall acceptability of the samples by using 9 point hedonic testing scale. to find out the acceptability of the products.

Out of the four formulation the S4 shown highest scores for all sensory attributes in terms of colour (9), appearance (9), taste(9), texture(9), flavor (9), consistency(9), and overall acceptability (9). The fermented food products were acceptable even across 3 month of storage. The slight increase in overall acceptability of fermented products in sensory scores over storage was seen from 1 month to 3 months. The study showed that the fermented products can be stored till 3 months with changes in sensory attributes terms of colour, appearance, taste, texture, flavour, crispiness, overall acceptability. Isolation and morphological characterization of the microorganism present in across storage of fermented food products were also performed it shows that among 5 samples NA of fermented fish, $NA10^{-4}$ and NA 10^{-5}, were found to be gram negative. Likewise among 5 samples NA of fermented bamboo shoot, $NA10^{-3}$, NA 10^{-4} and NA 10^{-5} were found to be gram

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It can be concluded from the study that the people of Manipur prefer fermented food in their daily diet, though knowledge and attitude about preservation and storage of fermented food was very poor. Hence a study was done on storage stability of selected fermented products and found that it can be stored till 3 months without affecting the taste as well as no microbial load. Extensive study is require to work with indigenous people to explore better knowledge of health benefit about fermented food products and further nutritional assessment will be more useful.

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