

A survey of medium trees for shaded area temperature reduction for utilization in urban communities.

Student : Mr. Supachai Klinngam

Project advisor : Assoc.Prof.Kitti Akamphon

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

The effects of global warming and climate change are of concern for human life. Urban community is one of the main neighborhoods that are directly affected especially where high-rise buildings are becoming the norms. Heat island is the result which follow and will eventually increase the electrical cooling load demand of cities and may results in energy shortage in the future.

This study aims to select medium – size tree species with high potential in reducing surface temperature under tree shade for further use in improving environmental qualities in urban communities. Twenty species of medium – size trees are used in the investigation for their ability in temperature and light intensity reduction , other related parameters , and human use values of the trees. The overall potential of each tree species is measured by means of scoring procedure. The outcome of the process will help make the decision in selecting appropriate medium – size tree species for surface temperature reduction for further urban communities use.

Key word : Temperature reduction

An ethnobotany study at Nabon village Amphur Kommaung, Kalasin

Student : Miss Thanyalak lamnarongrit

Project advisor : Asst. Prof. Somang Homchaun

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

An ethnobotanical survey was conducted on June — October 2003 at Nabon Village, Amphur Kommaung, Kalasin. This survey aimed to collect local information on plants used for self medical care by the residents. By systematic random and questionnaire-based interview from 32 out of 105 households (host more than 40 year-old) ,78 % of the household was found to have experience on herbal self-treatment and 7 households or 22 % was found to have no experience on it. Collectively, 125 plant items were recorded, mainly with simple methods of application for various ailments, such as fever and gastrointestinal discomforts and cooking_ One hundred and eleven species 52 family were identified by plant characteristics; 94 species 44 family were dicotyledons, most of them were Acanthaceae and Rubiaceae anothers were Annonaceae, Euphorbiaceae and Rutaceae. Sixteen species 7 family were monocotyledons; Zingiberaceae was the most another was Poaceae(Graminae). One species 1 family was Pteridophyta (Fern). Fourteen items could not be identified by scientific name. In this study, it was found that residents especially, 70-79 year-old have a good ethnobotanical knowledge. Most of them was women. The information obtained from this survey is supposed to be helpful for the community education on their indigenous resources, as well as for designing tourist programs with regards to natural resource conservation and management.

Key word : ethnobotany study

Chemical Properties of Drinking Water in Sealed Bottles Sold in KKU.

Student : MR.KANAKHON SRIKOTE

Project advisor : Associate Professor. Kitti Akamphon

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

The study concerns the chemical quality of drinking water in Khan Kaen University which is used for drinking water with closed top during July October 1999. By using drinking water bottle samples from shops in in Khan Kaen University which has 17 product Parameters in this study are iron, manganese, copper, zinc, chloride, fluoride, nitrate and total hardness . Drinking water properties has the value between 0 — 0.40 mg/l, 0.006 — 0.016 mg/l , 0 - 1.75 mg/l , 0 — 0.08 mg/l, 24 - 104 , 0.0025-1.25 mg/l, 0-0.24mg/l , 3 - 40 mg/l. The average value equals to 0.072 mg/l , 0.0109 mg/l , 0.33 mg/l, 0.026 mg/l, 54.88 mg/l, 0.485 mg/l, 0.1mg/l, 20.52 mg/l. From this analysis and checks of quality of chemical drinking water, we could see that three samples from thirty-four samples have over standard values(8.8% of all drinking water samples)are copper & fluoride .Statistically analysis of T-test will be used in this study. It tells use that the values is still in the range, that is p less than 0.05.

Key word : Chemical Properties, Drinking Water

Effect of furadan to mortality of rice field crab, *Somanniathelphusa dugasti*

Student : Miss Sugunya Surasiang

Project advisor : Asst.prof.Turenjai Dooljindachabaporn

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

The effect of furadan to mortality of rice field crabs, *Somanniathelphusa dugasti* was studied by using the statistic bioassay. The crabs were exposed to ten concentrations of furadan. The toxicity was determined by median lethal concentration (LC 50) at 24, 48, 72 and 96 hours at 95 percent confidence intervals. The LC 50 at each period were 96.37, 75.27, 59.81 and 55.58 part per million (ppm) respectively.

Key word : Effect of furadan

Efficiency of *Cotesia plutellae* Kurdjumov (Hymenoptera: Braconidae) as Parasitoid of *Plutella xylostella* (L.) (Lepidoptera: Yponomeutidae).

Student : Miss Mali Kuabsantheh

Project advisor : Asst. Prof. Dr. Phenprapha Phetcharaburanin

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

Female of diamondback moth, *Plutella xylostella*, laid 16-123 eggs / female / day. The maximum eggs deposition was on the first day after adult emergence, 56.9 eggs /female /day. Studies on the parasitism efficiency of larval parasitoid, *Cotesia plutellae*, of *P. xylostella* showed that the efficiency related to area size and parasitoid numbers. Two different test area size were used in the experiments, plastic petridish (39.3 cm³) and plastic cage (1,000 cm³). The test area contained 30 second larval instar of host, in which different number of the *C. plutellae* female 1,2,4,8,16 was introduced. In the petridish test area, 16 parasitoids showed the highest percentage of parasitism with 95.53 %. The Highest percentage of parasitoid cocoon and adult emergence found in the 2 parasitoids test with 83.62 % and 77.55 %, respectively. The host larvae died during the experiment were dissected under stereo - microscope in order to examine the developmental stage of the parasitoid. The test of 8 and 16 parasitoids showed the highest percentage of 50 % dying host larvae, of which the host larvae died at the egg and the first instar larva of the parasitoid. Whereas the test of one parasitoid, the host larvae died during the second and third instar larvae of the parasitoid with 30.72 % and 69.72 %, respectively. In the cage test, the 4 parasitoids test showed the highest number of parasitism rate, 76.67 %, which was statistically different to the test of 8 parasitoids. Field survey of diamondback moth and the parasitoid carried out in the Chinese kale crop at the Vegetable Section, Department of Horticulture, Faculty of Agriculture and in the farmer field, non-chemical vegetable project, located at Chum Chon Nong Wat 2 (rail way area). The survey was during July-October 1998. The number of the both insects was found higher in the former field than in the latter.

Key word : Efficiency of *Cotesia plutellae*,

Environmental Impact Evaluation of Natural Recreation Source Utilization in Suan Rom Klao Kalapaphruek , Khon Kaen University.

Student : Miss Panadda Sriyayang

Project advisor : Asst. Prof. Samang Homchuen

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

Suan Rom Klao Kalapaphruek is an important Natural Recreation Source in Khon Kaen University that has 2 parts: In Natural Forest and Out Natural Forest.

In the Natural Forest Part, Scattered about social of vegetation and animal are nearly abundant. In this part has object to use route for study natural that has many interesting boards about knowledge of trees.

Out the Natural Forest Part. Scattered about small cluster of vegetation and animal. In this part, many activities and happened such as Exercise, Resting, Admire view, Having food or supper, Reading, etc.

Environmental Impacts would occur more or less, when many activities are happened. In the evaluation of utilization has 4 lifer— system that are

- Physical Resources.

- Biological Resources.

- Human Use Value.

- Quality of Life

As a result student is the major group of utilization in this park. And the Environmental Impact Evaluation in each tier like this

Physical Impact: Problems from Exercise (soccer) in lawn at Part out the Natural Forest Bicycle and motorbike riding in Suan Rom Klao that are blown-dust and annoyed noise. As well as construction for develop these area, physical condition had changed.

Biological Impact: Annual plants in particular grass and epifauna are trampled. As well as fire and smoke from branches and leaves burning in Suan Rom Klao.

Key word : Environmental Impact Evaluation, Natural Recreation Source

Ethanol Fermentation from Pineapple and Rambutan peel extract By yeast.

Student : Miss Soraros Pholsab

Project advisor : Asst.prof.Turenjai Dooljindachabaporn

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

A part from study Ethanol Fermentation from Acid Hydrolysis pineapple and rambutan peel extract by yeast. The peel hydrolysate were obtained through treatment with concentrate hydrochloric acid 1.5% on dried pineapple and rambutan peel of saccharification and fermented for 30 hours and measured reducing sugar by Dinitrosalicylic acid method. The quantity of ethanol were measured by Dichromate Oxidation and Gas Chromatograph method by 0,2,4,6,12,18,24 until 30 hours respectively. The results showed that the reducing sugar obtained in the pineapple and rambutan peel extract were 1.32 g/l and 1,25 g/l respectively. The quantity of ethanol fermentation of pineapple peel was more than rambutan peel about 1.5-2 and showed that measured ethanol by Dichromate Oxidation and Gas Chromatograph methods are difference, The average quantity of ethanol from pineapple and rambutan peel extract were at 0.020 g/l/hr and 0.013g/l/hr when measured by Dichromate Oxidation and the average quantity of ethanol from pineapple and rambutan peel extract were at 0.012 g/l/hr and 0.006 g/l/hr when measured by Gas Chromatograph.

Key word : Ethanol Fermentation, Pineapple and Rambutan peel

Khonkaen Municipality's trees and air improvement procedure.

Student : Miss Prairin Srepaco

Project advisor : Asst.prof.Turenjai Dooljindachabaporn

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

The aim of this study was to assess the tree's potential in increasing humidity and decreasing temperature and light transmittance on the road surface. The study was done in Khonkaen Municipality. Five species of tree were selected ,i.e. *Plerocarpus Indicus*, *Tamarindus indica* Linn, *Samanea saman* (Jacq.) Merr., *Caesalpinia pulcherrima* (L.) Sw. and *Cassia fistula* Linn. Three replicates of each species were investigated. Tree's height, diameter, canopy cover and canopy density were measured. For each tree, the data were collected every two weeks for 5 times both in the shade and in the sunlight at 4 sites.

It was found that *Plerocarpus Indicus* had the highest potential in decreasing light transmittance (88.89 %) followed by *Caesalpinia pulcherrima* (L.) Sw. (85.90%), *Cassia fistula* Linn (79.31%). and *Samanea saman* (Jacq.) Merr. (75.67%) whereas *Tamarindus indica* Linn had the least potential (73.64 %). *Plerocarpus Indicus* had the highest potential in increasing humidity (5.34% %) followed by *Caesalpinia pulcherrima* (L.) Sw. (4.01 %), *Cassia fistula* Linn. (3.21 %) and *Samanea saman* (Jacq.) Merr. (3.36 %) whereas *Tamarindus indica* had the least potential (2.20 %). *Plerocarpus Indicus* had the highest potential in decreasing temperature (7.59 %) followed by *Caesalpinia pulcherrima* (L.) Sw. (6.45 %) and *Cassia fistula* Linn. (5.38 %) whereas *Tamarindus indica* Linn and *Samanea saman* (Jacq.) Merr. had the least potential which is 2.17 percent. Furthermore, it was found that there were correlations among the studied factors.

Key word : air improvement

Odor Dispersion from Khon Kaen Municipality Landfill.

Student : Miss. Chiraphorn Lubsungnoen.

Project advisor : Asst. Prof. Turenjai Doolgindachbaporn

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

The study of odor dispersion from landfill. This research was study to questionnaire method and check on odor by ad hoc committee, analyzed the area was to received odor and collected meteorology data. Collected geographic co-ordinate data for made odor receipted map during May and December month 2010 from area and population sample of agent who live in the area around Khon Kaen municipality landfill. This research was study the area within radius area 5 kilometers, amount 9 stations together with to check on odor for the study result confirmed 4 stations. The results had shown that both of the rainy season and the winter. Odor was dispersed from landfill and had an effect on the village around landfill far from landfill between 0.5-3.0 km. Totality 4 villages (station) were Ban Kam Bon , Ban Non, Ban Sub Cha Ream, and Ban Bung Kae .

Odor receipted of 2 villages (station) were Ban Kam Bon and Ban Bung Kae were relate to local wind. Odor receipted of Another station were Ban Non and Ban Sub Cha Ream. weren't relate to local wind.

Key word : Odor Dispersion

Preliminary Survey of Forest Conditions in tourist Areas in Pa Hin Ngam National Park, Thep Sa Thit District, Chaiyaphum Province.

Student : Miss Penpairin Theppiyawong

Project advisor : Asst. Prof. Dr. Phenprapha Phetcharaburanin

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

Key word : Preliminary Survey, Forest Conditions

Pollutants from Student's Motorcycle in KKU Campus.

Student : Miss Pranee Talubsri

Project advisor : Asst.prof.Turenjai Dooljindachabaporn

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

Carbonmonoxide (CO) and Hydrocarbon as n-Hexane (HC) measurement from motorcycle exhaust pipe by NON-DISPERSIVE' INFRARED ANALYZER (NDIR) and record motorcycle's characters and motorcycle using by 400 questionnaire. The result found that the quantity of CO and HC have mean 2.79% and 3827.39 ppm, standard deviation value are 1.625 and 3045.992 and maximum value are 9.04% and 18000 ppm. Exhaust gases release from HONDA had the lowest CO and HC concentrations, while KAWASAKI, SUZUKI and YAMAHA had higher ranking of these 2 pollutants concentrations, respectively. Quantities of CO and HC from 2 stroke HONDA are higher than 4 stroke. Comparison with standard value found that there are 46 sample of Motorcycle (12%) release CO over standard value (4.5%) and there are 31 sample of Motorcycle (8%) release HC over **standard** value (10000 ppm). If using time motorcycle increase, CO and HC releasing will be increased too. The motorcycle used gasoline octane 9i will release CO and HC higher than gasoline octane 95.

Key word : Pollutants, Student's Motorcycle

Preliminary Study on Heavy Metals Bioleaching from Rice Husk and Rice Husk Ash using Acidophiles.

Student : Miss Sukanlaya Larloon

Project advisor : Asst. prof. Dr. Pisit Chareonsudjai

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

There were two groups of mesophile acidophile microorganisms in this study. They were mesophile-temperature range 29_35 °C, Firstly those grew in iron medium (9k medium) were Iron-oxidizing bacteria and secondly those grew in sulfur medium (wk medium) were sulfur-oxidizing bacteria.

Preliminary study on heavy metal bioleaching from rice husk and its ash using these groups comparing to the control –(without microorganisms) were studied. Duration of study was 20 days, samples were collected every 5 days period and pH and temperature of the solution were measured everyday. Only one replicate was studied. The sequence of bioleaching concentration from the highest to the lowest was Cu > Cr > Cd. Hg and Pb were not detectable. Comparison study of the heavy metal bioleached concentrations from rice husk and its ash was not much different. However, the concentrations were significantly higher than the control (without acidophile addition). In solution with rice husk and sulfur-oxidizing bacteria found Cu $0.32_3 \pm 0.001$ mg/kg, Cr 0.303 ± 0.001 mg/kg and Cd 0.120 ± 0.001 mg/kg. Rice husk with iron-oxidizing bacteria found Cu 0.317 ± 0.001 mg/kg, Cr $0.267 + 0.001$ mg/kg and Cd 0.103 ± 0.001 mg/kg. Cu 0.333 ± 0.001 mg/kg, Cr 0.303 ± 0.001 mg/kg and Cd 0.110 ± 0.001 mg/kg were leached from rice husk ash using sulfur-oxidizing bacteria. Using iron-oxidizing bacteria, Cu 0.327 ± 0.001 mg/kg, Cr 0.313 ± 0.001 mg/kg and Cd $0.130 + 0.001$ mg/kg were leached.

Key word : Preliminary Study, Heavy Metals, Rice Husk

Protozoa Diversity and the relationship with some soil characteristics in the Plant genetic protection area, sirindhorn dam, sirindhorn, Ubon Ratchathani under The Royal initiative of Her Royal Highness Princess Maha Chakri Sirindhorn.

Student : Mr. Nattapon Limarporn

Project advisor : Asst. Prof. Dr.Pisit Charoensudjai

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

The purpose of this study was to study the protozoa diversity and the relationship of the number of species and the density of protozoa some soil characteristics in the plant genetic protection area, sirindhorn dam, sirindhorn, Ubon Ratchathani eight sampling site were studied. There were four site in the mixed deciduous forest, including grassland, moss near a stream bamboo forest. in dipterocarp forest sample one and one sample form hills in the two ecosystem were collected termite plant genetic. Hundred and four species of protozoa relenged to 6 classes were recorded ; 1.) Class Kinetofragminophorea 2.) Class Oligohymenophorea 3.) Class Polyhymenophorea 4.) Class Phytomastigophorea 5.) Class Lobosea and 6.) Class Heliozoa. A.) the protozoa diversity depended upon the habitat. The highest diversified site was the area covered by moss, while the index(H') equal 0.363 and the lowest diversity index was area near stream, equal to 0.116. There were five common found species, including to *Centropyxis* sp., *Halteria glandinella*, *Sphenophrya* sp., *Arcella arenaria*, and *Centropyxis minuta*. B.) Most of the protozoa were specific to the habitat, only found *Centropyxis* sp.1, *Diffflugia* sp., *Arcella vargaris*, and *Nebela* sp. C.) At the area covered by moss was the highest density protozoa (360,000 cell/g.) and the lowest density was the site near stream (18,000 cell/g.). Density and the number of species were related to some soil physical – chemical characteristics. The number of species significantly ($p < 0.05$) related to soil pH and organic matter while the density related to organic matter and total nitrogen significantly at 95% confidential level.

Key word : Protozoa Diversity, Soil Characteristics

Solid Wastes Management in Khon kaen University Dormitory : Central Male Dormitory.

Student : Miss Kritsana Chunua

Project advisor : Asst. Prof. Dr. Pisit Chareonsudjai

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

The objective of this study is to improve the solid wastes management in the central male dormitory, Khon Kaen University. The solid waste data produced from the male dormitory were collected during August to September 2009. The research methodology is to observing and collecting the data for 3 weeks twice a week, in total 6 times, six dormitories were the representatives of central male dormitory, the normal density and humidity, Quantitative and qualitative, Characteristics were studying, the quantity, per capital production rate, type and composition. Observations and interview were the method for the currently wastes management system, the current wastes management system problems analysis for finding the proper method of wastes management by economical measurement and the suitable measurement by using the matrix method.

The result showed that the currently wastes management system is a method which is without waste recycling and waiting for the collecting by municipalities. The average quantity of solid waste was 541.15 kg/day (10 dormitories or 1,667 persons). The average percapita solid waste production rate was 0.32 kg/day/person. The average normal density was 146.66 kg/m³. The average moisture content was 38.36 percent. The compositions of the solid waste were divided into 4 types. They are; the decomposable waste 33.35 percent, the recyclable waste 55.6 percent, the general waste 9.51 percent and the hazardous waste 1.54 percent. The wastes recycling were divided into 2 parts; the first part was done by the housekeepers (20.78 percent), it will be sold for the recycle waste buyer, then the second part was recycled by the waiting for the collection.

The result from the analyzing showed that the solid wastes management should be improved by sorting the recyclable waste and setting up a recycle centre before selling then to the garbage buyers. This kind of method will earn 77,929.20 Baht / month whereas it can reduce the amount of wastes 9.03 ton/month or 108.30 ton/year.

Key word : Solid Wastes Management

Studies of human activity in the natural recreation place Bung Nong Koat, Khon Kaen.

Student : Miss Yuvadee Khunteekul

Project advisor : Asst. Prof. Samang Homchuen

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

Bung Nong Koat is a large public lake, located in Tambon Ban Ped Amphur **Muang**, Khon Kaen and was under the administration of Tambon Ban Ped administrative council. This public lake was sited at about 3 Km away from downtown area, and the area was about 795 rai contemporarily this lake was utilized by those who wanted to find their peace of mind and admire natural beauty, the studies of the details of those who visited this lake was necessary in order to find out better means to prevent and solve impact that might happen in future. The studies were done by 100 questionnaires distributed.

The results showed that, the students at 16 —25 year old was the majority of those who came to utilize the area during week days by riding on motorcycle. The purposes were for admiring natural beauty and for recreation, The incentive that took them to this lake was scenery beauty and tranquilize environment of the place.

Concerning with environmental issues, the access road was in good condition but the urgent problems that needed immediate solution were the insufficient of rubbish containers and the safety of the visitors.

Key word : human activity , natural recreation place

Studies of The Potential of PREMTINNASULANON MILITARY CAMP as the Ecotourism place.

Student : Miss Rujira Wiwatmanuskul

Project advisor : Asst. Prof. Dr. Phenprapha Phetcharaburanin

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

Studies of the potential of PREMTINNASULANON MILITARY CAMP as the ecotourism attraction place were the basic data of the camp included survey ,in order to compute the potential of the camp as ecotourist attraction place by mean of weighting score method , The results showed that the camp score 2.61 which could be classified as high potential and was main ecotourist attaction place.

From the questionnaire distributed to the tourists indicated that some factors such as parking place restaurant and lavatory needed to be improve. Anyhow since the development project of the area was now implemented in the camp so after the completion of the project PREMTINNASULANON MILITARY CAMP would have higher potential as ecotourism attraction place.

Key word : Ecotourism

Studies of The Potential of Ubonratana Dam as Tourist Attraction.

Student : Miss Lamyai Hongsing

Project advisor : Asst. Prof. Dr. Phenprapha Phetcharaburanin

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

Studies of the potential of Ubonratana dam as tourist attraction were conducted limited to the area pertaining to Electric Generation Authority of Thailand (EGAT). Basic information were obtained by Weighting Score Method , the parameter included transportation . touristable supportation importance and attraction tourist timetable , group of tourist attraction and tourist safety

The results show that Ubonratana dam is the tourist attraction with high potential and high importance . The darn can be classified as a main tourist attraction in the region .

In general Ubonratana darn offerred good service for tourists but it need to improve the information and promotion of the darn .

Key word : Tourist Attraction

Study on some Parameter of Tepwater in PREMTINNASULANON CAMP.

Student : MISS WANNIPA GUAYJAREN PANICHK

Project advisor : Asst. Prof. Dr. Phenprapha Phetcharaburanin

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

The study of tapwater quality from Prem Tinnasulanon camp use three analytical methods ; physical ,chemical and microbiological analysis. The results will be compared with standard of drinking water of WHO (World Health Organization) and Standard of Thailand drinking water (1978)

The characteristics analyzed could be classified as follow ;

1. Physical characteristics are test , odor , pH and turbidity
2. Chemical characteristics are total solids , hardness , and chloride .
3. Microbiological characteristics are total bacteria (Standard Plate Count), Total Coliform Bacteria which measured by MPN (Most Probable Number) and E.coli

The results are as follow ; Physical and Chemical qualities are at standard level , but microbiological qualities are lower than standard level . Therefore , it indicates that the water is not clean to direct consume . More chlorine should be added in to the tapwater system (but not more than 200 mg /1) in order to decrease the number of bacteria and before consuming , the water should be boiled.

Key word : Tepwater

Study of Noise Pollution on KKU Main Street (KKU 1.)

Student : Miss Piyanan Kosonwittavanan

Project advisor : Asst.prof.Turenjai Dooljindachabaporn

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

The study of Noise Pollution on KKU Main Street (KKU 1.) in four areas, i.e, Faculty of Education's Demonstration School (the first area), basketball field (the second area), 25th Anniversary building (the third area), and in front of the central library (the fourth area) The result showed that the noise levels of all areas were higher than the US.EPA standard of noise level which 15 hour Leq is 55 dBA .Noise level of all areas were above the WHO standard of noise level which 8 hour Leq is 75 dBA The peaks of noise nuisance problem were observed between 07,00-09,00AM. and 04.00- 06.00PM..The maximum of noise levels were found to be 70.79,70.73,67.78 and 62.50 dBA at the first, fourth, second, and third area respectively.

Key word : Noise Pollution

Survey on Diversity of Orchids in Phu Khieo Wildlife Sanctuary, Chaiyapoom Provinc.

Student : Mr. nuttawut sukasam

Project advisor : Asst. Prof. Samang Homchuen

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

The study of Orchids Diversity on a nature trail (Thung Ka Mang), 3850 meters, at Phu Khieo Wildlife Sanctuary in Chaiyapoom Province was conducted from July 1998 - December 1998, 29 Species, 21 Genera of Orchids were found. In different vegetation types, different number of Orchids were found as follows : Dry - dipterocarp - Pinus Association 20 species, 14 genera were found, Tropical rain forest, 8 species, 7 genera were found, Hill evergreen forest , 7 species, 6 genera were found, But no species of orchids found in grassland. The species which occur only in Dry Dipterocarp - Pinus Association 17 species were found, in Tropical Rain Forest 2 species were found, and in Hill Evergreen Forest 5 species were found. And 2 species which occur in three vegetation type, *Cleisostoma sagittiform* Garey. and *Cymbidium dayanum* Rchb. F

Key word : Diversity of Orchids

Test of Mathematical Model in Air Quality Impact Assessment.

Student : Mr. Utain Onniam

Project advisor : Asst.prof.Turenjai Dooljindachabaporn

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

Test of Mathematical Model in Air Quality Impact Assessment used Industrial Source Complex - Short Term version3 (ISCST3) model. Phoenix industrial is case study of source and areas around are receptors. Pollutant type is Sulfur Dioxide (SO_2). The running model that used Mae Moh stability class, Mae Moh mixing height and U.S. EPA stability class, U.S. EPA mixing height compared the measurement concentration.

The result of study, show that averaged concentration is not higher than the atmospheric quality standard of Pollution Control Department. And the concentration of the model used Mae Moh stability class and Mae Moh mixing height is nearly the concentration of measurement than the concentration of the model used U.S. EPA stability class and U.S. EPA mixing height. At the measurement point are Ban Udomsin and Ban Combongpattana.

This practice can not conclude that Mae Moh stability class and Mae Moh mixing height is suitable for Khon Kaen province. Because of measurement time and measurement point is not enough.

Key word : Mathematical Model, Quality Impact Assessment

The application of Geographic Information System for the selection of landfill site of Khon Kean Municipality.

Student : Miss Urawan Chanket

Project advisor : Asst. Prof. Samang Homchuen

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

The pollution of Khon Kaen Municipality is predicted to reach 478,076 by the year 2017 an increase of 220,298 from present (B.E.2540). This calls for search of suitable sanitary landfill sites large enough to accommodate the 725.30 tons per day solid waste expected to be produced then this figure leads to an area estimate of at least 530 rai required for this purpose. Geographically, the physical factors taken into account in this study are land use, soil, groundwater, topography, hydrology, transportation network and human communities settlement. The study is carried out on a Geographic Information System (GIS). Input map layers include land use, soil type, groundwater, landform, hydrology, and transportation network. Buffering and overlay analysis of these data layers on the GIS produces a map for which several potential sites were identified. With the shape of each site as the criteria, these sites were then classified into two classes; highly potential 4 sites and moderately potential 13 sites. The highly potential sites range from 1,067.56 to 4,622.27 square Kms. and are located in Ban Kam Bon, Ban Kai Na, Ban Hlao Yai and Ban Nong Lhai. The moderately potential sites range from 650.79 to 12,151.95 square Kms. are located in Ban Muang, Ban Phang, Ban Nong Chiung Chui, Ban Hin Lad, Ban Nong Yang, Ban Pa Sing, Ban Kok Se, Ban Na Yom, Ban Sam Rong and Ban Don Sa Wan. Finally, the theoretical findings on the GIS were verified by ground truthing. All sites, but one, were found to be in accordance with the GIS result.

Key word : Geographic Information System, landfill site

Variation of Species and Number of Plankton in Constructed Wetlands at Mitr Phu Viang Sugar Factory.

Student : Miss Jaruwan Aksornpim

Project advisor : Asst. Prof. Samang Homchuen

Department of Environmental Science, Faculty of Science , Khon Kaen University. Thailand.

Species variation and number of plankton in constructed wetlands at MPV Sugar factory were investigated at 2 intervals, i.e., August 1999, and December 1999. Samples were collected from 6 investigating stations along the wastewater treatment system. The results showed that altogether there were 27 plankton species and 7 unidentifiable species. In the first interval, there were 25 species of plankton found, i.e., 3 species of division Cyanophyta, 10 species of division Chlorophyta, 3 species of division Chromophyta, 6 species of phylum Rotifera and 3 species of phylum Arthropoda. There were 7 spp. that could not be classified. No significant correlations were found between distances from the influent and the plankton diversity indices except for that between station 3 and station 5 and 6. In the second interval, 26 species were found, i.e., 3 spp. of division Cyanophyta, 11 species of division Chlorophyta, 3 species of division Chromophyta, 7 species of phylum Rotifera and 2 species of phylum Arthropoda. 6 spp. that could not be classified. No significant correlations were found between distances from the influent and the plankton diversity indices except for those between station 1, 2 and 3 and station 4; and between station 2 and station 5.

Key word : Variation of Species, Plankton, Constructed Wetlands