

**LEMBAR**  
**HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW**  
**KARYA ILMIAH : PROSIDING INTERNASIONAL**

Judul Karya Ilmiah/Artikel : Benzo (a) Pyrene Potential Analysis on Smoked Fish (Case Study : Traditional Method and Smoking Kiln)

Jumlah Penulis : 3(tiga)

Status Pengusul : Penulis pertama/ ~~penulis ke 2/ penulis korespondensi\*~~

Penulis Karya Ilmiah : Swastawati F., Surti T., Agustini T.W., Riyadi P.H.

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# CERTIFICATE

Is hereby presented to

FRONTHEA SWASTAWATI

as

Paper Presenter

The 1<sup>st</sup> International Symposium on Aquatic Product Processing

"Maximizing Benefits and Minimizing Risks on Aquatic Product Processing: Blue Economy Approach"

13-15<sup>th</sup> November 2013, IPB International Convention Center, Bogor Indonesia

Ir. Saut Parulian Hutagalung, MSc

Director General of Fisheries Product  
Processing and Marketing,  
Ministry of Marine Affairs and Fisheries,  
The Republic of Indonesia

Prof. Indra Jaya

Dean of Faculty of Fisheries and Marine Science,  
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KnE Life Sciences

Int. Symposium on Aquatic Product Processing (ISAPPROSH) 2013

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KnE Life Sciences / International Symposium on Aquatic Product Processing (ISAPPROSH) 2013

This proceeding consists of papers presented at the 1st International Symposium on Aquatic Product Processing, Safety and Health (ISAPPROSH- 2013), with the theme of *Maximizing Benefits and Minimizing Risks on Aquatic Product Processing: Blue Economy Approach*. This conference was jointly programmed by the Directorate General of Marine and Fisheries Products Competitiveness Enhancement; Ministry of Marine Affairs and Fisheries, Republic of Indonesia; Department of Aquatic Products Technology; Faculty of Fisheries and Marine Science, Bogor Agricultural University; Tokyo University of Marine Sciences and Technology; and Indonesian Society of Fisheries Products Processing with the aim of sharing the research and technological innovation from institutions/organizations.

The Symposium included 9 very valuable keynote speeches (presented by experts from Japan, Thailand, European Union, and Indonesia), 65 oral presentations (26 in processing, 16 biotechnologies, 13 aquaculture, 10 fishing technology), and 33 posters (15 processing, 7 biotechnology, 1 fishing technology). This proceeding consists of 33 selected papers from 98 manuscripts that have been submitted.

All 33 manuscripts in KnE Life Sciences vol 1 (2015) had been reviewed by the editors from the University of Latvia, Riga Latvia; Linnaeus University, Sweden; International Islamic University, Malaysia; Universitas Merdeka Madiun, Indonesia; and Ma Chung University, Indonesia.

**Conference date:** 13–14 November 2013  
**Location:** Bogor, Indonesia  
**Editors:** Roy Hendroko Setyobudi (Malang, IDN), Juris Burlakovs (Kalmar, SWE), Maizirwan Mei (Kuala Lumpur, MYS), Praptiningsih Gamawati Adinurani (Madiun, IDN), and Zane Vincēviča-Gaile (Riga, LVA),  
**Published:** September 2015  
**ISSN:** 2413-0877

The image shows the front cover of a journal issue. It has a solid orange background. At the top left is a small icon of an open book. To its right is the 'Knowledge E' logo with the tagline 'enriching | engaging | empowering'. Below these is a small green box with 'KnE Life Sciences' in white. The main title 'Int. Symposium on Aquatic Product Processing (ISAPPROSH) 2013' is centered in white, with the ISSN '2413-0877' below it. At the bottom is a large, faint, stylized line drawing of a globe or network. The website 'www.KnEpublishing.com' is printed in small white text at the bottom right.

## Keynote Speaker



KnE Life Sciences

ISSN 2413-0877 Volume 1 (2013)

The 1st International Symposium on Aquatic Product Processing 2013

### PREFACE

This Proceeding consists of papers presented at the First International Symposium on Aquatic Product Processing, Safety and Health (ISAPPROSH), held in Bogor, Indonesia, November 13-14, 2013. In this Symposium there was 9 very valuable keynote speeches (presented by expert from Japan, Thailand, European Union, and Indonesia), 65 oral presentation (26 in processing, 16 biotechnologies, 13 Aquaculture, 10 Fishing Technology), 33 posters (15 processing, 7 biotechnology, 1 fishing technology). This proceeding are consists of 33 selected paper from 98 manuscripts that have been submitted.

This international symposium allowed to gather many researchers from research center and universities, seafood safety consultant, regulators/government officials, and industrial representatives to discuss such a broad spectrum of information as zero waste concept on fish utilization, resources availability, sustainable utilization of the resources, processing technologies, bioactive and functional components in aquatic organisms, utilization of wastes, seafood quality and safety. Almost all of these items are, of course, closely related to seafood science and technology; several papers are involved in aquaculture and fishing technologies areas, and also medical and environmental fields, all of which would be highly evaluated to meet the current situation. There would be numerous personal and scientific links with fellow readers together with much scientific and technical information not only in the academic side but also in the industries.

I gratefully acknowledge to Ir. Saut P. Hutagalung M.Sc, Prof. Indra Jaya, Prof. Hari Eko Irianto, Prof. Takafumi Arimoto and Prof. Toshiaki Ohshima (Tokyo Marine Science and Technology University, Japan). They have contributed outstandingly as steering committee and organizing Japan delegation before and during the symposium. Thanks are also greatly due to scientific committee (Dr. Ruddy Suwandi, Dr. Maman Hermawan, Prof. Sukoso, Prof. Dr. Linawati Hardjito, Prof. Fredrik Rieuwpassa, Dr. Aef Permadi, Dr. Eddy Afrianto, Dr. Amir Husni, Dr. Tri Winarni Agustini, Dr. Singgih Wibowo, M.Sc, Dr. Alimuddin, and Dr. Sugeng Hari Wisudo) as well as organizing committee.

My thanks are due to the review of proceedings papers and also to the editorial works by local members including ; Prof. Hari Eko Irianto, Prof. Joko Santoso, Dr. Tri Winarni, Dr. Alimuddin, Dr. Amir Husni, Dr. Ekowati Casanah, Dr. Iriani Setyaningsih, Dr. Mala Nurilmala, Dr. Singgih Wibowo, Dr. Wini Trilaksani, Dr.Eng. Uju and Dr.rer.nat Kustiariyah Tarman.

I would like to express my sincere gratitude to the invited and general speakers, presenters of the poster session, and all the participants. The sponsorship and donation by the MMAF, the public organizations and supporting companies are greatly appreciated. In addition, some other donors contributed the symposium expenses and provided seafood for the reception. Finally, special thanks are also due to Mr. Ateng Supriatna, M.Sc, Dr. Iriani Setyaningsih, Dr.rer.nat Kustiariyah Tarman and Mr. Wahyu Ramadhan who took on many assistant secretarial works for the symposium holding.

Bogor, 10 October 2014

Dr. Wini Trilaksani, M.Sc

Department of Aquatic Products Technology

Faculty of Fisheries and Marine Science, Bogor Agricultural University (IPB)

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**EFFECT OF PREPARING CONDITIONS ON PROPERTIES OF GELATIN FILM FROM HORSE MACKEREL SCALE****Le Thi Minh Thuy, Hiroki Maki, Emiko Okazaki, Kazufumi Osako\***Food Processing Laboratory, Tokyo University of Marine Science and Technology,  
Minato-ku, Tokyo, 108-8477, Japan

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**ABSTRACT**

In this study, the effect of preparing conditions, such as protein concentrations and glycerol concentrations of film forming solution (FFS) on properties of gelatin film from horse mackerel scale were investigated. Properties of edible film from gelatin was extracted at 70°C for 1 h at various protein concentrations (1, 2, and 3%) in film-forming solution (FFS) were examined. Films from FFS containing higher protein content showed the higher TS and EAB. WVP of film increased with increasing protein concentration of FFS. The study about the effect of glycerol in FFS on the film property showed that addition of glycerol as a plasticizer into FFS at the concentrations of 0, 10, 15, 20 and 25 % of protein lead to the decline of TS of gelatin film, while both EAB and WVP of film increased. The SDS-PAGE patterns showed that all gelatin films consisted of two different  $\alpha$  chains,  $\alpha_1$  and  $\alpha_2$ , as well as a  $\beta$  component and no differences in protein patterns among the protein concentrations and glycerol concentrations of FFS.

Key words: gelatin, films, horse mackerel, scales.

**INTRODUCTION**

Gelatin, one of the most popular biopolymers, is widely used in food field because it has unique functional and technological properties. Gelatin is extracted from mammalian resource and marine resource. One of these important applications of fish gelatin was film-forming ability. Fish gelatin film used as covering foodstuffs has ability to protect food against drying, light and oxygen (Gómez-Guillén *et al.* 2008).

Horse mackerel (*Trachurus japonicus*) is one of the most important fish species in Japan, and used as a raw materials of frozen *surimi* (Simizu 1987, Yamanaka and Tanaka 2007). However, during fish processing, a large amount of byproducts, such as skin, scales and bone, which accounts for 50-70% of fish weight, are discarded and underutilized (Kittiphattanabawon *et al.* 2005). Utilization of marine waste, including scales, is necessary from the viewpoints of both environmental conservation and the development of new industries.

**MATERIAL AND METHODS****1. Preparation of gelatin films**

Gelatin powder extracted at 70°C for 1 h was dissolved in distilled water at 60°C for 30 min to obtain the FFS with protein concentration of 1, 2, and 3% (w/v) determined by Lowry's method. Glycerol as a plasticizer was added into FFS at the concentration of 20% (w/w) of protein. The air bubbles in FFS were removed by a hybrid mixer (HM – 500; Keyence Co., Tokyo, Japan). The prepared FFS (4g) was cast onto a rimmed silicone plate (50 x 50 mm)

# **POTENTIAL OF NOSTOC MUSCORUM CULTURED IN BG-II MEDIUM AS BIODIESEL FEEDSTOCK SOURCE: EVALUATION OF NUTRIENT REQUIREMENT FOR CULTURE AND ITS DAILY LIPID CONTENT**

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## **ABSTRACT**

Increment of industrial development and energy demands for transportation and electricity have increased diesel-fuel uses to fulfil global energy needs. Carbon emission as impact of high fossil diesel use which pollutes the air gradually increases green house gases (GHG) and increases the intensity of acid rains. Furthermore, scarcity of fossil-fuels resources has caused high price of diesel-fuel which in turn to have increased the prices of all commodities. *Nostoc muscorum* is filamentous Cyanobacteria species which lives both terrestrial and freshwater aquatic environment. This strain has good ability in producing high biomass and potential in producing lipid. In where, *Nostoc muscorum* has potential as biodiesel feedstock alternative of food-plants sources. This study was conducting to evaluate the potential of *Nostoc muscorum* cultured in BG-II medium as biodiesel feedstock source. Evaluation of the nutrient requirement of *Nostoc muscorum* cultured in BG-II medium was done through assimilation of nitrate (NaNO<sub>3</sub>)-phosphate (K<sub>2</sub>HPO<sub>4</sub>). Biomass production as growth parameter was measured by weighing the dried biomass for 14 days of culture. Daily lipid production was evaluated by lipid extraction using Soxhlet method. The result showed that *Nostoc muscorum* cultured in BG-II medium required 644.6795 mg/L of NO<sub>3</sub><sup>-</sup> and 25.1566 mg/L of HPO<sub>4</sub><sup>-</sup> with the highest biomass production 0.21 grams/300 mL. Furthermore, *Nostoc muscorum* as multicellular Cyanobacteria could grow well in BG-II medium at SGR 0.0964 µ/day. Lipid production of *Nostoc muscorum* during cultivation in BG-II for 14 days decreased day by day. The highest lipid production was reached up in day 4<sup>th</sup> of culture that was 9.53 mg/g. Based on this study, *Nostoc muscorum* has good potential as biodiesel feedstock through producing high biomass in BG-II medium.

**Keywords:** *Nostoc muscorum*, *Synechococcus elongatus*, Tofu wastewater, Lipid content, Cell disruption, Biodiesel.

## **INTRODUCTION**

Limitation of non-renewable fuel resources is one of the big issues faced by the world. Whereas, the increment of global energy demands for industrial development, transportation, and electricity continuously increases diesel-fuel use. According to Energy Information Administration (EIA) of USA (2012), the usage of world liquid fuels increased by an estimation of 0.8 million bbl/d in 2011. EIA predicted that liquid fuels demand would increase by 20% (up to 1.0 million bbl/d) from 2012 to 2013. Increasing fossil-fuel use also has led some adverse impacts to environment, natural resources, economic and social aspect. Increment of carbon emission pollutes air, which gradually leads to increase greenhouse gases (GHG) in the atmosphere and the intensity of acid rains. Scarcity of fossil-fuels resources has caused high price of diesel-fuel which in turn to has increased the prices of all commodities.

**BENZO ( $\alpha$ ) PYRENE POTENTIAL ANALYSIS ON SMOKED FISH  
(CASE STUDY: TRADITIONAL METHOD AND SMOKING KILN)**

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**ABSTRACT**

Benzo( $\alpha$ )pyrene were determined by Gass Chromatography Mass Spectrofotometry method on nile, tilapia, milkfish, little tuna, narrow bared spanish mackerel, marine catfish, canine catfish and stingray processed by traditional method and the used of smoking kiln. Eight samples of smoked fish processed by traditional method showed a higher BaP levels ranging from 0.03 to 4.58 ppb. Whereas, BaP levels on smoked fish processed by smoking kiln were found in average lower than traditional method ranging from 0.01 to 3.04 ppb. Different fish species gave very significant different ( $P < 0.01$ ) to BaP levels. Meanwhile, different method of smoking fish gave no significant different ( $P > 0.05$ ) on carbonyl compounds (phenol, formaldehyde, and organic acid) levels on smoked fish processed by traditional method and smoking kiln, but different fish species gave very significant different ( $P < 0.01$ ) to carbonyl compound level (phenol, formaldehyde, and organic acid).

Keywords: Benzo( $\alpha$ )pyrene, carbonyl, smoking kiln, smoked fish, traditional method

**INTRODUCTION**

Smoking is one of the fish preservation methods that combine drying and natural chemical decomposition from wood combustion, i.e. phenol, formaldehyde, organic acids and *Polycyclic Aromatic Hydrocarbons* (PAHs). PAHs are chemical compounds that compose of three or more aromatic rings. PAHs formed by wood combustion and occur during wood, charcoal, oil combustion levels (Basak *et al.* 2010; Wretling *et al.* 2010).

PAHs often function as a carcinogenic group that found in smoked products and always be identified for its composition intensively. Hence, several PAHs compounds represent carcinogenic especially for smoked fish. The EU Scientific Committee on Food (SCF) has identified 15 PAHs compounds as carcinogenic genotoxic i.e. benz(a)anthracene, benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, cyclopenta(c,d)pyrene, dibenz(a,h)anthracene, dibenzo(a,e)pyrene, dibenzo(a,h)pyrene, dibenzo(a,i)pyrene, dibenzo(a,l)pyrene, indeno(1,2,3-cd)pyrene, and 5-methylchrysene. Especially for benzo ( $\alpha$ ) pyrene, has carcinogenic value higher than other PAHs compound, benzo ( $\alpha$ ) pyrene gives contribute 1-20% from total carcinogenic that found in foodstuff such as smoked products (Swastawati *et al.* 2007; European Commission 2002; Simon *et al.* 2006).

PAHs contamination from smoked fish can be significantly decreased by replacing of smoking position, where the fish are not placed directly from the smoke source (Visciano *et al.* 2008).