

Comparative study on quality of dry Fish (*Puntius spp.*) produce under Solar Tent Dryer and Open Sun Drying

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Received: May 27, 2017; Revised: June 4, 2017 Accepted: June 11, 2017, Published June, 2017

ABSTRACT

Krishi Vigyan Kendra, Cachar, Assam Agricultural University was carried out an experiment to compare the effect of solar tent drying and open sun drying on the qualities of *Puntius spp.* during September - October, 2016 in Dakshin Saidpur village under Sonai Agricultural Developmental Block of Cachar District, Assam. Proximate composition of small variety dried fish products *Puntius spp.* were determined. The fishes were dried experimentally under solar tent dryer and same species of dried product were dried through open sun drying method. The results of proximate analysis showed significant difference ($p < 0.05$) between the two techniques. Organoleptic evaluations showed no physical damage and no discolouration of fishes under solar tent dryer but in case of open sun drying condition dust and insect infestation were observed. The study reveals that solar tent dried fish products are hygienic compared to that of open sun dried products of same species.

Key word: *Puntius spp.*, solar tent dryer, open sun drying, proximate composition.

INTRODUCTION

Salting and drying is an ancient and simplest method to preserve fish. In India about 17% of the total catch is being used for salting and drying [1]. The fish must be dried quickly and cleaned through sunlight and moving air. This protects the fish from microbes, insects and dirt. Salting and sun drying of fish is a traditional method of seafood preservation employed in many countries. Curing is the simplest method to preserve fish. In India, utilization of dried fish comes next to fresh fish about 8 million tons of

fish (25-30%) of the world catch are being used for human consumption as dried, salted, smoked or treated by some combination of these processes [2]. This is still applied to a larger extent to preserve fish and squid [3]. Fishes are washed, gutted and sun dried on ground, rocks, wooden platforms, palm leaves and also on the sandy beaches. The possibility of contamination is obvious in sun dried fishes using these traditional methods and sun drying on these substrates. The fishes dried slowly and unhygienic ally in direct sunlight in the absence of moving air. During the past few years, there has been a decline in the export of Indian cured fishery products mainly because of their poor quality [4]. This causes considerable loss to the fish curing industry in India. Anonymous [4] suggested that the quality of dry fish available in the country requires much improvement. In North-Eastern part of India, the smaller varieties of freshwater fishes are sun dried without salt and are available abundantly in the markets. Microbiological and biochemical quality assessments are necessary to ensure the food safety of sun dried fish products. Therefore, in the present study, the biochemical and microbiological analysis were carried out to assess the qualities of commercially available and experimentally sun dried fish products.

MATERIALS AND METHODS

The commercially high valued small variety fish like *Puntius spp.* were selected for this study. Fresh raw fishes (sample A) were bought from local market in an insulated ice box for proximate analysis. The average size and weight of the fish were 9.0 ± 0.5 cm and 12.26 ± 0.99 g respectively. A part of raw fishes were dried (sample B) under solar tent dryer and another part of raw fishes were dried (sample C) under open sunlight to compare the time taken for proper drying and to analyses the proximate composition of fishes in both the methods. *Proximate analyses*: Moisture, ash, total lipid and crude protein analysis of all the fishes were carried out using standard procedures of Anonymous [5].

RESULTS AND DISCUSSION

The proximate composition of fresh, solar tent dried and open sun dried fish samples of *Puntius spp.* are presented in Table 1. The moisture content of raw *Puntius spp.* was registered 72.55%, whereas it was 10.34% in dried fish produced under Solar Tent Dryer (STD) and 17.36 in open sun dried fish of the same species. The low content of moisture in dried fishes is attributed to the evaporation of water during drying. Bombay duck was dried to a moisture content of 15% from 89.8% in 9 h of drying in STD (solar tunnel dryer) as compared to 20 h of open sun drying [6]. Anonymous [7] reported that moisture content of fresh *Tilapia nilotica*, *Arius parkii* and *Silurus glanis* after sun drying reduced to 14.06%, 13.92% and 11.50% respectively. Anonymous [8] observed reduction of moisture content from 73.6% in wet fish to 25.8% in the dried milk fish (*Chanos chanos*), when dried for 24 h in hot air oven at 60°C. The protein, ash and lipid content of both the raw fishes (sample A) were found to be comparatively less than that of sun dried fish Table 1. This could be explained due to product dehydration which

concentrated protein content and due to the reduction of moisture content during drying lipid raised and thus increasing the nutritional value [9]. Heat treatment, sun-drying and smoke drying increased protein contents [7, 10]. Protein content of the sun-dried fish was found higher than the oven-dried and smoke-dried fish and this was explained as the denaturation of fish protein associated with oven dried and smoked fish [10]. Fat content of sun-dried *M. gulio* and *P. sophore* were reported as $14.4 \pm 0.28\%$ and $18.4 \pm 0.22\%$ respectively [11], 3.7-17.8% and 3-8.2% were reported for sun-dried fishes of India and Bangladesh [12, 13]. Amid the STD dried (sample B) and open sun dried (sample C) fish products, the protein and lipid contents were high in STD dried fish products. The low nutritive value in open sun dried fish product could be due to improper handling, inadequate preservation and unhygienic mode of drying. Fat content of open sun-dried *Puntius spp.* was reported as $18.4 \pm 0.22\%$ [11], 3 - 8.2 % was reported for sun-dried fishes of India and Bangladesh [12, 13]

CONCLUSION

The proximate analyses showed that the quality of Solar Tent Dried fish product was better than the open sun dried fish product. The study also revealed that fish dried under solar tent dryer had good nutritional qualities and hygienic.

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Citation: Nath K D. et al. (2017), Comparative Study on Quality of Dry Fish (*Puntius spp.*) Produce under Solar Tent Dryer and Open Sun Drying, Volume 1, Issue 3

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LIST OF TABLES

Table no.1: Proximate composition of raw and sun dried fish

Sample	Moisture (%)	Ash (%)	Crude Protein (%)	Total Lipid (%)
Sample A (Fresh Fish)	72.55	1.72	18.21	4.49
Sample B (Solar tent dried fish)	10.34	4.39	63.25	13.91
Sample C (Open sun dried fish)	12.36	8.27	52.73	11.59