

DRY FISH PRODUCTION AND TRADITIONAL DRY FISH DISHES IN AGARTALA AREA OF TRIPURA

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Abstract

Dry fishes are one type of preserved food product used by various communities of a particular geographical location. A study was carried out in a dry fish market of Maharajganja bazaar, Agartala, Tripura. The study was conducted during June to August through interviews with five informants. A total of ten types of dry fishes were recorded with description. This study deals with the method of production, uses and precaution taken during production of dry fishes. Various types of dishes are prepared using dry fishes almost in the same way according to their own taste. The mostly available Sidal and Nuna (Lona) ilish production procedure is reported. Two types of dry fishes are prepared locally and others are supplied to Tripura from various parts of the country as well as from Bangladesh. Traditionally dry fishes are used for nutritional purpose. The deteriorated dry fishes are used for production of poultry/fish feed. Use of formalin or chlorinated insecticides in dry fishes to prevent deterioration may be considered as a serious problem so far as the health is concerned.

Key words: Dry fish, *Sidal*, *Nuna ilish*, DDT, Tripura.

Introduction

Food preservation practices exist in human civilization and different methods are followed by various tribes to preserve plant and animal products. Dry fishes are such example and are prepared from fishes collected from river and sea.

In hilly and rural areas, transportation facility and other modes of communication facility are poor; people of such areas opt for production of dry fish for preservation, when they catch big fishes or large quantities of fishes. The weight of dry fishes is less and hence it is also convenient to carry. These dry fishes are mostly used by Tribal communities such as Tripuris, Manipuris, Kukis and also by non-tribal communities of NE region.

Tripura is one of the seven states in the north eastern part of India. It is the second smallest state in India. It is bounded in the north, west, south and south-east by Bangladesh and in

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the east with Assam and Mizoram. Tripura is the place where varieties of dry fishes are available. The local name of available dry fishes are *Sidal*, *Nuna (Lona) Ilish*, *Tangra*, *Bashpati*, *Loita*, *Chhuri*, *Chingri*, *Kechhki*, *Chandana*, *Phaluya*. Among these *Sidal* and *Nuna ilish* are prepared in Tripura and also imported from Bangladesh. Production of *Lona ilish* has been reported by Majumdar and Basu, 2010. The dry fishes which are prepared from Sea fishes such as *Loita*, *chandana* are supplied from various parts of India. Others, such as *Chingri*, *kechhki* etc. are found in various places of Tripura, such as Gandacherra, Santir bazar etc.

Generally, salt is used to prevent deterioration of dry fish. However, uses of chlorinated insecticides in dry fish available in Bangladesh have been reported (Bhuiyan NH *et al* 2008; Bhuiyan NI *et al* 2009; Chowdhury *et al* 2010; Siddique and Aktar 2012).

Therefore, it was thought to carry out a survey regarding the method of dry fish production in Tripura. Agartala, being the capital of Tripura, was selected for this study because of the availability of various types of dry fish and availability of consumers.

This report includes types of dry fish available, method of production and uses of dry fish in Tripura.

Materials and Methods

Study area

The State Tripura (Fig 1) is extended between Latitude 22°56' N and 24°32' N and Longitude 91°09' E and 92°20' E with total area of 10,491.69 km² and total population of 3,671,032. The temperature during summer ranges from 13 °C to 36 °C and during winter, ranges from 24°C - 27°C. The normal annual rainfall in the state is 2,196.40 mm. Capture water area is 0.07 km², Water area for fish culture is 0.19 km² and the annual fish production is 42.268 X 10⁶ kg.

The study was carried out in a dry fish market, Maharajganja Bazar, Agartala and a few areas of dry fish production in and around Agartala. The study was based on personal interview, audio-visual recordings and photographs. Mr. Prabir Das, a shopkeeper of dry fish market, provided information regarding various types of dry fish available in Agartala market. Mr. Shankar Das, dry fish maker, provided information regarding method of production of various types of dry fish especially *Sidal* and *Nuna ilish* (also known as

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Lona ilish), he also provided information regarding the utilization of deteriorated dry fishes. Mr. Pradip Das, a worker in fish culture area at Jogendranagar,

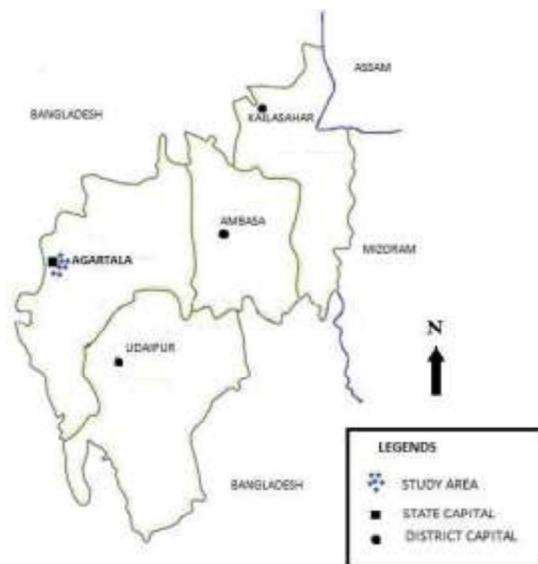


Fig 1: Location of Study area, Tripura

Agartala, provided information about fish culture and confirmed the local name of the fishes. The scientific names were confirmed through literature (Datta and Srivastava 2002; Rahman 2005; Carlisle DB 1955; Gupta MV 1967; Stephen *et al* 1996 and Pandey *et al* 2012). Mrs. Prativa Dhar, East Pratapgarh, Agartala provided information regarding various type of dishes prepared with dry fish.

Information provided by individuals and confirmed by other informants are reported here.

Results

Different types of dry fishes available in the study area, their method of production wherever applicable are presented below. The following description is for the two types of dry fish produced locally. The description is presented by their local name (Bengali), followed by English name and scientific name. Method of production presented here is the general method and as described by the informants. Other types of dry fishes are supplied from different parts of the country and also from Bangladesh and are presented in Table 1. Various dishes prepared with the dry fishes are summarized in Table 2-6. The

weight or volume of the ingredients of dishes mentioned in Table 2-6 are approximate value.

Table 1: Types of dry fishes available in Agartala, Tripura.

Sl. no.	Local Name	English Name	Used as	Scientific Name
1	Loita	Bombay duck or bummalo	Chutney, Curry	<i>Harpadon nehereus</i>
2	Kechhki	Ganges river sprat	Curry	<i>Corica soborna</i>
3	Eaccha/ Chingri	Shrimp	Fry, Chutney	<i>Leander Serratus</i>
4	Tangra	Catfish	Curry	<i>Mystus cavasius</i>
5	Chhuri	Cutlass fish	Curry	<i>Lepturacanthus savala</i>
6	Phaluya	Foli Fish	Chutney	<i>Notopterus notopterus</i>
7	Chandana	Toli shad	Curry	<i>Tenulosa toli</i>
8.	Basapati	Sind danio	Chutney	<i>Devario devario</i>

Table 2: Preparation of *Sidal* chutney.

Ingredients	Amount	Procedure
<i>Sidal</i>	25 g	At first <i>Sidal</i> is washed with tape water, kept aside. Tomato and onion are cut in small pieces. A paste of garlic and chili is prepared. In a deep fry pan oil is added and onion pieces are added in hot oil, and allowed it to fry. The garlic and chili paste is added to above with continuous stirring. Then turmeric powder, salt, and <i>Sidal</i> are added to it with continuous stirring. Then tomato is added to it and frying is continued till all the content is properly boiled and forms gravy like thick mass. Take the taste of salt and ready it to take. Note: During preparation care should taken that the heat of the flame should not too much high which may cause charring of the contents.
Tomato (Raw)	150 g	
Mustered Oil	125 ml	
Onion (Raw)	150 g	
Garlic (Raw)	50 g	
Chili (Raw)	25 g	
Turmeric powder	1 tea spoonful/ q.s	
Salt	q.s	

Dry fishes produced locally

Sidal; Swamp barb or Puntio barb; *Puntius chola* and *Puntius puntio*.

Method of Preparation

Sidal is a fermented dry fish prepared from *Puntius chola* or *Puntius puntio*. After collecting the Fish, it is washed to remove sand and other material. Then it is dried under sunlight till the moisture is removed. The removal of moisture is observed by feeling with hand. After drying, it is packed and then after approximately six month it is removed from the pack. Then it is washed with water, after that it is tightly packed in an earthen container. Mustard oil is applied on the inside surface of the container

During packing in the container, care is taken to remove space between dry fish. Presence of air causes deterioration of dry fish. After packing, the opening of the container is sealed to ensure that there is no exchange of air from outside to inside the container. This packed container is kept for longer period of time (more than 6 months) for fermentation. The product is known as *Sidal*. The cost and taste of *Sidal* is dependent on the time of fermentation. *Sidal*, which are kept for longer period of time

(more than 1 year), are costlier and the taste is better than that kept for a lesser period of time.

These types of dry fishes are generally prepared in all season. From April to September, there is large collection of *Puti* fish, hence, the production of *Sidal* is also more during that season.

Nuna ilish (Lona Ilish); Hilsa shad; *Tenulosa ilisha*

Method of Production: *Nuna ilish* is prepared from *Ilish* fish. Each year a large number of fishes are caught in the Padma-Meghna-Jamuna delta, which flows into the Bay of Bengal. It is a sea fish but enters river during breeding time. The young *Ilish*, known as *Jatrik*, then swim back to the sea. The fishes are caught while they come to river and at the time of moving to the sea. *Ilish* is also caught from the sea.

After collection of these fishes, they are washed to remove sand and others. Then the scales of that fishes are removed carefully, after that the fishes are cut either in pieces or

Table 3: Preparation of *Sidal* curry.

Ingredients	Amount	Procedure
<i>Sidal</i>	50 g	At first <i>Sidal</i> is washed with tape water, kept aside. The pumpkin vines, brinjal, potato, onion, are cut into small pieces. A paste of garlic and chili is prepared. In a deep fry pan oil is added and the onion pieces are added in hot oil, and then allow it to fry. The garlic and chili paste is added to it with continuous stirring. Then turmeric powder, salt, and <i>Sidal</i> are added to it with continuous stirring. Then pumpkin vine pieces, potato, brinjal are added to it with continuous stirring during frying. After proper fry sufficient quantity of water was added to it and boil it till all the ingredients are properly boiled. Take the taste of salt and ready it to take.
Pumpkin Vine	250 gm	
Brinjal	250 g	
Potato	250 g	
Mustered Oil	150 ml	
Onion	150 g	
Garlic	50 g	
Chili	25 g	
Turmeric powder	1 tea spoon full	
Salt	q.s	
Water	q.s	

Table 4: Preparation of *Nuna (Lona) ilish* chutney.

Ingredients	Amount	Procedure
<i>Nuna ilish</i>	100 g	At first <i>Nuna ilish</i> is washed with tape water and cut in small pieces then kept aside. Tomato and onion are cut in small pieces. A paste of garlic and chili is prepared. In a deep fry pan oil is added and the onion pieces are added in hot oil, and then allow it to fry. The onion pieces are added in hot oil, and then allow it to fry. The garlic and chili paste is added to it with continuous stirring. Then turmeric powder, salt, and <i>Nuna ilish</i> are added to it with continuous stirring during frying. Then tomato is added to it and frying is continued till all the content is properly boiled and forms gravy like thick mass. Take the taste of salt and ready it to take. Note: During preparation care is taken that the heat of is not too high which may cause charring of the contents.
Tomato	150 g	
Mustered Oil	150 ml	
Onion	125 g	
Garlic	25 g	
Chili	25 g	
Turmeric powder	1 tea spoon	
Salt	q.s	

Table 5: Preparation of *Nuna ilish* curry.

Ingredients	Amount	Procedure
<i>Nuna ilish</i>	125 g	At first <i>Nuna ilish</i> is washed with tape water and cut in small pieces then kept aside. Brinjal, Potatto and onion are cut in small pieces. A paste of garlic and chili is prepared. In a deep fry pan oil is added, the onion pieces are added in hot oil, and then allow it to fry. The garlic and chili paste is added to it with continuous stirring during frying. Then turmeric powder, salt, and <i>Nuna ilish</i> are added to it with continuous stirring. Then Potato, Brinjal are added to it with continuous stirring. After proper fry sufficient quantity of water was added to it and boil it till all the ingredients are properly boiled. Take the taste of salt and ready it to take.
Brinjal	250 g	
Potato	300 g	
Onion	150 g	
Garlic	30 g	
Mustered oil	150 ml	
Chili	30 g	
Turmeric powder	1 tea spoon	
Salt	q.s	
Water	q.s	

Table 6: Preparation of *Nuna illish* fry.

Ingredients	Amount	Procedure
<i>Nuna ilish</i>	100 g	At first <i>Nuna ilish</i> is washed with tape water and cut in small pieces then keep aside. The pumpkin leaves are washed and kept aside. By <i>Nuna ilish</i> , onion, garlic, chili, and salt, make one paste and kept aside. These pastes are (small small amount) fold in the pumpkin leaf. In a deep fry pan oil is added Keep gently the folded leaf in hot oil and allow it to fry, till the colour of the leaves changes to brownish green. During frying care should taken that there should not excess flame that may cause charring of that content.
Pumpkin Leaf	7-8 nos.	
Garlic	30 g	
Chili	25 g	
Onion	125 g	
Salt	q.s.	
Mustered Oil	150 ml	

cut marks are created on fish with knife by striking. The fishes are then treated with salt. After salt treatment, it is kept in a container in tightly packed and sealed condition. After

few days, all the oil is removed from fish and the colour of the fishes is turned to yellow. Then it is removed from the container and it is ready to be sold. If the fishes are cut, then after storage, it is sold along with that container.

Dry fishes available in Agartala

The other types of dry fishes available in Agartala area of Tripura are presented in Table 1.

Discussion

Dry fish is a component of diet and is common among various ethnic groups of North east region. These are generally prepared in coastal area and river bank from fresh fishes only and salt is used during preparation as preservative. Production of dry fish depends on the availability of fresh fishes. The period from September to April is the best time to prepare dry fish.

Stored dry fishes are occasionally kept under sunlight. During preparation of *Sidal*, if the fishes are not tightly packed in earthen container that will deteriorate very easily because of presence of air. The taste of *Sidal* depends on storage time, the *Sidal* kept for longer period of time is tastier than *Sidal* which are kept for shorter period of time. For preparation of dry *Nuna ilish* the storage time depends on the removal of oil, if the oil is not properly removed from *Ilish* fish (Hilsa shad) that may cause deterioration of the fish. The removal of oil from *Ilish* is done by application of salt. The other dry fishes are prepared from sea fishes and care is taken during drying to protect from flies or other insects. It is generally prepared by drying fish over roof or drying racks, which are made of bamboo or wood. The deteriorated dry fishes are used to prepare poultry/fish feed.

Besides the use as food, *Sidal* curry is also given to patient suffering from fever especially suffering from malaria. The reason may be to reduce/mask the bitterness felt by the patient. So far, anti pyretic or anti malaial activity of *Sidal* has not been reported. However, local people believe that *Sidal* has antipyretic activity.

It has been reported (Bhuiyan *et al* 2008; Bhuiyan *et al* 2009; Chowdhury *et al* 2010; Siddique and Aktar 2012) that DDT is used during preparation of dry fishes. Use of DDT or other chlorinated insecticides during preparation of dry fish is a serious matter so far as human health is concerned. The acceptable daily intake of DDT for human is 0.01 mg/kg body weight (European Food Safety Authority (2008) and regular consumption of

such dry fishes may cause accumulation of such toxic chemicals in human body. Presence of DDT has been reported in dry fish samples of Bangladesh and such dry fishes coming from Bangladesh to India obviously may contain such chlorinated insecticides. During the interview, the informants reported that they do not use any chemical substance as preservative and fishes treated with formalin are rejected. The use of toxic chemicals in food substances is questionable and concerned authorities should take necessary steps to prevent such activity.

Conclusion

The people of Tripura use dry fish in their diet and prepare dishes almost in the same way according to their own taste. Only two varieties of dry fishes are produced locally. A few types of dry fishes come from Bangladesh and the rest of the types come from various places of country. Dry fishes are used as food and the deteriorated dry fish are used for production of poultry/fish feed. In addition, dry fish dishes are also used for the ailment of common cold etc. Study of such preparations would reveal its potential use as probiotics. However, addition of toxic insecticides in dry fish may prove to be a health hazard and may develop chronic toxic syndromes. Therefore tests should be carried out to find the presence of such chemicals by concerned authorities. So far as human health and environmental protection are concerned necessary steps as applicable under legal provisions should be taken to prevent addition of such substances.

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