ICEMP 2018

2018 The 7th International Conference on Engineering Mathematics and Physics

ICNSAM 2018

2018 The 3rd International Conference on Natural Science and Applied Mathematics

June 15-18, 2018

Prague, Czech Republic

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FRONT PAGE

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SESSIONS

June 16th, 2018

Session III

[Bioinformatics and Environmental Science]

🕑 15:50-18:10

⊙ Room Gallery @ Ground floor

Chaired by

7 presentations—

MP3002, AM015, AM022, AM023, MP010, AM010, AM011

*Note:

Please arrive 30 minutes ahead of the sessions to prepare and test your PowerPoint.

Certificate of Presentation will be awarded to each presenter by the session chair when the

session is over.

One Best Presentation will be selected from each parallel session and the author of best

presentation will be announced and awarded when the session is over.

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MP3002 15:50-16:10	Thermal anomalies detection using comparative method for small earthquake **Pisanu Wongpornchai** and Chanida Suwanprasit Chiang Mai University, Thailand Abstract— Thermal anomaly is one of the earthquake precursor in the earthquake preparatory phase. Remote sensing in thermal region has been employed based on the concept of stress accumulation in the active plate tectonics region, which may be transformed as temperature variation prior to earthquake. MODIS Land Surface Temperature has been commonly used to locate the thermal anomalies before the earthquake. Recently researches have been focusing on moderate or large magnitude earthquake events. In Thailand, small earthquake can severely damage the unprepared area. This study, the daily day- and night-time data of MODIS MOD11A1 product for 30 days before and 15 days after the earthquake on April 22, 2007, in Wiang Pa Pao District, Chiang Rai Province, Thailand, were processed and analysed to locate possibility of thermal anomalies. Thermal anomalies before and after the earthquakes were detected using the comparative method. The result found that the thermal anomaly temperature could be high up to 4.1 - 10.9 °C which occurred in 21 - 22 days prior to the earthquake. Therefore, it may conclude that small earthquake can also release energy as the detectable thermal anomaly. However, more study about the relationship between thermal precursor and earthquake is needed to continue.
AM015 16:10-16:30	Evaluation of RegCM 4.4 to get Cloud and Monsoon Features with seasons over India **Ruchita Shah** and Rohit Srivastava Pandit Deendayal Petroleum University, India Abstract— Global warming may affect sea level, precipitation patterns, heat waves, melting of glaciers, frequent droughts and storms which alter dynamics of earth-atmosphere system. Uneven precipitation pattern can be understood well by cloud processes with the help of cloud microphysical properties. These properties can be studied by various methods but model simulation plays a significant role as it can reproduce features with high spatial and temporal resolution. Such high resolution study may be done with the help of regional climate models. Study of cloud properties at high resolution is important for a country like India as almost 70% of the population depends on agriculture for their livelihood. Thus there is a need to understand monsoon variability to sustain economy of India. Present study tries to reproduce monsoon features over Indian subcontinent and adjoining regions to know the performance of regional climate model (RegCM4.4), which is essential to gain confidence in the model. For this purpose, a normal rainfall year 2010 is chosen to study monsoon features. Paper focuses to link the properties of cloud, precipitation and relative humidity to capture major features of the monsoon. Beginning of south-west monsoon over Arabian Sea and north-east monsoon over Bay of Bengal is captured well by the model. During pre-monsoon, initial phase of south-west monsoon is picked well with relative humidity (80-100%) and cloud liquid water content (0.4-1.8 kg/m2) over Arabian Sea. Also during post-monsoon, initial phase of north-east monsoon is captured with relative humidity (80-100%) and cloud liquid water content (0.2-1.2 kg/m2) over Bay of Bengal.

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	Simulation of such dependent parameters may help to understand monsoon variability and may be applicable to tropical regions.
AM022 16:30-16:50	Reconnaissance Study on Saltwater Intrusion Control at Main Raw Water Pumping Station of Metropolitan Waterworks Authority (Thailand) **Lerdlekha Sriratana** and Krisda Bisalyaputra Ramkhamhaeng University, Thailand Abstract— At present, saltwater intrusion in water resource is highly concerned as it could severely affect various sectors such as water utilization, irrigation as well as water supply production process. This study aims to assess the problem of saltwater intrusion in raw water resource of Metropolitan Waterworks Authority (Thailand). In addition, a conceptual framework to handle this crisis was developed based on literature review and revised by the experts for applicability and sustainability of the proposed framework. From study, it can be noted that saltwater intrusion in this case could be effectively controlled by integrating several methods such as water diversion, fresh water discharge, barrage with sluice gates, submerged weir/rubber dam, Abstraction Desalination and Recharge (ADR), and Cutoff wall. Moreover, water resource management should be well considered and applied to overcome such problem.
AM023 16:50-17:10	A Study on Dry Leaf Composting in Reused Small-Size Bottle **Nannapasorn Inyim** Faculty of Engineering, Ramkhamhaeng University, Bangkok, Thailand Abstract— Daily falling tree leaves generate a large number of dry leaves that requires a proper management. Among traditional waste disposal methods, composting is considered more sustainable and eco-friendly for handling the leaf waste. The final product of the process is an organic fertilizer (compost) which is very useful to apply for soil amendment. However, the composting of dry leaves has difficulties because a degradation of the material is a time-consuming process. This paper proposed a way to increase the rate of dry leaf degradation in a composting process. A survey of literature to investigate major factors affecting composting process and experiments on dry leaf composting in a small-size reactor made of discarded water bottles were conducted. Operational conditions in the experiments were based on the most recommended values including the C/N ratio of 25, the moisture of 60%, and the particle size of 3.35-20 mm. From experimental results, the co-composting of dry leaves and vegetable waste under the above conditions resulted in 31.2% reduction of organic matter within three weeks. The final product of the co-composting contained a C/N ratio of 14.3 indicating the maturity of the obtained compost. It was found that the initial ratio of C/N in composting material played a key role among other factors. This was evidently indicated by comparing degradation rates in terms of organic matter reduction between the composting of dry leaves with the C/N ratio adjustment and that without the C/N adjustment. The reduction of organic matter in the first case was nearly twofold that of the second one within the same period.

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MP010 17:10-17:30	Optimal control strategies for the resurgence of vaccine preventable diseases in Thailand **Teerapol Saleewong** King Mongkut's University of Thonburi, Thailand Abstract— The purpose of this research is to study the allocation of limited vaccine to get the optimal control strategies for the resurgence of vaccine preventable diseases in Thailand. Using data of movement patterns of migrant workers (Cambodia, Myanmar and Laos) and the patients with diphtheria data in Thailand in 2015, we determined proportion of vaccine allocation for three migrant populations who should receive the vaccine. From the mathematical models and an optimization method with 100% doses of vaccine, the optimal vaccine allocation for migrant workers from Myanmar, Laos and Cambodia are 64.5%, 35.56% and 0% respectively. Sensitivity analysis was performed with attentive to vaccine efficacy. We also found that vaccine-preventable epidemics could further decrease by 50% among migrants and Thais, taking into account the effects of population movement.
AM010 17:30-17:50	Salmonella Gallinarum lysed cells by GI24 induce robust immune response and provide effective protection in chickens Ja Young Moon, Won Kyong Kim, **Jin Hur*** Veterinary Public Health, College of Veterinary Medicine, Chonbuk National University, Special Campus, Iksan, Republic of Korea Abstract— *Salmonella* Gallinarum was lysed by GI24 and protection efficacy was evaluated as a vaccine candidate in chickens. Group A chickens were intramuscularly (IM) immunized with sterile PBS; group B chickens were IM immunized with approximately 3 x 109 of S. Gallinarum lysed cells; and group C chickens IM immunized with approximately 3 x 108 colony-forming units of live S. Gallinarum SG9R. S. Gallinarum outer membrane proteins-specific serum IgG titers were considerably higher in groups B-C than in group A. The levels of IFN-γ in groups B-C than in group A were significantly higher. Following oral challenge with virulent wild-type S. Gallinarum, no chicken in groups B-C was dead. However, all chickens in group A were dead after oral challenge. The results of this study demonstrated that IM immunization with approximately 3 x 109 of the S. Gallinarum lysed cells by GI24 induced robust antibody and cell-mediated immune responses in chickens. The lysed cells also conferred protection against infection with wild-type S. Gallinarum. These results suggest that IM immunization with S. Gallinarum lysed cells using GI24 is a good vaccine candidate against brucellosis in Chickens.
AM011 17:50-18:10	A Study on Drying Characteristics of Korean Oyster in a Decompressed Heat Pump Dryer (DHPD) **Hyun-Chol Jung,** Sim-Gyu Wee, Sang-Ro Lee, Nguyen Thanh Tri, Byeong-Dae Choi Research Center, A1 Engineering Co. Ltd., Korea Abstract— Oysters are rich in hematopoietic substances such as calcium and iron, which are good for children's development and those of weak constitution. They are low-calorie foods that prevent obesity. They have many nutrients such as glycogen, taurine, minerals and vitamins to prevent heart disease, hypertension, constipation and diabetes. It is one of the foods with excellent impact and health functionalities.

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Oysters are usually consumed in their raw form, but they are also distributed as processed commodities such as frozen goods, dried produce and canned foods. However, the processed goods market is so small that it has barely significant impact on oyster sales. Therefore, there is an increasing demand for improved oyster drying process to promote its distribution and consumption.

The purpose of this study is to investigate the changes in nutrient composition and to compare the characteristics of nutrients in dried oyster processed using different drying methods. Hybrid depressed pressure heat pump drying method used in this study is a new drying process which can improve drying time and drying efficiency than other drying methods (freeze drying, hot-air drying, etc) by using a heat pump in a lean air atmosphere. For the vacuum drying, DHPD works in the range of 0~4,500 mmAqg vacuum and 20~65℃ temperature. In this study, we carried out aronia drying in 0~3,000 mmAqg vacuum and 55℃ temperature. The eco-friendly air extraction device was used for 0~3,000 mmAqg of low air pressure and two stage condenser for obtaining 20~65℃ of heat pump extraction temperature.

The moisture content, general composition, volatile nitrogen and freshness of the dried oysters processed using hybrid drying, hot-air drying and smoked method were analyzed. The content of crude protein was the highest in hybrid drying at 33.2g/100g, with hot-air drying at 29.5g/100g, and smoked drying at 22.3g/100g, respectively. During storage for 60 days, hybrid drying was 34.5g/100g, hot-air drying was 28.96g/100g, and smoked was 21.2g/100g, respectively.

Water activity was 0.44 for hybrid drying, 0.79 for hot-air drying and 0.92 for smoked drying oysters. During storage for 60 days, hybrid drying was 0.57, hot-air drying was 0.89, and smoked oyster was 0.96, respectively. From these results, hybrid drying is superior in terms of alteration such as microbial propagation. The value of total volatile basic-nitrogen (TVB-N) of hybrid drying was 18.4mg/100g, which was higher than that of hot-air drying, 23.3mg/100g, and smoked oyster, 22.3mg/100g.

Consequently, through the analysis of the nutrient characteristics of the processed dry oysters, we confirmed that the drying performance of the hybrid heat pump and the characteristics of long-term storage excelled much compared to the other drying methods.

Dinner @ Atrium | <18:10-20:00>