The EH’s Academic Letters Vol. IV starts from February-July 2016. It consists of 2 main parts such as the Department Project & Activity and the Research Articles Publication both in the conference & journals. Especially in June-July, our colleagues includes our students were active in the national conferences.

All activities continuously provide an academic atmosphere in our department and also support the faculty vision of “to be the Learning Organization”. To go further, our department should focus on how to produce our academic work in an internal level and how to produce our students to achieve a national standard quality of education. This will really show that we are real "Learning Organization" and also real "Teacher".

Best Wishes,
Asst.Prof.Dr. Nutchanat Chamchoi
Head of Department of Environmental Health
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Department Activity in 2016;
Our students and lecturers joined the national conferences in Bangkok and Phetchabun Province, THAILAND

Department of Environmental Health, HCU
The Cabinet on 7 May 2015 endorsed the designation of 4 July each year “Thai Environmental Health Day,” as proposed by Ministry of Public Health.

4 July marks the birthday of Her Royal Highness Princess Chulabhorn, who has contributed to environmental health-related work. Her Royal Highness is recognized as a role model in this field of public health. She has also inspired environmental health officials to the protection of the public’s right to good health and the solving of environmental health problems.

The proclamation of Thai Environmental Health Day was to honor Her Royal Highness and to raise public awareness of environmental health for the people’s better quality of life and the country’s sustainable development.
Assessment of Biogas Production from Industrial Wastewater
Nutchanat Chamchoi and Suchada Yang-en

Abstract
The purpose of this research was to study the assessment method for biogas production from industrial wastewater. The wastewater from the animal bone factory and the inoculum from UASB reactor of a brewery factory were used. The experiment was conducted in completely closed and clear vials with the working volume of 60 mL. Batch experiment was divided by varying of the amount of organics in wastewater in terms of volatile solid such as 0.96, 2.05, 4.10, and 6.15 gVS/L for main experimental batch 1-4, respectively. The digestion temperature was 37°C. The volatile fatty acid was measure at the beginning of the experiment and the obtained amount of biogas accumulation was follow-up through the experiment.

From the results, it was found that the obtained amount of biogas accumulation through the experiment (25 days) was different depends on the amount of organics in each batch experiment. The amount of biogas accumulation was stable after 10 and 20 days of digestion in experimental batch 1-2 and 3-4, respectively. The highest amount of biogas accumulation was observed in experimental batch 4 (organics: 6.15 gVS/L). However, the obtained biogas at the end of experiment was almost the same amounts of 600 mL/gVS, which contains methane and carbon dioxide gas of 75-77% and 23-25%. The specific methane yield per organics amount from the experiment was 400-483 L/kgVS, which closely to the theoretical value (530 L/kgVS). In addition, when the different amount of inoculums was used, the rate of biogas production was obviously different. The high amount of inoculums provides faster rate of organics digestion and biogas production.

Keywords: biogas; methane gas; industrial wastewater
Treatment of Textile Wastewater with Aluminium and Iron Electrode by Electrocoagulation Process  
Isaree Rodtusna, Parichart Kaewsan and Siriluck Pinwatthanachai

Abstract
Objective of this study was to determine the efficiency of textile wastewater treatment with aluminium and iron electrodes by Electrocoagulation process. To study, the voltage was 10.25 volt and reaction time were 30 and 60 minutes. Used aluminium plates size was 20 cm x 4 cm, and fixed distance between plates was 1 cm. The result showed that the optimal conditions of electrocoagulation by aluminium electrode were the voltage of 25 volt and reaction time of 30 minutes, which results in COD and color removal efficiency were 67% and 90% respectively. In addition, electrode consumption was 0.056 gAl/gCOD removed and specific electrical energy consumption was 0.0039 kWh/gCOD remove. The optimal conditions of electrocoagulation by iron electrode were the voltage of 25 volt and reaction time of 60 minutes, which results in COD and color removal efficiency were 81% and 71% respectively. While, electrode consumption was 0.16 gFe/gCOD removed and specific electrical energy consumption was 0.0039 kWh/gCOD remove. The comparison showed that aluminum electrode can more removal color and lower electrode consumption than iron electrode, while specific electrical energy consumption were equal.

Keywords: Electrocoagulation process, Electrode, Textile wastewater

Communication Strategies Used by University Students to Cope with Speaking and Listening Problems  
Taweesak Chooma and Apaporn Bulsathaporn

Abstract
This study aimed to investigate the influence of communication strategies used by university students. A total of 56 participants are 4th years students from faculty of public health and environment, Huachiew Chalermprakiet University major in Environmental Health in academic year 2015. The data were collected via Pearson correlation and volunteer interview. Questionnaire, Oral Communication Strategy Inventory (OC3), adopted from Nakatani (2006: 152-168) and Amy Fang-Yen Hsieh (2014: 1-16). The results showed that student group in high proficiency English used word-oriented strategies more than other groups. And student group in low proficiency English used grammar-oriented strategies. Meanwhile, strategies for coping with English listening problems, student group in high proficiency English and mid proficiency English used negotiation for meaning while listening strategies and getting the gist strategies while student group in low proficiency English used conversation maintenance strategies. Besides, the use of dictionary application on smartphone, iPad and using Google translation tool solve speaking and listening problems.

Keywords: Communication Strategies, Speaking and Listening English, University Students
Abstract — Absorbing CO₂ from atmosphere into forest is an important ecosystem service from the global warming perspectives. However, forest can be either a CO₂ source or sink. Soil respiration (Rs) or soil CO₂ emission which is a component of ecosystem respiration (Re) is one of the processes determining a sink-source capacity of a forest. In order to improve our understanding of forest carbon exchange, its source-sink capacity and its responses to climate change, enhancing accuracy in assessment of soil CO₂ emission in forest is required. This study aims to measure soil CO₂ by the newly established method using CO₂ profile gradient and to study variations in soil CO₂ effluxes in a dry dipterocarp forest and a mixed deciduous forest. During the studied periods in dry dipterocarp forest and in mixed deciduous forest for 181 days, we found that the average soil CO₂ efflux were 19±0.8 and 4.8±2.3 μmol m⁻² s⁻¹, respectively. Their accumulative soil CO₂ emissions were 2.6 and 6.7 kgCO₂ m⁻² y⁻¹, respectively. The Re accounted for 44.6% and 70.9% of the Rs respectively. In addition, Rs in mixed deciduous forest was about 2.6 times higher than in dry dipterocarp forest. This may indicate more active soil and forest floor processes including a rapid turnover of carbon in mixed deciduous forest compared to dry dipterocarp forest. At both sites, Rs is strongly related to soil moisture (r²=0.61, p<0.01, n=150 and r²=0.75, p<0.01, n=136, respectively). In addition, the soil CO₂ probes also enabled us to observe the behaviors of soil CO₂ emission during climate variability.

Keywords — soil respiration, ecosystem respiration, dry dipterocarp forest, mixed deciduous forest.

1. INTRODUCTION
Ecosystem services are parts of the 2030 Agenda for Sustainable Development and Sustainable Development Goals (SDGs), especially SDG 15 (managing sustainable
Knowledge and Behavior on Reducing Global Warming of Undergraduate Students in Faculty of Public Health and Environment at Huachiew Chalermprakiet University

Preeyaporn Nonsiri, Vattanavipa Sungpraphol, Supakit Hantjaidee, Kusumarn Noppathip, Apaporn Bulsathaporn, Orawan Koonsanong, and Thitiporn Bangboonruang.

Abstract

The objectives of this research were 1) to study levels of knowledge and behavior on reducing global warming among undergraduate students in Faculty of Public Health and Environment; 2) to compare knowledge and behavior on reducing global warming among undergraduate students in Faculty of Public Health and Environment as classified by disciplines; and 3) to find out the relationship between the knowledge and the behavior. The researcher selected a population sample consisting of 135 third-year undergraduate students in Faculty of Public Health and Environment at Huachiew Chalermprakiet University in the academic year 2015. The instruments used to gather data were an achievement test with reliability of 0.60 and a practice scale with reliability of 0.80. The statistical analyses used were mean, standard deviation, One-way ANOVA test (T-test) for comparing, and the Pearson's correlation coefficient for finding out the relationship.

The findings revealed that: 1) Knowledge on reducing global warming of undergraduate students in Faculty of Public Health and Environment were fair, behavior on reducing global warming of undergraduate students in Faculty of Public Health and Environment were good. 2) A Comparison of the knowledge as classified by disciplines was found to be significantly different at the 0.05 level. A Comparison of the behavior as classified by disciplines was found to be non-significant different. 3) There was non-significant relationship between the knowledge and the behavior.

Keywords: knowledge on reducing global warming, behavior on reducing global warming, undergraduate students.

Waste Sorting of Employees at an Automotive Parts Factory in Samut Prakan Province

Supakit Hantjaidee, Watcharakan Pramakatae, Apaporn Bulsathaporn, Niranyakarn Chantra, and Duangrat Suekhum

Abstract

The objectives of this research were to promote knowledge on waste sorting in plants using media in Thai and Myanmar language including knowledge boards, brochures, small waste container models, and video tutorials for employees and to compare average cost of hazardous waste disposal between before and during the implementation. The researcher selected a population sample consisting of 226 employees at a production department in an automotive parts factory in Samut Prakan province. The data were collected by practice test on the waste sorting, observing within all waste containers, and recording hazardous waste disposal cost. The statistical data analyses which used in this research were frequency, mean, percentage, and One-Sample T-test. After educating employees, the results found that most employees of 213 people (94.2 %) could sort the waste properly and the number of the waste containers which put the wrong waste, decreased 11 containers (55% decreases). Moreover the research found that average of hazardous waste disposal cost during the implementation was statistically significant less than three previous months (< 9,833.33 Bahts) at the 0.05 level (p=0.002, n=3), which decreased 9,650 Bahts (32.7 % decreases). Finally, these implementations and results could be a sample or an alternative of simple practices for solving the problems on waste sorting in other factories as well.

Keywords: waste sorting, employees, Samut Prakan
Health Protection and Unpleasant Symptoms of Garbage Collectors in Bangphli District, Samut Prakan Province

Naratip Rakdech, Sirinart Theankhunthod, Supawinee Inwat, Arintorn Naikongka, Orawan Koonsanong, and Apaporn Bulsathaporn

Abstract

The objectives of this research were to study unpleasant symptoms and health protection of garbage collectors and to study personal factors related to unpleasant symptoms of garbage collectors. The researcher selected a population sample consisting of 126 garbage collectors in Bangphli district, Samut Prakan province. The questionnaire was used for collecting the data. We used percentage, mean, and Chi-Square Test for statistical data analysis. The results were found that the most of unpleasant symptoms was accidental injuries from sharp objects in garbage consisting of 53 garbage collectors (42.1%). Protective gloves were used most of the 117 garbage collectors (96.7%). Personal factors were statistically significant associated with occurrence of unpleasant symptoms of the garbage collectors (p<0.05) including gender, types of housing, marital status, having children (parental status), and getting knowledge or training on safe work practices. Finally, these results showed that getting the good knowledge or training on safe work practices may be lead to good health protection and decrease the occurrence of unpleasant symptoms of the garbage collectors.

Keywords: health protection, unpleasant symptoms, garbage collectors

Efficacy of Herbal Extracts against Dengue Mosquito Larvae Aedes aegypti (Culicidae: Diptera)

Nattaphat Ungsunak, Areeya Sukpong, Soawalak Promkot, Porameet Buawan, Jirisuda Sinthusiri, and Teerawit Poopa

Abstract

Larvicidal efficacy of herbal extracts from kariyat mint leaves (Mentha cordifolia), kaffir lime peels (Citrus hystrix), sweet basil leaves (Ocimum basilicum), phalai rhizomes (Zingiber cassumunar) and black pepper seeds (Piper nigrum) were evaluated against third and fourth instar larvae of Aedes aegypti. The larvae were tested at 10, 50 and 100% concentrations in ethyl alcohol and compared them with chemical insecticide (temephos) by dipping method. The results revealed that black pepper seeds and kaffir lime peels extracts gave the high mortality against both of third and fourth instar larvae with median lethal concentration (LC50) less than 10%. Black peppes seeds and kaffir lime peels extracts showed 100% mortality of third larvae at 60 and 360 minutes, with median lethal time (LT50) were 47.30 and 66.21 minutes, respectively. Temephos gave 100% mortality of third larvae at 180 minutes and LT50 was 48.85 minutes. In addition, both kaffir lime peels and black pepper seeds extracts gave 100% mortality of fourth larvae at 360 minutes and LT50 were 94.27 and 203.27 minutes, respectively. Temephos gave 100% mortality of fourth larvae at 1,440 minutes and LT50 was 164.62 minutes. This study showed that herbal extracts of black pepper seeds, kaffir lime peels including temephos have the potential to control A. aegypti larvae not different significantly (P<0.05). Thus, the extracts of black pepper seeds and kaffir lime peels should be further studied for field applications.

Keywords: larvea mosquito, Aedes aegypti, herbal extracts
Abstract

This research was conducted to assess health risk from seafood consumption which contaminated with arsenic. Seafood samples consisted of Squids, Cuttlefish, Octopuses, Soft cuttlefish, Blue swimming crab, Giant freshwater prawns, Shrimps, and Fresh mackerels. The arsenic concentrations were analyzed by Graphite Furnace Atomic Absorption spectrophotometry. The results of arsenic contamination in seafood were found to be in ranges of 0.0007-0.0645 mg/kg. The highest arsenic concentration was found in cuttlefish comparing with other types of seafood. In addition, arsenic concentrations in cuttlefish, octopus, soft cuttlefish, Blue swimming crab, Giant malaysian prawn, banana shrimp, mackerel, were found to be 0.0457±0.001, 0.0115±0.001, 0.00525±0.00005, 0.0022±0.0006, 0.00355±0.0002, 0.001105±0.0003, 0.0007±0.0002 and 0.002±0.0001 mg/kg, respectively. Health risk assessment of seafood consumption found that has Hazard quotient (HQ) ranging from 0.0003-0.0630 which shows that all types of seafood have no health risk to consumers. However, the assessment of safe consumption rate were found that Squids, was the maximum consumption, while the mackerels was the minimum consumption.

Keywords: Arsenic, Seafood, Health risk assessment.
Fouling and cleaning of reverse osmosis membrane applied to membrane bioreactor effluent treating textile wastewater
Thirdpong Srisukphun, Chart Chiemchaisri, Wilai Chiemchaisri, Monthon Thanuttamavong

ABSTRACT
Membrane bioreactor (MBR) and reverse osmosis (RO) membrane system was applied to the treatment and reclamation of textile wastewater in Thailand. An experiment was carried out to determine the fouling behavior and effect of anti-scalant and biocide addition to flux decline and its recovery through chemical cleaning. The RO unit was operated for one month after which the fouled membranes were cleaned by sequential chemical cleaning method. RO flux was found rapidly declined during initial period and only slightly decreased further in long-term operation. The main foulants were organic compounds and thus sequential cleaning using alkaline solution followed by acid solution was found to be the most effective method. The provision of anti-scalant and biocide in feed-water could not prevent deposition of foulant on the membrane surface but helped improving the membrane cleaning efficiencies.

Keywords: Fouling, Membrane cleaning, Reverse osmosis, Textile wastewater, Wastewater reclamation