

# Improvement of Traditional Fish-based Products in Andhra Pradesh

D. Imam Khasim<sup>1</sup>, J. Charles Jeeva<sup>2</sup> and Sib Sankar Gupta

Research Centre of Central Institute of Fisheries Technology,  
Pandurangapuram, Visakhapatnam-530 003, Andhra Pradesh, India  
E-mail: dkhasim@rediffmail.com

Dried fish, cured and dried fish and smoked shrimps are the major traditional fish-based products processed and marketed from Andhra Pradesh. In fish drying sector, traditional and often unhygienic drying is practiced in many parts of Andhra Pradesh. The traditional fish drying contributes to the income and sustenance of fisherwomen and economically weaker sections of fisher population along the coastline. With the help from some NGOs, a few processors have started fish drying in a hygienic way on raised platforms. Recent development in fish drying is installation of a solar drier in a fishing village near Visakhapatnam. In this paper, various technological studies done by CIFT in Andhra Pradesh in improving the quality of cured and dried fish, control of insect infestation, improvement in *jithaka* smoking process, preparation of pickle from clam, fish and shrimp meat and others are discussed and guidelines are given for implementation of the improved techniques.

**Key words :** Traditional fishery products, *jithaka* smoking, curing, drying, insect infestation

The major traditional fishery products in Andhra Pradesh are dried fish, cured and dried fish and smoked shrimps. The smaller fishes like anchovies, silverbellies, *Acetes* sp., smaller size groups of sciaenids and ribbonfishes are sun-dried and marketed. Cured and dried products are mostly prepared from ribbonfishes, sciaenids, seerfishes, sharks and pomfrets, depending on their seasonal availability. Smoked shrimp is a specialty dried product of Andhra Pradesh and the process is locally known as *jithaka* smoking.

Traditionally, two methods of curing are practiced in Andhra Pradesh, viz., (i) dry salting and (ii) wet salting (curing). In curing, salt is the main ingredient

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Present address:

<sup>1</sup>Research Centre of CIFT, Matsya Bhavan, Bhidia Plot, Veraval-362 269, Gujarat, India

<sup>2</sup>Central Institute of Fisheries Technology, P.O. Matsyapuri, Cochin-682 029, Kerala, India

and a major factor contributing to both the quality and cost of the product. Optimum use of salt is the best way to minimize spoilage. However, fisherwomen tend to minimize the use of salt in curing process leading to *quality problems* in the cured product. During wet curing, due to the use of same brine for consecutive batches, salt concentration is lowered, leading to *spoilage of fish and insect infestation*.

In many parts of Andhra Pradesh, traditional ways of unhygienic drying methods such as drying directly on the ground, the beach sand or by the road side, old stretched nets on the ground and palmyra leaves spread over the ground, are being practiced.

### **Technological developments**

The major problems in cured and dried fish are (i) sand content, (ii) rancidity in fatty fishes, (iii) insect infestation, (iv) mould infestation and (v) red halophilic bacterial infestation. Central Institute of Fisheries Technology (CIFT) and its research centres have carried out many studies in order to improve the quality of cured and dried fish products. The most important step is the maintenance of good standards of hygiene and sanitation in handling, dressing and cleaning of the fish used for curing and drying. Use of good quality salt and clean water are essential in order to maintain the quality of cured products. Use of good salt in required quantity will minimize the sand content and red halophilic bacterial attack in dried fish.

### ***Curing brine***

By maintaining a concentration not less than 20% salt in the brine, the spoilage of brine and formation of volatile bases can be prevented and growth of maggots could be controlled. Use of higher levels of chlorination in brine is to be avoided, as there is a possibility of formation of chloramines in the tissues. The chloramines are carcinogenic in nature and are very dangerous for the health of the consumers. It was observed that even though chlorination masks the odour, there is no effect on halophilic bacterial growth.

### ***Control of insect infestation***

Control of insect infestation in dried fish is a challenging issue. The materials used and the methods employed for controlling insect infestation, should not be harmful to the consumer and should not affect the organoleptic characteristics of the dried fish. It has been observed that some fisherfolk and traders use harmful chemicals such as pesticides in dusting and in the curing brine, and use phosgene

tablets for fumigating the bags of dried fish in storage rooms. These are very dangerous methods and directly harmful to the consumers. The research studies carried out at Visakhapatnam Research Centre of CIFT have shown that using neem cake or neem oil and dusting with sodium tri-poly phosphate (STPP) powder during storage will control insect infestation in dried fish (CIFT, 1994). Similarly, in the cured fish, using neem oil or citronella oil in the curing brine or on the surface of the salt in the curing tanks will repel the flies and other insects (Mathen *et al.*, 1992; CIFT, 2002). These natural volatile oils besides repelling, also have anti-feedant property i.e., the insects or larvae do not feed on the fish but come out of the tank or brine. An emulsion of these oils in water can be made and spread over the fish dressing, cleaning and drying areas. Due to the smell of these oils, the insects and flies are repelled from these areas and gives maximum protection from insect infestation. The formulation and application of these oils are very easy, economical, harmless and also have maximum effect in controlling insect infestation. The studies have shown good results in controlling insect infestation in dried anchovies, cured and dried ribbonfishes, sciaenids and other fishes.

#### ***Treatment with STPP***

Treatment of fish with STPP at 3% of salt level during curing, improves the texture, reduces red halophilic bacterial attack, controls rancidity and acts as an anti-oxidant (CIFT, 2002). Mould growth in cured and dried fish can be prevented using sodium benzoate at 1% of salt. Thus a total package of treatment with STPP, sodium benzoate and citronella oil will offer protection from insect infestation, red halophilic bacterial attack, mould growth and rancidity during storage of cured and dried fish.

#### ***Improvements in drying platforms***

Raised racks made out of locally available materials such as pieces from the trunk of palmyra trees and casuarina branches are always easy to dry the fish hygienically. Visakhapatnam Research Centre of CIFT has studied the effect of different raised drying surfaces such as cement platforms, galvanised iron or aluminium trays, stretched old nets and palmyra leaf mats, on rate of drying of fishes. It was found that, on all these drying surfaces, the rate of drying of fish under sun is almost same. Bay of Bengal Programme (BOBP), some NGOs and CIFT have conducted several demonstrations and training programmes to popularize these raised racks for drying of fishes in fishing villages in Andhra Pradesh, in collaboration with the State Fisheries Departments and District Rural Development Agencies (DRDA).

***Improved kilns for smoking of shrimps***

In the coastal delta regions of Krishna and Godavari rivers in Andhra Pradesh, small shrimps, mainly juveniles, are caught from the estuaries. These are processed into smoked product by local fisherwomen, by a process locally known as *jithaka*, which has a good market demand. There are possibilities of fire hazards in the traditional ways of smoking. To have better control on smoking process and to enhance the quality of smoked prawns, Visakhapatnam Research Centre of CIFT has worked on the improvement and development of smoking kiln (Khasim *et al.*, 1989). BOBP and some NGOs have promoted the use of *improved smoking kilns to the fisherwomen in villages near Kakinada*. The Centre has worked on the *quality and benzopyrene contents in the smoked prawns*. Some of these studies are dealt in other papers in the proceedings.

***Pickles***

Pickles were prepared from the meat of low cost fishes, small sized shrimps and clams. The process of preparation of pickles with local recipe was standardized. Many training, extension and demonstration programmes were conducted by Visakhapatnam Research Centre of CIFT for the benefit of the members of cooperative societies, women self-help groups (SHGs) and unemployed youth, in collaboration with State Government Agencies and NGOs. Problems of raw material availability and marketing have to be addressed, in order to improve the level of operations for this product.

**Development needs**

Nearly 30 years back, there were some well-run Govt. curing yards in Andhra Pradesh. Good infrastructures such as cement curing yards, raised drying platforms, drying mats made out of the sticks of palm trees and good storage facilities for salt and dried products were available in some villages like Uppada and Danavaypeta. Good quality salt was provided on subsidiary prices. Subsequently, due to various reasons including sea erosion, these facilities have fallen into disuse. The use of raised platforms by the fisherfolk has not been implemented in many villages in Andhra Pradesh, in spite of their obvious advantages. It is time to revive traditional fish drying and curing industry in important fish drying areas like Krishnapatnam (Nellore District), Kothapatnam (Prakasam District), Machilipatnam (Krishna District), Dummulapeta, Etimoga, Uppada, Danvayapeta (East Godavari District), Nakkapalle (Visakhapatnam District), Bhavanapadu (Vizianagaram District) and Baruva (Srikakulam District), along the coastal Andhra Pradesh.

The State Institute of Fisheries Technology (SIFT), Kakinada, Dept. of Fisheries and NGOs in this field could promote the use of raised platforms, facilitate availability of good quality salt, required chemicals and oils, plastic sheets, bleaching powder, good packing materials and storage facilities. The SIFT, Kakinada and District Rural Development Agency (DRDA) in Visakhapatnam have excellent training and extension facilities. The Central and State Govt. agencies should regularly conduct training and extension programmes in these villages taking follow-up actions, with active support of NGOs. In recent times, marketing systems for dried and cured fish products have improved due to the women SHGs and DWCRA (Development of Women and Children in Rural Areas) groups in Andhra Pradesh.

The traditional fish curing and drying sector is the backbone, generating income and sustenance to a significant number of fisherwomen along the coastline, where it is difficult to provide alternate livelihood activities. Any development in this sector will be a direct help and benefit to these economically weaker sections. Establishment of electrical and solar driers are to be encouraged in important villages along the coast of Andhra Pradesh, adopting modern management techniques in packaging and marketing. Sustainable development in the traditional fish drying and curing sector would lead to improvement in the socio-economic conditions of coastal fisher community in Andhra Pradesh.

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