2019 9th International Conference on Environment Science and Biotechnology (ICESB 2019)

December 28-30, 2019

Phuket, Thailand

Sponsored by

Published and Indexed by

www.icesb.org | www.cbees.org
Conference Venue

Patong Merlin Hotel

Address: 44 Thawewong Rd, Tambon Patong, Amphoe Kathu, Chang Wat Phuket, Thailand, 83150
Tel: +66(0)76 349888-9 Fax: +66(0)76 340394
www.merlinpatong.com

The Patong Merlin Hotel is only five-minute walk from the Andaman Sea and Patong beachfront, the most lively holiday destination in Phuket. Patong is a sprawling city backed by lush mountains with a beautiful 3.5 kilometre white sand beach. It is a centre for shopping and nightlife with the famous Bangla Road walking street attracting crowds of visitors each evening to enjoy the vibrant entertainment, bars and nightclubs.

Nearby Attractions

- Hard Rock Café: 200m
- Patong Beach: 450m
- Jungceylon Shopping: 900m
- Bangla Road nightlife: 1km
- Banana Walk Shopping Mall: 1km
- Phuket Old Town: 13km
- Phuket International Airport: 34km

The organizer won't provide accommodation, we suggest you make an early reservation, since December is peak season in Phuket. Thank you!
# Table of Contents

2019 Phuket Conference Introductions .................................................. 4  
Presentation Instructions .................................................................. 5  
Brief Schedule for Conference .............................................................. 6  
Keynote Speaker Introductions ............................................................... 8  
Session 1 Oral Presentations ................................................................. 13  
L8012 Presentation 1 (13:30~13:45) ....................................................... 13  
L9002 Presentation 2 (13:45~14:00) ....................................................... 14  
L5009 Presentation 3 (14:00~14:15) ....................................................... 15  
L9001 Presentation 4 (14:15~14:30) ....................................................... 16  
L5008 Presentation 5 (14:30~14:45) ....................................................... 17  
L5010 Presentation 6 (14:45~15:00) ....................................................... 18  
L5005 Presentation 7 (15:00~15:15) ....................................................... 19  
L5006 Presentation 8 (15:15~15:30) ....................................................... 20  
Session 2 Oral Presentations ................................................................. 21  
L8002 Presentation 1 (15:50~16:05) ....................................................... 21  
L8003 Presentation 2 (16:05~16:20) ....................................................... 22  
L5004 Presentation 3 (16:20~16:35) ....................................................... 23  
L8004 Presentation 4 (16:35~16:50) ....................................................... 24  
L8010 Presentation 5 (16:50~17:05) ....................................................... 25  
L6012 Presentation 6 (17:05~17:20) ....................................................... 26  
L8006 Presentation 7 (17:20~17:35) ....................................................... 27  
L8005 Presentation 8 (17:35~17:50) ....................................................... 28  
One Day Visit .................................................................................... 29  
Note ................................................................................................... 31
Phuket Conference Introductions

Welcome to 2019 HKCBEES Phuket conference. This conference is organized by HKCBEES. The objective of the Phuket conference is to bring together innovative academics and industrial experts in the field of environment science and biotechnology to a common forum.

2019 9th International Conference on Environment Science and Biotechnology (ICESB 2019)

Accepted papers will be published in the following journal:
International Journal of Environmental Science and Development (IJESD) (ISSN: 2010-0264), and all papers will be indexed by Scopus (Since 2019), Chemical Abstracts Services (CAS), CABI, Ulrich Periodicals Directory, Electronic Journals Library, Crossref, ProQuest.

Conference website and email: http://www.icesb.org/; icesb@cbees.org
Presentation Instructions

Instructions for Oral Presentations

Devices Provided by the Conference Organizer:
Laptop Computer (MS Windows Operating System with MS PowerPoint and Adobe Acrobat Reader)
Digital Projectors and Screen
Laser Sticks

Materials Provided by the Presenters:
PowerPoint or PDF Files (Files should be copied to the Conference laptop at the beginning of each Session.)

Duration of each Presentation (Tentatively):
Regular Oral Presentation: about 10 Minutes of Presentation and 5 Minutes of Question and Answer
Keynote Speech: about 40 Minutes of Presentation and 5 Minutes of Question and Answer

Best Presentation Award
One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on December 29, 2019.

Dress code
Please wear formal clothes or national representative of clothing.
# Brief Schedule for Conference

<table>
<thead>
<tr>
<th>Day 1</th>
<th>December 28, 2019 (Saturday)</th>
<th>10:00~17:00</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Venue: Patong Merlin Hotel Lobby</td>
<td>Participants Onsite Registration &amp; Conference Materials Collection</td>
</tr>
</tbody>
</table>

#### Day 2

<table>
<thead>
<tr>
<th>December 29, 2019 (Sunday)</th>
<th>9:30~17:50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrival Registration, Keynote Speech, Conference Presentation</td>
<td></td>
</tr>
</tbody>
</table>

## Morning Conference

**Venue:** Pikul Room

### Opening Remarks

9:30~9:35

Prof. Orawan Siriratpiriya
Environmental Expert Aquatic Resources Research Institute, Chulalongkorn University, Bangkok, Thailand

### Keynote Speech I

9:35~10:20

**Topic:** “A Comparative Review of Catalytic and Fast Hydrothermal Liquefactions”
(Prof. Khanh-Quang Tran, Norwegian University of Science and Technology, Trondheim, Norway)

### Coffee Break & Group Photo Taking

10:20~10:40

### Keynote Speech II

10:40~11:25

**Topic:** “Environmental Science Approached Closed Agro-waste Loop Enhancing Circularity”
(Prof. Orawan Siriratpiriya, Environmental Expert Aquatic Resources Research Institute, Chulalongkorn University (ARRIC), Bangkok, Thailand)

### Keynote Speech III

11:25~12:10

**Topic:** “Technological Development for the Commercial Production of Crocodile Bile”
(Assoc. Prof. Win Chaeychomsri, Kasetsart University, Bangkok, Thailand)

### Lunch 12:10~13:30

**Venue:** SeaSide Terrace
(All the participants will go to the catering site together)

## Afternoon Conference

**Venue:** Pikul Room

**Session Chairs:** Prof. Orawan Siriratpiriya | Assoc. Prof. Natdhera Sanmanee

**Session 1:** 13:30~15:30

8 presentations-Topic: “Agricultural Science and Environmental Engineering”
Coffee Break 15:30~15:50  
Session Chair: Assoc. Prof. Win Chaeychomsri  
**Session 2**: 15:50~17:50  
8 presentations-Topic: “Food Engineering and Biotechnology”

Dinner 18:00  
Venue: SeaSide Terrace  
(All the participants will go to the catering site together)

Tips: Please arrive at the conference to upload or copy PPT into the laptop room 10 minutes before the session begins.  
Note: (1) The registration can also be done at any time during the conference.  
(2) The organizer doesn’t provide accommodation, and we suggest you make an early reservation.  
(3) One Best Presentation will be selected from each presentation session, and the Certificate for Best Presentation will be awarded at the end of each session on December 29, 2019.

For the personal and property safety of the participants, please pay attention to notes below:  
1-Please take care of your belongings all the time in case of any loss.  
2-Participants are required to wear the conference representative card near the conference venue, please do not lend the representative card to the irrelevant people and not "carry" irrelevant people into the venue.  
3-The organizer is not responsible for the loss of participants.
Keynote Speaker Introductions

Keynote Speaker I (9:35~10:20)

Prof. Khanh-Quang Tran
Norwegian University of Science and Technology, Trondheim, Norway

Dr. Quang Khanh Tran obtained both of his PhD and MSc in Chemical Engineering from Chalmers University of Technology, Gothenburg, Sweden. After serving a number of postdoctoral positions in various countries including the UK, Finland, and Sweden. In 2007 Dr. Tran moved to Norway and has become full professor of the Department of Energy and Process Engineering, Norwegian University of Science and Technology since 2014. His research areas are among others including hydrothermal processing of biomass for production of biofuels and chemicals, and Supercritical Water Oxidation (SWO) for wastewater treatment with energy recovery. He has published more than 100 papers and book chapters, of which more than 65 are in reputed international journals indexed by Scopus with the h-index of 23.


Abstract—Hydrothermal liquefaction (HTL) is a promising technology for valorization of low-grade wet lignocellulosic material and biomass residues. However, its applications are limited due to the relatively low conversion efficiency and product selectivity. One way to overcome these limitations are to add catalysts to the process. An alternative approach is to employ fast heating in combination with short reaction time. In this mini review, these two approaches are presented, analyzed, and compared in connection with the Process Intensification theory.

Coffee Break & Group Photo Taking 10:20~10:40
Keynote Speaker II (10:40–11:25)

Prof. Orawan Siriratpiriya
Environmental Expert Aquatic Resources Research Institute, Chulalongkorn University, Bangkok, Thailand

EDUCATION
1990 Cert. in Environmental Management Specialized in Risk Assessment and Analysis, UNEP/Tufts University, USA.
1984 Research Dip. in Environmental Science, The Agricultural University of Norway, NORWAY.
1979 M.Sc. (Environmental Science-Soil) Kasetsart University, Bangkok, THAILAND
1976 B.Ed. (Chemistry-Biology) Chulalongkorn University, Bangkok, THAILAND

RELATED EXPERIENCES
1. Working experience in environmental research as principal investigator, project director/integrator/manager/coordinator, lecturer and thesis adviser at The Environmental Research Institute, Chulalongkorn University (1979-2014).
2. Expert in Environmental Impact Assessment (License) of Juristic Person ‘Chulalongkorn University’ (1991-present)
6. APRU Fellow, 5th APRU (Association of Pacific Rim Univ.) Fellow Program 2004 on Globalization and the Environment: Multidisciplinary Perspective” at Univ. of California Santa Barbara, Santa Barbara, USA. and Osaka University, Osaka, Japan. (2004)
Abstract—Circularity refers to a circular economy aimed at eliminating waste and continual use as a resource for another product. Circular systems employ reduce, reuse, and recycling to create a close-loop system leading to the use of resource inputs with less creation of waste, pollution and carbon emissions. Agro-waste can be utilized as material supply, nutrient elements for plant growth, carbon sequestration into the soil, capture CO2 via photosynthesis and accumulation of CO2 as carbon fixed in the plant biomass. Besides, become food for another process, either a by-product or recovered resource for another industrial process, or regenerative resources for nature, e.g., compost. Green productivity as coined by acceptance waste equals food. The innovative technologies have to be deployed safely and managed their risks properly. Closed-loop systems are the conceptualization of integrated approach to manage the entire life cycle of resources as a philosophy driven zero waste signified waste as a resource lead to developing technologies and innovations about turning the materials recovered from waste into new products provided similar environmental quality and benefits. Fact-finding through the environmental science approach and realized how the natural environment is treated brings about clarify and open-ended the value loaded natural environment with accountability in the working process and enhancing circularity.
Keynote Speaker III (11:25~12:10)

Assoc. Prof. Win Chaeychomsri
Kasetsart University, Bangkok, Thailand

Assoc. Prof. Win Chaeychomsri received a Bachelor’s Degree in Biology, Master’s Degree in Tropical Medicine, and Doctoral Degree in Animal Biotechnology. He has been a lecturer in Department of Zoology, Faculty of Science, Kasetsart University since 1994. He is an outstanding lecturer in research and innovation. His current research interests are in the fields of parasitology, immunology and animal biotechnology. He has authored books, published more than 100 technical papers in various journals and conference proceedings. He gets 3 petty patents and 2 patents. These petty patents and patents involve the production technology of freeze-dried crocodile blood that will be used as dietary supplement for health improvement. In addition, he is in an ongoing effort trying to develop new products from crocodile bile and bone for health maintenance and also crocodile oil products for health promotion and skin treatment.
Abstract—Bile is a dark green to yellowish brown fluid, produced by the liver and stored in the gall bladder. Crocodile bile has historically proven its value as a source of traditional medicine. Traditionally, crocodile bile is the dried gall bladder of Siamese crocodile (*Crocodylus siamensis*). Dried gall bladder or bile has been used in Traditional Chinese Medicine for the treatment of asthma, laryngitis, acute and chronic bronchitis. Modern scientists have demonstrated that bile has a wide range of pharmacological activity with little toxicological side effect. Accumulating research evidence has indicated that crocodile bile exhibits inhibitory effects on cancer cells and may have therapeutic potential for the treatment of human cancer. However, traditional processing method such as sun drying is not permitted for exports of crocodile bile products due to food safety concern. The present study provides information on technological development for the commercial production of crocodile bile with the goal to ensure the product quality, and also consumer safety. The products were derived wholly from captive Siamese crocodile bile (SCB), containing 100% natural ingredients and no artificial preservatives added. The bile collecting and freeze-drying processes of SCB were designed and developed. Due to the bitter taste of bile that may induce vomiting, the freeze-dried SCB products were packed in capsules, testing for microbial and heavy metal contamination. The results showed that freeze-dried SCB products had no microbial and heavy metal contamination. The acute, sub-chronic and chronic oral toxicity studies of freeze-dried SCB were performed in Sprague Dawley rats according to the Organisation for Economic Co-operation and Development (OECD) guidelines. The results of this study were used to determine the no-observed-adverse-effect level (NOAEL) of freeze-dried SCB in rats. No significant histopathological changes were observed in the treated rats. Thus, it can be concluded that freeze-dried SCB is absent of the oral toxicity. According to the results obtained in this study, effective production of SCB can be achieved by freeze-drying technology. Most importantly, the products are safe since they have no microbial contamination and no adverse effects associated with long-term treatment.
Session 1

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

December 29, 2019 (Sunday)

Time: 13:30~15:30

Venue: Pikul Room

8 presentations- Topic: “Agricultural Science and Environmental Engineering”

Session Chairs: Assoc.Prof.Natdhera Sanmanee | Prof.Orawan Siriratpiriya

L5006 Presentation 1 (13:30~13:45)

Effect of Composting on the Cu Speciation in Cow-Based Compost using BCR Sequential Extraction

Natdhera Sanmanee and Sirichai Nubdee

Silpakorn University, Bangkok, Thailand

Abstract—Compost derived from cow-based manure mixed with agricultural waste was studied for four Cu fractions: exchangeable fraction (Cu-Ex), oxide-bound fraction (Cu-Ox), organically-bound fraction (Cu-Org), and residual fraction (Cu-Res). Cu-Res was found the most for entire process of composting within the range of 68.6-97.1% following by Cu-Org, Cu-Ex, and Cu-Ox indicating the high preference of more stable forms. As the organic matters were decomposed, the mobility of Cu increased corresponding with time (p<0.01) especially after reaching mature stage at day 35. Thus, composting process helped to increase the amounts of Cu. Nevertheless, using the compost to the field still needed to consider other characteristics, such as organic matter and other nutrients which should not be depleted by microorganism under too long composting.
Session 1

December 29, 2019 (Sunday)

Time: 13:30~15:30

Venue: Pikul Room

8 presentations- Topic: “Agricultural Science and Environmental Engineering”

Session Chairs: Assoc.Prof.Natdhera Sanmanee | Prof.Orawan Siriratpiriya

L9002 Presentation 2 (13:45~14:00)

D.P. Indoor Intensive Aqua-Culture Facility (IACF)

Bar Eytan, Eyal Dotan, Li Xu, Fenglin Yang

Guangzhou EWA Technologies, Science City Guangzhou, Guangdong, China

Abstract—D.P. IACF technology is fully controlled, able to stimulate growth conditions of most fishes, crabs and shellfish of economic interest. The D.P. IACF operated as Recycling Aquaculture System (RAS) with 0-5% water discharge and therefore it has no environmental impact, low dependence on continue water supply so it could be located inland in arid zone. The D.P. IACF was designed and construct as set of water-pools in a way that each pool is separate individual ecosystem and therefore applicable for variety aquaculture systems and methods (extensive, intensive, recirculated) to increase its sustainability, while pools size could be verified from 30 to 300MC each with annual production ranging from 300 to 20,000 tons (for example, Salmon biomass density is about 50kg/m3) and electricity consumption is less than 50% of alternative IACF systems (for example, Salmon 0.65kWh/m3). D.P. systems could design for existing infrastructure to minimize infrastructure expenses and due to the high growth density and low investment cost ROI is 3 to 3.5 years only. The low Environmental finger print, low water consumption, flexibility of design, independency of the individual pools, the sophisticate controlling enable stimulation of various natural growth conditions make the D.P IACF attractive solution for aquaculture for small and big farms in Asia and Africa.
Effect of Flood Disaster and Long Term Changes during 2011 to 2018 on Community Structure of Zooplankton in the Inner Gulf of Thailand

Porntep Punnarak, Pramot Sojisuporn, Hattaya Jitrapat and Ajcharaporn Piumsomboon

Aquatic Resources Research Institute, Chulalongkorn University, Bangkok, Thailand

Abstract—This study of community structure of zooplankton in the Inner Gulf of Thailand was initiated in late 2011 in response to a major flood disaster event and continued intermittently to 2018. Six cruises with 13-20 replicate stations/cruise, provided data for contour maps of zooplankton, nutrients, water hydrography, pigments and algae; this manuscript utilized this diverse data set to focus on mesozooplankton. Immediately after the flood, November 2011, mesozooplankton communities were dominated by calanoid copepods with contributions of about 78% of the total. This changed in 2012 to 2018 which the proportion of calanoid copepods was decreased while the other zooplankton such as hydromedusae, polychaete larvae, barnacle nauplii, pelagic shrimp (Lucifer sp. and protozoa) and chaetognaths were increased. The density of mesozooplankton varied between 1.70 x 104 to 1.26 x 106 ind./100 m3 with noticeably high densities near the four river mouths that flow into Inner Gulf. Distribution patterns of mesozooplankton emerged that are likely similar to the long-term patterns of this region which effected by water circulation in the Inner Gulf of Thailand. However, high density of zooplankton in November 2012 and October 2017 appeared along the north-eastern coast and may be related to the availability of food (i.e., algae). Zooplankton abundances in the Inner Gulf of Thailand were significantly correlated with environmental parameters mainly temperature, salinity and food supplies as represented by chlorophyll a concentrations.
Session 1

December 29, 2019 (Sunday)

Time: 13:30~15:30

Venue: Pikul Room

8 presentations- Topic: “Agricultural Science and Environmental Engineering”

Session Chairs: Assoc.Prof. Natdhera Sanmanee | Prof. Orawan Siriratpiriya

L9001 Presentation 4 (14:15~14:30)

Holistic System for Granulated Organic Turning Agricultural Waste to Fertilizer Production
High Quality Granulated Organic Fertilizer

Bar Eytan, Li Xu, Yang Fenglin, Wu Candy

Guangzhou EWA Technologies, Science City Guangzhou, Guangdong, China

Abstract—Agricultural farms produce various type of solid waste, including plant material, animal manure, animal corpses, plastic waste etc. An holistic waste technical management considering each type of waste as resource for energy or new fine product and thereby minimize energy consumption, eliminate effluents (liquid, solid and gas) and maximize the value of the recycled products will be presented. According to our holistic process, the energy source for the system produces by low temperature pyrolysis system, turning plastic and organic waste to syngas, diesel and carbon in single stage. The fuel, heat, electricity and carbon produced are use for the composting and granulation stage for production of organic fertilizer. In parallel to the pyrolysis system, manure, straw, kitchen waste, animal corpses and meat waste are all fermented by AI system that includes automatic composition adjustment system, 90-130degC disinfection stage, robotic turning, spreading and discharge system at 15 day process without human touch and no emission. High N rich granulate organic fertilizer product from the composted material, make use of low thermal and leachate free process combining natural Mg based desiccation components and coal powder that originated by the pyrolysis. The granulation efficiency is 95% and energy consumption is about 50% of alternative technologies. The composting and granulating systems make use waste heat and electricity originated by the pyrolysis part of the system. The holistic waste recycling management is currently designed at scales of 20 to 150T/day organic waste, produce 8.5 to 72 ton granulated organic fertilizer per day.
L5008 Presentation 5 (14:30~14:45)

Behaviour Analysis of PM2.5 during High Concentration Episodes for Recent Years in South Korea

Rhokho Kim, Dae Gyun Lee, Young Woo Kim

Air Quality Forecasting Center, National Institute of Environmental Research, Incheon, South Korea

Abstract—Due to concerns about the risks of PM2.5 emitted to the atmosphere, major countries around the world are making great efforts to identify the current state of their emissions and research on control technologies. The purpose of this study is to identify long-range transport and other behaviours of PM2.5 by using dispersion and receptor models that are based on data of Urban Air Quality Monitoring Sites and Roadside Air Quality Monitoring Sites. High-concentration PM2.5 events in South Korea during recent years were analyzed to find major patterns and associated features, then use such information in PM2.5 forecasting and ultimately improve the forecast accuracy particularly for high-concentration PM2.5 events. For the days when high concentration episodes air monitoring sites of South Korea reported for recent two years, back trajectory cluster analysis and computer simulation using PSCF modeling is conducted. The result indicates the high influence of long-range transport in winter and early spring, the heating period in China, due to the inflow of air that carries high levels of particulate matters to South Korea by the northwestern current. Major findings of this study are summarized below. High-concentration PM2.5 events can be classified into some major classes: long-range transport into South Korea, atmospheric stagnation, local circulation, and combination of stagnation and long-range transport. In general, the PM2.5 concentrations in cold season were significantly higher than those in other seasons. The computer simulation results suggest that the long-distance movement of particulate matters from large-scale emission sources in China had a great effect. In addition, the increase of coal consumption in cold season is considered to have a great effect on this phenomenon.
Lignin Isolation from Black Liquor for Wastewater Quality Improvement and Bio-material Recovery

H. Yotwadee, A. Duangduen, and S. Viboon

Aquatic Resources Research Institute, Chulalongkorn University, Bangkok, Thailand

Abstract—Spent pulping chemicals along with liberated lignin called black liquor are a major liquid waste stream from wood digestion process. For wastewater quality improvement, lignin residue could be isolated via various techniques. According to difference in chemical pulping process (kraft and soda), variations of organic and inorganic substance were suspended in waste stream. This research aims to investigate the effects of the cooking chemical on organic waste (lignin) in black liquor. Organic waste in black liquor was isolated as soda lignin (SL) from soda black liquor (SBL) and kraft lignin (KL) from kraft black liquor (KBL) by acidic precipitation. In addition, lignin model compound (LMC) was used to establish base case measurement. The elemental analysis revealed the similarity of C, H, and O content of samples in range of 32-33%, 3-4%, and 35-38%, respectively. FTIR results showed that structures of lignin, functional group and guaiacyl to syringyl ratio were vary depended on type of chemical pulping with β-O-4 as the primary composition of the samples. Moreover, Py-GC/MS technique was applied for analyzing the degradation products in order to corroborate the result with the structure and thermal behavior analysis. The TGA results showed high stability of lignin up to around 400°C. Main degraded compounds of all samples were phenol, vanillin, catechol, and guaiacol. This finding suggested that not only lignin which caused high BOD and COD could potentially be isolated for value added product but also the discharge quality could be improved. In addition, different chemical processes effect residual lignin in black liquor and underscore the importance of lignin in black liquor as a potential material for renewable energy and chemical production.
Characterization of Nozzle Reactor for Fast Hydrothermal Liquefaction

Khanh-Quang Tran

Norwegian University of Science and Technology, Trondheim, Norway

Abstract—This paper reports results from an experimental study on a reaction system including a nozzle reactor that has been developed for fast hydrothermal liquefaction. The reactor has been constructed and characterized with respect to temperature profile for 1) pure water flows; 2) a cold flow of water containing 10% w/w of glucose as model compound. Agreements and disagreements with the literature are observed and discussed.
Session 1

December 29, 2019 (Sunday)

Time: 13:30~15:30

Venue: Pikul Room

8 presentations- Topic: “Agricultural Science and Environmental Engineering”

Session Chairs: Assoc.Prof.Natdhera Sanmanee | Prof.Orawan Siriratpiriya

L8012 Presentation 8 (15:15~15:30)

A Convolutional Neural Network Based Imaging Solution for Disease Identification in Brassica Napus

Kuldeep Singh

Malaviya National Institute of Technology, Jaipur, India

Abstract—The Deep learning algorithms has shown promising results in solving various challenging tasks of agricultural applications. In this paper, a novel convolutional neural network based imaging solution is proposed for disease identification in Brassica Napus leaves. The state-of-the-art convolutional neural network (CNN) architectures are fine-tuned for feature extraction. These features are further utilized to train SVM classifier for classification of different diseases in Brassica Napus leaves. The proposed approach is based on ensemble of two fine-tuned CNN architectures follows the hypothesis that different CNN architectures learn different feature representation from images. A dataset is created for the fine tuning of the CNN models for domain adaption. Apart from the individual CNN features, the fusion of outcomes of both the CNN models is also experimented. The experimental results show excellent performance by the individual CNN models and the fusion outperforms the individual results.

Coffee Break & Group Photo Taking 15:30~15:50
Session 2

Tips: The schedule for each presentation is for reference only. In order not to miss your presentation, we strongly suggest that you attend the whole session.

December 29, 2019 (Sunday)

Time: 15:50~17:50

Venue: Pikul Room

8 presentations- Topic: “Food Engineering and Biotechnology”

Session Chair: Assoc. Prof. Win Chaeychomsri

L8002 Presentation 1 (15:50~16:05)

Carbon Fiber Matrixes as Electrochemical Sensors for Nitrite Determination

Wenxin Zhu, Yi Zhang, Jianlong Wang

Northwest A&F University, Shaanxi, China

Abstract—Commercial carbon fiber matrixes like carbon cloth and carbon paper have attracted enough attention to serve as either the conductive substrates to support catalysts or directly the monolithic electrodes after surface activation in the fields of electrocatalysis, supercapacitors, and batteries, due to their excellent conductivity, large surface area, high acid-base corrosion resistance, and good mechanical properties. However, little attention has been paid to the direct use of these carbon matrixes as the catalytic electrodes in electrochemical sensing of electro-active small molecules, especially the nitrite. Interestingly, we found that the carbon cloth without surface activation and carbon paper with simple surface activation could be directly used for nitrite detection. Both of them possess surprisingly high sensing performance toward nitrite, with low determination and detection limit, high sensitivity, wide linear detection range, excellent selectivity and stability, as well as good feasibility of testing nitrite in mineral water and sausage samples. The performance of these two sensors are comparable or even superior to those for most reported carbon-, transition metal-, and noble metal-based advanced nitrite sensors. The advantages such as superior sensing performance, low electrode cost, no complex treatment processes involved, and commercial off-the-shelf nature enable the commercial carbon matrixes to be ideal electrochemical sensors for nitrite determination in real food samples.
Session 2

December 29, 2019 (Sunday)

Time: 15:50~17:50

Venue: Pikul Room

8 presentations- Topic: “Food Engineering and Biotechnology”

Session Chair: Assoc. Prof. Win Chaeychomsri

L8003 Presentation 2 (16:05~16:20)

Superhydrophobic SERS Substrates based on Silver Dendrite-Decorated Filter Paper for Trace Detection of Nitenpyram in Agricultural Products

Qinzhi Wang, Liming Wang, Li Wang

Northwest A&F University, Shaanxi, China
Guangzhou University, Guangzhou, China

Abstract—In the present work, highly sensitive Raman detection of nitenpyram using superhydrophobic filter paper as substrates is introduced. The process is simple, and efficient. By sequentially coating silver dendrites and Octyltrimethoxysilane (OTMOS) on filter paper, we produced highly active surface-enhanced Raman scattering (SERS) substrates which show advancing and receding water contact angles of $\theta_a/\theta_r = 159^\circ/156^\circ$. Nitenpyram, a type of pesticides popularly used in agriculture, can be easily detected with the detection limit as low as 1 nM using the superhydrophobic filter paper as SERS substrates, which validates their use in Raman applications in monitoring food safety.
Session 2

December 29, 2019 (Sunday)

Time: 15:50~17:50

Venue: Pikul Room

8 presentations- Topic: “Food Engineering and Biotechnology”

Session Chair: Assoc. Prof. Win Chaeychomsri

L5004 Presentation 3 (16:20~16:35)

Protein Structure Prediction Based on Improved Genetic Algorithm

Jiaxi Liu

The Masters School, New York, USA

Abstract—Protein structure prediction is essential to bioscience, and its research results are important for other research areas. The prediction of protein structure based on average hydrophobic values is discussed and an improved genetic algorithm is proposed to solve the optimization problem of hydrophobic protein structure prediction. An adjustment operator is designed with the average hydrophobic value to prevent the overlapping of amino acid positions. Some numerical experiments are conducted to verify the feasibility and effectiveness of the proposed algorithm.
Session 2

December 29, 2019 (Sunday)

Time: 15:50~17:50

Venue: Pikul Room

8 presentations- Topic: “Food Engineering and Biotechnology”

Session Chair: Assoc. Prof. Win Chaeychomsri

L8004 Presentation 4 (16:35~16:50)

Purification, Characterization and Antibacterial Mechanism of Bacteriocin BM173

Zhu Qiao, Xin Lv

Northwest A&F University, Shaanxi, China

Abstract—Bacteriocins are ribosomally synthesized antimicrobial peptides or proteins with antimicrobial activity which have been considered as potential antibiotic alternatives. In this study, the gene of bacteriocin BM173 was cloned and expressed in Escherichia coli expression system. Bacteriocin BM173 was purified using Ni-NTA Cartridge column and reverse-phase high-performance liquid chromatography. The molecular weight of Bacteriocin BM173 was approximately 6.11kDa by Tricine-SDS-PAGE analysis. Bacteriocin BM173 exhibited broad-spectrum antibacterial activity against Gram-positive and Gram-negative bacteria. In addition, it had high thermal stability (20 min, 121 °C), active over a range of pH 2-11, resistant to proteinases and surfactants. Bacteriocin BM173 had bactericidal action by the growth curve and time-kill assay. The results showed that Bacteriocin BM173 disrupted the integrity of cell membrane, induced leakage of cell contents. This research indicated that Bacteriocin BM173 has potential applied as a bio-preservative in food industry.
L8010 Presentation 5 (16:50~17:05)

Preparation, Characterization of *Pachyrhizus Erosus* Polysaccharide and Hypoglycemic Effect on Streptozotocin Induced Diabetic Mice

Qingyu Ma

Northwest A&F University, Shaanxi, China

*Abstract*—The polysaccharides were extracted with hot water from *Pachyrhizus erosus* L.(PEP) and separated by ethanol precipitation (PEP60, PEP80 and PEP95). Hypoglycemic activities of PEP were evaluated by streptozotocin-induced diabetic mouse model. Results showed that PEP increased the body weight and reduced fasting blood glucose levels in diabetic mice, and regulated the levels of glycated serum protein, triglyceride and total cholesterol in serum. Glycogen content in mice liver was restored by PEP close to normal, which further increased the levels of glutathione peroxidase, superoxide dismutase activities and lipid peroxidation. PEP fractions inhibited the expression of transforming growth factor-β1 and decreased the mesangial matrix index in kidney. The histological analysis illustrated that PEP fractions could alleviate pathological damages in the tissue structures of pancreas, liver and kidney. PEP95 demonstrated strongest hypoglycemic activity among these three fractions. PEP95-DS was purified and separated from PEP95 by DEAE-cellulose and Sephadex G-100 column chromatography. The chemical characteristics and spectral properties of PEP95-DS were analyzed. The average molecular weight of PEP95-DS was 11.4 kDa, and it was composed of mannose: rhamnose: glucosamine: glucose: galactose: xylose: arabinose was 5.4:1.7:8.5:160.7:11.8:1:2.7. Moreover, these results indicate that PEP could be used as a functional ingredient in foods to prevent oxidation and diabetes.
The Potential of Sea Grapes (*Caulerpa Lentilifera*) extracted Polysaccharide as Prebiotics on Inhibiting Pathogenic Bacteria *Vibrio Parahaemolyticus*

Anek Sopon, Ekthida Thongdet, Porntep Punnarak and Sucharat Suksai

Aquatic Resources Research Institute, Chulalongkorn University, Bangkok, Thailand

*Abstract*—Sea grapes or green caviar (*Caulerpa lentilifera*), a common tropical green seaweed, consisted of polysaccharides to be used as a prebiotic precursor for prevention of pathogens in aquatic animals. The efficiency of polysaccharides extracted from sea grapes for prebiotic properties was conducted by comparing the growth of probiotic bacteria *Bacillus subtilis* at different concentrations in co-cultured with pathogenic bacteria *Vibrio parahaemolyticus*, a gram-negative motile bacterium that inhabits marine and estuarine environments throughout the world, causes of violent diseases outbreak in aquatic animals. The experimental research was 4 treatments with 4 replications including control group (LB broth), extracted sea grape enrichment in LB broth at 0.5, 1.0 and 2.7 mg.C/l. The result showed that the highest growth of probiotic bacteria appeared significantly at extracted sea grape in LB broth with 0.5 mg.C/l (7.19 ± 0.17 log cfu/ml). The said concentration was used as benchmark to clarify the pathogenic resistance. The comparison between monoculture of probiotic bacteria and co-culture of probiotic bacteria plus pathogenic bacteria indicated that there was non significantly different in growth of the bacterias. Hence extracted polysaccharides from sea graps (*C. lentilifera*) had potential to be utilized not only as a growth enrichment of probiotic bacteria but also inhibiting pathogenic bacteria.
Thiol-Functionalized Inactivated Yeast Embedded in Agar Aerogel for Highly Efficient Adsorption of Patulin in Juice

Yue Qiu, Tianli Yue, Yahong Yuan

Northwest A&F University, Shaanxi, China

Abstract—Patulin (PAT) contamination in food and feed poses a threat to human and animal health. In recent years, inactivated microbial adsorbents have shown many advantages in the removal of PAT contaminations. However, the inactivated microbial adsorbents have problems of separation difficulty and limited adsorption efficiency. In the present study, several thiol functional methods were used to modify the inactivated yeast adsorbent to increase its affinity for PAT. Thiol-functionalized inactivated yeast by glutaraldehyde cross-linking method (Y-SH(Gl)) increased the thiol group content of the yeast cells to 1.26 ± 0.03 mmol/g and improved the PAT adsorption capacity of inactivated yeast in phosphate-citrate buffer and in apple juice by three times and 150 times, respectively. The adsorption of PAT by Y-SH(Gl) was spontaneous endothermic process and was consistent with the Elovich kinetic model and the Freundlich model. Y-SH(Gl) was wrapped in agar aerogel to obtain an easy-to-separate composite adsorbent Y-SH(Gl)@Agar with good PAT adsorption properties in apple juice. The adsorption treatment manifested negligible effects on juice quality, thereby demonstrating that Y-SH(Gl)@Agar may be a promising adsorbent material for the control of PAT contaminants in juice.
Session 2

December 29, 2019 (Sunday)

Time: 15:50~17:50

Venue: Pikul Room

8 presentations- Topic: “Food Engineering and Biotechnology”

Session Chair: Assoc. Prof. Win Chaeychomsri

L8005 Presentation 8 (17:35~17:50)

Structural Elucidation, Thermal, Rheological and in Vitro Digestibility Properties of Corn Starch–Palmitic Acid Complex Prepared with Different Amounts of Palmitic Acid at Frying Temperature

Qi Li, Shaoxia Shi, Xiuzhu Yu

Northwest A&F University, Shaanxi, China

Abstract—Starch–lipid complexes have been demonstrated hold significant health-giving implication due to its high nutrition value and functional properties similar to dietary fiber. Corn starch and palmitic acid was employed to investigate characteristics of corn starch–palmitic acid complex by applying palmitic acid addition of 5%, 10%, 15%, and 20% versus starch. V-type crystalline structure was identified in samples of starch–palmitic acid complex, and the sample prepared at 15% of palmitic acid showed the most obvious characteristic peak and the highest crystallinity. The enthalpies confirmed the starch–palmitic acid complex formation first increase and then decrease as palmitic acid content increase. Martials with more starch–palmitic acid complex possessed more liquid-like characteristics with lower storage and loss modulus. Strains of starch–palmitic acid complex sample pastes increased more significantly than the samples of fewer complexes under constant stress. And complex formation resulted in a marked drop in the digestion rate of native starch.
One Day Tour

December 30, 2019 (Monday) 9:30~19:40

(Tips: Please arrive at the Patong Merlin Hotel before 9:20 a.m. The following schedule is only for participants who registered the visit & tour. The following places are for references, and the final schedule should be adjusted to the actual notice.)

9:20: Assemble at the Patong Merlin Hotel

10:30~11:30: Old Phuket Town

We came to Phuket Old Street to experience the old ethnic style of Phuket. Phuket Town is located in the southeast of Phuket. There are not as many tourists in the town as the seaside; but take a trip to the old town, visit the market next weekend, take a local tea restaurant; Chinese + Portuguese unique style buildings, rustic Humanistic style will impress you!

11:30: Lunch buffet in King Power Cafeteria

12:00~15:00: King Power Duty Free Shop (Downtown Phuket)

15:00~15:50: WAT CHA-LONG

WAT CHA-LONG is a Buddhist temple in Phuket. WAT CHA-LONG is the most magnificent...
ornate Buddhist temple among the 29 hidden monasteries in Phuket. It is located in Chalong Bay in the south of Phuket. The entire temple combines the architectural styles of southern, central and northeastern Thailand. The hall dedicated to the 108 Golden Buddhas is quite impressive. [Tips: please observe local cultural customs, no slippers or shorts allowed]

15:50~16:10: Take a bus to Karon View Point

16:10~16:40: Karon View Point

It is a better viewing point for Phuket. You can also use a telescope to overlook the view. Coin-viewing, you can prepare coins in advance if you want to experience!

16:40~17:00: Take a bus to Prom Thep Cape

17:00~18:00: Prom Thep Cape

Most of the scenic spots you will choose to shoot are next to the Immortal Peninsula. This is a great place full of rituals, witnessing love, affection and friendship!

18:00~18:40: Take a bus to Phuket Simon Cabaret

18:40: Phuket Simon Cabaret

19:40: End your journey happily!