2014 3rd International Conference on Nutrition and Food Sciences
IPCBEE vol. 71 (2014) © (2014) IACSIT Press, Singapore
DOI: 10.7763/IPCBEE. 2014. V71. 11

Chemical and Microbiological Changes during Shrimp Seasoning Fermentation Using Seafood Processing Waste

Potjanan Reerueangchai[1+], Yardrung Suwannarat[2] and Jirapa Hinsui[1]

[1] Faculty of Fisheries, Kasetsart University, Thailand
[2] Faculty of Agricultural Technology, RambhaiBarniRajabhat University, Thailand

Abstract. Shrimp processing industries generate a lot of waste such as head and shell in each year. Objective in this research was to study chemical and microbiological changes during shrimp seasoning fermentation. Shrimp head and shell were fermented at various ratios of materials to salt (1:1, 1:2 and 1:3) at room temperature for 4 months. Shrimp seasoning was sampled every month to determine soluble protein, salt content and pH. The pH of shrimp seasoning was around 7.00 and salt content was 2.0-2.5% for all fermentation period. Soluble protein increased as fermentation time was progressed. The best condition for shrimp seasoning production using shrimp head and shell were at a ratio of materials to salt 1:1 for 3 and 4 months, respectively. Soluble protein content in head shrimp seasoning was higher than shell. Therefore shrimp head might be a good source for shrimp seasoning production.

Keywords: chemical and microbiological changes, shrimp seasoning fermentation, seafood processing waste

1. Introduction

Shrimp processing industries are the most important fishery industry in Thailand. Generally, the head, shell and tail portions of shrimp are remove during processing and these account for approximately50% of the catch. Increasing production of inedible parts of shrimp is causing environmental problems as a result of uncontrolled dumping. Thus, attention must be paid to greater utilization of shrimp processing by-products in order to address such concerns [1]. Studies on shrimp waste have included those on characteristics enzyme, nutrients and value-added products from shrimp processing discard [2], [3] and natural antioxidant extraction from shrimp [4]. Utilization of shrimp shell by-products for the extraction of carotenoprotein [5], [6], chitin [7], chitosan [6], [8]. Even through chitin and chitosan was produced from head and shell, but chitin/ chitosan production spends a lot of chemicals to get rid of protein. Protein in shrimp head and shell that may can be a source for shrimp seasoning fermentation. Objective in this research was to study chemical and microbiological changes during shrimp seasoning fermentation.

2. Materials and Methods

2.1. Raw Materials

White Shrimp head and shell (*Penaeusvannamei*) from Ongkorn Cold Storage Co., Ltd, Samutsakorn, Thailand. They were contained in ice box and transfer to faculty of Fisheries, Kasetsart University in 2 hr.

2.2. Shrimp Seasoning Fermentation

White shrimp head and shell were fermented at various ratios of materials to salt (1:1, 1:2 and 1:3) at room temperature (35 °C) for 4 months. Fermentation liquid was sampled every month by centrifuge at 20,000xg for 30 min.

+ Corresponding author. Tel.: + 6629428644-5; fax: +662948645#11.
E-mail address: lamy_hiso@hotmail.com

2.3. Chemical Analysis

2.3.1. Proximate analysis

Chemical composition of white shrimp head and shell were determined. Crude protein content was calculated by converting the nitrogen content determined by Kjeldahl's method (6.25xN) [9]. Moisture, ash, fat were determined [10].

2.3.2. Chemical quality analysis

Total volatile basic nitrogen (TVB-N) values of raw materials and fermentation liquid were determined using the Conway microdiffusion assay [10].

Soluble protein content of fermentation liquid was determined [11] using Bovine serum albumin as protein standard. Salt content, TVB-N value and pH of fermentation liquid were determined [10].

2.4. Proteolytic Activity

Protease activity was determined [12] using casein as a substrate. One ml of shrimp seasoning was mixed with 1 ml of 1%casein solution pH 7.0 then incubated at room temperature (35 °C) for 30 min then stop activity by adding 3 ml of 10%TCA. Soluble protein in the filtrate was determined [11].

2.5. Microbiological Analysis

Total bacteria count, proteolytic bacteria and lactic acid bacteria in fermentation liquid were determined [9]. Fermentation liquid was diluted in sterile water in ratio 1:10, 1:100, 1:1,000 and 1:10,000 then transfer 1 ml of each solution in PCA for total plate count bacteria, CCA for proteolytic bacteria and MRS for lactic acid bacteria then incubate in 37 °C for 24 , 72 and 48 hr., respectively.

2.6. Color Measurement

Color of fermentation liquid was determined by Minolta CM-3500d Spectrophotometer.

2.7. Sensory Evaluation

Nine point hedonic scales were performed for acceptance evaluation of shrimp head seasoning. Analysis was carried out with untrained 50 panelists who were under graduated and graduated students from the Department of Fishery Products, Kasetsart University, of age ranging from 19 to 22 years. The nine points hedonic scale, in which a score of 1 represented extreme dislike and 9 represented like extremely, was used for evaluation.

2.8. Statistical Analysis

A completely randomized design (CRD) was used throughout the study, and the experiments were done in triplicate. Data were subjected to analysis of variance (ANOVA) and mean comparisons were carried out using Duncan'smultiple range.

3. Results and Discussion

3.1. Chemical Analysis

3.1.1. Proximate analysis

Table I: Chemical composition of white shrimp head and shell

Shrimp portion	Chemical composition content (%)				TVB-N
	protein	moisture	ash	fat	(mg/100g)
head	12.90 ± 0.15	78.28 ± 0.39	5.25 ± 0.11	4.23 ± 0.35	9.00 ± 1.44
shell	13.18 ± 0.09	77.07 ± 0.59	4.93 ± 0.14	3.39 ± 0.58	8.50 ± 1.53

Chemical composition of white shrimp head and shell were shown in Table I. Shrimp head contained protein, moisture, ash and fat in similar amount of shrimp shell. The protein content in both head and shell were 12.90 ± 0.15 and 13.18 ± 0.09 %, respectively.

3.1.2. Chemical quality analysis

The pH of shrimp seasoning was around 7.00 (Figure 1). TVB-N value increased during the fermentation period (Figure 2), but these values were not effect to pH value. TVB-N of shrimp seasoning was lower than fish sauce [13], [14] even through salt content was 2.0-2.5% (Figure 3) for all fermentation period. It may from nitrogen source in shrimp waste lower than fish waste. TVB-N value indicated bacterial spoilage.

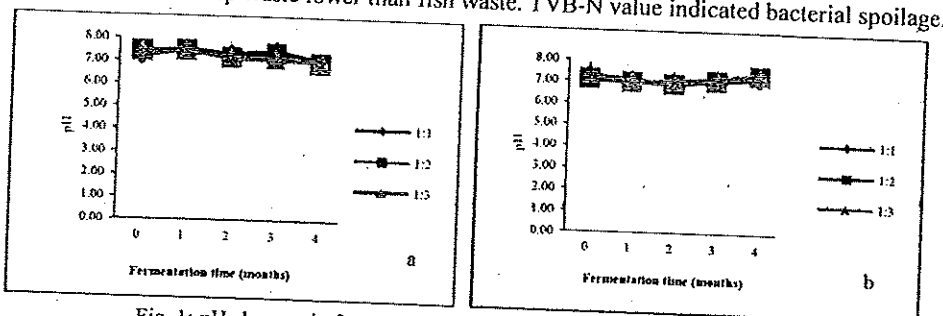


Fig. 1: pH changes in fermentation time of shrimp head (a) and shell (b)

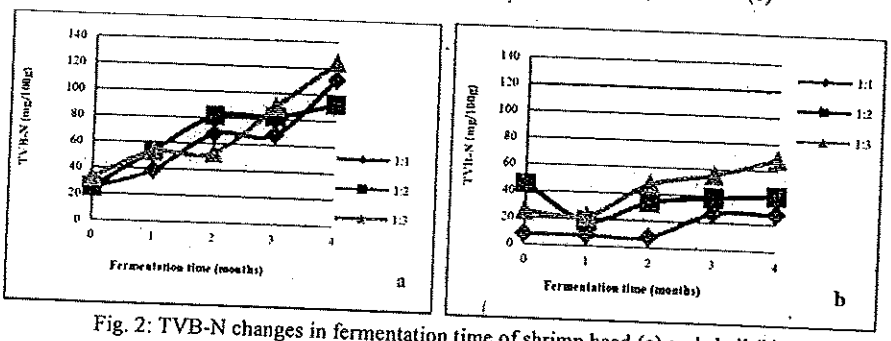


Fig. 2: TVB-N changes in fermentation time of shrimp head (a) and shell (b)

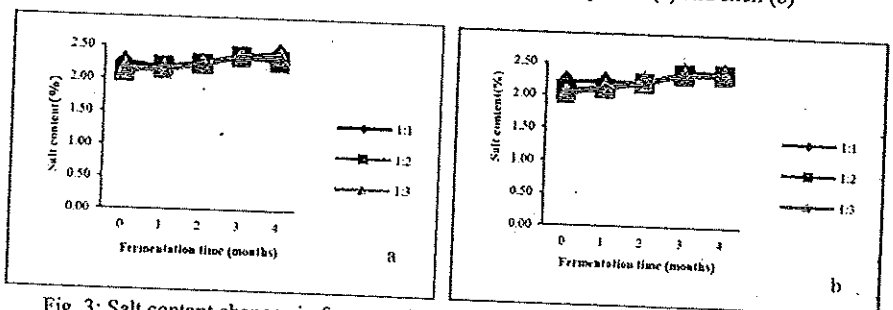


Fig. 3: Salt content changes in fermentation time of shrimp head (a) and shrimp shell (b)

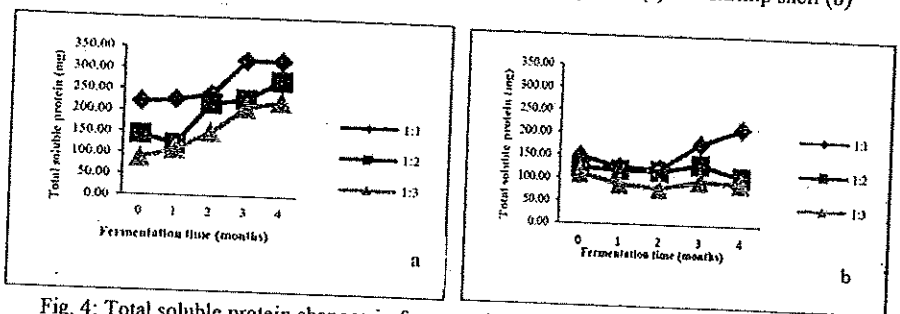


Fig. 4: Total soluble protein changes in fermentation time of shrimp head (a) and shell (b)

Total soluble protein increased as fermentation was progressed (Figure 4). This phenomenon was found in fish sauce production because of degradation of fish muscle by autolysis and bacteria [15]. The best condition for shrimp seasoning production using shrimp head and shell were at a ratio of materials to salt 1:1 for 3 and 4 months, respectively. Soluble protein content in head shrimp seasoning was higher than shell. Therefore shrimp head might be a good source for shrimp seasoning production.

3.2. Proteolytic Activity

Proteolytic activity in fermentation liquid of head shrimp fermentation was decrease when salt concentration was higher (Figure 5). After 2 months, amount of fermentation liquid was higher because of autolysis and bacterial degradation in shrimp head. Shell fermentation liquid was from bacterial degradation because it was respond to protease substrate.

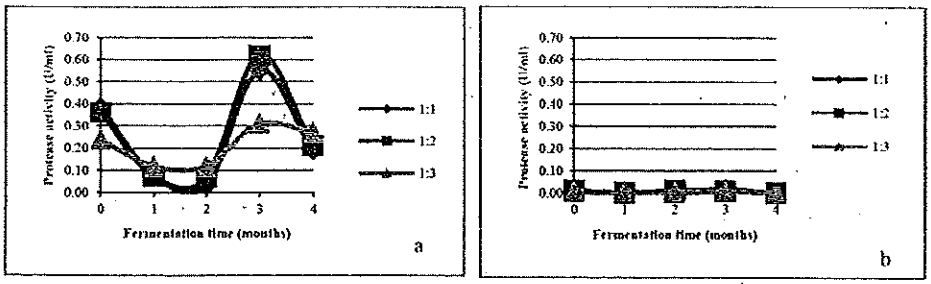


Fig. 5: Protease activity changes in fermentation time of shrimp head (a) and shell (b)

3.3. Microbiological Analysis

Amount of total bacteria was increased as fermentation time progress (Figure 6). This phenomenon related to increasing TVB-N value that indicated initial bacteria amount produced amine product. After 2 months, amount of bacteria was decreased because salt concentration (1:2 and 1:3) was higher to inhibit bacterial growth.

Amount of proteolytic bacteria was decreased as fermentation time progress (Figure 7), it may from salt concentration inhibit proteolytic bacteria growth. Lactic acid bacteria was not found in fermentation liquid. This result may be retained pH in 7.00.

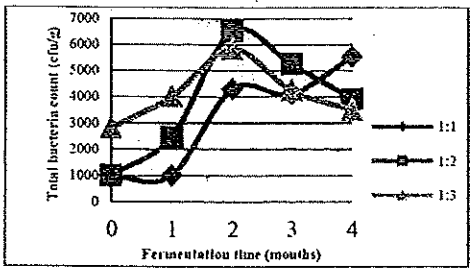


Fig. 6: Amount of total bacteria changes in fermentation time of shrimp head

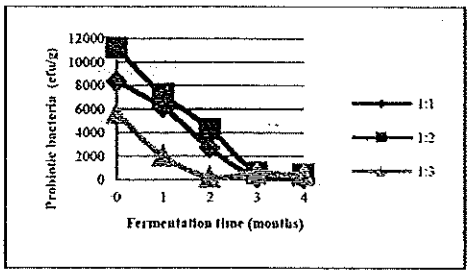


Fig. 7: Amount of probiotic bacteria changes in fermentation time of shrimp head

3.4. Color Measurement

Both of shrimp head and shell seasoning gave light yellow color ($L^* = 94.76$, $a^* = -1.77$, $b^* = 16.26$ and $L^* = 98.14$, $a^* = -0.19$, $b^* = 7.92$, respectively) even through the color was darker as fermentation time progress. The color was lighter than fish seasoning that may from different chemical composition of raw material.

3.5. Sensory Evaluation

Sensory evaluation of shrimp head seasoning was shown in Table II. Overall product liking of shrimp seasoning was lower than fish sauce. It may from quality and quantity of amino acid in shrimp waste lower than whole anchovy, fish sauce raw material.

Table II: Nine point hedonic scales for acceptance evaluation of shrimp head seasoning

	Average score ±SD	
	Control (fish sauce)	Shrimp seasoning
Color liking	6.69 ± 1.69^{a}	5.09 ± 1.57^{b}
Flavor liking	6.16 ± 1.85^{a}	2.44 ± 1.56^{b}
Saltiness intensity	6.72 ± 1.55^{a}	4.66 ± 1.84^{b}
Sweet intensity	5.84 ± 1.53^{a}	3.88 ± 1.83^{b}
Bitterness intensity	5.25 ± 2.02^{a}	3.88 ± 1.81^{b}
Overall product liking	6.56 ± 1.39^{a}	3.69 ± 1.60^{b}

4. Acknowledgements

The authors would like to thank Ongkorn Cold Storage Co., Ltd, Samutsakorn, Thailand for supporting raw materials.

5. References

[1] M.S. Heu, J.S. Kim and F. Shahidi. 2003. Components and nutritional quality of shrimp processing by-products. Food Chem. 82: 235–242.

[2] S.N. Doke and H.J. Ninjoor. 1987. Characteristics of an alkaline proteinase and exopeptidase from shrimp (*Penaeusindicus*) muscle. J. Food Sci., 52:1203–1208.

[3] F. Shahidi. and J. Synowiecki. 1991. Isolation and characterization of nutrients and value-addedproducts from snow crab (*Chinoecetesopilio*) and shrimp (*Pandalus borealis*) processing discards.J. Agri. Food Chem. 39: 1527-1532.

[4] L.J. de R. Pasqual and J.K. Babbitt. 1991. Isolation and partialcharacterization of a natural antioxidant from shrimp (*Pandalusjordani*). J. Food Sci. 56: 143–145.

[5] A. Carno-Lopez, B.K. Simpson and N.F. Haard. 1987.Extraction of carotenoprotein from shrimp process wastes withthe aid of trypsin from Atlantic cod. J. Food Sci. 52: 503–506.

[6] B.K. Simpson and N.F. Haard. 1985. The use of proteolytic enzymesto extract caratenoproteins from shrimp processing waste. J. Appl.Biochem. 7: 212–222.

[7] L. Johnson.1992. Recovery of pigments and chitin from pink shrimppeeling wastes. *In* G. J.Flick, Jr. and R. E. Martin (Eds.), Advances in seafood biochemistry, pp. 123–154. Lancaster, PA: Technomic Publishing.

[8] S. Benjakul and P.Sophanodora. 1993. Chitosan production fromcarapace and shell of balck tiger shrimp (Penaeusmonodon). AseanFood J. 8: 145–150.

[9] AOAC. 1995. Official Methods of Analysis. 16th ed. AOAC Inc. Washington, DC.

[10] K. Miwa and L. S. Ji. 1992. Laboratory manual on analytical methods and procedures for fish and fish products 2nd ed. Marine fisheries research department Southeast Asian Fisheries Development center Singapore and Japan International Cooperation Agency, Singapore.

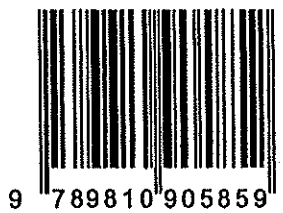
[11] O.H. Lowry, N.J. Rosebrough, A.L. Farr and R.J. Randall. 1951. Protein measurement with the folin phenol reagent. J. Biol. Chem. 193: 265-275.

[12] S. Yasumasu, I. Iuchi and K. Yamagami. 1989. Isolation and some properties of low choriolytic enzyme (LCE), a component of the hatching enzyme of the teleost, *Oryzias latipes*. J. Biochem. 105:212-218.

[13] I.L. Shih, L.G. Chen, T.S. Yu, W.T. Chang and S.L.Wang. 2003. Microbial reclamation of fish processing wastes forthe production of fish sauce.Enzyme Microbial Technol. 33: 154–162.

[14] J. Yongsawatdigul, Y.J. Choi and S. Udomporn. 2004. Biogenic amines formation in fish auce prepared from fresh and temperature-abused Indian anchovy (*Stolephorusindicus*). Food Chem. Toxicol. 69(4): 312-319.

[15] Z.E. Sikorski, S.P. Bonnie and F. Shahidi. 1994. Seafood protein. Chapman &Hall, Inc., New York.



ISBN 978-981-09-0585-9

IPCBEE Vol. 71 2014

ISSN 2010-4618, *Full text available at http://www.ipcbee.com*

0,80

International Proceedings of Chemical,

Biological & Environmental Engineering

Nutrition and Food Sciences

Volume 71

Edited by
Ms. Li Hairu

International Proceedings of Chemical, Biological & Environmental Engineering

ISSN: 2010-4618

Volumes are available in full text at *www.ipcbee.com*

IACSIT Press

International Association of Computer Science & Information Technology

Web: http://www.iacsitp.com

Singapore Office
#07-42, BLK 708
Jurong West
Street 71, Singapore
Phone: +65 81180258
E-mail: pub@iacsit.org

Hong Kong Office
Unit B on 15th Floor
EU YAN SANG Tower
Nos.11/15
Chatham Road South
Kowloon, Hong Kong.
Phone: +852-30697291
E-mail: admin@cbees.org

China Office
E12, No.51, Tengfei Street,
Qingyang District,
Chengdu, Sichuan, China
610017
Phone: +86-28-86528228
E-mail: iacsit@gmail.com

Nutrition and Food Sciences

Selected, peer reviewed papers from the
2014 3rd International Conference on Nutrition and Food Sciences
(ICNFS 2014)
June 18-20, 2014, Copenhagen, Denmark

Edited by

Li Hairu

International Association of Computer Science & Information Technology Press
Singapore Office
#07-42, BLK 708
Jurong West
Street 71, Singapore
E-mail: pub@iacsit.org, press@iacsit.org
Web: http://www.iacsitp.com

Volume 71 of
International Proceedings of Chemical, Biological & Environmental Engineering
ISSN 2010-4618

ISBN 978-981-09-0585-9

Full text available online at http://www.ipcbee.com

***Distributed** worldwide by*

International Association of Computer Science & Information Technology Press
Singapore Office
#07-42, BLK 708
Jurong West
Street 71, Singapore
E-mail: pub@iacsit.org, press@iacsit.org
Web: http://www.iacsitp.com

And in the Hong Kong by
Hong Kong Office
Unit B on 15th Floor
EU YAN SANG Tower
Nos.11/15
Chatham Road South
Kowloon, Hong Kong

Organizing Committees

Conference General Co-Chairs

Prof. Bogdan Zygmunt, Gdańsk Univeristy of Technology, Poland

Honorary Chairs

Prof. Jacek Namiesnik, Gdańsk Univeristy of Technology, Poland

Program Co-Chairs

Prof Jan Hupka, Faculty of Chemistry, Gdansk University of Technology (GUT), Poland

Prof. Maciej Bagiński, Gdańsk Univeristy of Technology, Poland

Prof. Ewa Klugman-Radziemska, Gdańsk Univeristy of Technology, Poland

Prof. Samir Mekid, King Fahd University Petroleum and Minerals, Saudi Arabia

Prof. Diana Castro Frontana, National Polytechnic Institute, School of Biological Sciences, Department of Environmental Engineering Systems, Mexico

Keat Ghee Ong, Department of Biomedical Engineering, Michigan Technological University, USA

Technical Committee

Dr. Sreenivasan Sasidharan, Universiti Sains Malaysia, Malaysia

Dr. Chuan-Liang Hsu, Tunghai University Taiwan

Dr. Kwan Kit Woo, Universiti Tunku Abdul Rahman, Malaysia

Dr.Sitthipong Nalinanon, Choakhunthaharn Rd., Ladkrabang, Thailand

Anna Rangini Chellappa, QUEEN MARY'S COLLEGE, India

Dr. Ilga Gedrovica, Latvia University of Agriculture, Latvia

Dr. Farhad Lashgarara, Islamic Azad University, Iran

Prof. Bunyarit Uyyanonvara,Thammasat University, Thailand

Se Jong Kim, Sangju Persimmon Experiment Station, Korea

Witawat Jangiam, Faculty of Engineering, Burapha Universit, Thailand

Farzana Siddique, PMAS Arid Agriculture university, Rawalpindi, Pakistan

Dr. Pradeep Balkrishna Pathak, Yeshwant Mahavidyalaya Nanded, India

Thanh-Phuong Nguyen, The Microsoft Research-University of Trento Centre for Computational and Systems Biology (COSBI), Italy

Humberto Varum, Civil Engineering Department - University of Aveiro, Portugal

Lim Hwee San, Universiti Sains Malaysia (USM), 11800 Penang, Malaysia

Hamidreza Kamalan, Islamic Azad University-Pardis Branch, Iran

Prof. Dr ASHA ARORA, B.N.P.G.Girls College, Udaipur, India

NGUYEN THI HUE, INTERNATIONAL UNIVERSITY - VNU, Vietnam

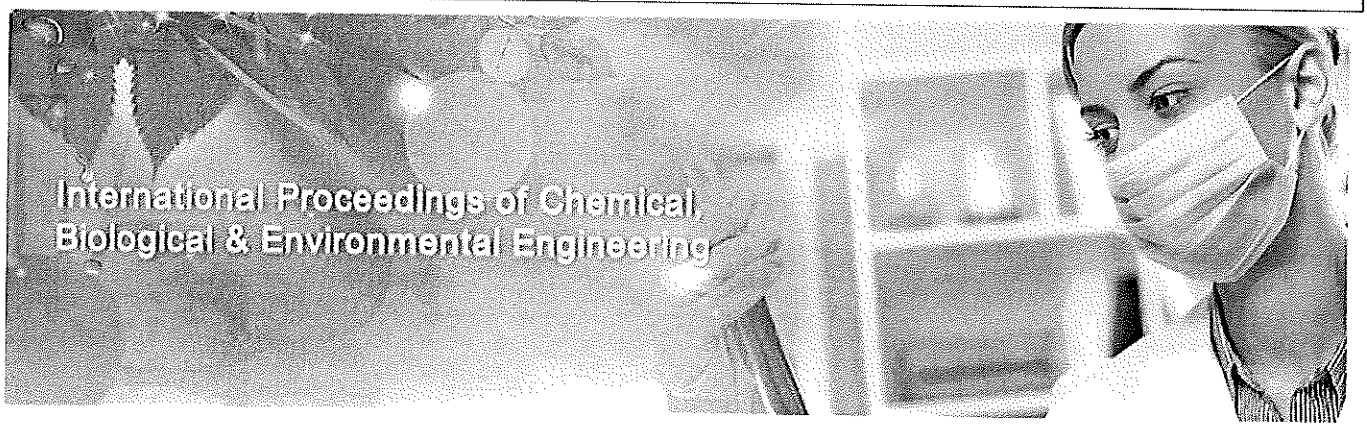
Dr. Tan Chew Khun, Universiti Tunku Abdul Rahman_(Faculty of Engineering and Green Technology)

Table of Contents

IPCBEE
ISSN: 2010-4618

All the Proceedings

International Proceedings of Chemical, Biological and Environmental Engineering



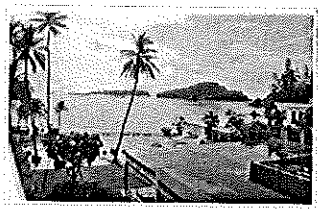
Welcome to IPCBEE

Started: April 2009
ISSN: 2010-4618
DOI: 10.7763/IPCBEE
Indexed by: EI Geobase(Elsevier), Chemical Abstracts Services (CAS), CABI, CNKI, WorldCat, Google Scholar, Ulrich's Periodicals Directory, Crossref, and Engineering & Technology Digital Library

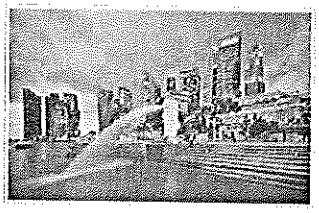
International Proceedings of Chemical, Biological and Environmental Engineering (IPCBEE) is a scholarly open access, peer-reviewed, interdisciplinary, monthly and fully refereed journal focusing on theories, methods and applications in chemical, biological and environmental engineering.

The journal aims to maintain a rapid editorial procedure and a rigorous peer-review system. The submitted articals are selected from CBEES conferences. All of the conference papers and proceedings are peer reviewed by leading expert researchers.

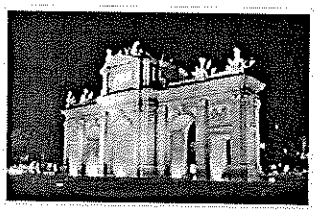
Upcoming Conferences



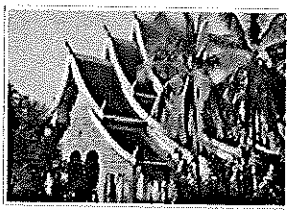
ICESR 2015
25 Dec - 26 Dec 2015
Phuket, Thailand
Submission due:15 Aug 2015



ICEST 2015
23 May - 24 May 2015
Singapore
Submission due:25 Mar 2015



ICEEB 2015
15 Jun - 16 Jun 2015
Madrid, Spain
Submission due:01 Apr 2015



ICNFS 2015
25 Jun - 26 Jun 2015
Bangkok, Thailand
Submission due:15 Feb 2015

What's New

Apr 30, 2015 News!Selected papers from ICEST 2015 will be published by IPCBEE [Click]

Apr 30, 2015 News!Volume 82 is available online now. [Click]

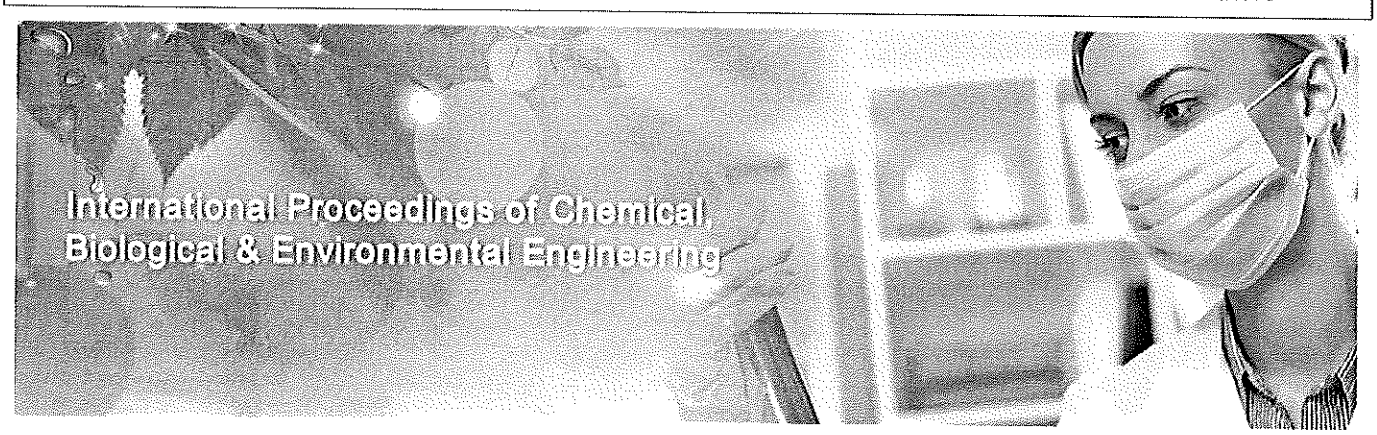
Mar 17, 2015 News!Selected papers from ICESE 2015 will be published by IPCBEE [Click]

READ MORE

Abstracting and Indexing

E-mail: pub@iacsit.org Tel./Fax:+65-31563599

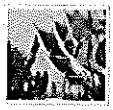
IPCBEE
ISSN: 2010-4618
International Proceedings of Chemical, Biological and Environmental Engineering



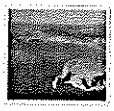
Upcoming Conferences

ICEST 2015
23 May - 24 May 2015
Singapore
Submission due:25 Mar 2015

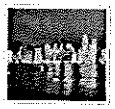
ICEEB 2015
15 Jun - 16 Jun 2015
Madrid, Spain
Submission due:01 Apr 2015



ICNFS 2015
25 Jun - 26 Jun 2015
Bangkok, Thailand
Submission due:15 Feb 2015



ICFNT 2015
29 Jul - 30 Jul 2015
Jeju Island,Republic of Korea
Submission due:10 Mar 2015



ICSEE 2015
27 Aug - 28 Aug 2015
Hong Kong
Submission due:20 Apr 2015

What News

Apr 30, 2015 News!Selected papers from ICEST 2015 will be published by IPCBEE [Click]

Apr 30, 2015 News!Volume 82 is available online now. [Click]

Mar 17, 2015 News!Selected papers from ICESE 2015 will be published by IPCBEE [Click]

Volume 71

Contents

2014 APCBEES COPENHAGEN, DENMARK CONFERENCES SCHEDULE

2014 3rd International Conference on Nutrition and Food Sciences (ICNFS 2014)
2014 3rd International Conference on Bioinformatics and Biomedical Science (ICBBS 2014)
2014 International Conference on Environmental and Engineering Geoscience (ICEEG 2014)

Copenhagen, Denmark

June 18-20, 2014

CABINN Scandinavia Hotel

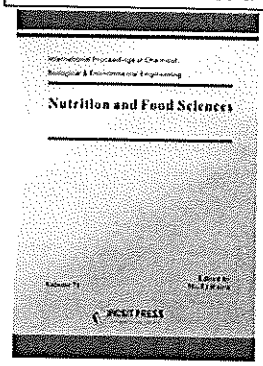
Sponsored and Published by

www.cbees.org

2014 APCBEES Copenhagen, Denmark Conferences Introduction

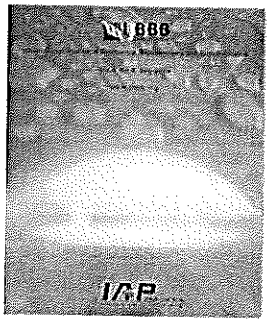
Welcome to CBEES 2014 conferences in Copenhagen, Denmark. The objective of the Copenhagen, Denmark conferences are to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Nutrition and Food Sciences, Bioinformatics and Biomedical Science, and Environmental and Engineering Geoscience.

2014 3rd International Conference on Nutrition and Food Sciences (ICNFS 2014)



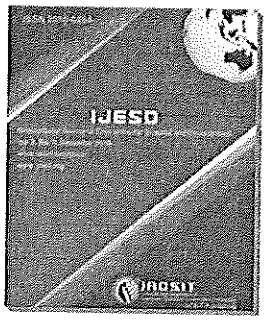
- **Paper publishing and index:** All ICNFS 2014 papers will be published in the Volume of Journal (IPCBEE, ISSN: 2010-4618), and all papers will be included in the Engineering & Technology Digital Library, and indexed by Ei Geobase(Elsevier), Ulrich's Periodicals Directory, Ulrich's Periodicals Directory, EBSCO, CNKI(中国知网), WorldCat, Google Scholar, Cross ref and sent to be reviewed by Compendex and ISI Proceedings.
- **Conference website and email: http://www.icnfs.org/; icnfs@cbees.org.**

2014 3rd International Conference on Bioinformatics and Biomedical Science (ICBBS 2014)



- **Paper publishing and index:** All papers of ICBBS 2014 will be published in the International Journal of Bioscience, Biochemistry and Bioinformatics (IJBBB, ISSN: 2010-3638), and all papers will be included in the Engineering & Technology Digital Library, and indexed by EBSCO, WorldCat, Google Scholar,Cross ref, ProQuest and sent to be reviewed by Ei Compendex and ISI Proceedings.
- **Conference website and email: http://www.icbbs.org/; icbbs@cbees.org.**

2014 International Conference on Environmental and Engineering Geoscience (ICEEG 2014)



- **Paper publishing and index:** All ICEEG 2014 papers will be published in the Journal of Environmental Science and Development (IJESD, ISSN:2010-0264), and all papers will be included in the Engineering & Technology Digital Library, and indexed by EBSCO, WorldCat, Google Scholar, Cross ref, ProQuest, CABI and sent to be reviewed by EI Compendex and ISI Proceedings.
- **Conference website and email: http://www.iceeg.org/; iceeg@cbees.net.**

Excellent Paper Award

- One excellent paper will be selected from each oral presentation sessions, and the Certificate for Excellent Papers will be awarded at the end of each session on June 19, 2014.

Instructions for Oral Presentations

Devices Provided by the Conference Organizer:

Laptops (with MS-Office & Adobe Reader)
Projectors & Screen
Laser Sticks

Materials Provided by the Presenters:

PowerPoint or PDF files (Files shall be copied to the Conference Computer at the beginning of each Session)

Duration of each Presentation (Tentatively):

Regular Oral Presentation: about 8 Minutes of Presentation and 2 Minutes of Q&A
Keynote Speech: 30 Minutes of Presentation and 10 Minutes of Q&A

Morning, June 19, 2014 (Thursday)

SESSION–1 (ICNFS 2014)

Venue: Rooms Plenum

Session Chair: Prof. Anders Permin

Time: 10:20am-12:30pm

A0005	Seasoning Sauce Fermentation Using Tuna Processing Waste Chawin Aungkatawiwat, Nichaphat Detkamhaeng and **Jirapa Hinsui** Kasetsart University *Abstract*—Tuna viscera were sources of enzyme and protein in tuna processing waste. The objective of this research was to produce seasoning sauce using tuna processing waste. Skipjack viscera were fermented in 0, 5 and 10% salt at room temperature. The 0% salt fermentation contained higher protein content than the sample at 5 and 10%, respectively. The best conditions for skipjack viscera fermentation were 0% salt for 5 days. The seasoning sauce contained amounts of crude protein, salt and fat of 18.62±0.14, 1.83±0.99 and 0.59 ± 0.24%, respectively. It contained essential amino acids, histidine, isoleucine, leucine, lysine, methionine, phenylalanine and tryptophane. The level of histamine (267.66 mg / kg) was below the level the safe level for human consumption. The seasoning sauce was brownish-yellow color which was different from anchovy fish sauce.
A0007	The Potential Effect of Fruits and Vegetables on Liver Functions and Liver Alterations Induced by Acrylamide in Mice Hala M Nagi, Walaa S M Amin and **Shafika A Zaki** Department of Food Science, Faculty of Agriculture, Cairo University, Giza, Egypt *Abstract*—The study aimed to assess the effect of some dried fruits and vegetables on liver functions and alterations against acrylamide that administered for Swiss adult male albino mice. A total of 49 mice (25±2g) were divided to seven groups. First group was considered as negative normal. The remaining mice were subjected for oral administration of 40 µg acrylamide / kg body weight daily for 8 weeks. Group 2 was considered as positive control. First and Second groups were fed on basal diet. Groups 3, 4, 5, 6 and 7 were given basal diets with 20% of with raisins, apricot, figs, tomato and carrot, respectively. Inverse associations were observed between the consumption of vegetables and fruits and liver changes. These diets significantly reduced the activity of transaminases (ALT and AST) and Liver histopathological alterations compared to positive control.
A0008	Prediction of Metabolized Sugar Levels from the IAUC (incremental area under the curve) of Rats **Seongweon Jeong**, Jongchan Kim and Jungmin Ha Korea Food Research Institute *Abstract*—Modern people's nutrient intakes in life are much higher than levels typically required. The excessive sugars in processed foods are being recognized as serious social problems and it has become important to predict the metabolized sugar levels in blood. In this study, the modified measurement methods of ISO 26642 international standard

	level of agreement was achieved (κ = 0.426, P = 0.000). **Conclusions:** Both tests correlated with each other with respect to age, LOS, and anthropometric and laboratory data in hospitalized patients. Therefore, these two techniques can be used for nutritional assessment in QHSC patients.
A1018	Evaluation of Heavy Metals Contamination and Assessment of Mineral Nutrients in Poultry Liver Using Inductively Coupled Plasma-Mass Spectrometry **Oana-Mărgărita Ghimpeţeanu**, Cristina Ţoca, Florin Furnaris, Manuella Militaru University of Agronomical Sciences and Veterinary Medicine of Bucharest, Faculty of Veterinary Medicine *Abstract*—The aim of this study was to perform a short characterization of heavy metals and mineral nutrients concentration in poultry liver samples with macroscopic lesions and their possible effect on food safety. Thirty-eight poultry liver samples with macroscopic lesions were submitted to analysis. Heavy metals (Cd, Pb, Al) and mineral nutrients (Cr, Mn, Cu, Fe, Zn, Ca, Mg, K, Na) were determined by ICP-MS. The concentrations for heavy metals ranged from 0,1 to 1,29 mg/kg for Cd, 0,02 to 0,08 mg/kg for Pb and 0,13 to 8,85 mg/kg Al. For mineral nutrients, concentrations ranged from 0,13 to 2,66 mg/kg for Cr; 0.24 to 1,08 mg/kg for Mn; 0.74 to 2,92mg/kg for Cu; 14,11 to 54,65 mg/kg for Fe; 4,37 to 17,86 mg/kg for Zn, 43,2 to 199,51 mg/kg for Ca, 78,35 to 275,81 mg/kg for Mg, 989,54 to 3108,65 mg/kg for K, 276,28 to 1059,16 mg/kg for Na. Although it is known that people ingest heavy metals from animal products, the concentrations obtained in this study showed that there is no risk for human health linked to the consumption of poultry liver.
A1019	Effect of Marinating on Formation bf Polycyclic Aromatic Hydrocarbons in Grilled Chicken Meat **Afsaneh Farhadian**, Jinap Selamat and Faridah, Abass University Malaysia S abah *Abstract*—The study was conducted to investigate the effect of marinating on the formation of Polycyclic Aromatic Hydrocarbons in grilled chicken meat. Seven marinade treatments containing Basic marinade (mix of sugar, water, onion, turmeric, lemongrass, salt, garlic, coriander and cinnamon); Basic-oil marinade (the common marinade treatment for satay in Malaysia); Commercial marinade (packed powder of the satay marinade available in the local grocery stores); Basic-lemon marinade; Basic-oil-lemon marinade; Basic-oil-tamarind; and Commercial-tamarind marinade at four time intervals (0, 4, 8 and 12 hr) were applied to meat samples before charcoal grilling. Tandem solid-phase extraction (SPE) was used to clean the samples. A high performance liquid chromatography (HPLC-Fl) was used for PAHs analysis. Acidic marinade (addition of lemon juice to the basic marinade) showed the most important and significant effect on the lower concentration of PAHs formation. The study showed significant reduction (27% to 60%) of sum of three PAHs formation by basic-lemon juice marinating followed by commercial-tamarind, basic-oil-tamarind and basic-oil-lemon juice marinating.
A1021	Chemical and Microbiological Changes during Shrimp Seasoning Fermentation Using Seafood Processing Waste **Potjanan Reerueangchai**, Yardrung Suwannarat and Jirapa Hinsui

	Kasetsart University *Abstract*—Shrimp processing industries generate a lot of waste such as head and shell in each year. Objective in this research was to study chemical and microbiological changes during shrimp seasoning fermentation. Shrimp head and shell were fermented at various ratios of materials to salt (1:1, 1:2 and 1:3) at room temperature for 4 months. Shrimp seasoning was sampled every month to determine soluble protein, salt content and pH. The pH of shrimp seasoning was around 7.00 and salt content was 2.0-2.5% for all fermentation period. Soluble protein increased as fermentation time was progressed. The best condition for shrimp seasoning production using shrimp head and shell were at a ratio of materials to salt 1:1 for 3 and 4 months, respectively. Soluble protein content in head shrimp seasoning was higher than shell. Therefore shrimp head might be a good source for shrimp seasoning production.
A1028	Effect of Freeze-Dried Celery Products on the Glutamic Acid Content in Model Meat Systems under Different Ripening Conditions Viktorija Eisinaitė, **Rimantė Vinauskienė**, Ina Jasutienė, Daiva Leskauskaitė Kaunas University of Technology *Abstract*—The effect of celery products (3 %), starter culture and ripening conditions on pH and free glutamic acid content in model meat system were evaluated. For that reason model meat system from minced pork, lyophilized celery products and starter cultures were formulated and ripened at different conditions. It was determinated that carbohydrates presented in celery products and higher temperature (20 – 24 °C) influenced the faster decrease of pH in model meat system. Ripening process for 10 hours at +8 °C was too short for protein degradation and free glutamic acid formation. Due to the action of starter culture and endogenous meat enzymes free glutamic acid content increased in 4 – 5 times after 4 days of ripening at 20 – 24 °C temperature. Added freeze-dried celery products did not affect glutamic acid content.

12:30pm-1:30pm	**Lunch**

Afternoon, June 19, 2014 (Thursday)

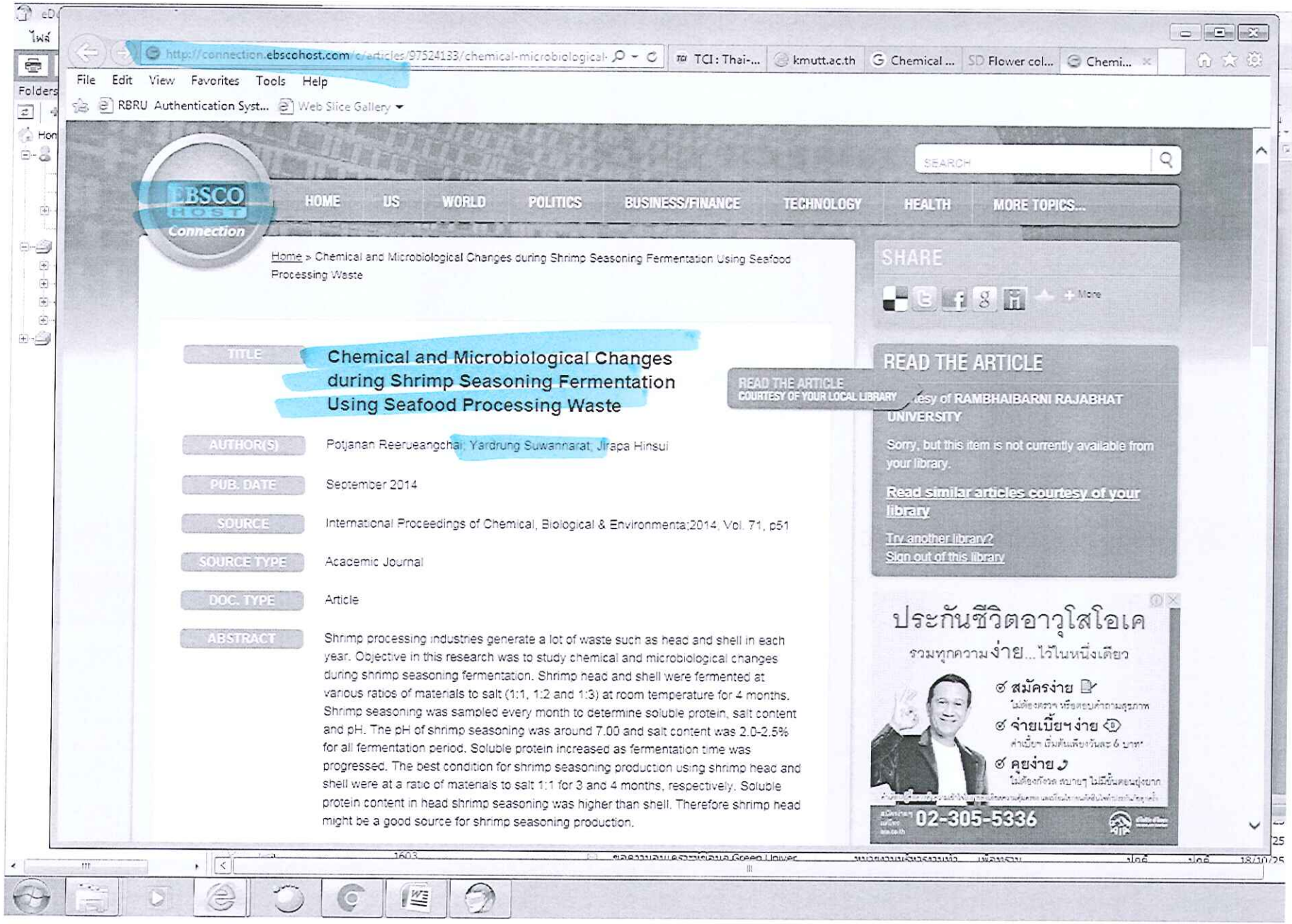
SESSION–2 (ICNFS 2014&ICEEG 2014)

Venue: Rooms Plenum

Session Chair: Prof. Shafika A Zaki

Time: 1:30pm-3:50pm

A1022	Evolutions of β-carotene and Lycopene in a Natural Food Colorant from Gac (Momordica cochinchinensis Spreng) Arils during Drying **Yardfon Tanongkankit**, Thammanoon Sutthaphan, Jutarut Kaewmanas, Poonpat Poonnoy and Kanjana Narkprasom Maejo University *Abstract*—The use of a natural food colorant is recently of interest from the health benefit


http://connection.ebscohost.com/c/articles/97524133/chemical-microbiological-
File Edit View Favorites Tools Help
RBRU Authentication Syst... Web Slice Gallery
EBSCO HOST Connection
HOME US WORLD POLITICS BUSINESS/FINANCE TECHNOLOGY HEALTH MORE TOPICS...
SEARCH
Home » Chemical and Microbiological Changes during Shrimp Seasoning Fermentation Using Seafood Processing Waste
SHARE
TITLE
Chemical and Microbiological Changes during Shrimp Seasoning Fermentation Using Seafood Processing Waste
AUTHOR(S)
Potjanan Reerueangchai; Yardrung Suwannarat; Jirapa Hinsui
PUB. DATE
September 2014
SOURCE
International Proceedings of Chemical, Biological & Environmenta;2014, Vol. 71, p51
SOURCE TYPE
Academic Journal
DOC. TYPE
Article
ABSTRACT
Shrimp processing industries generate a lot of waste such as head and shell in each year. Objective in this research was to study chemical and microbiological changes during shrimp seasoning fermentation. Shrimp head and shell were fermented at various ratios of materials to salt (1:1, 1:2 and 1:3) at room temperature for 4 months. Shrimp seasoning was sampled every month to determine soluble protein, salt content and pH. The pH of shrimp seasoning was around 7.00 and salt content was 2.0-2.5% for all fermentation period. Soluble protein increased as fermentation time was progressed. The best condition for shrimp seasoning production using shrimp head and shell were at a ratio of materials to salt 1:1 for 3 and 4 months, respectively. Soluble protein content in head shrimp seasoning was higher than shell. Therefore shrimp head might be a good source for shrimp seasoning production.
READ THE ARTICLE
READ THE ARTICLE COURTESY OF YOUR LOCAL LIBRARY
READ THE ARTICLE
courtesy of RAMBHAIBARNI RAJABHAT UNIVERSITY
Sorry, but this item is not currently available from your library.
Read similar articles courtesy of your library
Try another library?
Sign out of this library
ประกันชีวิตอาวุโสโอเค
รวมทุกความง่าย... ไว้ในหนึ่งเดียว
สมัครง่าย
จ่ายเบี้ยฯ ง่าย
คุยง่าย
02-305-5336

เอกสารแนบท้ายประกาศ

วารสารทางวิชาการที่เป็นไปตามหลักเกณฑ์ที่ ก.พ.อ. กำหนด ได้แก่ วารสารที่มีชื่ออยู่ในฐานข้อมูลที่เป็นที่ยอมรับในระดับชาติและระดับนานาชาติ ดังต่อไปนี้

๑. ฐานข้อมูลระดับนานาชาติ

- Academic Search Premier (http://www.ebsco.com/home)
  (select ebscohost and then academic search premier)
- Agricola (http://agricola.nal.usda.gov)
- BIOSIS (http://www.biosis.org)
- CINAHL (http://www.ebscohost.com/academic/cinahl-plus-with-full-text)
- EiCOMPENDEX (http://www.ei.org)
- ERIC (http://www.eric.ed.gov/)
- H.W.Wilson (http://www.ebscohost.com)
  (select ebscohost and then H.W.Wilson)
- Infotrieve (http://www.infotrieve.com)
- Ingenta Connect (http://www.ingentaconnect.com)
- INSPEC (http://www.theiet.org/publishing/inspec)
- MathSciNet (http://www.ams.org/mathscinet)
- MEDLINE/Pubmed (http://www.ncbi.nlm.nih.gov/pubmed/)
- PsycINFO (http://www.apa.org/pubs/databases/psycinfo/index.aspx)
- Pubmed (http://www.ncbi.nlm.nih.gov/pubmed/)
- ScienceDirect (http://www.sciencedirect.com)
- SciFinder (https://scifinder.cas.org/)
- Scopus (http://www.info.scopus.com)
- Social Science Research Network
  (http://papers.ssrn.com/sol3/DisplayAbstractSearch.cfm)
- Web of Knowledge (http://wokinfo.com)

๒. ฐานข้อมูลระดับชาติ ได้แก่ ศูนย์ดัชนีการอ้างอิงวารสารไทย (Thai Journal Citation Index -- TCI) เฉพาะวารสารที่มีชื่ออยู่ในกลุ่มที่ ๑ และกลุ่มที่ ๒ (http://www.kmutt.ac.th/jif/public_html/list%20journal.php)

หมายเหตุ กรณีที่มีการเปลี่ยนแปลงชื่อฐานข้อมูล ก.พ.อ. จะได้มีการประกาศเพิ่มเติมต่อไป