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## Research Article

### FISH PRESERVATION TECHNIQUES PRACTISED BY THE MOYON TRIBE, CHANDEL DISTRICT MANIPUR

**Wanglar Alphonsa Wanglar\*, L. Arunkumar and Shanoi Moses Tarao**

Department of Zoology, South East Manipur College, Komlathabi, P.O- Pallel,  
Chandel District, Manipur, India

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#### ABSTRACT

The Chandel District of Manipur, India, is a region with rich cultural diversity and ethnic groups. The Moyon are one of the minority tribes inhabiting Chandel District. Like any other ethnic groups, the Moyon also have their own unique methods of fish processing and fermentation for preservation, taste and nutritional enhancement. These techniques have been practiced from time immemorial. With the present scenario of scientific technology, availability of food commodities in ready made package and the impact of globalization, these lesser known indigenous fish processing techniques of the Moyon is facing the risk of extinction. And it becomes a necessity to preserve this indigenous fish products and maintain the traditional value of fish preservation for the years to come. Thus, an extensive field survey was conducted on all the interior villages mainly focussing on seven Moyon villages whose livelihood and occupation are based on fishing, with thorough interrogation with the fishermen and local people who practise fish preservation traditionally. This paper is an attempt to find out various fish preservation techniques practised by the local fishermen of Moyon tribe, Chandel District and also to provide written record on the findings of the different techniques documented during the one year study, from July, 2017 to June, 2018.

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#### INTRODUCTION

Fish is one of the protein food that needs careful handling (Eyo, 2004). They are highly perishable food commodity and spoilage sets in as soon as the fish dies. There are countless bacteria naturally present on the skin, gills and intestine of fish (Karube et al., 2001). These bacteria are normally harmless to a living fish, however they begin to multiply shortly after death and cause speedy decaying. Moreover, the fish capturing sites are far off from the market place and there is a chance of decomposition and the uncertainties of their sale in the market. Hence, immediate preservation and processing become the prior necessities to prevent deterioration, to retain quality with a minimal loss of flavor, taste, odour, nutritive value and digestibility of their flesh and also for transportation of it to the market in good usable condition. A number of fish preserving techniques are employed in different regions like drying, salting, smoking, icing, refrigerator or freezing. However, the Moyon people used age old, simple but cost effective and easy operating traditional methods of fish processing and preservation such as smoking, roasting and fermentation. Besides enhancing the taste and appetizing look, smoking increases the product's shelf life and helps preserve the fish by

slowing down the spoilage of fat and growth of bacteria. Smoking also prevent fats from developing a rancid taste. In addition to preservation, fermented fish products have provide not only bio-nutrients, minerals and enhancement of flavor and aroma but it also increases digestibility and exert health promoting benefits (Jeyaram et al., 2009). Fermentation has been used by man from time immemorial. It is one of the oldest and most economic methods of preserving the quality and safety of food. Sekar & Mariappan (2007) remarked that the indigenous people have been using microbes unknowingly for various purposes.

During harvesting when there is a large catch, fishes cannot be sold out immediately in fresh condition. In such situation, fishes are processed to preserve and also to consume during off season. In Oriental countries, fermented food supplements having varied flavor are highly consumed. Almost everywhere fermented fish is taken as a condiment of rice dishes. Some people prefer the flavor of processed and preserved fish to fresh fish. In Southeast Asia, the main principal of traditional fish processing for preservation and storage of fish are salting, drying and smoking (Cooke et al.). Moyons are no exception.

\*Corresponding author: **Wanglar Alphonsa Wanglar**

Department of Zoology, South East Manipur College, Komlathabi, P.O- Pallel, Chandel District, Manipur, India

## Area of Study

The Moyon is one of the least populated tribe in Manipur. Chandel district is located in the south eastern part of Manipur and extends between 23°50'N-24°38'N latitudes and 93°45'E-94°25'E longitudes. It occupies an area of 3,313 sq km flanked by Ukhrul district in the east, Thoubal district in the north, Myanmar in the south and Churachandpur district in the west respectively. The population of the district is 14,028 according to census 2011. The district is basically a hilly and rugged terrain adorned with lush dense forest having a subtropical to temperate climate. The main rivers coursing through the deep gorges and enchanted landscape are; Sekmai, Chakpi and Lokchao. Chandel is inhabited by the Moyon tribe along with other prominent tribes like Anal, Chothe, Lamkang, Maring, Monsang, Aimol, Kom, Zou, Paite etc. Each of these tribes has its own indigenous methods of fish processing and fermentation. In India, there are 16 Moyon villages in Chandel District, Manipur. Seven sample Moyon villages, viz, Mitong (Matung), Thangkin, Khongjon (Khungjuur), Chumthar, Laarfhuw, Rashankhur and Moyon Khullen (BujuurKhufhuw) have been selected for intensive study (Map.1.Fig.1)

## MATERIALS AND METHODS

A field survey was conducted in the said villages during the month of July, 2017 to June, 2018. The purpose was to document the traditional knowledge associated with the indigenous processing and fermentation of fish in detail. The information and related data were gathered and collected by in-depth interviews from the local people and fishermen who practice fish preservation traditionally. It was found that women also take active part in the processing of fish. Procedure of preparation and mode of consumption were noted down during the study. The raw materials used include fish, bamboo, bamboo container, cover lid etc.

## RESULTS AND DISCUSSIONS

Fishes after harvest are mostly processed by smoking, drying, roasting and fermentation. Smaller sized fishes are subject to fermentation. The most commonly used techniques of fish preservation among the Moyon tribe found out during the study are described below with the local names (in italics) and Common names (in parentheses);

### *Ngaynchong (Smoking and drying)*

In this technique, the fish caught, are properly washed in clean water and their bellies are cut open to remove the visceral organs to prevent from speedy deterioration. Small sized fishes measuring less than one foot are smoked as a whole. The cleansed fishes are smoked and dried by placing them upon the wire net or mesh woven bamboo net called 'irap' (in Moyon language) which is placed about two and half feet in height above the ground upon the four erected supporting posts (in Plate.1 fig.1). Fire is set below using firewood in such a way that direct burning of fishes are avoided so as to maintain its texture and taste. The fishes are repeatedly turned upside down about every 10 minutes till these are partially dehydrated and fluid oozes out of its body. In this way, smoking is continued till it is completely dry and the colour of the fish changes to golden brown or brownish black. They are then removed from the 'irap' and put inside a woven bamboo basket called,

'polaang'. Bigger sized 'polaang' contain 100 fishes which is sold at the price of Rs. 300/ as of now, whereas, a smaller sized 'polaang' contain 50 fishes which is sold at Rs. 50/ per basket. The fishes thus processed may be stored or kept for a month or two depending on the care taken.

### *Ngaruwynthir (Fish smoking)*

In this technique, the fishes caught are properly cleansed in stream water. Then a thin finely split bamboo piece is inserted deep into the viscera through the mouth via the anus. In this way, seven fishes are inserted transversely and the two ends of the threads are knotted, giving a garland shape. It is termed as 'ngaruwynthir'. Fishes like *barilius* sp is commonly preserved in this manner. In some cases, 10 fishes are arranged in the same manner as above. The pierced fish is then hung or suspended at the erected supporting post (Plate.1 fig.2) above the flame till the fishes gets completely dried. The dry fish is then sold in the market at Rs. 150-200 per ngaruw.

### *Ngalruu (Roasting)*

Fishes like murels, eels, *Garra* sp. and catfishes are processed by this technique. A stick is directly inserted through the mouth of the fish deep into the viscera. Then the fish is roasted briefly in a flame and cooled. After that the fishes are put in a basket container and is covered with a lid. In some fish species like *channa gachuna* and *channa punctata* the scale is properly removed after slight warming up and a stick is inserted directly as mentioned above or it can be folded and pierce across the body as is done in eels. Then it is roasted. The fish thus processed remains soft as it is not completely dry. Such fishes are re-roasted or cooked before consumption. They are mostly given to the mothers who gave birth recently, old aged or children with the belief that it has a medicinal value.

### *Ngaphor (Smoking after splitting)*

In this technique, larger fishes measuring about one foot and above (in length) are cut or dissected with a sharp knife dorsally on one side of the vertebral column from head to tail. The intestinal parts are removed and the abdomen is washed thoroughly to prevent from the bacterial attack. The dissected fish is then flattened by spreading out the two lateral sides (Plate.1. Fig.3). Fish thus processed is kept on the wire net or bamboo woven mesh and is smoked in the flame for half an hour till the colour of the fish turns into golden brown or brownish black. It is then preserved in a bamboo basket, 'polaang' (Plate.2.Fig.6) or stored in 'rupak' (bamboo woven basket, Plate.2. Fig.7) for selling or for domestic consumption. Large fishes such as *Anguilla bengalensis* and *C. carpio* are mostly smoked by this technique. In the case of *Anguilla bengalensis*, the fish is cut into pieces, each piece measuring about one foot. It is then washed and smoked in the fire as above. The smoked fish 'Ngaphor' fetches as high as Rs.300 per kg specially that of *Anguilla bengalensis* as it is belief to extend life span of a person.

### *Ithitongka (Fermentation)*

Small fishes caught by means of 'Chiituk' (Community herbal fishing technique) are collected for fermentation. They are cleansed and washed thoroughly without squeezing out the viscera. The fishes are then put into a container made of (cut off), young bamboo known as 'tongka', measuring about one

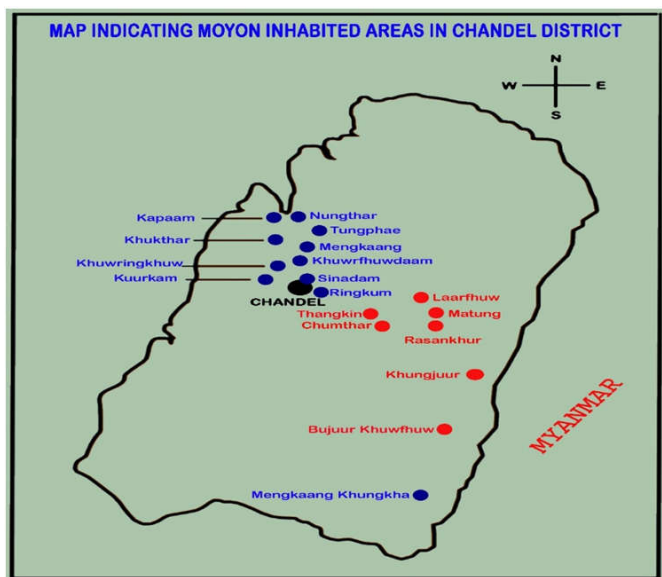
and half feet long. The mouth of the container is tightly sealed with turmeric leaves and cooked in a fire till the bamboo is burnt (Plate.1.fig.4) and external shrinkage of its cover is observed indicating its dryness. The bamboo container is then allowed to cool for some time and the first layer of its covering is scaled out. The fish product thus formed is called ‘Ithiitongka’. It is kept either above the fire in ‘erap’ or near the fire to avoid from rotting. The fermented fish have certain flavor and taste and is mainly prepared for local consumption. This product can be stored for a week or two if care is taken to seal the mouth of the preserving container tightly.

**Nga-ih(Fish intestine)**

The digestive system of fishes removed before smoking are collected and cooked in a container (pot) for half an hour and then grounded into paste. The fish paste is filled in a bamboo container, sealed tightly and kept near the fire alcove for a day or two. The ‘nga-ih’ thus prepared is consumed by mixing it with salt, chilly, ginger, garlic etc. Nowadays all the preferred additives are added to the intestine before cooking while preparing ‘nga-ih’ at home. The product has a delicious flavor and taste, mostly taken in small amounts. It can be preserved for a month.

**Iriikoh (preservation by plant bark)**

Fishes are mostly processed at the fish capturing site. When fishes are caught in large amount and the fishermen plan to leave for home or market and there was no possible means of preserving them by any of the above techniques due to time constraint, the barks of *Gnetummontanum* Markgraf is used as a means of preservation .The barks of this tree is scaled or peeled out in small pieces by a knife and mixed with the fishes as shown in Plate.1, fig.5. The fishes are put inside a bamboo basket called ‘tungpuur/buwtuw’ (Plate.2.Fig.8) or ‘buwkaangidii’ (Plate.2.Fig.9) or ‘rupeer’ (basket used by men among Moyon tribe, Plate.2.Fig.10), after lining the basket with banana or turmeric or fig leaves. The bark prevents fish from decomposition, whereas, leaves keep the fish from drying. Small to medium fishes can be preserved by this method for two to three days.



Map 1 Map indicating Moyon inhabited areas in Chandel District.

Fig.1 Study site indicated by red dot

Plate.1



Fig 1.Nga ynchong (Smoking and drying)



Fig 2 Ngaruwynthir (Fish smoking)

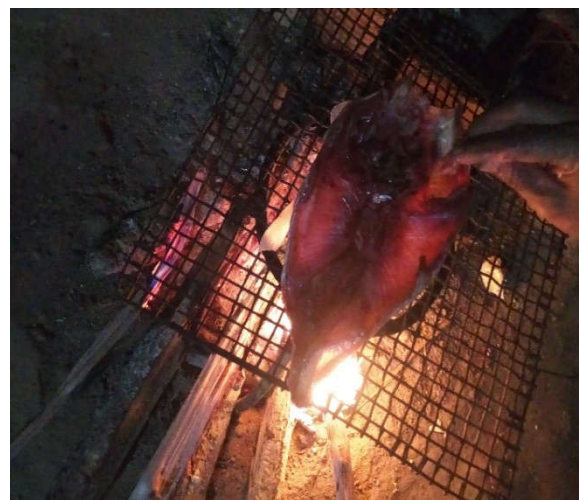


Fig 3 Ngaphor (Smoking after splitting)



Fig 4 Ithiitongka (Fermentation)



Fig 5 Preservation of fish by the bark of *Gnetum montanum* Markgraf.



Fig 6 Polaang



Fig 7 Ropak



Fig 8 Tungpuur/ Buwtuw



Fig 9 Buwkaangidii



Fig 10 Rupeer

## CONCLUSION

Smoking accelerates rancidity of fat and so reduces digestibility of fat products. Hot smoking of fish results to the loss of protein along with weight loss (Bhuiyan *et al.* 1986). However, smoked fish is rich in protein as well as low in calories. It not only improves the organoleptic qualities of the fish but also extends shelf life and delay the onset of bacterial and fungal attack. Smoked deposited on the fish in the process has preservative effect since it contains formaldehyde, phenol and other substances evolved from woody smoked (Stansby, 1963). Thus, smoking process gives unique taste, colour and flavor.

Fermented fish, 'Ithiitongka' and 'Nga-ih' are the two most sought after product by the local people as it is believed to improve digestion and enhance the appetite of a person. These two products are used as delicious and flavourous agents while taking food.

All the products made out of the fish as explained above are the favourites of the Moyon tribe. Considering the popularity and high demands of these fish products among the Moyon tribe itself and the adjoining local people in the District, it becomes important to produce good quality fish products. If such type of products are scientifically prepared, it would definitely capture the rural markets of the region as well as other parts of the country. These indigenous technique may be helpful in employment generation if proper measurement is taken by the concerned authorities.

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