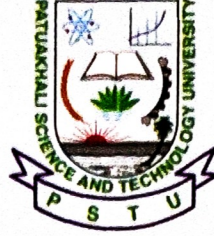


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Date: 23.10.2022

To whom it may concern

"Certificate of Experience"

This is to certify that, **Pronoy Mondal** son of **Atul Chandra Mondal** bearing ID-**FSTJJ001/2020**, Reg-05776, Session: 2015-16 is engaged as **"Research Assistant"** for the research project entitled **"Identification of Microplastic Contamination in Commercial Dried Marine Fish from the Bay of Bengal: an Implication of Marine Pollution to Seafood Safety"** funded by Grant for Advanced Research and Education (GARE), Bangladesh Bureau of Educational Information and Statistics (BANBEIS), Ministry of Education, Bangladesh during the period of **July 2021 to present time**.

As a Research Assistant, he is contributing in collecting samples, conducting the lab work and microscopic identification of Microplastic and also doing several multivariate analysis and interpretation of the result. Mr. Pronoy's work is quite articulate and with high quality. He is decent, dedicated and highly committed. Hope his research work on Microplastic in consumables will carry immense value to the world and helps in food safety.

The authority wish him a bright future.

Principal Investigator

(Prof. Dr. Md Sazedul Hoque)

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স্মারক নং- পবিপ্রবি/ FOF/FST/P-BANBEIS/LS/2024/612/2022 তারিখ: 21.06.2022

অফিস আদেশ

বিষয়ঃ বাংলাদেশ শিক্ষা মন্ত্রণালয় Grant for Advanced Research in Education (GARE), Bangladesh Bureau of Educational Information & Statistics (BANBEIS) এর অর্থায়নে পরিচালিত 'Identification of Microplastics Contamination in Commercial Dried Marine Fish from the Bay of Bengal: an Implication of Marine Pollution to Seafood Safety' শীর্ষক প্রকল্পের Research Assistant হিসেবে ফিসারিজ টেকনোলজী বিভাগের এমএস এর ১ (এক) জন ছাত্রকে মনোনয়ন প্রদান প্রসঙ্গে।

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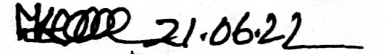
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প্রাপক :

প্রণয় মন্ডল

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৬. সংশ্লিষ্ট নথি
৭. মহানথি।

Evaluation of sensory, biochemical, and microbial quality of fermented shrimp paste product during long-term cold storage

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Abstract

Shrimp paste (Ngapi) is the oldest method of preservation and is used as a condiment in culinary in almost all Asian countries. It has specific taste and flavor properties developed due to aging or fermentation. Therefore, the primary goal of the current study was to investigate the shelf-life of shrimp paste produced in the laboratory. The sensory characteristics, biochemical, and microbiological aspects of low salt fermented shrimp paste products were conducted at various storage periods (0, 10, 20, 30, 50, 70, and 90 days). Ngapi samples were kept at chilled storage of $-2.2 \pm 0.5^{\circ}\text{C}$ during the experimental period. Sensory attributes were determined by expert panel members, and nutritional, biochemical, and microbial quality were determined by the standard validated methods. Sensory investigation revealed that the quality was adequate during the storage period. The protein, lipid, and moisture decreased significantly ($p < 0.05$), although ash and total volatile base-nitrogen increased during the experimental period. Throughout the investigation, the microbial quality remained within permissible limits. Finally, the findings of the study demonstrated that the nutritional, biochemical, and microbiological quality of shrimp paste (Ngapi) products could be preserved for a longer storage duration, providing a safer food item for consumers especially ethnic people in Bangladesh.

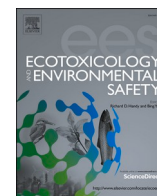
1. Introduction

Fermentation is a well-known and conventional food preservation or processing technique that increases the shelf life and enhances the nutritional properties of foods (Visessanguan *et al.*, 2004; Kim *et al.*, 2014; Lv *et al.*, 2020). Shrimp paste is one of the most frequent preservation methods in South and Southeast Asian countries due to effective, simple technology and the availability of low-cost raw materials and equipment that are generally used in the shrimp fermentation process (Cai *et al.*, 2017). Nonetheless, shrimp paste is widely used in cuisine because of its umami flavor, delicious nutritional value, and appetite-stimulating aroma (Pongsetkul *et al.*, 2015). Shrimp paste is also known as

“Xiajiang” in China, “Terasi” in Indonesia, “Saeu-jeot” in Korea, “Mamruoc” in Vietnam, “Kapi” in Thailand, “belacan” in Brunei and Malaysia, and “Ngapi” in Bangladesh and Myanmar (Kim *et al.*, 2014). Ngapi is a popular fermented fishery product for some ethnic groups of people of the Hill Tract region in Bangladesh (Chakma *et al.*, 2015) and is produced by converting shrimp into high-value-added products (Irianto and Giyatmi, 1997). Under ambient conditions, typical shrimp pastes are naturally fermented with 25-30% salt. Traditional fermentation of shrimp paste products is not fully emphasized in some essential points such as proper salt percentage, quality of raw shrimp, storage periods, and hygienic conditions. Owing to the addition of sand,

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Dried fish more prone to microplastics contamination over fresh fish – Higher potential of trophic transfer to human body

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ABSTRACT

Globally, microplastics (MPs) contamination in aquatic organisms is emerging as an alarming phenomenon. In the present study, we investigated MPs in three commercially important fishes (Bombay duck *Harpodon nehereus*, ribbon fish *Trichiurus lepturus* and hairfin anchovy *Setipinna phasa*) in fresh and dried conditions collected from two sites (Chattogram and Kuakata) of the Bay of Bengal. It was evident that fresh *T. lepturus* ingested highest amount of MPs through the gills (6.41 mps/g) from Chattogram followed by in the gastrointestinal tract, GIT (6.20 mps/g) and in the muscle (1.20 mps/g) from Kuakata. Among the fresh fishes, *H. nehereus* from Kuakata accumulated highest amount of MPs (0.21 mps/g), while *S. phasa* from Kuakata contained the least amount of MPs (0.06 mps/g). On the other hand, among the dried fishes, *T. lepturus* from Kuakata contained highest amount of MPs (46.00 mps/g), while *S. phasa* from Kuakata retained lowest amount of MPs (2.17 mps/g). Strangely, all the dried fishes showed significantly higher amount of MPs compared to fresh fishes from both the locations. Fiber was the most dominant type of shape of MPs which accounted 66 %, followed by fragment (27.38 %), microbeads (3.59 %), film (1.48 %), foam (1.31 %) and pellet (0.25 %). Size-wise, the major portion (39.66 %) of MPs was present to be in size range less than 0.5 mm followed by 37.67 % in the size range of 0.5–1.0 mm group and rest 22.67 % within 1.0–5.0 mm. Red (41.55 %) colored MPs was the most prominent, followed by brown (22.11 %), blue (16.32 %), pink (11.69 %), purple (5.10 %), and green (2.25 %). Among polymer types, low-density polyethylene (LDPE) was the most common (38 %), followed by polystyrene (PS-22 %), polyvinyl chloride (PVC-16 %), polyamide (PA-13 %) and ethylene-vinyl acetate (EVA-9 %). The present study confirms high occurrence of MPs in the dried fishes over the fresh fishes from the Bay of Bengal, with high potential of trophic transfer to the human body.

1. Introduction

Microplastics (MPs) are particles derived from large plastic components used in a range of mechanical and photo oxidative procedures which are less than 5 mm in size (Arthur et al., 2009). Large amounts of non-degradable and hazardous solid waste have been distributed in the aquatic ecosystem due to extensive uses of plastics which is increasing the accumulation rate severely over the past decades (Selvam et al., 2021). The methodical cohesion of bigger plastics traces are broken down through biological, physical and chemical activities that transform into microscopic particles afterwards (Rahman et al., 2020). It is estimated that around 93–268 kilotons of MPs are streaming along the

ocean at present (Aliko et al., 2022; Jambeck et al., 2015; Seville et al., 2015). MPs are denser than sea water such as acrylics pile up in the ocean floor those lead to a significant quantity of MPs accumulation in the deep sea and pass through the food webs of marine species eventually. These plastics are eventually causing the presence of MPs in various tissues of marine organisms including commercially important species such as mollusks, crustaceans and fishes (Alimba et al., 2021; Prokić et al., 2021; Hossain et al., 2019; Mak et al., 2019; Hossain and Olden, 2022). MPs may transfer from marine organisms to the human body and can lead as potential hazards to human health (Crew et al., 2020; Sunitha et al., 2021).

The Bay of Bengal is a good source of numerous aquatic organisms

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Research article

Nutritional, microbial and various quality aspects of common dried fish from commercial fish drying centers in Bangladesh



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ABSTRACT

The purpose of this study was to evaluate the nutritional, microbial and sensory quality of five dried fish species from five fish drying centers in Bangladesh, and consumers' perception on quality and perceived health problems of consuming dried fish. Proximate composition and bacterial load were determined following AOAC and total plate count method, respectively. Data on peoples' perception regarding the quality aspects of dried fish were collected using a structured questionnaire. Sensory analysis showed samples from Cox's Bazar had higher acceptability than other regions. Moisture content ranged from $12.00 \pm 1.12\%$ to $22.99 \pm 1.09\%$, the highest found in Bombay duck from Patuakhali. The highest values of protein were found in shrimp from Chittagong ($64.33 \pm 0.99\%$) and the lowest in Bombay duck from Bhola ($51.80 \pm 0.95\%$). The lipid content varied from $5.38 \pm 0.37\%$ (Bombay duck from Cox's Bazar) to $8.67 \pm 0.96\%$ (Bombay duck from Khulna). The ash content was ranged from $13.89 \pm 0.94\%$ to $20.07 \pm 1.64\%$ in Bombay duck from Patuakhali and Cox's Bazar. The mean total plate count of dried Bombay duck were $7.1 \pm 0.2 \times 10^7$, $9.8 \pm 0.1 \times 10^7$ and $7.8 \pm 0.52 \times 10^7$ cfu/g, whereas, total *Vibrio* spp. count were estimated $1.1 \pm 0.1 \times 10^3$, $3.7 \pm 0.2 \times 10^5$ and $1.8 \pm 0.1 \times 10^5$ cfu/g for Chittagong, Cox's Bazar and Bhola, respectively. The pathogenic bacterial species *E. coli* and *Salmonella* sp. were absent in dried Bombay duck from all locations. Of 500 respondents, the majority (94.8%) reported no complications after consuming dried fish. Significant quality variation among the dried fish samples suggested further improvement in dried fish quality through maintaining hygiene and sanitation to produce quality and safe dried fish for the consumers in home and abroad.

1. Introduction

Bangladesh's fisheries sector contributed 3.57% and 25.30% to the national and agricultural gross domestic product (GDP), respectively, and earns approximately \$5 million by exporting fish and fisheries products in 2017–18 (DoF, 2018). Additionally, by contributing 60% of the total animal protein, this sector helps to ensure food and nutrition security (DoF, 2018). Among all fisheries products, dried fish known as “Shutki” locally, is the cheapest source of essential amino acid containing protein along with essential fatty acids, several minerals and vitamins (Mazumder et al., 2008; Siddique and Aktar 2011).

Bangladesh is endowed with vast diversified fisheries resources (Hanif et al., 2015; Islam et al., 2017), and dried fish and fishery products are produced from a wide range of freshwater and marine water fish

species, including Bombay duck, Chinese pomfret, Ribbon fish, Shrimp, and Silver jewfish (Paul et al., 2018). Moreover, several fish species such as Bombay duck and Ribbon fish are preferred to be taken as dried rather fresh condition (Hoque et al., 2021). Apart from that, people usually consumed dried fish because of its distinctive flavor and aroma (Hossain et al., 2013). Given this enormous demand, nowadays fish is dried commercially in several areas of Bangladesh. The major areas for dried fish production are Chittagong, Dublar Chor of Bagerhat, Moheskhal, Sonadia and St. Martin Island of Cox's Bazar, and Kuakata of Patuakhali (Hossain et al., 2013; Nowsad, 2007).

Despite potential market demand and the nutritional benefits of dried fish, there are a range of challenges with the traditional sun-drying process (Mithun et al., 2021; Reza et al. 2005; Roy et al. 2014). Dried fish may lose nutritional value if kept for an extended period of time

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Probabilistic public health risks associated with pesticides and heavy metal exposure through consumption of common dried fish in coastal regions of Bangladesh

Md. Sazedul Hoque¹ · Fatema Tamanna¹ · Md. Mahmudul Hasan¹ · Md. Hasan Al Banna² · Pronoy Mondal¹ · Mohammad Dalower Hossain Prodhan³ · Md. Zillur Rahman⁴ · Martin Louis van Brakel⁵

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Abstract

The chemical contaminants in dried fish are of great food safety concern and an emerging public health issue in Bangladesh. The aim of this study was to assess the public health risk associated with exposure to pesticides (organochlorine and organophosphorus) and heavy metals (lead, mercury, cadmium, chromium, arsenic) through the consumption of dried fish (Bombay duck, ribbon fish, silver jewfish, shrimp, Chinese promfret) in coastal districts (Cox's Bazar, Chittagong, Bhola, Patuakhali, Khulna) of Bangladesh. Dried fish consumption data were collected from 500 adult respondents (100 from each district) using a food frequency questionnaire (FFQ). Pesticide residues were determined using QuEChERS extraction coupled to gas chromatography and gas chromatography mass spectrometry, and heavy metals were estimated using an atomic absorption spectrophotometric method. The results revealed that the frequency and amount of dried fish consumption was highest for Bombay duck in Cox's Bazar (11.57 g/capita/day) and ribbon fish (12.10 g/capita/day) in Chittagong. The estimated daily intake (EDI, 7.40×10^{-5} to 1.10×10^{-4} mg/kg/day) and health risk index (HRI, 0.013 to 0.16) values expressed no health risk from pesticide residues in all the positive samples. For heavy metals, target hazard quotients (THQ) for non-carcinogenic health risk were below 1 (0.001–0.154), indicating no health risk for all samples. However, carcinogenic risk R value indicated a potential health risk for chromium (2.64×10^{-6} to 4.06×10^{-6}), and carcinogenic R_T value (2.82×10^{-6} to 5.71×10^{-6}) indicated a potential health risk for all the metals. It is concluded that the risk of exposure to pesticides through the consumption of dried fish is low, while heavy metals pose moderate-to-high health risks to dried fish consumers in the study area. Thus, the study suggests an appropriate risk management policy that controls pesticides and heavy metals in dried fish to ensure safe food for local and global consumers, underpinned by a producers' capacity building and consumers' awareness raising strategy.

Keywords Dried fish · Consumption frequency and tendency · Pesticide residues · Heavy metal risk index · Seafood consumers and safety

Responsible Editor: Lotfi Aleya

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⁵ Papendrecht, the Netherlands

Certificate of participation

CDV SAFETY



This certificate is presented to:

Mondal Pronoy

Training: “the usage of fire extinguishers and first aid initiation”



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Sem De Vos,
Training manager

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Datum: 23/10/2023

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5th International Scientific Conference on Food Safety and Health 2023

THIS IS TO CERTIFY THAT

Pronoy Mondal

has participated in the "5th International Scientific Conference on Food Safety and Health 2023"
on 18 February 2023 organized by
Bangladesh Society for Safe Food (BSSF)
We wish for his / her bright future.

Dr. Mohammad Rafiqul Islam
President
Bangladesh Society for Safe Food

Dr. KHM Nazmul Hussain Nazir
General Secretary
Bangladesh Society for Safe Food



Government of the People's Republic of Bangladesh
Laboratory Services Department
Colonel Malek Medical College, Manikganj



Certificate of Training

This certificate is hereby bestowed upon

PRONoy MONDAL

for the technical training on

"Applied RT-PCR and Microbiology for Food and Health"

13 - 17 November, 2022

This is to certify that **Pronoy Mondal** has performed exceptionally that led to the successful completion of a self-motivated engagement in a technical training on "Applied RT-PCR and Microbiology for Food and Health" at the Department of Microbiology and Molecular Biology, Colonel Malek Medical College, Manikganj, Bangladesh. The core proficiency of the training was combined with all practical steps including Sample processing, DNA and RNA extraction, Master mixed preparation, Instrumental calibration and analysis and Interpretation of the RT-PCR result. Besides, Mr. Pronoy practically learned the application and significance of microbial culture in normal and distinct selective media (Nutrient agar, XLD, TCBS, and Macconkey) for several perspectives. The training authority wish for him.

Manikganj, November 17, 2022.

Sr. Lab Technologist

Md. Shahanur Islam
(Microbiology and Molecular
Biology)

Technical and Quality Manager

Dilip Kumar Mondal
Department of Microbiology and Molecular Biology
Colonel Malek Medical College, Manikganj
Email: dilipkumar96433@gmail.com

4th National Scientific Conference on Food Safety and Health

CERTIFICATE FOR PARTICIPATION

THIS CERTIFICATE IS PROUDLY PRESENTED TO

Tony Tondal

Organized by Bangladesh Society for Safe Food on 29 October 2021 at
Bangladesh University of Health Sciences.

[Signature]

Prof. Dr. KHM Nazmul H. Nazir
General Secretary, BSSF



[Signature]

Dr. Mohammad Rafiqul Islam
President, BSSF



This is to certify that



PRONAY MONDAL

Participated in

"Symposium on Communication for Development (C4D) Curriculum and Research"

26 January 2020, TSC Conference Hall

Patuakhali Science and Technology University

Dumki, Patuakhali-8602

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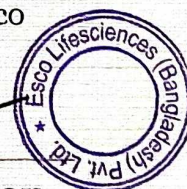
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**Overview & Safe Use of Laboratory Ventilation Equipment,
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Issued On:

10 April 2019

For and on behalf of Esco



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Business Development Manager

Esco Lifesciences Bangladesh Pvt. Ltd

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ডীন'স মেধা বৃত্তি সার্টিফিকেট

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এই মর্মে প্রত্যয়ন করা যাচ্ছে যে,.....শ্রীমান সঞ্জয়....., রেজি: নম্বর-.....০৫৭৭৫....., জন্ম-.....২০০৫-১০-১৫.....,
অত্র বিশ্ববিদ্যালয়ের মাধ্যমিকশিক্ষা অনুদান থেকে লেভেল-.....৪..... এর পরপর দু'টি সেমিস্টার এ জিপিএ-.....৬.৫৫৬..... ও৬.৫৫৪..... সহ সাফল্যজনক
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recognition of his/her outstanding performance of last two semesters at level...4... obtaining GPA...3.863... & ...3.864... in
the scale of 4.00.

I wish him / her every success in life.

Prepared by:

Date of issue: 20.09.2021

Dean



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The Students of Faculty of Fisheries, PSTU



Certificate of Membership

This is to certify that Pronoy Mondal, Session 2015-16 was a student of the Faculty of Fisheries. He was committed and contributed to the progressive activities of this association. As a competent organizer he was President of this association for the year 2021.

He has excellent conduct and character. We wish bright success in his every future endeavor.

Abdullah-Al-Hasan
Director
Anushilon

Prof. Dr. M. Lokman Ali
Chief Advisor
Anushilon

Reference: PSTU/ANF/2021/003
Date of issue: 20/10/2022



SANATAN SANGHA

Patuakhali Science and Technology University
Dumki, Patuakhali-8602, Bangladesh



TO WHOM IT MAY CONCERN

This is to certify that **Phonoy Mondal**, Session **2015-16** was a student of the Faculty of **Biotechnology**.

He/She was committed and contributed to the progressive activities of this association. As a competent organizer **he/she** was **Vice President** of this association for the year **2019**.

He/She has excellent conduct and character. We wish bright success in **his/her** every future endeavor.

Advisor

Papi Hazra

Assistant Professor

Dept. of Environmental Science, PSTU

Advisor

Sujan Kanti Mali

Assistant Professor

Dept. of Biochemistry & Food Analysis, PSTU

Reference: PSTU/SS/2019/035

Date of Issue: 28/11/2019



Certificate of Completion

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on the recognition of successfully completing the course
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during the period of 1st November to 1st December, 2021.

Rashidul Islam

Rashidul Islam

Trainer and Vice President,
Workshop and Training Wing,
PSTU ESDM Club

Md. Mahmudul Hasan

Md. Mahmudul Hasan

Advisor, PSTU ESDM Club and Chairman,
Department of Geo Information Science
and Earth Observation, PSTU

Ahmed Parvez

Professor Dr. Ahmed Parvez

Chief Advisor, PSTU ESDM Club and
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Patuakhali Science and Technology University

Department of Physical Education

Certificate

This is to certify that Prany Mondal son of Shri Chandra Mondal bearing ID. 1504016 Registration No: 05776 was a student of Faculty of Fisheries. He has successfully participated in all types of Football Tournament organized by Patuakhali Science and Technology University. He was a member of the Champion team at Inter Faculty Football Tournament 2016. We wish him utmost success in life.

Mohammad Abu Hanif

Deputy Director

Department of Physical Education

Patuakhali Science and Technology University

Sulan Kanti Mall

Director (Incharge)

Department of Physical Education

Patuakhali Science and Technology University



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CONFERENCE AGENDA

MON OCT. 23

TUE OCT. 24

WED OCT. 25

THU OCT. 26



Speakers

- [Constanza Vergara, Trade Regulatory Affairs Division Specialist, Ministry of Foreign Affairs, Chile](#)
- [Javiera Cornejo Kelly, Associate Professor, Faculty of Veterinary and Livestock Sciences, University of Chile](#)
- [Rolando Ibarra, Senior Fellow on Global Aquaculture Science, Monterey Bay Aquarium](#)
- [Estefania Humud, Head of ESG Management and Climate Change, Blumar Seafoods](#)

COMMUNITY LIGHTNING ROUND – PART TWO: 10:30 – 11:30 AM

Ballroom A

Stress Testing Science-Based Targets for the Seafood Value Chain



Revolutionizing ROI – Unlocking the Full Benefits of Electronic Catch Documentation and Traceability in the Seafood Industry



Responsible Fisheries Management – a Tool for Innovation



Microplastics in Seafood: a Challenge for Sustainable Seafood from the Bay of Bengal Bangladesh



Speaker

- [Md. Sazedul Hogue, Professor, Patuakhali Science and Technology University](#)



FSB-YFSC 2023

**Fisheries Society of Bangladesh (FSB)-Young
Fisheries Scientists Conference 2023**

11 March 2023

Conference Theme

**Young Scientists in Achieving Sustainable
Aquaculture and Fisheries**



Organized by:

Fisheries Society of Bangladesh (FSB)

Conference Venue:

Faculty of Fisheries, Aquaculture & Marine Science
Sher-e-Bangla Agricultural University, Dhaka-1207

Microplastic contamination in marine fresh fish from the Bay of Bengal: A seafood safety concern in Bangladesh

Pronoy Mondal¹, Md. Sazedul Hoque¹ and Md. Shahjahan¹

¹*Department of Fisheries Technology, Faculty of Fisheries, Patuakhali Science and Technology University, Dumki, Patuakhali 8602, Bangladesh*

Correspondence: Pronoy Mondal (pronoyfstmondal360@gmail.com)

Abstract

Globally, microplastic pollution is a significant issue for the marine environment and numerous studies identified microplastics (<5 mm) in marine animals. However, the extent of microplastic in marine fish from the southwest (Kuakata part) Bay of Bengal is still unknown. Thus, the study aimed to determine the microplastic components in the muscle, gut, and gill of six commercial important marine fish tuna *Katsuwonus pelamis*, Hilsa *Tenualosa ilisha*, seabass *Lates calcarifer*, ribbon fish *Trichiurus lepturus*, Bombay duck *Harpadon nehereus* and jewfish *Johnius argentatus* (n=10 per species) collected from the Kuakata region of the Bay of Bengal, Bangladesh. Two-step digestion methods were applied including alkali (KOH) and peroxide (H₂O₂) followed by extraction and microscopic identification. Microplastics were grouped into four sizes, five colors, four shapes, and three morphological groups. A total of 7085 MP items were identified and counted using the visual microscopic technique, where tuna barely contained the highest amounts of MPs, and the lowest was found in Bombay duck. The mean abundance of MPs samples was found to be 1.56±0.39 (Seabass) to 7.16±1.36 MP/g (tuna) in muscle, 1.91±0.32 (seabass) to 4.46±0.75 MP/g (ribbon fish) in the gut and 2.36±0.24 (Hilsa) to 6.53±1.58 MP/g (Bombay duck) in gill. Among various sizes, colors, shapes, and types of microplastics, 1-5 mm (33.33-62.78%), white/transparent (18.45-54.63%), filament (75.00-94.71%), and fiber (73.21-94.71%) were dominant. The study concluded that the hierarchy of significant contamination was found by species tuna> jewfish> Hilsa> seabass> ribbon fish> Bombay duck and, by sample gut> gill> muscle. The study's results prompted worries about the microplastics in the seafood supply chains, thus proper initiatives should be taken into consideration to mitigate the microplastics based human health risk.

Keywords: microplastic, marine fish, seafood safety, Bay of Bengal

INTERNATIONAL SYMPOSIUM
on
**Healthy Mangroves and Sustainable Fisheries for
Climate Resilient Coastal Community in South Asia**

Book of Abstracts

1-3 March, 2023

**Fisheries & Marine Resource Technology Discipline (FMRT)
Khulna University, Khulna
Bangladesh**

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MPs in Marine Fishes from the Bay of Bengal: A Concern for the Sustainable Marine Fisheries of Bangladesh

Md. Sazedul Hoque^{*1}, Pronoy Mondal¹, and Md. Shahjahan²

¹Department of Fisheries Technology, Faculty of Fisheries, Patuakhali Science and Technology University, Dumki, Patuakhali-8602, Bangladesh.

²Department of Fisheries Management, Faculty of Fisheries, Bangladesh Agricultural University, Mymensingh-2200.

*Email: sazedul.fst@pstu.ac.bd

Marine pollution due to plastic is a great concern for the marine environment, and numerous studies identified MPs <5 mm in marine fishes. However, the extent of MP in marine fish from the south-west Bay of Bengal is still unknown. Thus, the study aims to determine MPs in the muscle, gut, and gill of six commercially important marine fish Tuna *Katsuwonus pelamis*, Hilsa *Tenualosa ilisha*, Seabass *Lates calcarifer*, Ribbon fish *Trichiurus lepturus*, Bombay duck *Harpadon nehereus* and Jewfish *Johnius argentatus* (n=10) collected from Kuakata, Bangladesh. Two-step alkali (KOH) and peroxide (H₂O₂) based digestion followed by filtration, microscopic and FTIR-based identification was applied. MPs were grouped into four sizes, five colors, four shapes, and three morphological groups. A total of 7085 MP items were identified and counted using the visual microscopic technique where Tuna barely contained the highest amounts of MPs, and the lowest was found in Bombay duck. The mean abundance of MPs was 1.56±0.39 (Seabass) to 7.16±1.36 MP/g (Tuna) in muscle, 1.91±0.32 (Seabass) to 4.46±0.75 MP/g (Ribbon fish) in gut and 2.36±0.24 (Hilsa) to 6.53±1.58 MP/g (Bombay duck) in gill. Among various sizes, colors, shapes, and types of MPs, 1-5mm (33.33-62.78%), white/transparent (18.45-54.63%), filament (75.00–94.71%), and fiber (73.21–94.71%) were dominant. The study concluded the MPs abundance hierarchy by species Tuna> Jewfish> Hilsa> Seabass> Ribbon fish> Bombay duck and, by sample Gut> Gill> Muscle. Thus, MPs is a great concern for safe seafood, and measures should be taken into consideration to mitigate MPs based human health risk.

5th International Scientific Conference on Food Safety and Health, 2023

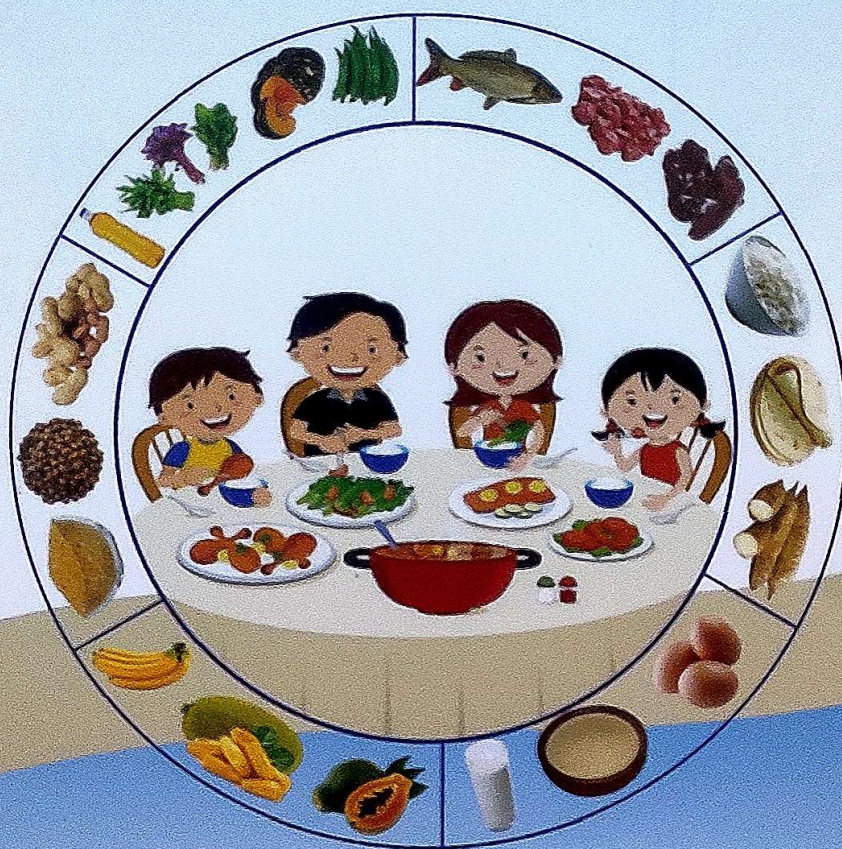
18 February 2023

Auditorium, Bangladesh Agricultural Research Council (BARC)
Farmgate Dhaka

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Conference theme

Ensuring Safe and Nutritious Foods through One Health Approach



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Nutrition Unit, BARC

P-15

MICROPLASTICS IN MARINE FISH SPECIES FROM THE BAY OF BENGAL: A SEAFOOD SAFETY CONCERN IN BANGLADESH

Md. Sazedul Hoque*¹, Pronoy Mondal¹, and Md. Shahjahan²

1. Department of Fisheries Technology, Faculty of Fisheries, Patuakhali Science and Technology University, Dumki, Patuakhali-8602, Bangladesh. 2. Department of Fisheries Management, Faculty of Fisheries, Bangladesh Agricultural University, Mymensingh-2200.

Corresponding E-mail: sazedul.fst@pstu.ac.bd

Marine pollution due to plastic is a great concern for the marine environment, and numerous studies identified microplastics (<5 mm) in marine fishes. However, the extent of microplastic in marine fish from the south-west Bay of Bengal is still unknown. Thus, the study aims to determine microplastics in the muscle, gut, and gill of six commercially important marine fish Tuna *Katsuwonus pelamis*, Hilsa *Tenualosa ilisha*, Seabass *Lateolabrax niloticus*, Ribbon fish *Trichiurus lepturus*, Bombay duck *Harpodon nehereus* and Jewfish *Johnius argentatus* (n=10) collected from Kuakata, Bangladesh. Two-step alkali (KOH) and peroxide (H₂O₂) based digestion followed by filtration, microscopic and FTIR-based identification was applied. Microplastics were grouped into four sizes, five colors, four shapes, and three morphological groups. A total of 7085 MP items were identified and counted using the visual microscopic technique where Tuna barely contained the highest amounts of MPs, and the lowest was found in Bombay duck. The mean abundance of MPs was 1.56±0.39 (Seabass) to 7.16±1.36 MP/g (Tuna) in muscle, 1.91±0.32 (Seabass) to 4.46±0.75 MP/g (Ribbon fish) in gut and 2.36±0.24 (Hilsa) to 6.53±1.58 MP/g (Bombay duck) in gill. Among various sizes, colors, shapes, and types of microplastics, 1-5mm (33.33-62.78%), white/transparent (18.45-54.63%), filament (75.00-94.71%), and fiber (73.21-94.71%) were dominant. The study concluded the MPs abundance hierarchy by species Tuna> Jewfish> Hilsa> Seabass> Ribbon fish> Bombay duck and, by sample Gut> Gill> Muscle. Thus, microplastics is a great concern for safe seafood, and measures should be taken into consideration to mitigate microplastics based human health risk.

Key words: Microplastic, Marine fish, Seafood Safety, Bay of Bengal, Bangladesh.

P-16

AN ASSESSMENT OF FOOD SAFETY KNOWLEDGE, ATTITUDE AND PRACTICES OF RESTAURANT FOOD HANDLERS IN MYMENSINGH CITY, BANGLADESH

Fateha Akther Ema, Md. Ariful Islam, Mst. Minara Khatun

Department of Microbiology and Hygiene, Bangladesh Agricultural University, Mymensingh- 2202, Bangladesh

Corresponding E-mail: minaramicro2003@yahoo.com

Food safety is an important strategy with a view to control foodborne diseases and subsequently improving the overall health status of the community. This study aimed at evaluating the knowledge, attitudes and practices regarding food safety among restaurant food handlers in the district of Mymensingh, Bangladesh. A cross-sectional study was conducted from April to June, 2019 at 20 different restaurants of Mymensingh region of Bangladesh which provides ready-to-eat food. A total of 115 food handlers were recruited for this survey and an interviewer-administered, semi-structured questionnaire was used to evaluate their knowledge, attitude, and practices on food safety. The data were collected by face-to-face interview through the questionnaire & analyzed by using software SPSS (Version 20). The mean (SD) scores of knowledge, attitude and self-reported practices of the respondents were found 9.10 ± 4.16 , 12.83 ± 2.57 , 10.78 ± 8.87 respectively. There was significant correlation between food safety training and knowledge, knowledge and attitude or knowledge and practices ($p < 0.001$). Regarding the insufficient KAP studies in Bangladesh on food safety knowledge and practice amongst restaurant food handlers, this study was conducted for the first time in Bangladesh to assess the status of knowledge, attitude and practice (KAP) level of food handlers. Identifying the status of food safety knowledge and practice among food handlers is an essential step to improving the food safety standards and preventing foodborne diseases. Moreover, based on the results observed hands on food safety and food hygiene training or workshops for food handlers are highly recommended.

Key words: Knowledge, Attitudes, Practices, Ready-to-eat food, Food handlers

PROGRAMME BOOK

9th Biennial Conference & Research Fair 2022

28-29 May, 2022
Dhaka, Bangladesh

Sustainable Aquaculture, Resilient Fisheries & Overcoming Pandemic Challenges



**Bangladesh Fisheries Research Forum (BFRF), Bangladesh
Universiti Malaysia Sarawak (UNIMAS), Malaysia**



TECHNICAL SESSION- DAY 2

Day 02: 29th May 2022

Technical Session 7: Post-Harvest, Processing and Value Addition

Chairperson: Prof. Dr. AKM Nowsad Alam, Dept. of Fisheries Technology, BAU

Co-Chairman: Prof. Dr. Mohammad Shamsur Rahman, Dept. of Fisheries, DU

Rapporteurs

Prof. Dr. Md. Shaheed Reza, Dept. of Fisheries Technology, BAU

Prof. Dr. Md. Tariqul Islam, Dept. of Fisheries, RU

Venue: Auditorium

Time: 10:00–11:00

Author(s)	Title of the paper	Organizations
Md. Sazedul Hoque*, Fatima Tamanna, Md. Mahmudul Hasan, Md. Hasan Al Banna, Pronoy Mondal, Mohammad Dalower Hossain Prodhan, Md. Zillur Rahman and Martin Louis Van Brakel	PESTICIDES AND HEAVY METALS IN DRIED FISH: A PUBLIC HEALTH CONCERNS ASSOCIATED WITH CONSUMPTION OF COMMON DRIED FISH IN COASTAL AREA OF BANGLADESH	Dept. of Fisheries Technology, PSTU
Imran Hossain*, Md. Mahfuzul Haque and Md. Enamul Hoq	ASSESSMENT OF CONTAMINANTS AT DIFFERENT STAGES OF FISH HANDLING AND PRESERVATION IN FISH LANDING CENTERS OF BANGLADESH	Dept. of Fisheries Management, BAU
Syed M Istiak*, Sumaiya Ahmed, Fariha Islam and Sujit Kumar Chatterjee	DEVELOPMENT OF READY-TO-EAT SASHIMI MEAT FROM CUTTLEFISH (<i>Sepia officinalis</i>)	Deep Sea Fishers Ltd and ASAP Healthy Food Ltd.
Israt Jahan*, Md. Golam Rasul and A.K.M. Azad Shah	ENHANCEMENT OF QUALITY AND SHELF LIFE OF FROZEN NILE TILAPIA <i>Oreochromis niloticus</i> FILLETS USING WATER LILY EXTRACTS	Dept. of Fisheries Technology, BSMRAU
Muhammad Hasan Jamil Sakib, Md. Motaher Hossain* and Mohammad Abu Jafor Bapary	MICROBIAL STATUS OF CATLA (<i>Catla catla</i>) AT DIFFERENT MARKETING CHANNELS IN SYLHET SADAR	Department of Fisheries Technology and Quality Control, SyAU
Soma Sultana*, Md. Ashraf Hussain, Md. Jakiul Islam and Md. Abu Sayeed	INFORMATION ON CULTURE PRACTICE INFLUENCE THE CONSUMERS' ATTITUDE TOWARDS FARMED TILAPIA	Dept. of Fisheries Technology and Quality Control, SyAU

4th National Scientific Conference on Food Safety and Health



29 October 2021
Ibrahim Auditorium
Bangladesh University of Health Sciences

■ ■ ■ CONFERENCE
■ ■ ■ PROCEEDINGS

conference theme

**Safe and Nutritious Foods for Combating
Covid-19 Pandemic**



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FACULTY OF PUBLIC HEALTH, BUHS

07

ASSESSMENT OF PUBLIC HEALTH RISK ASSOCIATED WITH PESTICIDES AND HEAVY METAL CONTENT IN COMMON DRIED FISH FROM DIFFERENT COASTAL REGIONS OF BANGLADESH

Md. Sazedul Hoque^{1*}, Fatima Tamanna², Md. Mahmudul Hasan², Md. Hasan Al-Banna³, Pronoy Mondal², Mohammad Dally Hossain Prodhan⁴, and MdZillur Rahman⁵

^{1*} Associate Professor, Department of Fisheries Technology, Patuakhali Science and Technology University, Dumki, Bangladesh. ² M.S in Department of Fisheries Technology, Faculty of Fisheries, Patuakhali Science and Technology University, Dumki, Patuakhali-8602, Bangladesh. ³ M.S in Department of Food Microbiology, Faculty of Nutrition and Food Science, Patuakhali Science and Technology University, Dumki, Patuakhali-8602, Bangladesh. ⁴ Senior Scientific Officer, Pesticide Analytical Laboratory, Division of Entomology, Bangladesh Agricultural Research Institute (BARI), Gazipur-1701, Bangladesh. ⁵ Md. Zillur Rahman, Senior Assistant Director (Quality Manager), Office of the Quality Assurance Manager, Quality Control Laboratory, Department of Fisheries, Khulna-9000, Bangladesh.

ABSTRACT

Introduction: Dried fish is traditionally processed nutritious food but chemical contaminants are the great public health concern. The aim of this study was to determine the consumption tendency of dried fish (Bombay duck, Ribbon fish, Silver jewfish, Shad, Chinese promfret), and its pesticides and heavy metal associated public health risk in Cox's Bazar, Chittagong, Bhola, Patuakhali and Khulna, Bangladesh. **Methods:** Dried fish consumption data was collected using a food frequency questionnaire. Pesticides (organochlorine, OCPs and organophosphate, OPs) and heavy metals (Pb, Hg, Cd, Cr and As) content of dried were determined using QuEChERS extraction based GC-MC estimation, and atomic absorption spectrophotometric method, respectively. **Results:** Both dried fish consumption frequency and amount was higher for Bombay duck and Ribbon fish in Chittagong and Cox's Bazar, respectively. Organochlorine pesticides (Aldrin and DDT) were not detected in any of the samples. However, Chlorpyrifos organophosphate was 0.338 ± 0.08 and 1.322 ± 0.47 mg/kg in Ribbon fish from Cox's Bazar and Chittagong, respectively. Dimethylmercury was found 0.526 ± 0.11 mg/kg in Ribbon fish and 1.055 ± 0.34 mg/kg in Bombay duck from Bhola. The calculated ADI, EDI and value referred no health risk for all the positive samples. Heavy metal Pb (0.05-0.14 mg/kg), Hg (0.03-0.08 mg/kg), Cd (0.01-0.03 mg/kg) and Cr (0.03-0.5 mg/kg) indicated carcinogenic health risk (R) for Ribbon fish and Bombay duck from Cox's Bazar, Chittagong and Bhola. **Conclusion:** Thus, the effective risk management strategy should consider to controlling pesticide and heavy metal in dried fish to ensure food safety for local and global dried fish consumers.

08

DETECTION AND MOLECULAR CHARACTERIZATION OF IMPORTANT ANTIBIOTIC RESISTANT BACTERIA IN THE BIRDS OF LAYER AND BACKYARD FARMS IN MYMENSINGH

Md. Hadiuzzaman¹, Anny Khatun¹, Ashik Ahmed Durber¹, Md. Zihad Hossain¹, Marzia Rahman¹, Md. Kamruj Jaman Bhuiyan¹, Tanvir Rahman¹, Kazi Rafiq³ and Muhammad Tofazzal Hossain^{1*}

- ¹ Department of Microbiology and Hygiene, Bangladesh Agricultural University, Mymensingh, Bangladesh,
- ² Department of Pharmacology, Bangladesh Agricultural University, Mymensingh, Bangladesh
- ³ Department of Agricultural and Applied Statistics, Bangladesh Agricultural University, Mymensingh, Bangladesh

*Corresponding author: tofazzalmh@bau.edu.bd

ABSTRACT

Introduction: Antibiotic resistant bacteria associated with livestock and poultry remain on a major concern worldwide as they can be transmitted from animals to humans and cause foodborne and zoonotic diseases. The present study was conducted to detect and identify antibiotic resistant *Escherichia coli*, *Salmonella* spp. and *Staphylococcus aureus* from selected poultry farms. A total of 245 feces (layer and backyard poultry) and drinking water from waterer were collected at day old and followed by a month interval for seven months from 7 selected layer farms in Mymensingh, Bangladesh. Isolation and identification of *Escherichia coli*, *Salmonella* spp. and *S. aureus* were done by culturing on selective media, Gram's staining and PCR followed by antibiotic sensitivity pattern by disk diffusion method. Emphasis was given on phenotypic and genotypic relation to tetracycline and ampicillin sensitivity pattern, because these two antibiotics were widely used in the farms. **Results:** Among the 245 samples, 185 were detected as *Escherichia coli*, 39 as *Salmonella* spp. and 120 as *S. aureus* by PCR. The *E. coli* isolates from layer and backyard birds showed resistance to tetracycline, ampicillin, amoxicillin, doxycycline, tetracycline, azithromycin and ciprofloxacin; similarly *Salmonella* spp. were resistant to amoxicillin, ampicillin, cefalexin, erythromycin and tetracycline; and *S. aureus* showed resistance to amoxicillin, ampicillin, cefalexin, erythromycin, doxycycline and tetracycline. Most of the *E. coli* and *Salmonella* spp. contained *tetA* and *blaTEM1* and 10 isolates of *S. aureus* were positive for *mecA* gene. **Conclusion:** It can be concluded that multidrug resistant common bacteria can be a potential threat not only for the environment but also for public health.

Hosted by: Faculty of Public Health, BUHS

011

NUTRITIONAL AND MICROBIAL QUALITY OF COMMON DRIED FISH FROM DIFFERENT COMMERCIAL FISH DRYING CENTERS IN BANGLADESH

Md. Hasan Al-Banna¹, Md. Sazedul Hoque^{2*}, Fatima Tamanna³, Md. Mahmudul Hasan³, Pronoy Mondal³ and Md. Shafiqul Khan⁴

1 M.S in Department of Food Microbiology, Faculty of Nutrition and Food Science, Patuakhali Science and Technology University, Dumki, Patuakhali-8602, Bangladesh. 2* Associate Professor, Department of Fisheries Technology, Patuakhali Science and Technology University, Dumki, Bangladesh. 3 M.S in Department of Fisheries Technology, Faculty of Fisheries, Patuakhali Science and Technology University, Dumki, Patuakhali-8602, Bangladesh. 4 Professor, Department of Food Microbiology, Faculty of Nutrition and Food Science, Patuakhali Science and Technology University, Dumki, Patuakhali-8602, Bangladesh.

ABSTRACT

Introduction: Food/nutritional security and food safety is an emerging public health issue in Bangladesh where dried fish is playing a vital role. The purpose of this study was to evaluate the nutritional and microbial quality of dried fish (Bombay duck, Ribbon fish, and shrimp) from different fish drying centers (Cox's Bazar, Chittagong, Bhola, Patuakhali and Khulna) in Bangladesh. **Methods:** Nutritional (moisture, protein, lipid and ash) and microbial quality were determined following AOAC and aerobic plate count method. **Results:** Result showed that moisture content was ranged from $12.00 \pm 1.12\%$ to $22.99 \pm 1.03\%$, the highest found in Bombay duck from Patuakhali. The highest values of protein found in shrimp from Chittagong ($64.33 \pm 0.99\%$) and lowest in Bombay duck from Bhola ($51.80 \pm 0.95\%$). The lipid content of dried fish were varied from $5.38 \pm 0.37\%$ to $8.67 \pm 0.96\%$ with highest and lowest in Bombay duck from Khulna and Cox's Bazar, respectively. The ash content of dried fish was ranged from $13.89 \pm 0.94\%$ to $20.07 \pm 1.64\%$ with lowest and highest value in Bombay duck from Patuakhali and Cox's Bazar, respectively. The mean aerobic plate count of dried Bombay duck from Chittagong, Cox's Bazar and Bhola were $7.1 \pm 0.2 \times 10^7$, $9.8 \pm 0.1 \times 10^7$ and $7.8 \pm 0.52 \times 10^7$ cfu/g, whereas, total vibrio spp. count were estimated as $1.1 \pm 0.1 \times 10^3$, $3.7 \pm 0.2 \times 10^5$ and $1.8 \pm 0.1 \times 10^5$ cfu/g, respectively. The pathogenic E. coli and Salmonella sp. was absent in all dried fish samples from all locations. **Conclusion:** Significant quality variation among the dried fish samples suggested further improvement in dried fish quality through maintaining hygiene and sanitation to produce safe and quality dried fish for consumers in home and aboard.

012

POTENTIAL OF *Dioscorea* spp. FOR SAFE AND HEALTHY FOOD PRODUCTION

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ABSTRACT

Introduction: The food plays decisive roles on 'Good Health and Well-being' of human. In the quest of food production during twentieth century, the so-called modern agriculture focused on selected crops resulting in to creation of several 'underutilized' crops, which are often nutritious, safe and climate resilient. In the class of underutilized crops, *Dioscorea* spp. occupies significant niche because it contains several nutraceuticals in addition to basic essential nutrients. **Methods:** research was undertaken to evaluate the nutritional attributes of tubers (both underground and aerial) produced by *Dioscorea* spp. (RMHF007), grown at BAU Germplasm Centre. **Results:** The particular germplasm is known as 'Dhanm' and capable to produce both underground and aerial tubers. After harvesting, tubers were subjected to proximate analysis followed by mineral estimation. The study revealed organic matter 94.91 and 95.43%, total ash 5.09 and 4.57%, crude protein 8.69 and 11.35%, crude fiber 0.7 and 1.51%, crude fat 0.74 and 1.2%, nitrogen free extract 72.91 and 69.48%, in underground and aerial tubers, respectively. The mineral profiling reflected the presence of Calcium (0.09 vs. 0.09%), Phosphorus (0.11 vs. 0.18%), Potassium (1.59 vs. 1.14%), Sodium (0.02 vs. 0.12%), Sulphur (0.03 vs. 0.04%), Magnesium (0.06 vs. 0.05%), Zinc (1.1 vs. 5.58 ppm), Iron (55.43 vs. 36.29 ppm), and Copper (8.14 vs. 9.56 ppm) in underground and aerial tubers, respectively. **Conclusion:** The potentiality of *Dioscorea* spp. as crop to address safe food and health for generation next people and species in COVID 19, including its producers i.e., poor and marginal farmers of Bangladesh.

P19

CHANGES IN ORGANOLEPTIC CHARACTERISTICS OF COMMON DRIED FISH DURING CONSECUTIVE STORAGE PERIOD

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ABSTRACT

Introduction: Dried fish is one of the distinctive traditionally processed fishery products produced in different coastal areas of Bangladesh where quality are varied on sites, species and storage condition. Thus, objective of this study was to evaluate the sensory quality of common dried fish (Bombay duck, Ribbon fish, Silver jewfish, Chinese pomfret, Shrimp) from coastal districts (Cox's Bazar, Chittagong, Bhola, Patuakhali and Khulna) of Bangladesh. **Methods:** The organoleptic attributes (color, odor, texture, flavor, infestation etc.) of collected dried fish samples were assessed monthly (up to fifth month) by 10 panelists. **Results:** The results showed significant ($P < 0.05$) changes of sensory quality (reduced gradually) of all samples from first to fifth month under storage condition. The excellent with highly acceptable result was found in first month analysis where the poor with slightly unacceptable to fully rejected result was found in fifth month. Significant quality variation was also observed for the same dried fish species collected from different locations. Chinese pomfret from Chittagong and Shrimp from Cox's Bazar had better textural quality up to fifth month storage. Shrimp from Bhola showed best flavor attributes in final storage period. Likewise, the lowest insect infestation found in Bombay duck from Chittagong in the fifth month storage time. Statistically, dried Bombay duck from Bhola gained the lowest defect point (3.37 ± 0.19) in final storage month which indicate the best storage stability than others species and source. **Conclusion:** The results conclude that proper storage facilities of dried fish could ensure quality and extend the shelf-life during storage.

P20

HEALTH KNOWLEDGE, PRACTICE, AND ECONOMIC IMPACTS OF COVID-19 ON SMALL-SCALE COASTAL FISHING COMMUNITIES IN BANGLADESH

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ABSTRACT

Introduction: COVID-19 has profoundly impacted global livelihoods and disrupted the food supply chain, including aquaculture and fisheries. Little is known about the response to COVID-19 and the impact on incomes and livelihoods, health knowledge and practice in coastal artisanal fishers in Bangladesh. Therefore, the aim of this study was to determine the socio-economic and practice of selected coastal fishers, their knowledge about COVID-19 and preventive practice taken to reduce it. The impact on their fishing habits and income was also examined to determine potential policy areas where assistance was required. **Methods:** Data were collected via a structured questionnaire from 250 respondents from three coastal districts, Cox's Bazar, Patuakhali and Barguna, Bangladesh during April–June 2020. **Results:** The research shows that the fishers' knowledge about COVID-19 and measures taken to reduce it were significantly higher in Patuakhali and Barguna than in Cox's Bazar. The pandemic caused lower consumer demand, reduced fish prices and fish transportation issues due to movement restrictions enforced during lockdown. Irrespective of geographical location, all fishing trips were reduced in terms of frequency and duration compared with the pre-COVID-19 period, consequently lowering the income of fishers. Fishers have received little or no support from private, non-governmental or governmental sources. **Conclusion:** Considering the evidence this study recommends that fishers in Bangladesh should be provided with support to improve their health education, access to professional health facilities and financial services. This will ensure food security and healthy livelihoods that can better withstand local and/or global crises.

P21 EVALUATION OF NUTRITIONAL, PESTICIDES AND HEAVY METAL CONTENT IN COMMON DRIED FISH FROM DIFFERENT REGIONS: RISK-BENEFIT OF DRIED FISH CONSUMPTION IN BANGLADESH

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ABSTRACT

Introduction: Dried fish is nutritious and least expensive traditionally processed food product in Bangladesh. Now-a-days, consumers are highly concern on quality of dried fish. Thus, the aim of this study was to determine consumption tendency of common five dried fish (Bombay duck, Ribbon fish, Silver jewfish, Shrimp and Chinese pomfret) in five coastal districts (Cox's Bazar, Chittagong, Bhola, Patuakhali and Khulna) of Bangladesh. **Methods:** Dried fish consumption data was collected using a food frequency questionnaire (FFQ). Nutritional quality (moisture, protein, ash, lipid), pesticides (organochlorine, OCPs and organophosphate, OPs) and heavy metals (Pb, Hg, Cd, Cr and As) content of dried were determined using standard AOAC, QuEChERS extraction based GC-MC estimation, and atomic absorption spectrophotometric method, respectively. **Results:** Higher fraction of dried fish consumption was found for Bombay duck (32.7%) and Ribbon fish (54.5%) in Chittagong and Cox's Bazar, respectively. Non-consumption fraction were higher for Chinese pomfret (26.3%) in Bhola and Silver jewfish (26.7%) in Khulna. In amount, higher consumption (80 g/person/day) found for Ribbon fish and Bombay duck in Chittagong and Patuakhali, and lower consumption (2.10 g/person/day) was in Bhola for Chinese pomfret. Protein content was higher in Shrimp from Chittagong (64.33%) and lower in Bombay duck from Bhola (51.80%) ($p < 0.05$). Organochlorine pesticides (Aldrin and DDT) was not detected in any of the selected sample tested. However, Chlorpyrifos organophosphate was 0.338 ± 0.08 and 1.322 ± 0.47 mg/kg in Ribbon fish from Cox's Bazar and Chittagong, respectively. Dimethoate was found 0.526 ± 0.11 mg/kg in Ribbon fish and 1.055 ± 0.34 mg/kg in Bombay duck from Bhola. The result showed that all the positive samples exceeded the acceptable limit (0.25 mg/kg) by FDA. Heavy metal content was Pb (0.05-0.14 mg/kg), Hg (0.03-0.08 mg/kg), Cd (0.02-0.08 mg/kg) and Cr (0.03-0.5 mg/kg) and As were not detected in Ribbon fish and Bombay duck from Cox's Bazar, Chittagong and Bhola. **Conclusion:** Thus, the study concluded the different aspects of risk-benefit information on dried fish consumption which could be helpful during risk management strategy for local and global food safety aspect.

P22 FOOD AS MEDICINE: COVID-19 PERSPECTIVES

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ABSTRACT

Introduction: The whole world is passing the terrible times of this millennium and there is no definite hope yet to overcome this disastrous troubleshooting. Till now, management of COVID-19 is not soundly defined though different drugs and vaccines are already available. Scientific community has suggested for strengthening self immunity system which could be attainable through proper and adequate diet. **Discussion:** Foods are regarded as the sole source of immunity boosting for anti-viral properties. So, appropriate nutrient and mineral rich foods could be used as arsenal of immunity boosting for combating against this deadly virus. Already, it has been reported that vitamin complex, zinc incorporated foods, compounds of poly-phenolic nature enhance the immunity. Basically, medicinal plants including spices and fruit vegetables played a tremendous impact in COVID time as well as general health concerns. Besides this, some recent studies on functional food demonstrates a new horizon of medicinal application of food. **Conclusion:** By reviewing the recent studies, it is crystal clear that the role of adequate and nutritious food in pandemic time is certain. Nonetheless, use of nutrient diet and functional foods for antiviral activity is the prime objective of our study though numerous scientific experiments are needed to validate the concept of food as medicine.

Key words: COVID-19, Food as Medicine, Immune-modulation, Antiviral activity



Fisheries Society of Bangladesh (FSB)

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25-26 DECEMBER, 2021

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- 16 Reproductive biology of *Anodontostoma chacunda* in the Bay of Bengal: Confirm to sustainable management and conservation
- 17 Reproductive Biology of *Heteropneustes fossilis* in the Padma River, northwestern Bangladesh
- 18 Isolation, Screening and Production of Protease as Potential Fish Feed Supplement from Indigenous Bacteria
- 19 Investigation of emerging tilapia lake virus disease (TiLVD) in farmed raised Nile tilapia of several districts in Bangladesh
- 20 Immune epitopes identification and designing of an epitope-based vaccine against antibiotic resistant *Aeromonas veronii* in fish species: A molecular dynamics and immune simulation approaches
- 21 Production enhancement of carps and tilapia in creeks of Chittagong hill tract districts, Bangladesh
- 22 Blue LED light positively regulates the growth, chlorophyll, β -carotene contents and proximate composition of *Chlorella ellipsoidea*
- 23 Development of native probiotic formulations for enhanced fish production in Bangladesh
- 24 Replacement of fish meal with blood meal in diet for butter catfish (*Ompok pabda*)
- 25 Evaluation of dietary microalgae as growth enhancer and immunostimulant in fish
- 26 Molecular characterization of the growth hormone gene and selection of fast growing stinging catfish (*Heteropneustes fossilis*, Bloch) by marker assisted selection
- 27 Effects of synbiotics on growth, persistence and immune responses in stinging catfish (*Heteropneustes fossilis*)

Session-3: Aquatic Resources Management & Post-Harvest Fisheries

Day-1: 25 December 2021, 2:00 pm

Zoom: <https://bdren.zoom.us/j/2360602191> (Meeting ID: 236 060 2191)

Session Chair: **Prof. Dr. Md. Kamal, FoF, BAU**
 Co-chairs: **Prof. Dr. Md. Tariqul Islam, FoF, RU**
 Rapporteurs: **Prof. Dr. Md. Nurul Haider, FoF, BAU; Dr. Kizar Ahmed Sumon, FoF, BAU**

KeyNote Paper: Post-harvest losses in fish in Bangladesh, quality and safety issues and mitigation measures

By: **Prof. Dr. A. K. M. Nowsad Alam**, Department of Fisheries Technology, Bangladesh Agricultural University, Mymensingh

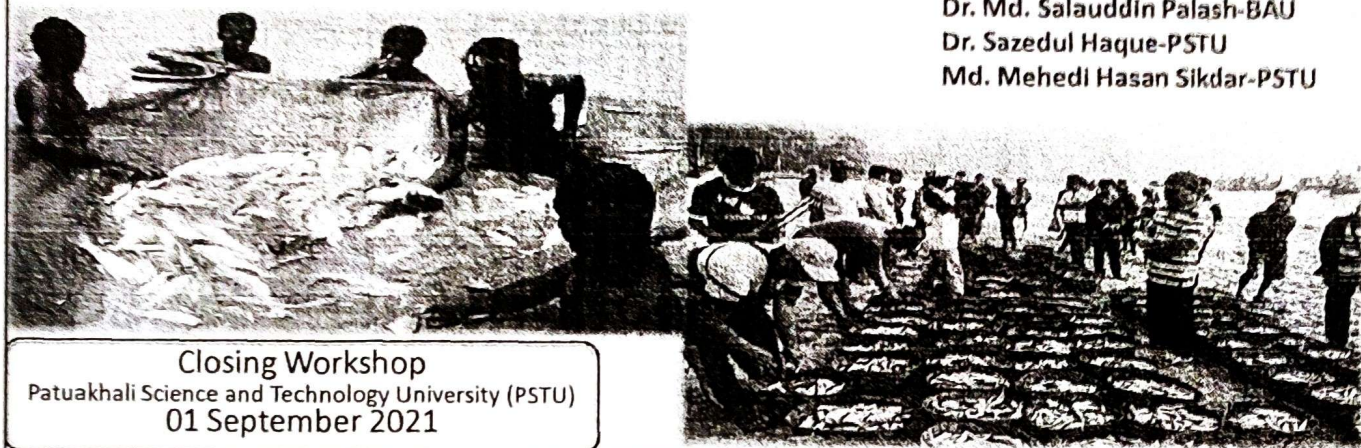
- 28 Diversity of adaptive gear and their impacts on Kaptai lake fisheries
- 29 Population parameters of ten commercially important small indigenous fish species (SIFS) in the Oxbow lake, Southwestern Bangladesh
- 30 Stock assessment and management of Bombay duck *Harpadon nehereus* in the Bay of Bengal
- 31 Current status of the small fish species in the Gorai and the Horai rivers from the central Bangladesh
- 32 An assessment of underwater biodiversity in Saint Martin's Island of Bangladesh
- 33 Assessment of ecological risk of the River Halda: A tidal fed natural spawning ground of major carps in Bangladesh
- 34 Effect of arsenic on the growth and development and gene expression of commercially important fish *Labeo rohita*
- 35 Ichthyotoxicity and growth characteristics of a noxious blue-green algae *Planktothrix* sp.
- 36 Effect of pH on mixed culture and ichthyotoxicity of noxious blue-green algae, *Planktothrix subtilissima* and *Microcystis aeruginosa*
- 37 Seasonal variation of plankton and physicochemical parameters of Kaptai Lake, Bangladesh
- 38 Public health risks associated with pesticides and heavy metal exposure through consumption of common dried fish in coastal regions of Bangladesh
- 39 Effects of delayed icing on the histamine production in Hilsa shad (*Tenualosa ilisha*)
- 40 A study on the quality and safety aspect of Giant Tiger Prawn (*Penaeus monodon*) and related characteristics of seawater of the Bay of Bengal along the Cox's Bazar coast of Bangladesh



Post-harvest Losses, Supply and Value Chain Analysis of Fisheries Sub-sector in Bangladesh

BARC/PBRG Project No. 036

Dr. Md. Akhtaruzzaman Khan-BAU
Dr. Md. Mamur Or Rashid-PSTU
Dr. Md. Salauddin Palash-BAU
Dr. Sazedul Haque-PSTU
Md. Mehedi Hasan Sikdar-PSTU



Closing Workshop
Patuakhali Science and Technology University (PSTU)
01 September 2021

Goal and Objectives

Sub-project goal : To generate information on postharvest losses, supply and value chain structure of fisheries sub-sector in Bangladesh

Specific objectives :

1. Assessing post-harvest losses (quantitative) and factors affecting losses of capture, culture and marine fisheries of Bangladesh;
2. Analyzing existing supply chain structure of capture, culture and marine fisheries; and
3. Analyzing value chain structure, extent of value addition and factor affecting fish value chain of specific fish species;

ISCFSH 2023

5th International Scientific Conference on
Food Safety and Health

18 February 2023
BARC Auditorium

PARTICIPANT

Name : Pronoy Mondal

Designation : MS student

Institute : Patuakhali Science and Technology University



Organized by
Bangladesh Society for Safe Food



9th Biennial Conference & Research Fair 2022

28 - 29 May, 2022
Dhaka, Bangladesh

Name : Pronoy Mondal

Designation : MS student

Organization : Patuakhali Science
and Technology University



NCFSSH-2021

4th National Scientific Conference on
Food Safety and Health

29 October, 2021

Ibrahim Auditorium
Bangladesh University of Health Sciences

PARTICIPANT

Name : Pronoy Mondal

Designation : MS student

Institute : PSTU



Organized by: Bangladesh Society for Safe Food
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Merit SL.	Reg No.	Name	Mobile No.	University	Department	Research Title	Amount (Tk.)
427	311	Mst. Suraiya Akter	01303398751	HSTU	Agronomy	Response to Herbicides and Exogenous Application of Zinc on Yield and Quality of Aromatic Rice	54000/-
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**MICROPLASTIC CONTAMINATION IN MARINE FRESH FISH
FROM THE BAY OF BENGAL: A SEAFOOD SAFETY
CONCERN IN BANGLADESH**

A Thesis

Submitted to

Patuakhali Science and Technology University, Patuakhali

In Partial Fulfilment of the Requirements for the degree of

Master of Science
in
Fisheries Technology

Approved as to style and contents by



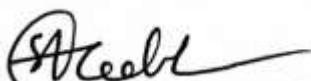
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May 2021

Proximate Composition, Microbial and Sensory Assessment of Low Salt Fermented Shrimp Paste Product (*Nga-pi*)

A Bachelor Dissertation

By

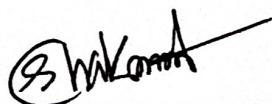
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