

# 2017 HKCBEEs BUSAN CONFERENCE ABSTRACT

2017 8th International Conference on Biology, Environment and Chemistry

(ICBEC 2017)

2017 7th International Conference on Environment and BioScience

(ICEBS 2017)

Pusan National University, Busan, South Korea

October 11-13, 2017

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# Busan Conference Introductions

Welcome to 2017 HKCBEEES Busan conference. This conference is organized by HKCBEEES. The objective of the Busan conference is 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 Biology/BioScience, Environment and Chemistry.

## 2017 8th International Conference on Biology, Environment and Chemistry (ICBEC 2017)



Papers will be published in the following conference proceeding:

**International Proceedings of Chemical, Biological and Environmental Engineering (IPCBE, ISSN: 2010-4618)**, which is indexed by EBSCO, Chemical Abstracts Services (CAS), CABI, CNKI, WorldCat, Google Scholar, Ulrich's Periodicals Directory, Crossref, and Engineering & Technology Digital Library.

Conference website and email: <http://www.icbec.org/>; [icbec@cbees.org](mailto:icbec@cbees.org)

## 2017 7th International Conference on Environment and BioScience (ICEBS 2017)



Papers will be published in the following journal:

**Environmental Science and Development (IJESD, ISSN:2010-0264)**, which will be included in the Engineering & Technology Digital Library, and indexed by WorldCat, Google Scholar, Cross ref, ProQuest , CABI.

Conference website and email: <http://www.icebs.org/>; [icebs@cbees.org](mailto:icebs@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 12 Minutes of Presentation and 3 Minutes of Question and Answer

Keynote Speech: about 35 Minutes of Presentation and 5 Minutes of Question and Answer

## Instructions for Poster Presentation

### **Materials Provided by the Conference Organizer:**

The place to put poster

### **Materials Provided by the Presenters:**

Home-made Posters

Maximum poster size is A1

Load Capacity: Holds up to 0.5 kg

## 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 October 12, 2017.

## Dress code

Please wear formal clothes or national representative of clothing.

# Keynote Speaker Introductions

## Keynote Speaker I



Prof. Chan Jin Park

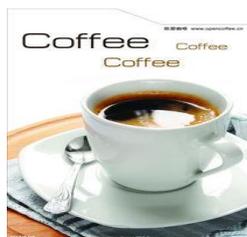
Incheon National University, Republic of Korea

**Prof. Park Chan Jin** graduated from Korea University, and got Master and PhD degrees in same university. His major fields of research are the air pollution control, greenhouse gas technology and odor management technology. His another interests is green growth policy. He is now full-professor in Incheon National University at Urban and Environmental Engineering School. He is member of INU ensemble taking part in piano (Chamber orchestra of his University).

Topic: “On the Green Energy Utilization for Sustainable Future”

Prof. Chan Jin Park  
Incheon National University, Republic of Korea

*Abstract*—The global climate change has become common challenge to all human life. Unfortunately greenhouse gas emissions are increasing although many climate protocols are being proceeded. In those situations green energy such as new and renewable energy are clearly the main solution to make our future sustainability. In this research current states of green energy utilization and the tasks to be solved were illustrated to make comfortable and sustainable future of our earth. More active actions for developing desirable energy generation such as waste energy recycling for greenhouse gas reduction were suggested.



<b>Coffee Break &amp; Group Photo Taking</b>	<b>10:30~10:50</b>
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## Keynote Speaker II



Prof. Suwan Park

Pusan National University, Republic of Korea

**Prof. Suwan Park** was born in Busan, Korea. He received the B.S. degree from the Department of Civil Engineering at Pusan National University in Busan, Korea in 1993. He also received the M.S. and Ph.D degree in Transportation and Hydrosystems engineering from the Department of Civil and Environmental Engineering at Virginia Polytechnic Institute and State University in Blacksburg, U.S.A. in the years 1996 and 2000, respectively.

In 2002 he was appointed as a professor in the Department of Civil Engineering at Dong-Seo University in Busan, Korea. In 2004 he moved to the Department of Civil Engineering at Pusan National University in Busan, Korea. Since he started his career as a professor in Korea, he has developed various methodologies and techniques for efficient operations of Water Supply System Planning and Operation, Maintenance Scheduling of Water Pipe Networks, and Reliability Analysis of Water and Wastewater Systems. He spent a year at Graz University of Technology in Graz, Austria as a visiting professor. Currently, he is a committee member of the Strategic Asset Management Specialist Group in the International Water Association since 2009.

Topic: “System Dynamics Computer Modeling of Water Supply Systems Management Based on the Concept of the Paradigm Shift in the Development and Usage of Water Resources”

Prof. Suwan Park

Pusan National University, Republic of Korea

*Abstract*—In this study the causal feedback relationships among the components that make up the working mechanism of water supply systems management, including key factors and their relationship to the management of water pipes, were identified based on the paradigm shift conceptual framework established for water supply systems management. Subsequently, a system dynamics computer simulation model, which can be used to aid efficient management of water supply systems, was developed. The model was verified using historical data from a water supply service case study. The purpose of developing alternate water sources is to secure water sources of sufficient quantity and high quality due to water quality and/or quantity problems of an existing water source and, thereby, raise the level of consumer satisfaction. Considering the enormous costs and the effects to the consumers and operation of water supply enterprises, a technique to support long term management of water supply systems is needed. In this study a System Dynamics computer simulation model was also developed to evaluate the effects of alternate water source development. The System Dynamics model was applied to the simulation of the effects of the alternate water source development project in Busan, South Korea.



<b>Lunch</b>	<b>12:00~14:00</b>
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## Brief Schedule for Conference

<b>Day 1</b>	<p><b>October 11, 2017 (Wednesday) 10:00~17:00</b>  <b>Venue: Outside Conference Room Moon-Chang hall</b>  <b>On the first floor of Building “Sang Nam” in the University</b>            Participants Onsite Registration &amp; Conference Materials Collection</p>
	<p><b>October 12, 2017 (Thursday) 9:20~17:50</b>            Registration, Keynote Speech and Conference Presentation</p> <p style="text-align: center;"><b>Morning Conference</b>  <b>Venue: Moon-Chang hall</b></p> <p><b>Opening Remarks 9:20~9:30</b>            Prof. Suwan Park            Pusan National University, Republic of Korea</p> <p><b>Keynote Speech I 9:30~10:30</b>  <b>Topic: “On the Green Energy Utilization for Sustainable Future”</b>            (Prof. Chan Jin Park, Incheon National University, Republic of Korea)</p> <p><b>Coffee Break &amp; Group Photo Taking 10:30~11:00</b></p> <p><b>Keynote Speech II 11:00~12:00</b>  <b>Topic: “System Dynamics Computer Modeling of Water Supply Systems Management Based on the Concept of the Paradigm Shift in the Development and Usage of Water Resources”</b>            (Prof. Suwan Park, Pusan National University, Republic of Korea)</p> <p style="text-align: center;"><b>Lunch 12:00~14:00</b>  <b>Venue: Beside the Moon-Chang hall</b></p> <p style="text-align: center;"><b>Afternoon Conference</b>  <b>Venue: Moon-Chang hall</b></p> <p><b>Session 1: 14:00~16:00</b>            8 presentations-Topic: “Environmental and Chemical Engineering”</p> <p><b>Coffee Break 16:00~16:20</b></p> <p><b>Session 2: 16:20~17:50</b>            6 presentations-Topic: “Agriculture and Biology”</p> <p style="text-align: center;"><b>Dinner 18:00</b>  <b>Venue: Beside the Moon-Chang hall</b></p>
<b>Day 2</b>	

**Tips:** Please arrive at the conference to upload or copy PPT into the laptop room 10 minutes before the session begins.

# Detailed Schedule for Conference

**October 12, 2017 (Thursday)**

**Venue: Moon-Chang hall**

9:20~9:30		<b>Opening Remarks</b> Prof. Suwan Park Pusan National University, Republic of Korea
9:30~10:30		<b>Keynote Speech I</b> Prof. Chan Jin Park Incheon National University, Republic of Korea Topic: “On the Green Energy Utilization for Sustainable Future”
10:30~11:00	<b>Coffee Break &amp; Group Photo Taking</b>	
11:00~12:00		<b>Keynote Speech II</b> Prof. Suwan Park Pusan National University, Republic of Korea Topic: “System Dynamics Computer Modeling of Water Supply Systems Management Based on the Concept of the Paradigm Shift in the Development and Usage of Water Resources”
12:00~14:00	<b>Lunch</b>	
14:00~16:00	<b>Session 1-8 presentations-Topic: “Environmental and Chemical Engineering”</b>	
16:00~16:20	<b>Coffee Break</b>	
16:20~17:50	<b>Session 2-6 presentations-Topic: “Agriculture and Biology”</b>	
18:00	<b>Dinner</b>	

**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 October 12, 2017.**

# Session 1

**Afternoon, October 12, 2017 (Thursday)**

**Time: 14:00~16:00**

**Venue: Moon-Chang hall**

**8 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Suwan Park**

C0012 Presentation 1 (14:00~14:15)

Integrated assessment modeling for the climate change and human impacts on water resources in the Vietnamese Mekong Delta

**Nguyen Thanh Tuu**, Seungdo Kim, Van Pham Dang Tri and Hyeonkyeong Kim

Department of Environmental Science and Biotechnology, College of Natural Sciences, Hallym University, South Korea

*Abstract*—An integrated assessment model (IAM) is developed to study the interactions between socioeconomic settings and water resources under the impact of climate change using a system dynamic modeling approach for the Vietnamese Mekong Delta (VMD). The average monthly rainfall and temperature data of 11 weather stations in the VMD from 1980 to 2006 and Representative Concentration Pathways scenarios (RCPs) are used to estimate the trend of the hydrology changes, water use and water availability. This research focuses on the changes of water resources under the impact of (1) seasonal rainfall and temperature increases under RCP4.5 and RCP8.5 scenarios, (2) the water flow from upstream countries increase 5%, and (3) the water consumption by human use, including domestic, industrial and agricultural activities. The results indicate that the average monthly evapotranspiration increases in the range 1 - 14%, and the average monthly total renewable water increases in the range 4 - 8% during the periods 2046-2065 and 2080-2099. In addition, the simulated irrigation water consumption is significantly higher than domestic and industrial water consumptions leading to the need to develop more techniques for reducing the irrigation water requirement, saving water or increasing water use efficiency need to be improved in agricultural cultivation.

# Session 1

**Afternoon, October 12, 2017 (Thursday)**

**Time: 14:00~16:00**

**Venue: Moon-Chang hall**

**8 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Suwan Park**

C0008 Presentation 2 (14:15~14:30)

Addition of ethanol to lower and stabilize the viscosity of fast pyrolysis coffee-ground bio-crude oil during storage

**Van-Quynh Nguyen, Yeon-sock Choi, Sang-kyu Choi, So-young Han, Seock-joon Kim, Tawsif Rahman**

Korea University of Science and Technology, South Korea

*Abstract*—Coffee ground is considered one of the promising biomass resources due to the growth of coffee consumption and higher calorific value from its larger carbon content and lipid component. Unfortunately, bio-crude oil produced from coffee ground by fast pyrolysis become more viscous rapidly than woody bio-crude oil during storage as known the aging of bio-crude oil. Ethanol was added at varying amounts to bio-crude oil after pyrolysis. The addition levels of ethanol in bio-crude oil were 10 wt %, 20 wt %, 30 wt %, 40 wt %, 50 wt %. Both samples were stored in closed bottles at room temperature (23 – 25oC). Also, higher heating value, water content, viscosity, density, and acetic acid concentration of the samples were measured. After three months of aging, from the results, even at 10 wt % level of ethanol in bio-crude oil, its viscosity was significantly reduced from original bio-crude oil, although bottom sludge was found. Increasing the addition level of ethanol in bio-crude oil resulted in greatly the reduction of the viscosity and the improvement of the homogeneity. The viscosity of modified bio-crude oil was the lowest with 50 wt % level of ethanol in bio-crude oil.

# Session 1

**Afternoon, October 12, 2017 (Thursday)**

**Time: 14:00~16:00**

**Venue: Moon-Chang hall**

**8 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Suwan Park**

C0017 Presentation 3 (14:30~14:45)

Electrochemistry evaluation of Chromocene in organic solvents for non-aqueous organic redox flow electrolyte

**Yongbeom Kim, Youngho Lee, Joonhyeon Jeon**

Dongguk University, Republic of Korea

*Abstract*—The redox flow battery (RFB) is kind of energy storage device for large scale energy storage system. It has many advantages for large scale energy storage system. But, conventional electrolyte has low energy density. So, for overcoming this problem, the chromocene, which is kind of metallocene and has high standard voltage, is studied for RFB. In this paper, the solvents (1-dioxolane, 2-tetrahydrofuran, 3-N,N-dimethylformamide, 4-benzene, 5-hexane, 6-toluene, 7-heptane, 8-acetonitrile, 9-propylene carbonate, 10-N-methyl-2-pyrrolidinone) for chromocene is researched. Solubility, electrical conductivity, electrochemistry properties determined by many experiments. As a result, N-methyl-2-pyrrolidinone has highest conductivity and toluene has highest solubility for using chromocene. Also, N-methyl-2-pyrrolidinone has suitable redox reaction and electrochemical property for RFB. Synthetically, N-methyl-2-pyrrolidinone is determined that it is proper for solvent of chromocene in RFB.

# Session 1

**Afternoon, October 12, 2017 (Thursday)**

**Time: 14:00~16:00**

**Venue: Moon-Chang hall**

**8 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Suwan Park**

C0018 Presentation 4 (14:45~15:00)

An effect of a thermal stability agent for vanadium redox flow battery at room temperature

**Donghyeon Kim, Daewon Chung and Joonhyeon Jeon**

Dongguk University, Seoul, Republic of Korea

*Abstract*—Vanadium redox flow battery (VRFB) is a rising technology for a wide range of applications such as large-scale renewable energy storage system (ESS) or electric vehicle (EV), but there are still thermal problems about that the concentration of vanadium species in the positive electrolyte is limited at high temperature. Thus, several studies have introduced to improve the thermal stability, such as a sodium formate. This paper describes the cyclic performance employing the positive electrolyte with the sodium formate at room temperature. The effect of the proposed electrolyte is demonstrated through the VRFB operation. Experimental results show that using the sodium formate leads to higher charge-discharge capacities and reduce of the capacity fading. Moreover, the coulombic (energy) efficiency employing the sodium formate one keeps stable above 81 % (96 %), and the average efficiencies of the miniature cell employing the sodium formate are higher than the pristine one. Therefore, this paper provides the effect of the sodium formate at room temperature and the additive can be considered for the VRFB.

# Session 1

**Afternoon, October 12, 2017 (Thursday)**

**Time: 14:00~16:00**

**Venue: Moon-Chang hall**

**8 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Suwan Park**

C0019 Presentation 5 (15:00~15:15)

Performance comparison of sulfonated polyimide/PTFE-reinforced membranes for ZnBr flow batteries

**Miae Kim**, Woon Cho, Joonhyeon Jeon

Department of Energy and Advanced Material Engineering, Dongguk University, Seoul, Republic of Korea

*Abstract*—Zinc Bromine Flow Battery (ZBB) is an energy storage system that can be applied as a storage for renewable energy. The core material of ZBB is a membrane. The required characteristics of the membrane were low electric resistance, high ion conductivity, and excellent bromine resistance. For the purpose, two different type membranes are used to 6cm<sup>2</sup> ZBB cell operations: one is PTFE#1 (porous PTFE membrane) based on a nafion with silica and the other is PTFE#2 (hydrophilic PTFE membrane) based on an aquivion with hollow silica. The performance comparisons are carried out using 2.0M ZnBr<sub>2</sub> solution and OCV comparisons are carried out using 1.0M ZnBr<sub>2</sub> solution. According to the experimental results, it is considered that both types of membranes can be used in ZBB since they are normally charged and discharged. Also, it was confirmed that the bromine permeability was lower than that of SF600, which was commercialized.

# Session 1

**Afternoon, October 12, 2017 (Thursday)**

**Time: 14:00~16:00**

**Venue: Moon-Chang hall**

**8 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Suwan Park**

S1001 Presentation 6 (15:15~15:30)

Nurturing a Sustainable Earth System in the Age of Science and Technology: From Francis Bacon’s Conquest of Nature to Albert Schweitzer’s Ethics of Reverence for Life

**Choy Yee Keong**

Keio University, Japan

*Abstract*—Compelling evidence reveals that exponential growth of human activities as a result of science and technological advancement over the past few decades has been driving planetary change at an unprecedented pace and magnitude. The cumulative anthropogenic environmental pressure threatening human long-term existence calls for urgent and immediate mitigating measures. The challenge here is to raise human environmental awareness based on an empirical assessment of human-driven environmental changes, and to examine the moral causes of environmentally destructive human practices rooted in the Baconian stance of human supremacy over nature. To orient further analysis towards this line of thought, the article attempts to craft a philosophical framework of nature drawing from Albert Schweitzer’s reverence for life ethics that will deepen our understanding of human environmental behaviour and ethical engagement with, and stewardship responsibility to, nature. It is concluded that nurturing a sustainable world requires the human race to uphold strong ethical commitment to protect and conserve non-human nature.

# Session 1

**Afternoon, October 12, 2017 (Thursday)**

**Time: 14:00~16:00**

**Venue: Moon-Chang hall**

**8 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Suwan Park**

S0004 Presentation 7 (15:30~15:45)

Catchment Clustering Through a Newly Purposed Method of Clustering of WE-SOM Case Study: Utah State

**Vahid Nourani** and Saeed Soleimani

University of Tabriz, Iran

*Abstract*—Considering the different hydro-climatological responses of even the adjacent catchments, there are motivations for classifying them into homogeneous clusters. Prediction in ungauged basins (PUB) and transferring information from gauged to the ungauged catchments are great ones. Model parameterization and understanding the potential impact of environmental changes are some others.

Partitioning catchments into natural groups through using clustering techniques is a common procedure in regionalization studies.

The present study investigated the similar catchments of Utah State, USA, via applying a newly proposed clustering method to the hydro-climatological time-series of a 14-year period from 2001 to 2015.

Data sets include more than 13,000 month-station streamflow, rainfall, and temperature data obtained from 27 catchments of the study area.

Homogeneous catchments were obtained by applying a newly proposed Wavelet-Entropy based (WE-SOM) clustering method. Each cluster signifies different hydro-climatological behaviors.

Comparing results of WE-SOM method with conventional clustering method of K-means, showed the superiority of the proposed method in catchment clustering studies, through the number of clusters and homogeneity of members in each cluster. Considering the dependency of the hydrological behavior of catchments on the physiographic field characteristics, WE-SOM method demonstrated a more acceptable performance.

WE-SOM seems to be a promising methodology in catchment clustering. It preserves the topological structure of data which can, as a result, be proofed in a greater number of clusters

compare with K-means method of clustering. The results also revealed the proficiency of wavelet transform to quantify the temporal variability of hydro-climatological time series of (rainfall, temperature and streamflow), thereby contributing to the regionalization of catchments.

# Session 1

**Afternoon, October 12, 2017 (Thursday)**

**Time: 14:00~16:00**

**Venue: Moon-Chang hall**

**8 presentations- Topic: “Environmental and Chemical Engineering”**

**Session Chair: Prof. Suwan Park**

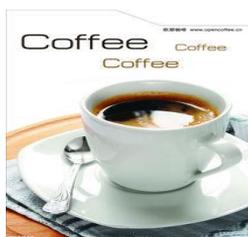
S3002 Presentation 8 (15:45~16:00)

Current Status of CCS Technology for Reducing Greenhouse Gases in Coal-Fired Power Plants

**JiYoung Kim**, HeeJung Kim, JiYe Yoo and ChanJin Park

Department of Energy and Environment Engineering, Incheon National University, Republic of Korea

*Abstract*—Recent increase of greenhouse gas has been serious in recent years. The status and problems of coal-fired power plants in Korea and discussions about reducing greenhouse gases emitted from coal-fired thermal power plants were investigated. The policy of power plants that would replace coal-fired thermal power plants and reduce greenhouse gases were studied. The current status of CCS and the methods about our environmental policy to solve global warming problems in Korea were suggested.



<b>Coffee Break</b>	<b>16:00~16:20</b>
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## 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.**

**Afternoon, October 12, 2017 (Thursday)**

**Time: 16:20~17:50**

**Venue: Moon-Chang hall**

**6 presentations- Topic: “Agriculture and Biology”**

**Session Chair: Prof. Chan Jin Park**

C0003 Presentation 1 (16:20~16:35)

Variation in flowering plant - bee linkages following experimental restoration of satoyama paddy fields

**Windra Priawandiputra**, Tetsuya Kasagi and Koji Nakamura

Department of Biology, Faculty of Mathematics and Natural Sciences, Bogor Agricultural University, Indonesia

*Abstract*—Deterioration of ecosystem services and biodiversity occurs in abandoned satoyama. Restoration practices seem to improve them in this case flowering plant-bee linkages, which is to be studied quantitatively. Sixteen pairs of restored and control plots (both 2 x 2 m<sup>2</sup>) were established in the study site in Kanazawa. A paddy was constructed inside each restored plot and weeded the bank, while control plots were left untouched. For these plots, the number of species and percentage coverage of flowering plants were recorded and flower-visiting bees were collected using sweeps net 3 times per month from May to October 2013. The flowering plant-bee linkage parameters were higher in control than restored plots except for nestedness. The linkages in restored plots were higher in May-June while those in control plots were higher in July to October. The combination of both plots with proper ratio could support the high biodiversity within satoyama landscape.

## Session 2

**Afternoon, October 12, 2017 (Thursday)**

**Time: 16:20~17:50**

**Venue: Moon-Chang hall**

**6 presentations- Topic: “Agriculture and Biology”**

**Session Chair: Prof. Chan Jin Park**

C3003 Presentation 2 (16:35~16:50)

Effects of Heavy Rain on Fruit Quality of Satsuma Mandarin (*Citrus unshiu* Marc. cv. Miyagawa) at Maturity Period

**Hyejin Lee**, Seokbeom Kang, and Young-eel Moon

Citrus Research Institute, National Institute of Horticultural & Herbal Science, RDA, Jeju, 63607, Korea

*Abstract*—Recently, the amount of precipitation has increased in the main cultivation area of Citrus during the fall, and it is predicted to increase steadily in Korea according to the Representative Concentration Pathways. To determine the effects of heavy rain on the fruit quality at each period, the plants received heavy rain treatments that were 30 mm per hour for 8 hours at 100, 130, and 160 days after flowering (DAF) twice, respectively. 20 year old Satsuma mandarin (*Citrus unshiu* Marc. cv. Miyagawa) planted in Citrus research institute were used as plant materials. After treating heavy rain at 100 DAF, the soluble solid content decreased in comparison to the untreated plants and the differences were still present on 190 DAF, which is the harvest period. Meanwhile, heavy rain treatments did not significantly influence the acid content. Peel puffing on 190 DAF slightly increased in untreated fruits at 100 and 130 DAF. The heavy rain treatments did not affect the fruit decay rate during storage. In conclusion, heavy rain at 100 DAF had an important impact. Moreover, if heavy rain persists during the fall, it is speculated that the cultivation conditions of Satsuma mandarin will be worsened by degraded the fruit quality.

## Session 2

Afternoon, October 12, 2017 (Thursday)

Time: 16:20~17:50

Venue: Moon-Chang hall

6 presentations- Topic: “Agriculture and Biology”

Session Chair: Prof. Chan Jin Park

C2001 Presentation 3 (16:50~17:05)

Efficacy of Morizena Mosquito Coils as an Bioinsecticide against *Culex quinquefasciatus*

**Rina Priastini Susilowati**

Biology Departement, Krida Wacana Christian University, Jakarta Indonesia

*Abstract*—Mosquito-transmitted diseases continue to be a major cause of illness and death. Morizena mosquito coils with the active ingredient mix from *Passiflora foetida* leaf extract, *Chrysanthemum* flower seed extract and essential oil from leaf-stem of *Andropogon nardus* together with blank coils were tested in the laboratory against *Culex quinquefasciatus*. This research aims to unravel the efficacy of Morizena mosquito coil to kill *Culex quinquefasciatus*. This research is experimentally with post-test only control group design. The research consists of seven groups treatment based on the concentration of Morizena mosquito coil (500 ppm, 1000 ppm, 2000 ppm, 3000 ppm, 4000 ppm), a positive control (transfluthrin 3000 ppm) and negative control (blank coil). Each group consists of 20 mosquitoes with four replication for each treatment. The data were obtained by analyzing the knockdown time 50 (KT<sub>50</sub>), knockdown time 90 (KT<sub>90</sub>) and probit analysis to obtain the LC<sub>50</sub> and LC<sub>90</sub> values and acetylcholinesterase activity. There are significant differences between the treatment groups. The results showed that the concentration of carbon monoxide (CO) emitted by the smoke of Morizena dose of 500 ppm is 140 ppm, dose of 1000 ppm is 165 ppm, dose of 2000 is 212 ppm, dose of 3000 ppm is 228 ppm, dose of 4000 ppm is 320 ppm, whereas dose of tranfluthrin 3000 ppm is 545 ppm. Besides that, there were differences between the Morizena group with graded dose and transfluthrin 3000 ppm group causing death by mosquitoes KT<sub>90</sub> more than >95%, and the LC<sub>50</sub> values at doses of 820 ppm and LC<sub>90</sub> values at a dose of 2064 ppm. It can be said to be the effective dose of Morizena is 2064 ppm.

## Session 2

**Afternoon, October 12, 2017 (Thursday)**

**Time: 16:20~17:50**

**Venue: Moon-Chang hall**

**6 presentations- Topic: “Agriculture and Biology”**

**Session Chair: Prof. Chan Jin Park**

C0011 Presentation 4 (17:05~17:20)

*Meyerozyme guilliermondii*: An alternative yeast for recombinant protein production

**Siti Nurbaya Oslan**, Abu Bakar Salleh

Universiti Putra Malaysia, Malaysia

*Abstract*—A locally isolated yeast *Meyerozyme guilliermondii* from Malaysia was first identified as *Pichia* sp. strain SO, which was isolated from spoiled orange, has shown its capability in the expression of a bacterial lipase from *Geobacillus zalihae* under the regulation of *Pichia pastoris* expression vector (containing AOXp). A commonly used yeast system *P. pastoris* required high methanol induction (2%) with 196 h cultivation time. Methanol induction was required every 24 h interval to induce the promoter. This production strategy was uneconomical and the produced protein was contaminated with methanol. Thus, the recombinant lipase was transformed into strain SO to overcome the bottlenecks. The result showed that the recombinant lipase has generated a stable integration in the genome. The production of the recombinant lipase was optimized and found that YPTM was the best production medium with 1.5% methanol induction at 30 h. This finding has proven that strain SO could be used to express the bacterial lipase efficiently. This alternative host may be used to express other recombinant proteins. This was the first study that used *M. guilliermondii* as a host organism. Current works in progress are to express other recombinant proteins in this host using AOXp and FLDp. In conclusion, *M. guilliermondii* strain SO was successfully used to express the recombinant protein and it was expected to overcome the limitations faced in existing yeast expression system. Resonance Surface Methodology technique can be implemented to find the optimum condition that may improve the recombinant protein yields in this new system.

## Session 2

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**6 presentations- Topic: “Agriculture and Biology”**

**Session Chair: Prof. Chan Jin Park**

S1003 Presentation 5 (17:20~17:35)

Evaluation of Altruistic Behavior in Public Health among Koreans Using Hamilton’s Law

**Sangyoon Lee**

Global Vision Christian School, Korea

*Abstract*—In 2015, MERS panic was spread over South Korea. Korean government has reported that some patients who were asked to quarantine themselves at home did not follow government’s recommendations; their egoistic attitude made other societal members vulnerable to severe disease. Thus, necessity to evaluate altruistic behavior in public health among Koreans has been suggested.

In the research, Hamilton’s kin relationship theory ( $rB > C$ ) is used to evaluate altruistic awareness about public health. The author selected Seoul Subway (Line number 2) as a sample and investigated floating population of Seoul in daytime. It was revealed that about a million of people might be exposed to the virus; thus,  $rB$  equals  $2.28 \times 10^{-70}$ . Since  $rB$  is too small, case of H1N1 influenza that had spread in 2012 in Korea is used as a control group in this research to calculate more accurately. Minimum  $rB$  in H1N1 case is  $1.37 \times 10^{-72}$ .

It is concluded that some Koreans in this research care about their own convenience at the risk of at least 166 people’s lives with confidence interval of 95%. This tendency might be due to rapid change of culture into individualism for recent decades. There are some limitations of confounding factors influencing the people’s ways of behavior. In regard of this, further research is necessary to evaluate more accurate altruistic behavior in public health among Koreans. Also, it would be interesting if comparisons are made among nations.

## Session 2

**Afternoon, October 12, 2017 (Thursday)**

**Time: 16:20~17:50**

**Venue: Moon-Chang hall**

**6 presentations- Topic: “Agriculture and Biology”**

**Session Chair: Prof. Chan Jin Park**

S0001 Presentation 8 (17:35~17:50)

Impacts of Mercuric Ions on the Cell Size, Surface Morphology and DNA of *Chlorella vulgaris*

**Hazlina Ahamad Zakeri** and Devanthiran Letchumanan

Universiti Malaysia Terengganu, Malaysia

*Abstract*—Heavy metals water pollution has become a big issue globally due to the adverse effects exhibited by the metals. Microalgae are important primary producers in marine and freshwater ecosystems. They have the ability to adsorb and bioaccumulate metals. Thus, heavy metals accumulated by the algae can be a big problem since the metals can reach us, the highest consumers. Alternatively, microalgae can also be used in bioremediation process. In this study, the effects of mercuric ions ( $Hg^{2+}$ ) on the morphology and DNA damage of a green microalga, *Chlorella vulgaris* (UMT- M1), were determined. The half maximal inhibitory concentration (i.e.  $IC_{50}$ ) of  $Hg^{2+}$  on the growth of *C. vulgaris* obtained from this study was 0.72 mg/L. Under the light and scanning electron microscopes, it was observed that  $Hg^{2+}$  treated cells become smaller in size (i.e.  $\sim 2.1 \mu m$ ) compared to untreated cells (i.e.  $\sim 3.2 \mu m$ ). The shape of the cells became deformed after treatments. The membrane of treated cells showed a rougher surface compared to treated cells which has a smooth surface structure. Apoptotic bodies were also observed under the 0.001 mg/L, 0.01 mg/L and 0.1 mg/L of  $Hg^{2+}$  but was not present in the highest concentration of 1.0 mg/L. The highest percentage of cells with level 4 DNA damage was observed in 0.1 mg/L  $Hg^{2+}$ . In conclusion, even a small amount of  $Hg^{2+}$  present in the environment can have an effect on *C. vulgaris* by changing its morphology, disrupting its physiological processes and damaging its DNA.

# POSTER

**Afternoon, October 12, 2017 (Thursday)**

**Time: 9:20~17:50**

**Venue: Moon-Chang hall**

C0015 Presentation (9:20~17:50)

Optimization of system dynamics modelling for evaluating the emission of greenhouse gas and treatment cost of solid waste

**Kanchan Popli**, Seungdo Kim, Yoonhee Choi, Jeejae Lim, Hyeonkyeong Kim, Sukyeong Yang, Taeho Lee

Department of Environmental Science and Biotechnology, Hallym University, South Korea

*Abstract*—The inappropriate way of treating the solid waste leads to the increase in the emission of greenhouse gases and hike in the cost of treatment of solid waste. South Korea is facing the problem of treating the municipal solid waste in a cost effective way and decided the target to reduce the GHG emissions by 23% from waste sector by 2030 from business-as-usual (BAU) level. Hence this study has been done to develop a model with the help of system dynamics to find an optimum methodology for disposal of municipal solid waste by using the unit emission and unit cost of treatment for the different methods of disposal, namely, landfill, recycling and incineration. In total five scenarios have been made to find the best method for the disposal of municipal solid waste. The model is simulated for thirty years with initial year of 1990. Among all, SCENARIO 3 has been chosen as the best method where the percentage of waste going to recycling is higher which has ended up in reducing the GHG emission and the cost of treatment. The need for the government policy has also been determined by using the parameter like ‘new waste generation per capita’. In conclusion, if the waste generation per capita is reduced, the total cost of treating the waste can be reduced with the reduction in the GHG emission from waste successfully.

# POSTER

**Afternoon, October 12, 2017 (Thursday)**

**Time: 9:20~17:50**

**Venue: Moon-Chang hall**

S0002 Presentation (9:20~17:50)

Effect of water treated with positive pulsed plasma on germination of brown rice

**Hua Han Chen, Xin Yi Zhou, Zi Yin Ken and Wan Yu Luo**

Department of Food Science, National Penghu University of Science and Technology,  
Makung city, Penghu Hsien 880, Taiwan

*Abstract*—Germination of brown rice decreases its hardness, follow by improving some shortcomings of cooked brown rice, such as hardness, hard to cook, long chewing time. In addition, the activities of hydrolysis enzymes increase after germination, follow by promoting the level of digestion due to higher hydrolysis of starch and protein. Meanwhile, other studies have pointed out that the cereal grains would produce the unique flavor and aroma components, increase the releasing amount of antioxidant compounds, and produce inositol and GABA after germination. Therefore, germinated brown rice can be a health food with a high nutritional value. Plasmas are generated by supplying external energy to a neutral gas causing the formation of charge carriers. Electrons and ions are produced in the gas phase when electrons or photons with sufficient energy collide with the neutral atoms and molecules in the feed gas. Plasma consists of neutral atoms or molecules, negative charges, positive charges, excited molecules, radicals and UV radiation. Non-thermal in contact with liquid has wide applications in e.g. waste water treatment and bacterial inactivation in aqueous solutions. Plasma produces a mixture of important reactive oxygen and reactive nitrogen species which, when mixed with water, are able to significantly influence plant lifecycle and have potential to add plasma as a valuable application in agriculture. Germination of brown rice with positive pulsed plasma-treated water can increase the germination percentage from 77% to 86% after 24 hr germinated time. In addition, seedling length and  $\alpha$ -amylase were significantly higher in treated groups than in controls. The main finding of this study indicates that water with plasma treatment is effective at enhancing the growth of germinated brown rice, which can supply high nutrition to consumer.



**Dinner**

**18:00**

# Conference Venue



Pusan National University (PNU, also called Busan National University) is one of ten flagship Korean national universities and a leading university in South Korea. Located mainly in Busan (or Pusan), the university's English name is a translation of its former Korean name, "Gungnip Pusan Daehakgyo" (국립 부산 대학교), but has since dropped "national" from its Korean moniker.

Continually ranked among one of top 500 world universities by ARWU World University Ranking and QS Top Universities Ranking, Pusan National University is one of only ten Korean universities ranked in both ARWU World University Ranking and QS Top Universities Ranking in 2010. In QS Top Universities Ranking 2010, Pusan National University is ranked in top five in social sciences and management, sixth in engineering and technology, sixth in life science and medicine, and ninth in arts and humanities among Korean universities. Pusan National University is one of only five Korean universities ranked in four subject areas in QS Top Universities Ranking 2010.

**The conference will be held in Sangnam International House, conference room Moon-Chang hall on the first floor. (Building number 209 in the map).**

**Map of University ([Click](#))**

**Address: 266-6 Jang-Jeon-Dong, Geumjeong-gu, Busan, 46241, Rep. of KOREA**

**In Korean Language (부산광역시 금정구 장전동 266-6 부산대학교 상남국제회관)**

Recommend Hotel nearby:

Hotel Nongshim: <http://www.hotelnongshim.com/html/main/>









## Feedback Information

(Please fill this form and return it to conference specialist during the conference days.)

<b>Personal Information</b>					
Conference Name and Paper ID					
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E-mail Address					
Area of Research					
Affiliation					
<b>Please indicate your overall satisfaction with this conference with “√”</b>					
	Very Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Very Dissatisfied
Conference Content					
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Venue					
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Are You A Member of HKCBEEES	Yes <input type="checkbox"/> No <input type="checkbox"/> (If “No”, you may apply membership from <a href="http://www.cbees.org/list-34-1.html">http://www.cbees.org/list-34-1.html</a> )				
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2017 HKCBEEES BUSAN CONFERENCE

<p>Would you please list the top 3 to 5 universities in your city?</p>	
<p>Other Field of Interest</p>	
<p>Any Other Suggestions/Comments</p>	

Thank you for taking time to participate in this conference evaluation. Your comments will enable us to execute future conferences better and tailor them to your needs! More conference information could be found in <http://www.cbees.org/list-15-1.html>