

A study on Traditional fish preservation method and certain ethnomedicinal fishes of Bodo tribe of Kokrajhar District, Assam, India

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Abstract- Kokrajhar district, located in the western part of Assam has abundant natural fishery resources consisting of streams, beels, flooded lands etc. The main community of the district is Bodo tribe. Bodo people consume fishes as delicious and medicinal diet. Fish is taken by them in different forms in fresh or in preserved. They use certain fishes as medicine for some diseases. Nafam is a traditional preserved fish product of Bodo tribe. Though traditional but the preparation technique of nafam have various advantages. In this study, the Nafam preparation method of Bodo tribe is broadly described. Certain ethnomedicinal fishes are also trying to highlight on this study.

Keywords—Nafam, Fish, Preserved, Ethnomedicine, Bodo Tribe

I. INTRODUCTION

North east India is not only biodiversity hot spots but is having rich diversity of traditional communities; such a rich diversity of traditional community and biological resources in the region has endowed with advantage for evolving in numerous ethno-zoological knowledge ^[1]. Kokrajhar district, located in the western part of Assam has abundant natural fishery resources consisting of streams, beels, flooded lands etc. The main community of the district is Bodo tribe. They depend on the fishes for their socio-economic development. Bodo people consume fishes as delicious and medicinal diet. Fish is taken by them in different forms in fresh or in preserved. They have some ethnic believes on fishes that certain fishes are medicine for some diseases.

Fish preservation and fermentation by various traditional methods are studied earlier by many workers. Traditional fermentation of *Lona ilish* of North East India was studied earlier ^[2]. Shidal a traditional fermented fishery product of North East India was also studied by earlier worker ^[3]. Shidal is a commonly known preserved fish product of North East India is known by different local names, among Bodo tribe it is known as 'Nafam'. The preparation technique of Nafam is slightly different from shidal preparation of other tribes. In this study, we broadly describe the Nafam preparation of Bodo tribe. Certain

fishes have medicinal food values, are also trying to highlight on this study.

II. METHODOLOGY

The study was carried out in Kokrajhar district of western Assam (89° 46'E to 90°38' E and 29°19'N to 26°54'N). The information was collected by case study and by interviewing the local people. Nafam preparation was documented by direct observation at the production sites and ethnic medicinal food values of fishes were documented by interviewing and distributing questionnaire. Twenty five villages were surveyed and asked to people and documented from 685 questionnaires during this study.

III. RESULTS AND DISCUSSION

Preparation of Nafam (fermented fish product of Bodo Tribe):

Nafam, where Na means fish and fam means tightly preserved or composed in cylinder of bamboo without entre of air for long time is a common fish preservation technique of Bodo tribe and is prepared in the following method (Figure-1)

Sun dried fishes are crushed. These crushed fishes are mixed with stems of locally available arum called 'Thaso' (*Colocasia sp.*) which making fish soft, tasty and also kill the bacteria, fungi etc. A clean cylinder of bamboo tree

where one side is closed and another side is opened. This bamboo cylinder is locally called owa hasung. The crushed fish paste is now put into the owa hasung (cylinder). The crushed fish paste is tightly put into the cylinder upto three of fourth of the cylinder. After putting crushed fishes, a clean leaf of banana tree, making it germs free by heating in fire is put into the cylinder. Banana leaf is also tightly put into the cylinder that air cannot pass through it. Now, ash or charcoal powder is put on the banana leaf. After ash, clay of heated soil is now used to seal the mouth of cylinder. This cylinder is now wrapped tightly by banana leaf and stored in a dry place of kitchen for one month or more and Nafam is thus prepared.

This Nafam is when put out from cylinder after one month becomes brownish in color and with rotten dry smell. It is cooked with local vegetables. This Nafam preparation is germs free preservation method because air is completely free inside the cylinder means external air cannot enter inside.

Fishes used as medicine by Bodo people:

Certain species of fishes were being used as medicine for certain diseases. The data collected from villagers are presented in Table.1

Table.1: List of fishes used as medicine along with local names, scientific names and their mode of preparation and used for medicine

Local name of the species	Scientific Name of species	Parts of body used	Mode of preparation	Mode of used/ mode of treatment
Gwri	<i>Channa punctatus</i>	Whole body in dried or fresh condition	Dried fishes are cooked with some leaves and spices make as soup and fresh fishes are consumed by cooking with local vegetables	Dried fish soup is used for the treatment of common cold and fresh fish for sick or physically weak.
Nasrai	<i>Channa gachua</i>	Whole body in dried or fresh condition	Dried fishes are cooked with some leaves and spices make as soup and fresh fishes are consumed by cooking with local vegetables	Used to increase breast milk secretion for new mother, after child delivery.
Nisla	<i>Channa stewartii</i>	Whole body in fresh condition	Cooked with light spices and local vegetables	Used to increase breast milk secretion

			consume as juice (soup)	for new mother after child delivery
Thengwna	<i>Mystus tengara</i>	Whole body in dried condition	Dried fishes are cooked with some leaves and spices make as soup	Dried fish soup is widely used for common cold which is totally curable. Also used to cure back bone pain.
Thuri	<i>Macrornathus pancalus</i>	Whole body in dried or fresh condition	Dried fishes are cooked with some leaves and spices make soup and fresh fishes are consumed by cooking with local vegetables	Dried fish soup is used for the treatment of common cold and fresh fish for sick or physically weak.
Khusia	<i>Monopterusuchia</i>	Whole body in fresh condition	Fresh fishes are cooked with local vegetables	Used for the treatment of physically weak or anaemia.
Magur	<i>Clarius batrachus</i>	Whole body in fresh condition	Fresh fishes are cooked with local vegetable leaf, called jwglauri.	Used for the treatment of malaria and sick.
Singi	<i>Heteropneustes fossilis</i>	Whole body in fresh condition	Fresh fishes are cooked with local vegetables	Used for the treatment of physically weak
Khangkhila	<i>Xenentodon cancila</i>	Mouth part in dried condition	Mouth part is dried on fire and the teeth containing jaws are used to pick the skin.	Used for certain skin diseases like allergy by pick up with the teeth-jaw on the affected area of the skin.
Maoa	<i>Amblypharyngodon mola</i>	Whole body in dried condition	Dried fishes are cooked with some leaves and spices make soup	Dried fish soup is used for the treatment of common cold,

				irritation, asthma etc.
Khaoi	<i>Anabas testudineus</i>	Whole body in fresh condition	Fresh fishes are cooked with local vegetables	Used for the treatment of physically weak.
Bengshi	<i>Colisa faciatus</i>	Whole body in dried and fresh condition	Dried fishes are cooked with some leaves and spices make soup and fresh fishes are consumed by cooking with local vegetables	Dried fish soup is used for the treatment of common cold and fresh fish for sick or physically weak.

Nafam preparation method is slightly different from shidal preparation method of other tribe of North East India. The main raw materials used for shidal preparation are fish, mutka, edible oil, cover paste and clay seal [3]. But for Nafam preparation bamboo cylinder is used in place of mutka and oil is not used. Arum stem is mixed with paste of fish to make nafam tasty and to kill bacteria fungi etc. so cannot infect in it. Charcoal powder or ash is used to seal the bamboo cylinder followed by germ free heated clay in nafam preparation which is completely germ free preservation technique and is differ from shidal preparation of other tribe. This method is a kind of germ free preservation of fish. Traditional nafam has advantages than others. In this Nafam preparation on the other side air is free inside the cylinder because external air cannot enter easily inside, so no microorganisms can enter inside and charcoal powder is also present in second layer, so that we can confirm that germ free inside the cylinder.

Some fishes mentioned above as medicinal fishes like *Clarias batrachus*, *Heteropneustes fossilis*, *Monopterus albus*, *Anabas testudineus*, *Colisa faciatus* and fishes of genus *Channa* are known to all as medicinal fishes for sick mostly for physically weak or anaemia. But many people do not know that *Clarias batrachus* is used as medicine for malaria by cooking local vegetable leaf called jwglaoiri; villagers believe that malaria is completely curable by consuming such food. Most dried fishes are used by the Bodo people by cooking with some local vegetable leaves and spices as choop for common cold and sick. Choop of dried *Mystus tengara* is completely curable medicine for common cold and back bone pain. On the other hand *Channa stewartii*, now rarely found fishes of North East India has ethnic medicinal value that increases the milk secretion of mammary gland. Jaw-teeth of *Xenentodon cancila* is used as medicine for skin diseases is rarely known to people.

Such traditional or ethical believes need further experimental study for confirmation for their specific medicinal values but has clues for further researchers. The over exploitation of the fishes by the people, not for medicinal purpose but for satisfying their greed for the delicious flesh; this has posed a big threat to the existence of many rare fishes [4]. Many fishes like *Channa stewartii*, *Xenentodon cancila* etc. are not known for their medicinal value and such species now facing serious threat to existence due to various human activities. Therefore, in this study importance of such medicinal fishes are highlighted for the conservation of such species.

IV. CONCLUSION AND FUTURE SCOPE

The present study is only the record of medicinal values of fishes; traditional believes of people of Bodo Tribe, but it is a clue for further experimental study that exactly curable medicine or not. This study also gives importance of certain Indigenous fishes for conservation in future. The fish preservation method or fermentation method of nafam gives an ethical and cultural importance and help to create a new method for fish fermentation for fish lovers.

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Figure.1: Nafam preparation method. A- Materials used for making Nafam, B- Stem of arum, *Colocasia sp.*, C- Bamboo cylinder, owa hasung, D- Grinding or crushing fish in traditional equipment called Uwal, E- Mixing stem of arun, thaso, F- Making paste of dried fish, G- moist paste is prepared, H- Putting paste fish inside the Bamboo cylinder, I- Dried fish paste is filled upto $\frac{3}{4}$ of bamboo cylinder, J- Banana leaf is cover on the paste, K- Ash or charcoal powder is put on the banana leaf, followed by heated clay sealed on it, L- cylinder is wrapped with banana leaf.

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