2019 10th International Conference on Agriculture and Animal Science (ICAAS 2019)

October 18-20, 2019

Hawaii, USA

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Conference Venue

University of Hawaiʻi at Mānoa Campus Center

Address: 2465 Campus Road Honolulu, HI 96822, Hawaii, USA

Campus Center Complex is the student union of the University of Hawaiʻi at Manoa. The student union offers the university community and the public a wide variety of meeting, dining and entertainment options to enrich campus life and the educational experience. Campus Center, located in the heart of the University, strives to meet the co-curricular needs and interests of the University community by utilizing the Campus Center Complex (Campus Center, Hemenway Hall and the Warrior Recreation Center) as the primary venue for programs and events to create an environment where individuals can come and relax, study and be entertained or challenged. Campus Center Complex affects the quality of life on campus by the variety of co-curricular programs it provides.

Transportation--Airport

When booking your flights to Honolulu, please select the Honolulu International Airport (HNL). From the airport, Waikiki and the University of Hawaiʻi at Mānoa is a short 15 minute drive.
Registration will be arranged in Campus Center Courtyard tent on the 1st floor.

Reports
Oct 19, 2019
9:00-17:30

Registration
Oct 18, 2019
10:00-17:00

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.
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**Session Chair:** Prof. Jae K. Park and Prof. Kokyo Oh

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Session 2

**Topic:** Biology and Ecology
**Session Chair:** Prof. Khaled M. Bali and Prof. Charles Kinoshita
### X2002: Presentation 1 (15:50–16:15)
**Studies on Phytoremediation Potential of Castor Oil Plant with Enhanced Measure in Heavy Metal Contaminated Soils**

- **Kokyo Oh**, Hongyan Cheng, Chiquan He, Shinichi Yonemochi, Tetsushi Yonekura, Yugo Isobe  
  Center for Environmental Science in Saitama, Saitama, Japan

### X8007: Presentation 2 (16:15–16:40)
**Immunomodulatory effect of thymopentin on lymphocytes from supramammary lymph nodes of dairy cows**

- **Ran Guan**, Wei Xu, Lijia Yuan, Yong Wang, Xuemei Cui and Songhua Hu  
  Zhejiang University, Zhejiang, China

### X8005: Presentation 3 (16:40–17:05)
**Flavonoids, Alkaloids and Tannins of Three Varieties of Horse Radish (Moringa oleifera Lam.) Extracts: Potential Components of Toothpastes**

  Adventist University of the Philippines and Isabela State University, Puting Kahoy, Silang, Cavite

### X8006: Presentation 4 (17:05–17:30)
**Investigating the Antibacterial Property of Clausena anisum-olens (Blanco) Merr. against Streptococcus mutans**

- Rachel Joy J. Ibasco, Summer Ricci G. Quinn, Reselle Joyce B. Sulit, Vicky C. Mergal, Agnes Dizon Lorcelie B. Taclan and Roderick Perez  
  Adventist University of the Philippines, Philippines

### X0024: Presentation 5 (17:30–17:55)
**Assessing the Impacts of Vegetation Cover Change in Mahazat Alsayd Natural Reserve Using Remote Sensing and Ground-truth Data**

- **Ali A. Al-Namazi**, and Khalid A. Almalki  
  King Abdul-Aziz City for Science and Technology (KACST), Saudi Arabia

### Poster Session

**X0010: Antimicrobial effect and environmental impact of controlled release iodine water disinfectant**

- **Yasuhiro Matsuda**, Kenichi Koshiro, Mari Fujita and Takashi Saito  
  University of Hokkaido, Ishikari-gun, Japan

**X0019-A: Endemic Flora & Place Identity: Embodied, Disembodied and Intrinsic Worldviews in Support of Biodiversity**

- **Jane Marie Francis Martin**  
  Victoria University of Wellington, New Zealand
Hawaii Conference Introductions

Welcome to 2019 HKCBEES Hawaii conference. This conference is organized by HKCBEES. The objective of the Hawaii conference is to bring together academics and experts in the field of Agriculture and Animal Science to a common forum.

2019 10th International Conference on Agriculture and Animal Science (ICAAS 2019)

Accepted papers will be published in the following Conference Proceeding:

Journal of Advanced Agricultural Technologies (JOAAT, ISSN: 2373-423X), which will be indexed by Ulrich’s Periodicals Directory, Google Scholar, Engineering & Technology Digital Library, Crossref and Electronic Journals Digital Library.

Conference website and email: http://www.icaas.net/; caas@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 20 Minutes of Presentation and 5 Minutes of Question and Answer
Keynote Speech: about 40 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 19, 2019.

Dress code
Please wear formal clothes or national representative of clothing.
Keynote Speaker Introductions

Keynote Speaker I  09:20~10:05

Prof. Jae K. Park
University of Wisconsin-Madison, USA

Dr. Park is a professor of the Civil and Environmental Engineering Department at the University of Wisconsin-Madison since 1988. He received a B.S. in Civil Engineering at Yonsei University in 1977 and a M.S. in Environmental Engineering at Seoul National University in 1979. He worked as a consulting engineer in Korea and Australia for two years after serving two and a half years of military service. He received a Ph.D. in Public Health Engineering at the University of Newcastle upon Tyne, United Kingdom in 1985. He worked as a research associate at the Sanitary and Environmental Health Research Laboratory, University of California, Berkeley from 1985 to 1988.

Since he joined University of Wisconsin-Madison in 1988, he has taught various environmental engineering courses such as water treatment plant design, wastewater treatment plant design, biological treatment, physicalemical treatment, hazardous waste management, solids and hazardous waste engineering, industrial water pollution control, etc. His research is in the areas of water quality management and river restoration; biological treatment; hazardous waste treatment; mass transport in the environment; fate of organic compounds in water and wastewater treatment processes; computer-aided design of water and wastewater treatment plants; and reuse of scrap vehicle tires as a contaminant sorbent. His research was supported by the National Science Foundation, the Department of Defense, municipalities, private industries, Wisconsin Department of Transportation, Wisconsin Department of Natural Resources, and various research institutes. He has served as the consultant of various governments, research institutes, utilities, universities, and industries all over the world.
Topic: ‘Sustainable Use of Tire-Derived Aggregate for Agricultural Pollutant Control’

Abstract—Agricultural pollution is caused by nonpoint runoff over farmlands, carrying fertilizer, manure, and soil into lakes and rivers. The most notable pollutant, phosphorus, has been recognized as the major controlling factor of plant and algae growth in waterbodies, resulting in reduced recreational use, lower property values and a threat to public health. Almost one billion scrap tires are generated and recycled, creating almost $8 billion of revenue worldwide. With stricter regulations, the market for the recovery and recycling of scrap tires is increasing at the rate of 4.5% annually. The three largest segments are fuel, civil engineering applications, and ground rubber markets. Recently, tire-derived aggregates (TDAs) are being widely used for civil engineering applications. The rubber used in manufacturing tires were found to adsorb toxic organic compounds and heavy metals. In addition, steel wires in tires are capable of removing phosphorus present in the environment. Various sizes of scrap tires can be used in a golf course as a substitute for aggregates and an adsorbent for removal of pesticides and fertilizers. A 20-cm thick tire rubber layer was found to be capable of removing $\geq 90\%$ for 37 out of 51 pesticides evaluated. By using scrap tires for the mitigation of pesticides and fertilizers, golf courses may be able to realize the dual benefits of waste utilization and reduced environmental contamination. A preliminary design was performed for a golf course where one million scrap tires stockpiled in a landfill are used. TDAs are good materials for stormwater management systems. TDA can hold twice more water and provide 75% lower cost than stone when used as underground water storage. TDA can also be used as an eco-friendly zone by treating roadway runoff in the bioswale. Recently, more steel wire exposed TDA was proposed for phosphorus removal from agricultural runoff. More case studies will be presented.
Keynote Speaker II

14:00~14:45

Prof. Khaled M. Bali
University of California, San Diego, USA

Prof. K. M. Bali is an Irrigation/Water Management Advisor and County Director at the University of California Desert Research and Extension Center in Holtville, California. He holds a Ph.D. Degree (1992) in Soil Science (soil physics) and MS Degree (1987) in Water Science (Irrigation and Drainage) from the University of California at Davis. He holds a Bachelor of Science Degree (1984) in soils and irrigation from the University of Jordan, Amman.

His main fields of scientific interest include water resources and management, water quality, irrigation systems, automation of surface irrigation, evapotranspiration, salinity, water quality, and reuse of wastewater for irrigation.

Dr. Bali a member of many professional societies as American Geophysical Union and United States Committee on Irrigation and Drainage. He is a U.S. Fulbright Scholar and served on a number of National and International Scientific Committees.
Topic: ‘Variable Rate Irrigation Practices on Orchards’

Abstract—Orchard growers in California are under continuous pressure to grow orchards with limited water supplies. In recent decades, pressurized micro-irrigation systems have greatly improved distribution uniformity and water use efficiency of applied water. However, different portions of a field may have varying water and fertilizer requirements due to soil spatial variability, water quality, climate and other factors influencing tree growth across the block.

Most irrigation systems have little capacity to differentially irrigate different sections of the field to account for various factors that affect crop water needs. Water applications to the entire field are based on the needs of the ‘weakest’ areas, which may lead to over applications and reduced system efficiency and yield potential. Variable rate irrigation (VRI) systems may improve water use efficiency by tailoring irrigation zones and sets to meet changing tree water requirements. We are testing here VRI system on a 70-acre block to document the impact of using such technology on crop yield, water use efficiency, economic feasibility, and potential improvements in energy and fertilizer use efficiency.
Keynote Speaker III  14:45~15:30

Prof. Charles Kinoshita
University of Hawai‘i at Mānoa, USA

Charles Kinoshita, P.E., Ph.D., is Professor of Molecular Biosciences and Bioengineering (MBBE) and Director of the Western Insular Pacific Sun Grant Subcenter, University of Hawaii at Manoa (UHM). Prior to those assignments, Dr. Kinoshita served as Associate Dean for Academic and Student Affairs, College of Tropical Agriculture and Human Resources; Chair, MBBE; Director, Marine Bioproducts Engineering Center; and Researcher, Hawaii Natural Energy Institute of the University of Hawaii. He has taught courses in transport phenomena, unit operations, thermosciences, and engineering design in the Biological Engineering and Mechanical Engineering programs at UHM, and has trained practicing engineers through various professional societies. Dr. Kinoshita has led major research programs involving renewable energy, bio-based products, and the environment, and as Principal Investigator, has garnered more than $20 million in extramural research and education grant funding from federal and state agencies, international institutions, industry, and philanthropic organizations. Prior to joining the University, Dr. Kinoshita served in managerial positions at the Experiment Station of the Hawaiian Sugar Planters’ Association, and as Research Assistant at the Lawrence Berkeley National Laboratory. Dr. Kinoshita has advised or consulted to numerous businesses and government agencies, locally, nationally and internationally. He received BS and MS degrees in Mechanical Engineering at the University of Hawai‘i at Mānoa and a PhD degree in Mechanical Engineering at the University of California at Berkeley.
Topic: ‘Assessment of Renewable Drop-In Biofuels Supply Chain In Hawaii’

Abstract—Renewable drop-in biofuels are fuels that are derived from biomass sources, which are physically and chemically interchangeable with petroleum gasoline, diesel, or jet fuel and are infrastructurally compatible with conventional petroleum. Factors that impact the potential for producing drop-in fuels from biomass in Hawaii are reviewed. These include: (1) energy crop production – types and quantities of biomass feedstocks producible in Hawaii based on the availability and suitability of land and water resources; (2) biofuels conversion – technologies that might be used to convert biomass feedstocks into drop-in fuels and the likely yield of biofuels; (3) other factors relating to biofuel production and use such as cost and carbon footprint.

The energy crops evaluated are those that have been grown commercially or tested most extensively in Hawaii including sugar-bearing species, sugarcane (Saccharum officinarum) and sorghum; high fiber grasses, banana grass (Pennisetum purpureum) and several varieties of energy cane; fiber tree crops, Eucalyptus and Leucaena leucocephala; and oil crops, oil palm (Elaeis guineensis), Jatropha curcas, and microalgae. Because biomass conversion generally benefits significantly from economies of scale, the evaluations focus on large tracts of contiguous agricultural lands with access to irrigation water (if needed), upon which vast quantities of biomass could be grown and harvested, then transported efficiently to a central facility for conversion into biofuels. Converting the biomass feedstock into a drop-in fuel can take several paths, involving different technologies and inputs. Fiber-based, sugar-based, crop-oil, and hybrid conversion pathways are compared on the basis of estimated fuel yield, fuel price, and commercial readiness. Life-cycle assessments and workforce requirements are discussed for selected drop-in fuel pathways.
## Brief Schedule for Conference

### Day 1

**October 18 (Friday) 10:00~17:00**  
*Venue: Campus Center Courtyard tent on the 1st floor*  
(Add: 2465 Campus Road Honolulu, HI 96822, Hawaii, USA)  
Participants Onsite Registration & Conference Materials Collection & Conference Reports

### Day 2

**October 19 (Saturday) 09:15~17:55**  
*Venue: Executive Dining Room (Campus Center 2nd floor)*  
(Add: 2465 Campus Road Honolulu, HI 96822, Hawaii, USA)  
Participants Onsite Registration & Conference Materials Collection & Conference Reports

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<th>Time</th>
<th>Event</th>
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<td>09:15~09:20</td>
<td><strong>Opening Remarks</strong></td>
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<td></td>
<td>Prof. Charles Kinoshita</td>
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<td>University of Hawaiʻi at Mānoa, USA</td>
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<tr>
<td>09:20~10:05</td>
<td><strong>Keynote Speech I</strong></td>
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<td>Topic: ‘Sustainable Use of Tire-Derived Aggregate for Agricultural Pollutant Control’</td>
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<td>(Prof. Jae K. Park, University of Wisconsin-Madison, USA)</td>
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<td>10:05~10:30</td>
<td><strong>Coffee Break &amp; Group Photo Taking</strong></td>
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<td>10:30~12:10</td>
<td><strong>Session 1:</strong> 4 presentations-Topic: “Environmental Science and Agricultural Science”</td>
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<td>Session Chair: Prof. Jae K. Park and Prof. Kokyo Oh</td>
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<td>12:10~14:00</td>
<td><strong>Lunch</strong></td>
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<td>14:00~14:45</td>
<td><strong>Keynote Speech II</strong></td>
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<td>Topic: ‘Variable Rate Irrigation Practices on Orchards’</td>
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<td>(Prof. Khaled M. Bali, University of California, San Diego, USA)</td>
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Keynote Speech III 14:45~15:30
Topic: ‘Assessment Of Renewable Drop-In Biofuels Supply Chain In Hawaii’
(Prof. Charles Kinoshita, University of Hawai‘i at Mānoa, USA)

Coffee Break 15:30~15:50

Session 2: 15:50~17:55
Venue: Executive Dining Room (Campus Center 2nd floor)
5 presentations-Topic: “Biology and Ecology”
Session Chair: Prof. Khaled M. Bali and Prof. Charles Kinoshita

Poster Session: 09:15-17:55
Venue: Executive Dining Room (Campus Center 2nd floor)

Dinner 18:00
Venue: Executive Dining Room (Campus Center 2nd floor)

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 Oct.19.
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.

Morning, Oct 19, 2019 (Saturday)

Time: 10:30~12:10

Venue: Executive Dining Room (2nd floor)

4 presentations-Topic: “Environmental Science and Agricultural Science”

Session Chair: Prof. Jae K. Park and Prof. Kokyo Oh

X0007 Presentation 1 (10:30~10:55)
Integrated Mobile Veld Fire Detection and Notification System for Rural Communities: A case of South Africa, Zimbabwe and Namibia
Taruzvinga Amon, Chikohora Edmore and Jere Nobert
University of Fort Hare, South Africa

Abstract—Socio-economic and environmental impacts of veld fires are acknowledged, documented and widely discussed at different forums. However, what is largely missing are solutions to reduce occurrence of veld fires mostly in rural areas. Literature also suggests that veld fires are to increase (more intense and long burning) with warming (hot and dry conditions – climate change). This is likely to affect rural poor households who largely depend on land based natural resources (field crops, forests harvest, grazing land); with limited access to fire brigades that mainly serve urban cities. With warming (drier and hotter conditions) rural areas who share boundaries with mountains, rangelands, forests and wetlands are predicted to face greater threats from veld fires because of the dry flammable biomass in these areas. Against these drawbacks and leveraging high mobile phones ownership and network coverage in rural areas we present; an integrated mobile application for veld fire detection and notification prototype that can be used by rural households to identify high fire danger areas and burning fires in near real time close to their location.
X1019: Presentation 2 (10:55~11:20)
Trends in national emissions of dioxins on incinerators in Korea

Ki-Hyup Hong, Eon-Seok Lee, Kyong-Il Chu, Yeong-Don Kwak, Deuk-Jong Jung
Korea Environmental Corporation, Incheon, Korea

Abstract—As Persistent organic pollutants are difficult to be decomposed photochemically, biologically, and chemically in the environment, they have characteristics such as toxicity, which cause harmful damage to human body and environment, accumulative concentration of animals and plants throughout the food chain, and long-range mobility that can travel far from the source.

The Stockholm Final Protocol has been adopted to mandate the reduction, prohibition or restriction of the release of POPs substances. After Korea signed the Stockholm Convention in October 2001, Korea has made great efforts to get the current situation of POPs discharge and to enact related laws. In October 2005, the Ministry of Environment of Korea prepared and released the first dioxin emission list in 2001 and the Korean government continues to manage.

The amount of dioxin emission on incinerators in Korea accounted for 26% of the total emissions of Korea in 2015.

In 2015, there were 515 domestic incineration facilities including 191 incineration facilities for municipal wastes, 262 incineration facilities for general industrial wastes, 49 incineration facilities for hazardous industrial wastes, and 13 incineration facilities for medical wastes.

Emission of incineration facilities in 2015 in Korea were 24.2 g I-TEQ / year that included 2 g I-TEQ / year from municipal wastes incineration facilities, 19.0 g I-TEQ / year from general industrial wastes incineration facilities, 1.6 g I-TEQ / year from hazardous industrial wastes incineration facilities and 1.6 g I-TEQ / year from the medical waste incineration facilities.

National emissions amount from incineration plant decreased significantly from 2001 to 2003 and from 2005 to 2007, because applying the dioxin regulations has been expanded from facilities above 2.0 ton / hour to facilities above 200kg / hr in 2001.

Emissions from incineration plant also decreased in 2006, as the emission standard for facilities that incinerate less than 2 ton / hour facilities was significantly tightened from 40 ng-TEQ / Nm³ to 10 ng-TEQ / Nm³. In addition,

Many small scale incinerators were closed in 2007, because small scale facilities with high level concentrations were not available to control dioxin emissions (Incineration facilities had been greatly reduced from 272 to 155 at that time)
Session 1

Morning, Oct 19, 2019 (Saturday)

Time: 10:30~12:10

Venue: Executive Dining Room (2nd floor)

4 presentations-Topic: “Environmental Science and Agricultural Science”

Session Chair: Prof. Jae K. Park and Prof. Kokyo Oh

X2001: Presentation 3 (11:20~11:45)
Finding ideal environmental conditions for giant and common leucaena to be used as fodder
Ahmed Bageel, Dulal Borthakur
University of Hawaii At Manoa, USA

Abstract—Leucaena leucocephala (leucaena) is an important forage legume because of its high protein content, easy cultivation, and resistance to biotic and abiotic stresses. Leucaena can be divided into two groups, giant leucaena and common leucaena. The major limiting factor for the use of leucaena as a fodder is the presence of undesirable secondary metabolites such as mimosine and tannin, and insoluble fibers in high concentrations in the foliage of leucaena. We hypothesize that amounts of these compounds in the leucaena foliage vary under different environmental conditions. The objective of this research is to identify the optimum environmental conditions where leucaena maintains its high protein content along with minimum contents of these two secondary metabolites, and a balanced fiber content. Foliage samples of giant and common leucaena have been collected every month from nine locations on Oahu with different environmental conditions, including temperature, rainfall and soil properties (moister, pH, total carbon and total nitrogen). Then, the foliage quality is tested every month by quantifying mimosine, tannin, proteins and fibers contents in the samples. These results will help in identifying the best conditions, under which mimosine and tannin are reduced to an acceptable, non-toxic level, and keeping protein and other nutritional components as high as possible. Reduction of mimosine and tannin contents through environmental management will increase potential uses for leucaena as a fodder.
Session 1

Morning, Oct 19, 2019 (Saturday)

Time: 10:30~12:10

Venue: Executive Dining Room (2nd floor)

4 presentations-Topic: “Environmental Science and Agricultural Science”

Session Chair: Prof. Jae K. Park and Prof. Kokyo Oh

X0029: Presentation 4 (11:45~12:10)
The Impact of Migration on Agriculture in Developing Countries.

**Dambar Uprety**
University of North Carolina Wilmington, USA

Abstract—This paper aims to assess the effect of migration on agriculture in developing countries, observing how this effect varies according to the level of education of migrants. We investigate this relationship by using panel data that measure international migration from developing countries to the main OECD destination countries. Agricultural sector is low-educated labor-intensive and developing countries are low-educated labor-abundant and high-educated labor-scarce. Emigration of high-educated labor increases the relative supply of low-educated leading to depress the wage to them while the wage of those of high-educated increases. Consequently, high-educated migration expands agricultural sector. Because agricultural sector could be endogeneous, thus this paper employs a dynamic GMM estimation methodology. Using a panel of 132 developing countries from 1980-2010, the study finds robust results to different specifications and subsamples that high-skilled migration increases agricultural farming while there appears to be no effect of low-educated migration. A clearer understanding of the channels through which high-educated migration will be beneficial for agricultural sector in developing countries may assist policymakers to craft appropriate policies.

JEL classification: F22, Q15

Lunch 12:10~14:00
Session 2

Afternoon, Oct 19, 2019 (Saturday)

Time: 15:50~17:55

Venue: Executive Dining Room (2nd floor)

5 presentations-Topic: “Biology and Ecology”

Session Chair: Prof. Khaled M. Bali and Prof. Charles Kinoshita

X2002: Presentation 1 (15:50~16:15)
Studies on Phytoremediation Potential of Castor Oil Plant with Enhanced Measure in Heavy Metal Contaminated Soils
Kokyo Oh, Hongyan Cheng, Chiquan He, Shinichi Yonemochi, Tetsushi Yonekura, Yugo Isobe
Center for Environmental Science in Saitama, Saitama, Japan

Abstract—Extensive soil contamination with toxic heavy metals such as Cd, Pb, Cu and Zn has been a great threat to environment quality, human health and land economic values, and there is a great need to develop effective remediation technologies, which is not only treatment of contaminated soils but save the soil resources and protect the economy income of the owners of the contaminated sites. The objectives of this study were to develop the profitable phytoremediation system with castor oil plant (Ricinus communis L.) in order to remediate the soil, save the soil resources, and obtain economy income from the use of castor oil seeds for biofuel production. The reason that the castor oil plant was used is that the plant is an important commercial plant for energy oil production, which is easy to establish on the field, resistant to drought, tolerate different types of soil even contaminated soil and marginal soil, and yield oil seeds. In this study, two heavy metal contaminated sites were used to test the feasibility of this profitable phytoremediation system with plantation of castor oil plant. The enhancement measures with application spent mushroom substrate (SMS) were also investigated. Yields of total biomass and oil seeds were investigated, heavy metal contents in different parts of the plants were analyzed, and the remediation potential and economic income levels were estimated. The results showed that the total biomass yields reached to 34 t/ha, which is much higher than other crops such as maize, sunflowers and sorghum nearby the experimental areas. The phytoremediation potential (g/ha) were evenly 155 for Cu, 708 for Zn, 27 for Pb and 59 for Ni. No extremely high heavy metal concentrations were found in castor oil plant compared with those from the uncontaminated soils, so it was estimated that the harvested oil seeds from the contaminated soil were suitable for energy production of biofuel, and the other parts of the plant were suitable for other industrial materials (such as biochar) production. Thus, in this way, it might generate economic income to the owners of contaminated sites. The study also found that SMS increased the extracted rates of Zn and Cd by 100%–230% and 50%–190%, respectively, indicating that SMS treatment could enhance the phytoremediation potential. Castor oil plant were assessed as the suitable biofuel plants for phytoremediation of heavy metal contaminated soils, as they showed the high phytoremediation potential and reasonable economic income. (This work was supported by JSPS KAKENHI No.16H05633).
Session 2

Afternoon, Oct 19, 2019 (Saturday)

Time: 15:50~17:55

Venue: Executive Dining Room (2nd floor)

5 presentations-Topic: “Biology and Ecology”

Session Chair: Prof. Khaled M. Bali and Prof. Charles Kinoshita

X8007: Presentation 2 (16:15~16:40)
Immunomodulatory effect of thymopentin on lymphocytes from supramammary lymph nodes of dairy cows
Ran Guan, Wei Xu, Lijia Yuan, Yong Wang, Xuemei Cui and Songhua Hu
Zhejiang University, Zhejiang, China

Abstract—Previous studies have shown the therapeutic effect of thymopentin (TP5) injected in the area of supramammary lymph nodes (SMLN) on bovine subclinical mastitis. The present study was designed to investigate the immunoregulatory activity of TP5 in SMLN lymphocytes. Lymphocyte proliferation, cell cycle distribution and cytokine mRNA expression were determined by MTT, FCM and RT-qPCR, respectively. Confocal laser scanning microscope was employed to observe the binding effect between TP5 and SMLN lymphocytes. Moreover, RNA-sequencing (RNA-seq) was performed to explore the underlying mechanism. The results indicated that TP5 significantly promoted lymphocyte proliferation, accelerated cell cycle progression, and enhanced the mRNA expression of IL-17A and IL-17F. 1094 genes were identified as differentially expressed genes (DEGs) using RNA-seq, of which the up and down regulated genes were 692 and 402, respectively. A total of 48 significantly enriched GO terms were identified by RNA-seq. In KEGG analysis, 1/3 of DEGs were enriched in the immune system pathway, including IL-17 signaling pathway, cytokine-cytokine receptor interaction, Th1 and Th2 cell differentiation, T cell receptor signaling pathway, Th17 cell differentiation, etc. Among them, the most prominent pathway was IL-17 signaling pathway. This study suggested that the therapeutic benefit of TP5 in bovine mastitis might be attributed to its immunomodulatory activity in SMLN lymphocytes.
Session 2

Afternoon, Oct 19, 2019 (Saturday)

Time: 15:50~17:55

Venue: Executive Dining Room (2nd floor)

5 presentations-Topic: “Biology and Ecology”

Session Chair: Prof. Khaled M. Bali and Prof. Charles Kinoshita

X8005: Presentation 3 (16:40~17:05)
Flavonoids, Alkaloids and Tannins of Three Varieties of Horse Radish (Moringa oleifera Lam.) Extracts: Potential Components of Toothpastes
Adventist University of the Philippines and Isabela State University, Puting Kahoy, Silang, Cavite

Abstract—Moringa oleifera Lam is a very common plant in tropical countries such as the Philippines. Recently, the Philippine Congress approved it as the national vegetable because of its various health benefits. The study generally identified the secondary compounds of the three varieties namely; Native, Yard Long, and Chinese through phytochemical analysis. Specifically, to establish the secondary compounds of the three varieties that would be potential components of toothpaste. Gathering of samples of the three varieties was done at the university campus. Each variety was dried using the Multi commodity heat pump dryer to preserve their nutritional contents before crude extraction that was done at the Department of Science and Technology-Industrial Technology Development Institute (DOST-ITDI) using 95% ethanol. Each extract was subjected to phytochemical analysis using standard laboratory procedures. Results revealed that the extracts contain flavonoids, alkaloids and tannins that are known to have antimicrobial and anti-inflammatory properties, thus, these Moringa varieties have potential natural components in the manufacture of toothpastes.
Session 2

Afternoon, Oct 19, 2019 (Saturday)

Time: 15:50~17:55

Venue: Executive Dining Room (2nd floor)

5 presentations-Topic: “Biology and Ecology”

Session Chair: Prof. Khaled M. Bali and Prof. Charles Kinoshita

X8006: Presentation 4 (17:05~17:30)
Investigating the Antibacterial Property of *Clausena anisum-olens* (Blanco) *Merr.* against *Streptococcus mutans*
Rachel Joy J. Ibasco, Summer Ricci G. Quinn, Reselle Joyce B. Sulit, Vicky C. Mergal, Agnes Dizon Lorcelie B. Taclan and Roderick Perez
Adventist University of the Philippines, Philippines

Abstract—Blanco, a traditional plant in the Philippines with several medicinal uses. However, investigating its antimicrobial properties against *Streptococcus mutans* has not yet been studied. The study determined the antibacterial property of Blanco against *Streptococcus mutans* through In vitro study, specifically to a) verify the authenticity of the plant through botanical authentication b) determine the secondary compounds of the plant through phytochemical analysis; c) to identify the antibacterial property of the oil extract against *Streptococcus mutans* through disc diffusion method. Collected Blanco leaves were submitted to the National Museum for authentication. Six kilograms of Blanco leaves were gathered and dried using the Multi Commodity Heat Pump Dryer (MCHPD). The dried Blanco was pulverized using a heavy-duty grinder. Ground Blanco was extracted using steam distillation for its essential oil. The extracted oil contained in an amber glass bottle was submitted to the Institute of Pharmaceutical Sciences, National Institutes of Health, UP Manila for the phytochemical test. In vitro analysis against *Streptococcus mutans* was done at UP Los Banos, Biotechnology Laboratory using disc diffusion method. Results revealed the following: Blanco is part of the Rutaceae family through plant authentication. Its essential oil contains Sterols, Triterpinols and Alkaloids. The investigation of the antibacterial property of Blanco leaves in *Streptococcus Mutans* produced a negative response. Nonetheless, its essential oils have multiple health benefits thus considered a medicinal herb. It is recommended as an inlet for further studies for its usage in the dental industry.
Session 2

Afternoon, Oct 19, 2019 (Saturday)

Time: 15:50~17:55

Venue: Executive Dining Room (2nd floor)

5 presentations-Topic: “Biology and Ecology”

Session Chair: Prof. Khaled M. Bali and Prof. Charles Kinoshita

X0024: Presentation 5 (17:30~17:55)
Assessing the Impacts of Vegetation Cover Change in Mahazat Alsayd Natural Reserve Using Remote Sensing and Ground-truth Data
Ali A. Al-Namazi, and Khalid A. Almalki
King Abdul-Aziz City for Science and Technology (KACST), Saudi Arabia

Abstract—Saudi Arabia is located within an arid to semi-arid region, however, it is a biological diverse area, because species have adapted to the adverse ecological circumstances. One of the most important habitats in Saudi Arabia is the Mahazat Alsayd natural reserve. Understanding changes in vegetation cover over time is important for studying the habitats present in the reserve, and for analyzing the availability of animal fodder, as well as the extent of vegetation regeneration. Using remote sensing data and field observations, we detected that the vegetation coverage of Mahazat Alsayd decreased by 80% from 1995 to 2015. Multiple factors are currently affecting the structure of the plant and animal communities within the reserve. Such factors include ecological changes and human activities. These factors might lead to the extinction of some plant and/or animal species in the near future, either directly or indirectly. Thus, a comprehensive management plan must be implemented in the reserve as soon as possible to maintain and recover vegetation to provide sufficient animal feed, facilitating the sustainable conservation of animals and plants within the reserve. The vegetation cover assessment presented here provides an important source of information for conservation planning.
Poster Session

Oct 19, 2019 (Saturday)

Time: 09:15-17:55

Venue: Executive Dining Room (2nd floor)

X0010 Presentation 1
Antimicrobial effect and environmental impact of controlled release iodine water disinfectant
Yasuhiro Matsuda, Kenichi Koshiro, Mari Fujita and Takashi Saito
University of Hokkaido, Ishikari-gun, Japan.

Abstract—The dental chair unit is used by many patients during dental treatment every day, so dental unit waterlines (DCWs) should be disinfected. DCWs often use disinfecting cartridges containing iodine. The aim of this study was to measure iodine concentration and to evaluate its antimicrobial effect. Distilled water flowed through the iodine release cartridge, and iodine concentration of the water pumped through the cartridge was collected and measured every day for 5 days. The antibacterial effect was evaluated by Quantitative PCR and PMA dye PCR method. The iodine concentration was 1.1 ppm at the collection time and started to decrease after two days. After 5 days the concentration was reduced to 0.4 ppm. The iodine water showed an antibacterial effect 12 h after application. The iodine-release DCW disinfectant product killed 99.99 % of the bacteria within 48 h, and the concentration of iodine was lower than that mentioned the drinking water guideline recommended by the WHO.
X0019-A Presentation 2
Endemic Flora & Place Identity: Embodied, Disembodied and Intrinsic Worldviews in Support of Biodiversity
Jane Marie Francis Martin
Victoria University of Wellington, New Zealand

Abstract—Reflecting a worldwide trend, generations of Māori and Pākehā (indigenous and colonial-descendant New Zealanders) have relocated from ancestral lands and are increasingly living in cities and industrialized agricultural settings. Their lifestyles, detached from traditional land-work, are heavily influenced by contemporary technology and economics. A loss of familiarity with and nuanced understanding of ecosystems undermines a generalized invigorated sense of urgency to respond to widely acknowledged environmental crises. Through first-hand landscape observations and interviews with relevant national and local agencies, the research traces this concern through the example of biodiversity support for endemic New Zealand flora under pressure from introduced invasive species. Investigating the effects of Indigenous and Western worldviews on peoples’ relationship to the natural environment uncovers points of difference. However, integration of Māori and Pākehā values has resulted in blended views which do not neatly categorize into historically relevant worldview dichotomies. Therefore, these outlooks are re-framed as Embodied and Disembodied respectively. The research draws on elements of both and proposes to consider the worldview of Nature itself. In this way the author seeks to identify potential mechanisms for re-engaging policy makers, environmental agents and the general public to bolster native plant ecologies while meaningfully re-connecting to place.
Feedback Information

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