AKDENIZ UNIVERSITY

HACETTEPE UNIVERSITY

# ISEEP 2011

ANTALYA - TURKEY

# 6th International Symposium on Ecology and Environmental Problems

**17-20 November 2011**
**Antalya**

Turkey

*Editors: Ali ERDOĞAN, Tamer ALBAYRAK, Kani IŞIK*

T.C.
ÇEVRE VE ŞEHİRCİLİK
BAKANLIĞI
TABİAT VARLIKLARINI KORUMA
GENEL MÜDÜRLÜĞÜ

# ISEEP 2011

## ANTALYA - TURKEY

**Ali Erdoğan, Tamer Albayrak, Kani Işık**
**(Editorial Board)**

# VI. International Symposium on Ecology and Environmental Problems

*17-20 November 2011*
*Antalya, Turkey*

*PLEASE NOTE:*

*Symposium Chairman Prof. Dr. İlhami KIZIROGLU, at age 67, will retire from his academic position at Hacettepe University on November 20, 2011, which is the same day as the termination date of the Symposium. As it was the case during his productive academic years, we wish successful, happy and healthy years to Professor Kiziroglu during his retirement years as well. A short resume of Professor Kiziroğlu is presented below.*

*Symposium Organizing Committee*


**Resume of Professor Dr. İLHAMİ KİZİROĞLU**

İlhami Kiziroğlu, born in Elazığ/Harput, graduated from Istanbul University, having a Senior Forest Engineering diploma in 1968. He has been awarded a scholarship and went to Germany for his masters and doctorate studies. He carried out his pre-doctorate study on spiders at the "Institut für angewandte Zoologie" in Munich Ludwigs-Maximillian University. While he was conducting his doctorate study on Nature Protection with Ecological context under Professor W. Schwenke, he was also appointed as technical assistant at the same department.

Dr Kizioğlu completed his doctorate study in 1976, and this study was published in an "A" class journal in the form of three articles.

During his doctorate study, Dr Kiziroglu participated in an international project on "Negative Impacts of Pesticides on Nature and Plants and Their Accumulation", which was published upon completion.

He took office in 1977 as a faculty member at the Department of Biology of Faculty of Science in Hacettepe University. He founded "The Department of Science

Education" that gives education in German language in the 1983/84 academic year, and acted as the Head of the Department.
In 1982 he became associate professor in the field of "Ecology" at Hacettepe University and became a full professor in 1988 in the same field. In 1994, Dr Kiziroglu was apointed as the Dean of the Faculty of Education at Hacettepe University. He founded the Environmental Education, Bird Research and Banding Center. He currently serves as the Director of the Research Center and actively participates on researches on ecology of birds.
He won the scientific scholarships of Alexander von Humboldt Foundation, a prestigious research scholarship presented by the German Academic Exchange Board in Germany. He conducted and published several scientific studies under this programs in different years at Münich Ludwigs-Maximillian University; Münich, Braunschweig and Berlin Technical Universities and at the School of Heidelberg Higher Education. With the support of Bayerische Forschungs-Allianz he worked as a researcher in an international European Project named "Heavy Metal Accumulation in the Fish Consumed in Europe".
Dr Kiziroğlu, besides his academic studies at the university, also assumed the following posts in various non-governmental organizations: (1) Chairman of Scientific Advisory Board of Germany HÜRTÜRK Civil Society Organization Ankara Branch; (2) Chairman of Scientific Advisory Board of Association of Protecting the Turkish Nature; (3) Secretary General of the Association of Ankara Alexander von Humboldt Scholars; (4) currently he is the Chairman of the Association of Ankara Alexander von Humboldt Scholars; (5) Vice-Chairman of Turkish-German Culture Consultation Board (he is currently the Vice-Chairman), (6) Vice-Chairman of the Turkish Hunting and Shooting Federation.
Dr Kiziroğlu completed 290 scientific studies, of which 24 were published in A/C class international journals screened in SCI. Two of his studies were published in foreign books (110 of the articles are in foreign language and the others are in Turkish). Out of these studies 20 of them are books (7 of them in foreign language). He also served as the editor of the 8 books. His scientific studies were cited for numerous times.
Seventh edition of the book "GENERAL BIOLOGY" was printed in October 2010. "Distribution Map of Turkish Birds (with size of 70x100 cm)" covering the native and migrating birds was published in such popular journals as ATLAS, 1994 (volumes of September and October) and TEMPO, 1995 (volumes of June and July).
His books named "BIRDS OF TURKEY" and "BIRD SPECIES OF TURKEY, RED DATA BOOK" were listed in "London Natural History Catalogue" and were accepted as standard works related to Turkish Birds. Second edition of "TURKISH BIRDS" "BIRDS SPECIES of TURKEY" was changed completely and published with the name "Pocketbook for Birds of Turkey" in Turkish/English languages, with colored pictures.
He published his book "Ecological Hunting: Photosafari Training" with his colleagues in 2011. The work "Beytepe and Biological Structure of Its Surroundings" has a feature of having been written in three languages.

His many original researches were published in the forms of abstracts in the journals of "Biological Abstract", "Zoological Abstract" and "Ornitologische Schriftenschau". He performs editorship in some native and foreign journals. He contributed to preparation of 3 standards, namely Rules for Protecting Birds, Rules for Protection of Wetlands; Rules for Methods for Monitoring Wetlands by the Turkish Standards Institute.

He lectured on Human Biology, Human Ecology, General Ecology, Nature Protection, Ethology, Histology, Cytology and General Biology.

He conducted several research projects with financial support from TUBİTAK in various periods. He administered and completed the Project on "Turkish Biological Diversity" supported by the World Bank. (Biological Diversity Action Plan.Wetland, River, Marine, Lake, Island and Cave Ecosystem. Report to World Bank. Focal Point Ministery of Forestry. General Directorate of National Parks and Game-Wildlife).

He participated in "Sultansazlığı Development Planning Project" of the Turkish Nature Protection Association in the GEF Project and accomplished it. Sultansazlığı Research and Administration Plan supported by the United Nations Development Programme(UNDP).

Dr Kiziroğlu participated in and completed "Varla Canyon Development Planning Project" supported by the FAO.

He wrote "Ecological Evaluation Reports" and "EAR" in various projects related mainly to HES, RES and Dam Projects. He is still active on writing similar reports.

He participaed in and accomplished "İğneada Longos Forest Development Planning Project" supported by the World Bank. Dr Kiziroğlu also participated in the Project "Umweltlernen in der Welt für eine Welt" with the German Braunschweig Technical University, the results of which was published in the form a book.

Dr Kiziroglu received the following awards for his academic and scientific accomplishments.

| *Award name* | *Presented by / for* |
|---|---|
| **Excellence Reward In Science** | **Hacettepe University Senate** |
| **Honor Award In Science** | **Turkish Nature Protection Association"** |
| **Henry Ford Environment Award** | **Sultansazlığı (Wetland) Development Planning Project** |
| **Poster Grand Prize** | **13th International Symposium on Environmental Pollution in the Mediterranean Region in Greece** |
| **2010 Environmental Science Service Award** | **Akdeniz University** |

Dr Kiziroğlu is married and has two children. He has got a good command of German and intermediate level of English.

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## CONTENTS

ISEEP_001

# THE ROLE OF RESIDUE ANALYSIS IN THE EXPORT-IMPORT RELATIONSHIPS OF FOOD SAMPLES

O.PROF.DR.HARUN PARLAR

CHAIR FOR CHEMICAL-TECHNICAL ANALYSIS OF THE TECHNICAL UNIVERSITY OF MUNICH-GERMANY , RESEARCH CENTER OF FOOD QUALITY AT THE TECHNICAL UNIVERSITY OF MUNICH-GERMANY, BAVARIAN RESEARCH ALLIANCE – BAVARIA MUNICH-GERMANY

The necessity of residue analysis in the export-import relationships will be discussed regarding the regulations and limitations, especially in the EU.Quality control of raw products during input analysis,food production and output analysis by the producers;quality control of commercial food due to the authorities and ranking of food products by the consumers are the main points,considered in this matter.

Difficulties in the residue analysis are mostly concentrated on complex mixtures-analysis,such as chloroparaffines,toxaphenes or chiral residues.An overview of these problems and their solutions will be presented.High resolution chromatographical methods,including multi-dimensional gaschromatography,high resolution mass spectroscopy,time of flight mass spectroscopy,enantioselective separations and high performance liquid chromatography will be evaluated in their advantages and desadvantages.

The problems, concerning official noel,adi and pl-values of these complex compounds and their concentration in different food samples will also be discussed and a new ranking system for the solution of these problems will be demonstrated in selected examples.

ISEEP_002

# EVOLUTION OF MAN – A HISTORY OF SUCCESS AND DESTRUCTION

MICHAEL WINK

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DNA analyses have helped to define the evolutionary history of Homo sapiens. About 5-6 million years ago a common ancestor existed from which the genera Pan and Homo diverged, indicating that chimpanzees and bonobos are the closest relatives of humans. Modern humans probably evolved about 150000 years ago in Africa from where emigrations took place to Australia, eastern Asia and Middle East and the New World. After the end of the last glaciation (about 12000 years ago) the development of human culture increased its speed. At that time the former hunter-gatherer society started to domesticate animals and plants and built villages and small cities. This started our history as farmers and city dwellers with labour sharing and hierarchies. Other key innovations followed in due course, such as written documents and tools made of metals. Writing speeded up cultural evolution and tools were essential for agriculture and warfare. The talk will summarize the molecular phylogeny and phylogeography of humans and discuss their history of technical success and environmental destruction.

ISEEP_003

# EXCEED – EXCELLENCE CENTRE FOR DEVELOPMENT COOPERATION SUSTAINABLE WATER MANAGEMENT IN DEVELOPING COUNTRIES - A PROJECT FOR CAPACITY BUILDING THROUGH HIGHER EDUCATION -

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**Aim:** Water is one of the 21st century's key development issues. Worldwide, 1.2 billion people do not have access to clean drinking water while around 3 billion (the half of the mankind) do not have suitable sanitary facilities or wastewater treatment. The Exceed Project at the TU Braunschweig mainly addresses to MDG 7/C "Ensure Environmental Sustainability – Halve by 2015 the proportion of the population without sustainable access to safe drinking water and basic sanitation", and its aims and goals are based on the availability of water.
In the future, two mega topics will have the highest international priority: Water and Energy. Therefore, Capacity Building through education and research is the primary objective of the *Excellence Centre for Development Cooperation – Sustainable Water Management in Developing Countries – Exceed* at the TU Braunschweig.

**Method:** The Exceed Project was implemented 2009 by TU Braunschweig together with 32 partner universities and research centres in developing countries, and is one of five projects on Millennium Development Goals MDG that were awarded funding with one million Euro per year each over a five-year period by the German Ministry for Economic Cooperation and Development (BMZ) and the German Academic Exchange Service (DAAD).
Through its specific study programs and research profile, TU Braunschweig offers outstanding expertise in Sustainable Water Management in Developing Countries. Pioneering research and academic cooperation projects with strategic partners from developing countries in Latin America, the Middle East, Sub-Sahara Africa, and South-East Asia have been developed with a strong focus on sustainable and transferable solutions for each region's predominant water-related issues.

**Results:** Based on a world-wide network of 32 partners the Excellence Centre in Braunschweig focuses on capacity building in developing countries through training of and networking between experts. The Coordination Unit is located at the TU Braunschweig; Four Satellite Centres are founded at the University of Guadalajara in Guadalajara, Mexico coordinating the Regional Network in Latin America, the Mut'ah University in Karak, Jordan coordinating Middle East, the University Ouagadougou in Ouagadougou, Burkina Faso coordinating Sub-Sahara Africa, and the Water Resources University in Hanoi, Vietnam coordinating South-East Asia.

The main objective of the Exceed Project is “capacity building” in Developing Countries through regional and global networking between partner universities. Exceed aims at imparting competencies and knowledge on sustainable water management to future experts and decision-makers in order to qualify them to shape technological, economic, organizational, and political change processes, thereby ultimately attaining the MDG.

**Conclusion:** To achieve these goals, all participating institutions are going to analyze and to upgrade the existing, and to implement new study programs in the field of Sustainable Water Management at MSc and PhD levels and to provide state-of-the-art measures for further education of technical and scientific staff members of universities, enterprises, and authorities at the respective regions. The project contributes to strengthening the intercultural competences at TU Braunschweig as well as to the formation of an international science community, gaining an additional edge through the dialogue at eye level with Developing Countries.
Further information is available under http://www.exceed.tu-braunschweig.de

**KEYWORDS:** SUSTAINABLE WATER MANAGEMENT, DEVELOPING COUNTRIES, CAPACITY BUILDING, CURRICULUM DEVELOPMENT, NETWORKING

ISEEP_1

# INVESTIGATIONS OF GIARDIA SPECIES BY IMMUNOFLORESAN TEST (IFT) IN WATER SUPPLIES OF ORDU, MIDDLE BLACK SEA

ZEYNEP KOLOREN, DERYA KAYA

ORDU UNIVERSITY, FACULTY OF ARTS AND SCIENCES,DEPARTMENT OF BIOLOGY,ORDU

**Aim:** A total of 70 water samples, including tap, river, fountain and well water were collected and investigated for the detection of Giardia cysts. The investigated areas include parts from the city of Ordu, its surroundings and boroughs in the period between September and December 2009. All collected water samples were purified by Al2(SO4)3-flocculation and then, they were subject to sucrose gradient centrifugation for water pellets.

**Methods:** The investigated areas include parts from the city of Ordu, its surroundings and boroughs in the period between September and December 2009. All collected water samples were purified by $Al_2(SO_4)_3$-flocculation and then, they were subject to sucrose gradient centrifugation for water pellets.

**Results:** The resulted pellets were stained with FITC conjugated monoclonal antibody obtained from Cellabs Pty Ltd. Subsequently, all 70 collected water samples were directly screened fluorescence microscopically for Giardia cyst detection by ImmunoFluorescence Test (IFT). 26 (37.14%) out of 70 water samples were positive for *Giardia spp*. Interstingly, 26 river water samples, (representing a ration of 53,06 %), out of 49 river water samples examined, were found contaminated with Giardia cysts by IFT. However, Giardia cysts were abscent in fountain, tap and well water by IFT.

**Conclusion:** The study implements to investigate the occurrence of waterborne parasites in the city of Ordu. Since there is no previous report about water-borne protozoans (*Giardia spp*) in this investigated area, the present article contributes not only to the protection of public health in this area but also it will be the platform for further studies of Black Sea Area.

**KEYWORDS:** GIARDIA, IFT, BLACK SEA, EPIDEMIOLOGY

ISEEP_10

# SPATIAL DISTRIBUTION OF ORGANIC MATTER AND NUTRIENTS IN THE MERSIN BAY, NORTHEAST MEDITERRANEAN

SULEYMAN TUGRUL[1], EMINE ERDOGAN[2], OZDEN BASTURK[2]

[1]METU-INSTITUTE OF MARINE SCEIENCES, ERDEMLI, MERSIN/TURKEY [2]MERSIN UNIVERSITY, FACULTY OF FISHERIES, 33169, MERSIN,TURKEY

**Aim:** In this study spatial distributions of particulate organic matter and nutrients were investigated to assess impacts of land-based inputs on the Mersin Bay coastal ecosystem.

**Methods:** The selected 6 stations were visited seasonally between April 2009-February 2010 by R/V Bilim (TUBITAK- 107G066 project). Hydrographic data were collected by a CTD probe coupled to a 12-bottle Rozette system. Standard methods were followed in analyses of nutrients, POM and Chl-a in seawater.

**Results:** Surface nitrate concentrations varied from 2.4 -12.4 µM to 0.1 in the offshore, whereas reactive phosphate values ranged merely between 0.02-0.1 µM over the bay. Total phosphorous, POC, PON concentrations increased about 10-fold in the polluted nearshore waters compared to the offshore values. The nitrate/phosphate (N/P) ratio was high (35-50) in the nearshore zone fed by nitrate-replete rivers. Large riverine inputs have drastically reduced light penetration and thus Secchi disc depth to 2-3m levels in the POM-enriched nearshore. POC/PON ratios (7-8) of bulk POM were similar to the Redfield ratio (6-7) whereas particulate N/P ratios ranged between 20-50.

**Conclusion:** Concentrations of nutrients, organic matter (POM) biomass (Chl-a) were markedly high in the shallow nearshore zone during the year due to large nutrient input from land-based sources and limited ventilation by the open sea.

**KEYWORDS:** NUTRIENTS, PARTICULATE ORGANIC MATTER, EUTROPHICATION, MERSIN BAY, MEDITERRANEAN SEA

ISEEP_17

# ENVIRONMENTAL LAW AND NEWS IN THE SERBIAN ENVIRONMENTAL LEGISLATION

PREDRAG STOJANOVIC, NEVENKA BACANIN, MILAN RAPAJIC

JOVANA CVIJICA 1, 34000 KRAGUJEVAC-REPUBLIC OF SERBIA

**Aim:** In this work the authors start from the philosophical basis of Enviromental law.We give our opinions on the relationship between ethics and ecology and environmental relations with religion.We talk about the place of environmental law in the legal system of Serbia and its relations with other older branches of law. Education in the field of environmental protection also has its legal division.At some law faculties in Serbia Enviromental law has been introduced as an elective subject.With revising of curriculum of Faculty of law in Kragujevac,Enviromental law will be introduced as a curriculum,but before that a special clinic for Enviromental law will be also introduced.

**Methods:** The historical and legal,normative-dogmatic and sociological method,because the enviromental policy is not only a part of legal policy and legislation is not good enough.The important thing is effective application of norms.

**Results:** In 2009 a whole set of so called environmental laws were brought.The authors talk about the effects of their application,especially paying attention to the introduction of two public agencies that deal with specific environmental protection and those are the Agency for chemicals, created on the model of the Swedish agency for Chemicals and the European Chemicals agency and the establishment of the Agency for protection against lonzing Radiation and Nuclear Safety of Serbia.

**Conclusion:** The results are connected with conclusions of this work-only dynamic activity of all professionals dealing with environmental issues can improve environmental awareness in Serbia.The awareness should be directed towards understanding the seriousness and importance of environmental issues as a priority issue for the future of every country.Knowledge gives birth to free opinion,the most important knowledges for professional orientation can be achieved under the arches of university centeres.Intellectual elite of one country must achieve ecological knowledge just in the regular studies.Becouse of that the authors in this paper initiates the formation of interdisciplinary university ecological areas in all universities in Serbia, because solving the accumulated environmental problems is not something you can leave for better future and to future generations.This is the task for our contemporaries because life on this planet is in great threaten.

**KEYWORDS:** ECOLOGY, ENVIRONMENTAL LAW, NEWS IN THE ENVIRONMENTAL LEGISLATION OF SERBIA, ENVIRONMENTAL EDUCATION

ISEEP_18

# BIODIVERSITY OF VAN PROVINCE

ATILLA DURMUŞ, ÖZDEMIR ADIZEL, FEVZI ÖZGÖKÇE, YUSUF UZUN, FAZLI ÖZTÜRK, MUHABBET KEMAL KOÇAK, MURAT ÜNAL, SINAN IŞLER, NILÜFER SELÇUK, ALI KELEŞ, LÜTFI BEHÇET, KENAN DEMIREL, AHMET ÖMER KOÇAK

YÜZÜNCÜ YIL UNIVERSITY, SCIENCE FAC.DEPT. OF BIOLOGY, VAN/TURKEY

**Aim:** With this study, the vegetation structure, naturally grown, edible and poisonous macrofungi, insect and bird fauna have been determined within the borders of the province of Van and intended to contribute to the identification, enrichment and the biodiversity of fauna and flora of Eastern Anatolia Region and Turkey.

**Methods:** The material of this research is biological entities within the boundaries province of Van. Floristic research in general from the beginning to the end of the vegetation period, at same time plant samples have been collected and photographed. Insect fauna identification work is required daytime and at night in two separate program. Transect line method was used for determination of bird fauna. Identification books has been used for a quantitative assessment. Spore structures and microscopic data of fungus that moved from the field to laboratory were obtained and described.

**Results:** As a result of all investigations between 1982 and 2011, approximately 55,000 plant specimens were collected in the Van province and its surrounding. As of today, totally 2571 species and subspecies belonging 103 families and 543 genus have been identified. In this study 13 new taxon for World and 17 new taxon for flora of Turkey have been determined. As a result of field and laboratory studies of description specimens 121 macrofungus were determined distribution 6 ordos, 25 families and 54 genus belong to Ascomycota and Basidiomycota Phylum. 1737 insect species were listed within the boundaries of the province of Van. 1131 of these species belong to Lepidoptera. Today, 407 butterfly species have been identified in Turkey. Van is known as one of the richest regions in Turkey with 225 butterfly species and percent 55%. In addition, 606 species belonging to other insect group were determined in vicinity of Van province. According to recent counts, 213 bird species have been determined in Van Lake Basin. Their residence status is as follows: 77 residents, 18 winter visitors, 89 migrants and 29 transit migrants.

**Conclusion:** The Van province that located in Van Lake Basin has the very important potential of biodiversity. Existing species lists will increase when continuation of Biodiversity studies. In addition, overgrazing, uncontrolled reed cutting, illegal hunting, drainage, egg collecting, domestic pollution, drying of wetlands, sand draw from river bed, lack of environmental awareness and intensive human activities around the wetland are the most important problems in the basin.

**KEYWORDS:** BIODIVERSITY, FLORA, MACROFUNGUS, ENTOMOLOGY, ORNITHOLOGY, VAN PROVINCE.

ISEEP_22

# ASSESMENTS ON PRIORITY PROBLEMS IN EROSION PREVENTION WORKS (A CASE STUDY OF ANTALYA)

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**Aim:** Land degradation in arid, semi-arid and dry subhumid areas occurring as a result of the various factors like climate change and human activities is described as desertification. Ever than, soil degradation is known as the decrease of soil quality in connection with the physically, chemically and biologically deterioration generally resulted from the human improper land uses. The goal of this work is to prioritize the regions in Antalya by taking into consideration the factors causing the erosion and desertification.

**Methods:** Materials of the work include the technical factors like soil depth, inclination spectrum, land use types, forest stand productivity and some socio-economic factors like proportions of forest village populations, coverage of agricultural fields, quantities of ovine and cattle, coverage of pastures, intensity of grazing, socio-economic development values, educational level, employment state and forest crimes. The data set obtained from those technical and socio-economic materials was assessed by multivariate analyses techniques (Principal component analyses, cluster analyses and factor analyses)

**Results:** The main factors causing the erosions are rain, surface flow, wind, vegetation, soil, inclination, slope length, human activities and etc. Intensive efforts and resources are required for studies on erosion and desertification preventions. Due to that the limited resources must rationally be used to prevent erosion and desertification. For rational use of resources, the regions where are sensitive to erosion and are priorities of investments should be defined and planned.

**Conclusion:** In conclusion, according the priorities in erosion prevention works, the towns in Antalya were sequenced. And the approach on proper erosion prevention investment was assessed by evaluating how the resources can rationally be used and which regions are of priorities.

**Keywords:** erosion and DESERTİFİCATİON, multivariate analyses techniques, rational use of resources, priorities of investments

ISEEP_29

# ENVIRONMENTAL ASSESSMENT OF CONFLICTS IN HUNTING AND WILDLIFE MANAGEMENT IN TURKEY

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**Aim:** There are both Human-Wildlife Conflicts (HWC) and Sense of Social Conflicts (SSC) in Turkey. Hence, conflict reasons, conflict parties and solution methods of conflicts are examined in terms of environmental, economic and social costs in this research.

**Methods:** Results are based on field studies and review of the scientific publications.

**Results:** Wild animals often come close areas to urban or villages to find food and water. Because of population rise, they also migrate different regions/habitats to find enough food. On the other hand, humans want to hunt the wild animals and also they fear wild animals. For these reasons, HWC arises. SSC is investigated as both individual and organizational level. In individual level, hunters have conflicts with villagers and shepherds. In organizational level, hunters have also conflicts with village headman, regional hunting societies, environmental societies, gendarme and authorities of hunting and wildlife.

**Conclusion:** Although wildlife is highly valued as a natural resource by society, wildlife and society are increasingly coming into conflict. HWC with environmental, economic and social costs are harmed people\'s welfare, health and safety. This conflicts lead to human injury, illness or death, loss of economic productivity, physical danger or a reduction in quality of life.

**KEYWORDS:** HUNTING, WILDLIFE MANAGEMENT, CONFLICT MANAGEMENT, HUMAN-WILDLIFE CONFLICTS

ISEEP_34

# POPULATION FLUCTUATIONS AND HABITAT SELECTION IN ISLAND BIRDS: INVASIVE HABITAT GENERALISTS VS. ENDEMIC FOREST SPECIALISTS

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**Aim:** In this study we to compare the temporal variation in abundance and the habitat selection pattern of invasive and endemic landbird species of Robinson Crusoe Island, Chile by testing four hypotheses.

**Methods:** We used Line Transect Methods for later analysis with PCA and MCMC using R2WinBUGS.

**Results:** Results show that perturbed habitats contained a low density of the endemics juan fernandez firecrown and juan fernandez tit-tyrant whereas the invasive green-backed firecrown (and austral thrush were significantly more abundant in perturbed scrub habitats. Landbird species show different habitat selection patterns, with endemics selecting for native forest and invasive species selecting for perturbed habitats, or using them at random. Landbird species experienced temporal fluctuations in their overall population sizes, with the endemic tit-tyrant suffering a significant decline in its population size of about 63 percent between 1994 and 2009. Only invasive species exhibited temporal changes in habitat use, significantly reducing their densities in the preferred scrub habitats, possibly as a response to decreased habitat quality. Thrushes apparently were able to compensate the population decrease in one non native habitat type by using native forests, a habitat giving them the opportunity of preying on nests of endemic species.

**Conclusion:** Effective conservation and control of endemic and invasive landbirds, respectively, requires actions based on the spatio-temporal patterns of habitat use by these species.

**KEYWORDS:** ALİEN SPECİES, ANAİRETES FERNANDEZİANUS, HABİTAT SELECTİON, ISLAND ENDEMİCS, POPULATİON DECLİNİNG, SEPHANOİDES FERNANDENSİS

ISEEP_35

# USE OF GENETICALLY MODIFIED ORGANISMS IN THE REMEDIATION OF SOIL AND WATER RESOURCES

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**Aim:** With parallel to population increase in the world, soil and water resources are being polluted rapidly. The importance of environmental biotechnology in pollution management are getting increased. Biotechnology has been used for converting harmful substances formed in ecocystem into decomposible form and for determining control methods. Genetically modified plants or microorganisms play an active role in removing industrial waste, in decreasing toxicity of some elements, and in eliminating pollution by hydrocarbons and petrol leakage.

**Methods:**

**Results:** Petrol and its derivative, polysiclic aromatic hydrocarbons (PAH) as a result of industrial development, form big risks on watery and terrestrial ecosystems. PAHs infected to the environment are primarily decomposed by bacteria and fungus. Microorgansims can metabolize hydrocarbons in limited ratio on their own. Genes which determine the characteristic of being able to decompose hazardous substances in nature, can be inserted into plasmid DNA, transferable from other organisms by transformation or conjugation via recombinant DNA technology. For instance, it is known that decomposition characteristic of naftalene, salisilat, camphor, octane, xylene and toluen is coded on plasmids in bacteria Pseudomonas spp.

**Conclusion:** Transfer of PAH decomposing plasmid or gene fragments to bacteria contrubutes the formation of new strains for eliminating environment from hydrocarbons in a shorter time.

**KEYWORDS:** GENETICALLY MODIFIED ORGANISMS, SOIL, WATER, REMEDIATION

ISEEP_42

# CONFLICTS ON THE IMPROVEMENT OF URBAN BIODIVERSITY

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**Aim:** Although the improvement of urban biodiversity is an important issue in current urbanization trend also, it includes some complex matters and dilemmas. This paper aims to explore some challenges and conflicts improving urban biodiversity in urban context. It intends to give answers of the following questions which of problems faced in creating and improving urban biodiversity in the big cities, the obstacles in the period of planning, design, implementation and the maintenance stages of urban biodiversity development.

**Methods:** These questions have been answered by three different views, especially from the landscape architects, local authorities (municipalities) and citizens. Their knowledge, awareness of biodiversity and their perceptions about conflicts issues biodiversity in the urban settings have been examined with interviews, literature citation and some observations from the selected case studies (from different municipalities boundaries) in Ankara City.

**Results:** According to citizens one reason for conflict is that wildlife which carriers of diseases that can be harmful to people. Another reason of conflicts is that the maintenance and clearance of urban landscape originating from the animals (such as birds) in case of urban green maintenance. Besides landscape architects face critical challenges to develop urban biodiversity for human activities in urban settings while under urbanization pressure and planning regulations, their role and other factors.

**Conclusion:** In conclusion, the results obtained from the interviews have been given related to challenges creating, planning and developing of urban biodiversity. On the other hand, evaluations related with this subject have been presented. This paper is also enclosed with brief discussions and recommendations to deal with the improvement of urban biodiversity dilemma.

**KEYWORDS:** URBAN BIODIVERSITY, CONFLICTS ON BIODIVERSITY, URBAN LANDSCAPES, THE AWARENESS OF BIODIVERSITY, ANKARA

ISEEP_53

# LIVING WALLS IN OUTDOOR ENVIRONMENTAL IN HOT-HUMID CLIMATES, A CASE STUDY OF KALEIÇI

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**Aim:** The aim of this study is to suggest the most suitable greening project(s) which can be in a good harmony with historical walls of Antalya Kaleiçi where are under strict protection.

**Methods:** Three different methods will be considered for greening walls: a) planting climbing plants very close to walls, b) plantation of climbing plants nearby by the walls already installed by wired cages, c) using PVC flat framing with self watering system.

**Results:** The importance of green areas has been widely accepted and appreciated by authorities in recent years. Green walls isolate noise, cold, heat; reduce air pollution, provide better habitat microclimates for biodiversity of animals and plants improve aesthetic characteristics of living areas and water management. Kaleiçi could have better atmosphere for tourists and the permanently living people in the region when the walls were greened.

**Conclusion:** Living walls are rather important in regions with hot summers as it's in the case of Mediterranean basin since they provide relatively cooler areas. They reduce air-conditions uses. Living walls should be wide-spread because of these advantages beside aesthetic and ecologic superiorities. The only disadvantages of the walls are the management of irrigation systems. Greened Kaleiçi green walls will be an excellent example for the whole region.

**KEYWORDS:** LIVING WALLS, KALEIÇI OLD CITY, WALLS, PLANTS

ISEEP_56

# CONCENTRATION OF SOME METALS IN FOOD WEB COMPONENTS OF LAKE ULUABAT, A RAMSAR SITE OF TURKEY

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**Aim:** The aim of this study was to investigate the levels of some metal pollution, and to determine the potential human risk of consumption of fish in Lake Uluabat.

**Methods:** The consentration of some metals (Cd, Cr, Pb, Cu, Ni and Zn) were examined in abiotic [lake water (n=9), sediment (n=9)] and biotic component [meiobenthos (Oligochaeta n=9 and Chironomidae larvae, n=9) and some tissues (gill, liver and muscle) of three commercial fish species Esox lucius (n=25, age=3-5), Carassius gibelio (n=30, age=3-5) and Scardinius erythropthalmus (n=32, age=3-4)] of food chain between August 2004 and July 2005 as monthly from 12 sites within the Lake Uluabat. Metals were determined by ICP-OES (Varian 720 ES).

**Results:** According to average values, the metal levels were as follows for the water in Lake Uluabat: Zn > Cu > Pb > Ni > Cr > Cd. According to the values established for water quality criteria in surface water by the Turkish Government, metal concentrations (especially lead, copper, and nickel) in the lake water surpass the upper limits. The metal concentrations found in the upper layer of the sediments of the 12 sampling sites varied considerably. Except the essential metals (zinc and nickel), lead was found in the highest concentrations at three sampling sites (3, 5, and 11). Our results showed that zinc concentration was highest (average 452 mg kg–1) in oligochaetes, while copper concentration was highest (average 460.8 mg kg–1) in chironomids. According to maximum value, the highest value of Cd, Cr, Pb and Cu were found in S. erythrophthalmus'liver. The highest value of Ni and Zn found in Carassius gibelio' muscle, Esox lucius' liver and S. erythrophthalmus' muscle respectively.

**Conclusion:** Our results reflect the general capacity of oligochaetes, chironomids, E. lucius, S. erythropthalmus and C. gibelio tendency to accumulate metal in their tissues. Resident who is living surrounding of Lake Uluabat, can be exposed to metals intake through both food and water.

**KEYWORDS:** LAKE ULUABAT, OLIGOCHAETA, CHIRONOMIDAE, METAL POLLUTION, ESOX LUCIUS, CARASSIUS GIBELIO, SCARDINIUS ERYTHROPHTHALMUS.

ISEEP_59

# INJURY REASONS OF THE RAPTORS IN VAN AND ITS NEIGHBOURHOOD CITIES, PEAK SEASONS OF INJURY AND ITS TREATMENTS

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**Aim:** In this study, the raptors in Van, Hakkari, Bitlis, Ağrı and Muş were considered even though they are not among the wildfowls. The study was carried out based on the raptors conveyed to Yüzuncü Yıl University, Veterinary Hospital through various ways in 2007-2010.

**Methods:** Most of the injured birds were conveyed to either official authorities or directly to the clinic by the volunteers. Majority of the volunteers were observed to be at least a secondary school graduate and not to be a hunter.

**Results:** It was observed that raptors came to the clinics numerically the most in the winter months; lesser in spring and autumn migration periods and the lest in number the summer months. Eagle owls that were numerically the most in number among the raptors were conveyed to the clinic. In lesser numbers, Golden Eagle Long Legged Buzzard, kinds of vultures and small raptors came to the clinic. It was found out that most of the birds got inured with the gun. Majority part of the raptors that were conveyed to the Veterinary Hospital were cured and left to nature again. The ones who would not be able to survive in nature were sent to various zoos. The birds less in number died as they hadn't responded to the treatment.

**Conclusion:** The most important reason why these birds got injured was determined as the fact that the hunter training wasn't carried out as required, inadequate inspection was done and the role of the raptors in nature wasn't explained.

**KEYWORDS:** RAPTORS, HUNTER TRAINING, INJURY OF A RAPTOR, TREATMENT OF A RAPTOR.

ISEEP_74

# ESTIMATING CARRYING CAPACITY OF OLIYMPOS BEY MOUNTAINS COASTAL NATIONAL PARK

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**Aim:** Due to a variety of recreational opportunities, National Parks are in great demand by increasing number of visitors day by day. Increasing recreational use may cause destruction of natural and cultural resource values at national parks. Therefore estimating national parks carrying capacity is an essential factor for their sensible use and management. In this study, carrying capacity of Oliympos Bey Mountains Coastal National Park was determined.

**Methods:** It was used "The Methodology for Estimating Protected Area Carrying Capacity" by Cifuentes (1992). This method supplies the calculation of physical, real and effective carrying capacities for all recreation sites (trails, beaches, camping and picking areas) by using environmental, ecological, climatic and managerial parameters in a formulation.

**Results:** Expected numbers which estimated three levels of carrying capacities were compared to current numbers of National Parks' visitors. It was revealed that the current numbers much more than estimated numbers of visitors on weekends in the summer.

**Conclusion:** Study findings were evaluated in order to determine how to link and integrate them a carrying capacity management plan through formulation of quality for the park's natural resources.

**KEYWORDS:** RECREATIONAL CARRYING CAPACITY, PHYSICAL CARRYING CAPACITY, NATIONAL PARKS, PROTECTED AREAS, RECREATION AND MANAGEMENT.

ISEEP_75

# CARRYING CAPACITY ASSESSMENT OF TORTUM WATERFALL

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**Aim:** Tortum Waterfall is one of the most remarkable natural treasures of Turkey and the third highest natural waterfall in the world. There is a recreation area around the Waterfall for tourists visiting the site. An observation platform allows the visitors to have a close sight to the Waterfall. A staircase leads to the underneath of the Waterfall. Heavily used areas, such as viewing platforms, staircases, pedestrian walkways are under increasing pressure as visitor numbers increase. High visitor numbers, more face to face encounters, not seeing scene completely decrease visitor satisfaction. The purpose of this study is to determine the pedestrian capacities.

**Methods:** It was used the method of Highway Capacity Manual (HCM) which has been published by The United State Federal Highway Administration (1998) and adapted to pedestrian walkways and viewing platforms by Itami (2002).

**Results:** Uninterrupted and interrupted pedestrian flows on walkways were analyzed and visitor numbers for optimum quality of recreation use was estimated.

**Conclusion:** Visitor management plans were suggested for comfortable visitation in Tortum Waterfall.

**KEYWORDS:** RECREATIONAL CARRYING CAPACITY, PHYSICAL CARRYING CAPACITY, PROTECTED AREAS, RECREATION AND MANAGEMENT, TORTUM WATERFALL

ISEEP_77

# ENERGY EFFICIENCY IN MUNICIPAL WASTEWATER TREATMENT PLANTS IN ISTANBUL

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**Aim:** Istanbul Water and Sewerage Administration (ISKI) currently operates 36 municipal wastewater treatment plants. The energy consumed by these treatment plants is equal to 5 % of all energy consumed in Istanbul [1]. Upon completion of the ongoing constructions and the planned treatment plants, the energy cost seems to increase in the future. The study is focused on determination of opportunities of energy efficiency in existing municipal wastewater treatment plants in Istanbul.

**Methods:** Energy management in wastewater treatment plants means “meeting the desired standards of discharge limits of treated wastewater with minimum cost and provide optimum and continuous energy for sustainable development”. This extensive description covers many actions from beginning of wastewater treatment plant projects to optimum operation of the wastewater treatment plant. Energy management can be achieved with the optimization and evaluation of many actions.

**Results:** The required number of WWTPs to be realized in the coming decades of more than 100 facilities of different sizes, the development of a guideline for energy efficiency will certainly contribute to realizing important energy savings in this sector.

**Conclusion:** Energy efficient installations will reduce the operating costs of facilities, especially when energy conservation measures are implemented at the design stage. As Turkey will still design quite a number of small, medium sized and large wastewater treatment installations, energy efficiency can be taken into account at least costs.

**KEYWORDS:** WASTEWATER, TREATMENT, ENERGY, ISKI, OPTIMIZATION

ISEEP_80

# THE DETERMINATION OF HEAVY METALS IN EDIBLE PARTS OF CULTIVATED PLANTS AND MEDIA SAMPLES FROM A VOLCANIC REGION IN ISPARTA, TURKEY

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**Aim:** We investigated the levels of eleven different heavy metals (Al, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Zn) in the soils and the edible parts of six different cultivated plants (Brassica oleracea, Portulaca oleracea, Vitis vinifera, Raphanus sativus, Phaseolus vulgaris and Vigna unguiculata) samples of Isparta region in southern Turkey where volcanic soils are present.

**Methods:** Heavy metal contents of the samples were determined by ICP-AES (Inductively Coupled Plasma Atomic Emission Spektrometer).

**Results:** Both soil and plant samples had significant differences in heavy metal concentrations. The mean heavy metal contents in soil samples decreased in the order of Fe>Al> Mn>Zn>Cu> Pb>Mo> Ni>Cr >Cd>Co. Mn concentration is the highest in P. oleracea.

**Conclusion:** Comparisons of our results to those of others in the related literature indicated that only one (Mn) of our results were above the accepted levels in P. oleracea. The concentrations of Cu and Pb exceeded their respective permissible limits in soil samples; however, they accumulated in plants to a lower extent, probably because of the physical and chemical properties of soils preventing their translocation to plants.

**KEYWORDS:** HEAVY METAL, VOLCANIC SOIL, CULTIVATED PLANTS, ISPARTA, TURKEY.

ISEEP_85

# THE ANALYSIS AND EVALUATION OF SPATIOTEMPORAL CHANGES OF LANDSCAPE CHARACTERS IN THE BALANCE OF PROTECTION-UTILIZATION BY USING REMOTE SENSING

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**Aim:** Providing the spatiotemporal change in existing land-use types, bringing comments about the attributes of change using landscape pattern metrics, analysing the ecological risks of changes brought on ecosystems bringing proposals of potential land uses in the basis of protection-utilization balance with the help of a suitability analysis.

**Methods:** To reveal the change of agricultural areas, artificial surfaces, forests and semi-natural areas and wetlands on Landsat TM and ETM satellite images (1997-2000-2005-2010) image processing techniques including supervised classification, unsupervised classification, change detection and overlay analysis were used. Landscape metrics used to proceed landscape mosaics. Ecological risk analysis is provided to introduce the ecological impacts of uses on other uses. Finally, outputs of potential land-use types have been obtained with the help of suitability analysis.

**Results:** The area coverd by existing land uses of four different dates has been revealed as hectares in numerical terms. Changes in landscape pattern grades are expressed. This spatiotemporal change, has been interpreted and discussed on the basis of ecosystems.

**Conclusion:** To present the ecological impact of changing be derived from the use and pattern differentiation and to bring suggestions about the potential uses, spatial-temporal change should be addressed as a whole in the light of the protection-utilization balance.

**KEYWORDS:** CLASSIFICATION, LANDSAT, LANDSCAPE PATTERN METRICS, ECOLOGICAL RISK ANALYSIS, SUITABILITY ANALYSIS

ISEEP_87

# THE CONCEPT OF SOLID WASTE MANAGEMENT IN THE TOURIST AREA OF LAKE BAIKAL

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**Aim:** Lake Baikal and its unique ecosystem have an exceptional value for all people living on Earth. Therefore, many leading scientists share the view that the international cooperation for solving environmental problems of Lake Baikal should be expanded on various aspects. A vivid example of a transfer of international experience of waste management is a Russian-German Environment Project "Development of the concept of waste management of the tourist area of Lake Baikal" program "Advising-Assistance Program", which was held in NR TU Irkutsk, with the participation of German scientists from the University of Duisburg-Essen, Government of Irkutsk region, the German firms working in the field of waste management and with the financial support of the Federal Ministry of Environment and Nuclear Safety (BMU). Bilateral project had a modeling character and was aimed at developing of strategic and conceptual positions in the management of waste in the tourist area of island Olkhon

**Methods:** The concept of integrated solid waste management was based on the systematic approach that includes analysis of the scientific research of domestic and German authors in the field of waste management, as well as the use of modern technological, analytical and information techniques in this area. Analysis of the German experience has shown that a central component of the guidelines for the developing of an integrated waste management concept is an assessment of the existing system of solid waste management, which should be based on a good data base, as well as on predicting the waste formation. The main tool in predicting and optimizing the management of MSW is the life cycle impact assessment of waste (LCIA), where the main indicators are the environmental, economic and social criteria. In developing the concept of integrated solid waste management the main target was to compare and assess the different possibilities, scenarios that meet environmental and economic requirements of Olkhon. Integrated solid waste management concept was developed taking into account the legal and social-economic, political factors and adapted to local conditions on Olkhon. Project experts have examined the most optimal combination of measures and technologies in the field of waste management, as well as their applicability to the central ecological zone of Lake Baikal.

**Results:** - Inventory and assessment of solid waste treatment system Olkhon; - Analysis of the morphology of solid waste; - Analysis of market for recycled materials; - Develop a business plan to venture to the separate collection and transportation of solid waste from Olkhon; - Developing the concept of sustainable solid waste management Olkhon. - 3 Scenarios solid waste management in the tourist area of Olkhon

**Conclusion:** Throughout the history of the state protection of Lake Baikal government solutions welcomed the idea of tourism development as the industry that is most

compatible with the lake conservation task. The same is declared in the law “On protection of Lake Baikal”. Baikal natural territory is the most suitable location for the experiment on testing a model of sustainable development in combination with eco-tourism. Because of the creation of tourist-recreational special economic zone (SEZ) on Lake Baikal and the awareness of the need for parallel development of a civilized system of waste management by the Government, developed an integrated concept can serve as a prototype for waste management strategy throughout the all Baikal area

**KEYWORDS:** THE GERMAN EXPERIENCE, CONCEPT, LAKE BAIKAL, SOLID WASTE MANAGEMENT

ISEEP_94

# HABITAT PREFERENCES OF BUTTERFLIES (ORDER: LEPIDOPTERA) IN THE KARPAZ PENINSULA, CYPRUS

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**Aim:** The Mediterranean region comprises of some of the world`s unique biogeographically important areas, harbouring high levels of biological diversity. On the other hand anthropogenic disturbances are causing degradation of diverse ecosystems within the region. The aim of this study was to determine the habitat preferences of butterfly species and the potential threats they may face within the Karpaz Peninsula of Cyprus.

**Methods**: To understand the importance of local vegetation characteristics of butterflies in Kapraz Peninsula ``Pollard Walk`` transect counts were used to assess the abundance and species richness of butterflies. Butterflies resting on plants and those in flight were counted and identified. Preferred plant species and habitat types (EUNIS and EU Habitats) of the butterflies are also identified.

**Results:** During the surveys in 2006 eleven butterfly species were recorded. Two of them (Glaucopsyche paphos and Maniola cypricola) were endemic species to Cyprus. Construction developments, road improvements and unregulated construction were recorded within the region and could result in habitat loss and degradation of diverse ecosystems.

**Conclusion:** Our results provided valuable knowledge about important habitats for Cypriot butterflies within the Karpaz Peninsula and additionally highlighted the need for their conservation in the face of large road developments and unregulated construction.

**KEYWORDS:** BUTTERFLIES, LEPIDOPTERA, HABITAT, CONSERVATION, CYPRUS

ISEEP_98

# THE EFFECTS OF DIFFERENT ECOLOGICAL CONDITIONS ON THE CHILDREN'S PERCEPTIONS TOWARD ENVIRONMENTAL ISSUES

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**Aim:** This study aims to investigate the effect of different environmental conditions on the children's perception towards environmental issues by their drawings.

**Methods:** To understand the effect of environmental conditions on the children's perceptions, four main ecologically different areas, namely (1) Coastal, (2) agro, (3) urban and (4) Forest ecosystems were selected along a gradient from sea level to 1470 meters. The data of the study were obtained from eight schools located in the four different environmental conditions in Adana region. The participants of the study were 402 school children between the ages of 11-12 enrolled in the 5th grade. Drawings were studied from the perspective of meaningfulness and each topic in the drawings was coded and all themes were formed by classifying these codes according to the relations and common points between them.

**Results:** Results show that children's perception widely different depending on their environmental conditions at their living areas. While, air pollution was expressed as prominent and common environmental problems by children, therefore behavioral contamination in urban ecosystems, urbanization, water and noise pollutions were mostly expressed by students from coastal and marine ecosystems.

**Conclusion:** As conclusions, it was found that children's perceptions deal with environmental problems widely depending on their environmental conditions.

**KEYWORDS:** ENVIRONMENTAL CONDITIONS, ENVIRONMENTAL PROBLEMS, ENVIRONMENTAL AWARENESS

ISEEP_108

# MAPPING FOREST FIRE RISK ZONES USING GIS: A CASE STUDY FROM KAHRAMANMARAŞ

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**Aim:** The objective of this paper is to describe and evaluate the method used to spatially predict fire risk zones and fire risk index (FRI). Fire risk maps were produced using Geographic Information Systems (GIS).

**Methods:** In this study, each variable class (species composition, stand crown closure, stand development stage, insolation, slope and, proximity of agricultural lands to forest and distance from settlement areas) was assigned a fire risk rating (extreme, high, moderate or low) according to the risk potential of each class. Then, each fire risk class was rated on a scale from 1 to 5. Finally, all variables were then integrated through GIS using the equation generated.

**Results:** The spatial structure of fire risk map was developed for the study area. According to the fire risk map developed for the Kahramanmaraş, the percentage of extreme and high fire risk category was determined as 43.4% and 27.3%, subsequently. Maximum number of fire risk rating was 500. According to results, study area was found to be very sensitive to wildfire.

**Conclusion:** The results of the study will demonstrate useful and serve overall fire management purposes. Fire risk map and FRI should be taken into consideration for forest management plans based on ecosystem management concept.

**KEYWORDS:** FOREST FIRE, FIRE RISK INDEX, FIRE RISK MAP, GIS, MEDITERRANEAN REGION

ISEEP_124

# ENVIRONMENTAL ETHIC VALUES THROUGH ECOLOGICAL EDUCATION

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**Aim:** We try to see where is situated the present relation between humanity and nature, respectively, if we can found inside us the capacity to change the way to look the other living thing on the Earth through the ecological education.

**Methods:** We analyse the results of debate topics on environmental ethics done during the Environmental Consultancy master degree programme in our university.

**Results:** The anthropocentric moral values seems to be flexible but also rigid, each really changing in the human moral values being done with great efforts. The education gives knowledge and values, shaping the attitudes and behaviours. The ecological education concept follows to change the people attitude regarding the nature, to develop a responsible environmental behaviour and change the present unresponsive attitude to a friendly attitude of human being to the nature. Now, in Romania, the principal challenges to achieve these aims are the lack of knowledge, cultural traditions, present material values of live and religious education.

**Conclusion:** Moral seem to have lost the content and strength in the contemporary world. Maybe it is the time to assume the humanity's position of link in the chain of life on the Earth.

**KEYWORDS:** PEOPLE, ETHIC VALUES, NATURE, EDUCATION

ISEEP_129

# THE EFFECTS OF URBANISATION, INDUSTRIALISATION AND POLLUTION IN GEDIZ DELTA: A COMPARISON OF BREEDING BIRDS AND THEIR DISTRIBUTIONS BETWEEN 2002 AND 2006

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**Aim:** The Gediz Delta is a Key Biodiversity Area and suffers from many environmental problems. Aim of this study was to identify the changes in locations and populations of breeding birds with respect to urbanization, industrialization and pollution/dumping.

**Methods:** Breeding Bird Surveys were applied in 2002 and 2006. 305 1x1 km2 UTM Grids were covered. The number of breeding birds, populations/distributions and threats were recorded. Breeding populations/distributions of eight Charadriiformes species were compared between 2002 and 2006 for 95 Grids under urbanization, industrialization and pollution/dumping threat in 2002. Breeding populations were compared with Paired Samples t-test, Wilcoxon Signed Ranks test and GIS.

**Results:** There was an decrease in the overall breeding populations of Charadrius alexandrinus(%15.7 decrease), Glareola pratincola(%32.3), Himantopus himantopus(%63.8), Recurvirostra avocetta(%76.9), Vanellus spinosus(%2.0). The maximum number of breeding pairs of Vanellus spinosus had decreased from 2.1±1.8 in 2002 to 0.6±1.0 in 2006 in UTM squares were under threat (p=0.01). There were decreases in the maximum number of breeding pairs of the other species as well, especially Burhinus oedicnemus from 1.1±0.3 to 0.6±0.7 (p=0.058) and Himantopus himantopus from 8.0±8.2 to 4.3±3.6 (p=0.084).

**Conclusion:** Urbanization, industrialization and pollution/dumping have shown their negative effect on the breeding populations in even four years time.

**KEYWORDS:** GEDİZ DELTA, BREEDİNG BİRDS, URBANİSATİON, INDUSTRİALİSATİON, POLLUTİON, GIS

ISEEP_133

# ENVIRONMENTAL POLLUTANTS MICROBIAL BIODEGRADATION. PHENOL BIOTRANSFORMATION BY BACTERIAL POLY (ETHYLENEOXIDE) BIOFILMS

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**Aim:** Recent investigations demonstrated that one of the most appropriate materials for microbial immobilization especially for biotechnological application are the synthetic polymers. A limited number of studies are reported for phenol biodegradation by immobilized in polymers bacteria. Immobilized bacteria are advantageous to the free swimming cells because of their higher activity, multiple application and easier biotechnological control. Additionally, when a microbial biofilm is formed it demonstrates enhanced functionality due to the increased plasmid transfer. Two xenobiotic degrading strains - Pseudomonas rhodesiae KCM R5 and Bacillus subtilis KCM RG5 were immobilized on polyethylene oxide (PEO) cryogels as careers. The capability of both immobilized strains to degrade phenol as a sole source of carbon and energy was studied.

**Methods:** The PEO cryogels-bacterial biofilms were tested for phenol biotransformation in batch experiment for 28 days. An increasing phenol concentrations from 300 to 1000 mg L-1 were applied.

**Results:** Our results show that the PEO cryogels are non-toxic, demonstrate high biocompability with bacteria and posses good mechanical characteristics as polymer careers. The biofilter PEO-KCM R5 removed phenol at concentration of 1000 mg L-1/24 h while the biofilter PEO-KCM RG5 was less effective and degraded phenol at concentrations not exceeding 600 mg L-1/24 h.

**Conclusion:** After the long phenol biodegradation process the PEO-biofilms remained compact, porous and elastic. Our results showed that so constructed biotechnological systems are sustainable and can degrade phenol in increasing concentrations with high effectiveness (90 – 100%). The results demonstrate that the novel biomaterial is a prospective innovation for application in the bioremediation detoxification technologies in industrially polluted waters.

Cryogels were obtained by Dr. Petar Petrov and Prof. Dr. Christo Tsvetanov, Institute of Polymers, Bulgarian Academy of Sciences, Sofia. Acknowledgements: Supported by Grant VUH-302/ National Science Fund, MOMN, Bulgaria.

**KEYWORDS:** POLLUTED ENVIRONMENTS, XENOBIOTIC TOLERANT BACTERIA, PHENOL BIODEGRADATION, IMMOBILIZATION, POLYMER CARRIERS

ISEEP_136

# ENDEMIC FRESHWATER ICHTHYOFAUNA OF IRANIAN DRAINAGES: BIODIVERSITY, ENVIRONMENTAL DISTURBANCE AND CONSERVATION CHALLENGES

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**Aim:** The freshwater fishes of Iran comprise 200 species, which are currently distributed in 19 basins. Endemic ichthyfauna forms a significant part of the total species known from Iran so that new species are being described from this country almost every year. As there is no sufficient information with regard to the biological diversity and conservation aspects of this fauna, therefore we investigated the biodiversity, environmental disturbance as well as conservation of the endemic fauna of Iranian drainages.

**Methods:** In this study we used the data of our field works since 2003 from entire distribution areas In Iran.

**Results:** The results revealed that the Tigris - Karoun basin in West and Southwest, Kor and Persian Gulf basins in south considered as center of speciation and hot spot of endemic ichthyofauna of Iran. Biogeographical situation, geological history, climate and thus diversity are the important reasons for this diversity. The different human-induced disturbance like demands for aquaculture, fish introductions, pollution, and habitat destruction and also the natural disturbance like drought in recent years, has marked effects on Iran\'s endemic ichthyodiversity.

**Conclusion:** In comparison to the other geographically closed and even European countries, the endemicity of freshwater fishes of Iran is rather high. At the present, endemic icthyodiversity is under different threats. Information concerning different aspects; in particular population, habitat structures and ecology of endemic ichthyofauna is not so sufficient and none conservational action has been taken with respect to this fauna. Therefore, conservation policy for the freshwater endemic fishes of Iran should be base on protecting their important habitats as naturally reserves.

**KEYWORDS:** ENDEMICITY, EXOTIC FISH, DROUGHT, GEOLOGICAL HISTORY, BIOGEOGRAPHICAL SITUATION

ISEEP_144

# THE RIVER AS AN ECOSYSTEM - SEDIMENTS AS AN IMPORTANT PART OF THE SYSTEM

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**Aim:** Sustainable Use of Water enabled by using an innovative sediment handling restoring reservoir capacity

**Methods:** An innovative technical approach makes reservoirs permeable for sediment on a very cost effective basis. Incoming and already settled sediment is permanently transferred downstream involving new equipment operation techniques. The application does not affect reservoir management and is performed during daily reservoir operation. The process restores overall sediment transport to a near nature state with overall benefits to ecology and the rivers morphological state, giving the operator back the desired reservoirs operational range. The new technical sediment management approach is transferable on almost any range of plants, small to large and run-of-river to pump storage. It is supported by environmental organizations.

**Results:** Almost every reservoir is affected by sedimentation. The World Commission on Dams - WCD (WCD 2000) estimated that each year around 1 % of worldwide storage capacity is lost due to this effect. Even the actual new build of reservoirs does not level out overall storage decrease. DB Sediments patented technology may decrease this effect.

**Conclusion:** The paper provides a technical solution that enables to minimize the impact of using water to the ecosystem “River” covering both economics and scientific results gained so far.

**KEYWORDS:** SEDIMENT, SEDIMENT MANAGEMENT, RESERVOIR, ECOLOGY

ISEEP_145

# HYDRAULIC STRUCTURES UNDER ECOLOGICAL AND ECONOMIC ASPECTS – INNOVATIVE CONCEPTS AND VALUE ENGINEERING

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**Aim:** The structured search for better design variants with the ecological and economic perspectives in mind is conducted either parallel to the design process or on the basis of the final design.

**Methods:** Civil engineering structures such as dams, bridges, airports etc. are essential to modern civilisation. Yet, the construction and operation of these structures often has a multitude of ecological impacts. This is why such construction projects are usually accompanied by an environmental impact assessment forming the basis of a landscaping plan, which shall mitigate and/or compensate negative impacts. The main focus is thus on additional ecological measures whereas little attention is paid to economic efficiency. It has turned out, though, that an optimum result as to ecological and economic aspects can be achieved only when extending the optimisation process to the design, construction and operation phases. Ecological and economic objectives can best be achieved when they are already considered during the design phase, which poses additional challenges to the design engineers. To successfully respond to these challenges, intelligent and innovative solutions are needed, which can be developed more easily using Value Management methods.

**Results:** The speaker presents a number of exemplary projects in the field of hydraulic engineering showing the extraordinary results that can be achieved in terms of ecological and economic sustainability when using the Value Management process.

**Conclusion:** Value Management processes encourage innovative approaches that facilitate the development of the best ecological, technical and economical solutions.

**KEYWORDS:** VALUE MANAGEMENT, VALUE ENGINEERING, VALUE ANALYSIS HYDRAULIC ENGINEERING, ECOLOGY

ISEEP_147

# REFURBISHMENT OF THE KLINGENBERG DAM - ENGINEERING STRUCTURES IN THE AREA OF CONFLICT BETWEEN ECOLOGY, TECHNOLOGY AND ECONOMICS

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**Aim:** The Klingenberg (located southeast of Dresden) dam was planned and built between 1908 and 1914 according to a design coming from an architectural ideas competition. Since then, the Klingenberg dam has become a sophisticated engineering structure that is part of the ecological environment. The dam must be now refurbished. The aim is the refurbishment of the Klingenberg dam, taking into account the ecological, technological and economic factors.

**Methods:** After almost 100 years of operation, there were signs of structural damage on the dam; the bottom outlets, intake system and other components of the dam. In particular, the spillway was seriously damaged during an extreme flood that occurred in 2002. During this flood, the discharge over the spillway was 75% higher than its design capacity. After the 2002 event, intense rehabilitation and repair works were carried out with the intent of bringing the dam to recommended standards. The main works carried out at the dam were: - building of a new upper dam - construction of a 3.3 km long tunnel - increase of the spillway capacity to cope with the new flood design - construction of a new inspection gallery into the dam - general refurbishment of the dam - construction of new hydraulic elements

**Results:** This article deals with the efforts that had to be undertaken to bring the various technical requirements in agreement with the different interests regarding monument protection and ecology (by or with economically justifiable expenditures).

**Conclusion:** Meanwhile, more dams are in need of rehabilitation. The main challenge is the rehabilitation of these dams, taking into account the ecological, technological and economic factors.

**KEYWORDS:** SPILLWAY, REFURBISHMENT, DAM, ECOLOGY

ISEEP_157

# BIOSORPTION OF CR (VI) ONTO PSEUDEVERNIA FURFURACEA /AQUEOUS SOLUTION INTERFACE

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**Aim:** This study addresses removal of a heavy metal, Cr(VI), from aqueous solutions by using dried Psedeuvernia furforcea biomass as biosorbent.

**Methods:** In this study, the effects of factors, such as the initial dye concentration, contact time, temperature, biosorbent dosage and mixing rate on biosorption of the heavy metal was investigated. Furthermore, it was investigated compliance of adsorption data with Langmuir, Freundlich, BET, Temkin, Redlich-Peterson, Henderson, Smith, Halsey, Harkins-Jura and Sips adsorption isotherms and then calculated separately the coefficients for each model. In order to explain the metal-functional group binding mechanisms, FTIR analysis was carried out.

**Results:** The achieving time to adsorption equilibrium was found to be 8h. Moreover, it was found that the amount of Cr(VI) adsorbed onto Psedeuvernia furforcea increased with increasing temperature and increasing sorbent dosage. The results suggest that the physical interactions between sorbent particles and sorbate ions play an important role for the adsorption of Cr(VI) onto the biosorbent. It was found that the biosorption data of Cr(VI) by Psedeuvernia furforcea biomass were fit on the Freundlich adsorption isotherms at 293, 313 and 333K. There was a change in the intensity of the bands at different regions after interaction with Cr (VI).

**Conclusion:** The amount of adsorbed dye increased with increasing temperature, indicating endothermic nature of biosorption process. The maximum removal capacities of Cr(VI) using Psedeuvernia furforcea were 67,252 mg/g. Hence, it can be said the studied biomass is effective for the removal of Cr(VI) ions. FTIR spectra fort he samples also clearly shows the the different functional groups have a significantly role in metal biosorption. Finally, it can be concluded that Psedeuvernia furforcea can be used as an economical sorbent in the removal of this ion

**KEYWORDS:** BIOSORPTION, CR (VI), PSEDEUVERNIA FURFORCEA , ISOTHERM MODELS

ISEEP_169

# ENVIRONMENTAL SOCIOLOGY AND ENVIRONMENTAL LAW: INDICATORS FOR THE CHANGING ECOLOGICAL AWARENESS AND THE ALTERING ATTITUDE TOWARDS NATURE IN RUSSIA

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**Aim:** to present the results of the interdisciplinary analysis and the proof that the timeframe and the orientation of the changes in the ecological awareness in Russia and in Germany are quite similar

**Methods:** interdisciplinary (sociological-juristic) analysis, expert interviews

**Results:** According to Russian natural scientists, "the public ambitions to protect the nature become especially strong in times of ecological crises. The objects to be protected always correspond to the character of the crisis" [Reimers/ Stilmark, 1978]. The sociological analysis of the development of ecological awareness and the relationship with nature were thus associated with time-related "key points", where the ecological problems in Russia were relatively severe (at the turn of the century, 1960s, 1986, the late 1990s). Our observations on the relationship with nature (as represented in literature, law, art, religion [Gephart, 2002]) will be based on four dimensions – a normative one (the development of environmental law), an organizational one (the environmental movements), a symbolic one (the reflections on ecocide in Russian literature) and the ritual one (feasts that are connected with the cycles of nature). The analysis shows that these temporal "key points" experienced considerable changes in at least three dimensions (normative, organizational, symbolic), e.g., the mid 1960s brought about a thorough reformation of the environmental law, a comprehensive network of environmental movements emerged and the public discourse on ecocide started to develop within the framework of journalism. Parallel changes of this kind triggered by the reciprocal impulses between the dimensions, are also examined at other temporal "key points".

**Conclusion:** The changes within the dimensions of the relationship with nature are also analyzed as indicators for the alterations in the ecological awareness. Paying special attention to the development of norms within the environmental law, I am going to perform the interdisciplinary (sociological-juristic) analysis by means of expert interviews on the formation and development of ecological awareness and the attitude towards nature in the Soviet Union and in Russia from the turn of the century to date. For this purpose, I will refer to the ISSP data 1993, 2000. At that congress, I would like to present the results of the interdisciplinary analysis and the proof that the timeframe and the orientation of the changes in the ecological awareness in Russia and in Germany are quite similar.

**KEYWORDS:** ENVIRONMENTAL SOCIOLOGY, ENVIRONMENTAL LAW

ISEEP_174

# THE USE OF TRIX INDEX FOR SCALING TROPHIC STATUS OF COASTAL WATERS: A CASE STUDY IN THE MERSIN BAY (2010-2011)

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**Aim:** Mersin Bay, located on the NE Mediterranean and highly influenced by land-based (riverine and domestic wastewater discharges) pollutants, was chosen as a pilot site to apply TRIX index to scale trophic status of the coastal waters under anthropogenic pressure.

**Methods:** TRIX (oxygen, Chl-a, nutrients) and hydrographic parameters were measured at about 50 stations selected in the shelf zone waters of the bay seasonally from February 2010 to February 2011.

**Results:** In the polluted nearshore zone, Secchi disc depth (SDD) was very low (1.5-3 m), reaching 25-30 m in the oligotrophic offshore waters. Nearshore nutrient and Chl-a concentrations, primary production (PP) and DIN/PO4 (N/P) ratios were markedly high (total-P: 0.05-1.21 µM; DIN: 0.2-23 µM; Chl-a: 0.1-5.5 µg/L; PP: 2.53-12 µgCl-1h-1; N/P>20) during the year due to riverine (Seyhan and Berdan) and domestic wastewater discharges. Phytoplankton biomass was dominated by diatoms in winter-spring period; however, by prochlorophytes and cyanobacteria in dry seasons in the coastal waters. TRIX estimates ranged from 4-6 in the eutrophic nearshore zone to <1-3 in the offshore waters.

**Conclusion:** TRIX index changes in the eutrophic bay waters were closely correlated with SDD and TP. Large algal biomass and nutrient values in the nearhore waters indicate weak ventilation with the open sea. Both bio-assay results and high N/P ratios indicate P-limited primary production in the bay. Therefore, eutrophication can controlled by reducing TP loads to the bay. This study has been supported by TUBITAK-SINHA (107G066) Project.

**KEYWORDS:** TRIX, NUTRIENTS, PRIMARY PRODUCTION, MEDITERRANEAN, MERSIN BAY.

ISEEP_182

# INTRA-SEASONAL CHANGES IN WATER QUALITY, ZOOPLANKTON AND BENTHIC COMMUNITIES IN COMMON CARP (*CYPRINUS CARPIO*) PONDS

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**Aim:** Common carp, globally one of the most widely distributed fish species, is blamed for strong size- and density-dependent impacts on biodiversity via water regime shift to turbidity. We investigated relationships between carp size-structure, water quality, and zooplankton and benthic communities.

**Methods:** We sampled zooplankton, benthic invertebrates and physico-chemical parameters of water between spring and mid-summer in semi-natural ponds stocked with three age (size) classes of carp.

**Results:** Most of the physico-chemical variables varied over season, but only turbidity, Secchi depth, dissolved oxygen and PO4-P concentrations differed between ponds stocked with different fish size-classes. Limnological parameters indicating transition to a turbid state did not reach levels correlated with substantial biodiversity loss in other studies. We found no significant differences, either intra-seasonal or between pond categories, in zooplankton and benthos diversity or in proportions of zooplankton taxa indicating oligosaprobic conditions and those characteristic of meso- or polysaprobic environments. Changes in zooplankton and benthic communities were typical for size-dependent effects of fish grazing, with shifts from cladocerans to copepods, decrease of total zooplankton biomass and lower total biomass of benthic invertebrates in the presence of larger, but not small-sized, carp.

**Conclusion:** Prior to a shift to a turbid state, significant carp effects on invertebrate communities are mediated by trophic interactions rather than environmental conditions.

**KEYWORDS:** BIODIVERSITY LOSS, COMMON CARP, ENVIRONMENTAL DETERIORATION, TURBIDITY

ISEEP_183

# DETERMINATION OF HEAVY METALS IN ORGANS OF FRESH WATER FISH *SALMO TRUTTA* MACROSTIGMA IN MUNZUR STREAM, TURKEY

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**Aim:** The present study aimed to determine the bioaccumulation of heavy metals in in gills, liver, muscles of the fresh water fish *Salmo trutta macrostigma* in Munzur Stream, Tunceli, Turkey.

**Methods:** Arsenic (As), Cadmium (Cd), Cupper (Cu), Mercury (Hg), Lead (Pb) concentrations were measured using Inductively Coupled Plasma-Optical Emission Spectrometer (ICP-OES).

**Results:** The present results showed that fish liver appeared to have significantly higher tendency for the accumulation of all the heavy metals in *S. t. macrostigma*. While the highest concentration of uranium (U) and lead (Pb) were recorded in the gills of *S. t. macrostigma* that Arsenic (As), cadmium (Cd), copper (Cu) were recorded highest levels in the liver. The concentrations of Arsenic (As), cadmium (Cd), copper (Cu) and lead (Pb) differed significantly ($p<0.05$) among two fish organs.

**Conclusion:** Heavy metals in the edible parts of the investigated fish were in the permissible safety levels for human uses.

**KEYWORDS:** SALMO TRUTTA MACROSTIGMA, TROUT, HEAVY METALS, MUNZUR STREAM

ISEEP_216

# ENVIRONMENTAL CONTAMINATION IN FOOD SOURCES AND FOOD SAFETY IN TURKEY

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The safe food is the primary key to have healthy individuals in a community by means of a balanced nutrition and diet. It is certainly achieved by good production techniques that are carried out in an unpolluted environment. There has been an increasing pollution in the enviroment because of released exhaust gases, agricultural chemicals and untreated industrial wastes. These hazardous agents exogenously contaminate food sources; especially those growing in the regions around heavy industries like steel and/or integrated chemical facilities. The human naturally intakes these agents by eating food, consuming water and breathing air. The outcome is consequently development of cancer and toxic adverse effects in the body if continously exposed to them. Cadmium (Cd), lead (Pb), mercury (Hg), dioxin and dioxin-like polychlorinated biphenyls (PCBs) are major toxic agents present in the environment, and have adverse effects on kidney, lungh, liver, central nervous system, cardiovascular system, immune system, pregnancy and bone mineralization. International organizations such as FAO and WHO regularly evaluate the safety assesment of food contaminants for public health protection. EC also controls the levels of chemical and elemental traces in food and environment. Turkey which is an associated candidate country for EC principally adopts the regulations of EC that assess the risks of contaminants for food safety and health. The aims of this study are: firstly to give a general info about the current situation of hazardous elements and chemicals present in food sources from a food safety perspective; and secondly to introduce the levels of these agents in the body of those who live in the industrilized areas and consume the produced foods there. Studies have shown that there is an increasing contamination in the seas, water resources and air around the industrilized areas of Turkey like the region of Marmara. The results have reported that levels of Cd, Pb, Hg, dioxin and dioxin-like PCBs in some food sources/foods and enviroment are above the upper limit. In conclusion, preventive actions are extremely needed to protect the public health against serious adverse effects of environmental pollution and contaminated food sources in Turkey.

**KEYWORDS:** DIOXIN; ENVIROMENTAL CONTAMINANT; FOOD SAFETY; PCB; TRACE ELEMENT

ISEEP_225

# AN URBAN ECOSYSTEM MODEL FROM AN ECOLOGICAL VIEWPOINT[1]

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**Aim**: The purpose of this paper is to develop an ecological model applicable to urban ecosystems. The model is based on certain ecological principles prevailing in natural ecosystems.

**Method**: Three main components of natural ecosystems –namely; producers, consumers and decomposers - are linked to one another through an efficient ecological sequence. These components are the driving forces in ecosystems, and they are deservedly called "the golden triangle". This triangle contributes to maintenance of healthy, self-supporting and independent ecosystems. This ecological principle working in natural ecosystems is presented in a model to fit the specific inputs and outputs of urban ecosystems.

**Result**: Urban ecosystems are heavily populated mainly by human species, a "super" consumer. Yet, the producers (plants) are almost eradicated in most urban ecosystems. Therefore, an urban ecosystem is dependent mostly upon the neighboring ecosystems for goods and materials flows to support its consumers. Such dependency usually results in destruction of the neighboring ecosystems. The soil in urban ecosystems is disappeared (usually covered by concrete and asphalts), which results in habitat loss and immobilization for decomposers' activity. As a result, the golden triangle in an urban ecosystem is disabled to function properly. Therefore, the outputs are not efficiently decomposed and not re-cycled within the system. The untreated outputs from urban areas are disseminated in the form of gases, liquids and solids, all of which also can be damaging for surrounding ecosystems.

**Conclusion**: The everlasting activities of human species to obtain and bring goods and materials from other ecosystems into urban areas, and diverse and unbearable outputs from urban ecosystems into the surrounding environments create various devastating environmental problems of various magnitudes. To prevent, or at least to minimize urban-originated environmental problems, the golden triangle working perpetually in natural ecosystems needs to be activated in urban ecosystems as well.

**KEYWORDS:** URBAN ECOSYSTEM, MODELING, ECOLOGICAL CYCLES, CONSUMERS, PRODUCERS

ISEEP_226

# A MATHAMATICAL PERSPECTIVE TO ECOLOGY AND ENVIRONMENTAL PROBLEMS

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**Aim**: The footprints of mathematics can be seen in every part of environment. The examples of fractal geometry, fibonacci series and golden ratio can be seen in nature directly. Mathematics and environment relationship does not only depend on the physical similarities; mathematics is also a really important tool for understanding the nature. In this research the role of matematics on ecology and environmental problems will be explained.

**Method**: In this research, literature survey, analysis and senthesis methods are used.

**Results**: Mathematics plays a key role in environmental and ecological studies because modelling, statistical tecniques, and all other applications of mathematics are used to understand the current situation and help to predict future conditions.

**Conclusion**: Mathematics is used to analyze critical issues such as pollution, the availability of resources, environmental clean-up, recycling, and population growth. Thus, mathematics is a really important tool for solving environmental and ecological problems.

KEYWORDS: MATHEMATİCS, FRACTALS, FİBONACCİ, ECOLOGY, ENVİRONMENT.

ISEEP_230

# BİODİVERSİTY AND İTS DİSTURBİNG FACTORS İN TURKEY"

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**Aim:** Within the scope of this study, the status of biological diversity in Turkey and the factors that threaten biological diversity evaluated

**Method :**In order to determine the status of biological diversity and the factors that, threaten biological diversity firstly, benefited from the data obtained from field studies, have been carried out the entire geographical regions of Turkey, by us. Literature controls were also carried out to complement the study.

**Results and coclution:** Turkey in terms of biological components and habitat richness is a considerable size. Turkey has appreciable richness in terms of biological components and habitats. The main components of this richness are vertebrates and plants. Studies on these groups are numerically higher than other groups. After reaching sufficient numbers of studies on invertebrates similar results are also expected.

Richness of biological diversity as well as data imposes a great responsibility to Turkish people. Because such a large number of components, and threats that they are facing in various degrees. As the results of assessment were made by us, 847 vertebrate species are in the annexes of the Bern Convention **Appendix-II**, 438; 326 species are located in **Appendix-III.** Similarly, 698 species of IUCN categories, "**LC**"; 52 species of "**NT**", 28 species, "VU", 20 types of "**EN**" and 13 species of the "**CR**" are in the categories.

According to only protection list of Turkey is the list of Central Hunting Commission, 503 species are in Annex-I, namely protected by the Ministry of Forest and Waterworks; 105 species are protected by this Commission and 38 species are allowed to hunt.

According to the Red Data Book for Birds of Turkey dated 2008, 101 bird species are listed as a criteria A.2, 95 species A.1.2; 94 species from the other categories, the categories ahead of A.3.

As we have seen that in Turkey, almost nearly all of the recorded components of the fauna of national or international scale, has a protected status This situation is linked disturbing the leading causes of large-scale habitats. These factors are increasing in size and diversity. The current status of biological diversity in Turkey within the scope of this work and is intended to be a comprehensive assessment of the threats.

KEY WORDS: TURKEY, BIODIVERSITY, THREATS

ISEEP_2

# STUDY OF THE INFLUENCE OF HAZE DUSTS ON THE ENVIRONMENT

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**Aim:** In recent decades, due to the development of cities and progress of technology in industrial world, air pollution has been growing increasingly and becomes a companion of human societies, while drastic climatic changes and prolonged and frequent droughts, increased the speed and intensity of the pollution. From the perspective of public health, aerosols in the air especially those contaminated with chemicals (called haze dust), are the main air pollutants and according to World Health Organization (WHO), annually 500,000 people due to exposure to these particles are dying prematurely.

**Method:** In this study, considering that in recent years some countries including Iran, facing extensive expansion and severe haze dusts, and by using documentary evidences we examine the short and long term effects of increased concentration of haze dusts on environment and the direct and indirect impact on human health.

**Results:** High concentration of haze dusts, in long term is resulting in climatic changes on local and global scale, also by reducing photolysis of gas species and mineral aerosols causing changes in Earth's atmosphere and affects cloud formation, changing clouds properties and effect the amount and acidity level of sleets. These aerosols increase the snow melting on mountains and by changing weather patterns causing expansion in habitants of mosquitoes carrying diseases, thus indirectly endangering human and animal health.

**Conclusion:** By residing of these aerosols on leaves and plants, disorders in breath and growth of the planet arises and reducing their resistance against pests and diseases. Haze dusts contain more than 10,000 different species of bacteria and nearly a million fungus spores, which the dominant type is Aspergillus. Breathing such aerosols for long-term increase different kinds of diseases including asthma, low IQ, headache, ischemic stroke type, lung problems and heart diseases, and also indirectly due to the nerve inflammation effects mental health, leading to increase of committing suicide. Generally, effects of increasing concentration of haze dusts in the air in long term is so severe that can increase death rate up to 6 percent and cause irreparable changes on the environment.

**KEYWORDS:** HAZE DUST; IRAN, HUMAN HEALTH; ENVIRONMENTAL POLLUTION.

ISEEP_3

# INVOLVEMENT OF SOIL SALINISATION ON *CENCHRUS CILIARIS* SCARCITY IN TUNISIAN ARID REGIONS

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**Aim:** We attempt to evaluate the involvement of soil salinization on *Cenchrus ciliaris* (Buffel grass) scarcity in arid regions of Tunisia.

**Methods:** We studied the germination and growth ability of this specie under experimental increase of NaCl stress (0, 50, 100, 200 and 300 mM).

**Results:** At moderate level of stress including 50 and 100 mM NaCl, *C. ciliaris* sustained sufficient germination capacity (GC), adequate germination mean time (GMT) and recovery aptitude (15%) after transferring seeds to distilled water. Shoot growth was reduced to 50% by salinity relative to control without inducing neither lipid oxidation nor tissues dehydration. Salt-induced gaïacol peroxydase (GPX) activity stimulation seemed to be efficient against oxidative stress. Severe stress, including 200 and 300 mM NaCl, lengthened seed dormancy, declined GC and germination rate (increasing GMT) with negligible germination recovery. While plant growth was not severely affected, increasing malonydialdehyde (MDA) production indicated that 200 and 300 mM NaCl provoked lipid oxidation and GPX could no longer overcome oxidative stress.

**Conclusion:** We concluded that soil salinisation with doses greater than 100 mM NaCl may contribute to *C. ciliaris* scarcity by lowering germination capacity and rate, increasing seed dormancy and inducing lipid peroxidation in shoot tissues.

**KEYWORDS:** CENCHRUS CILIARIS, SALINITY, SCARCITY, GERMINATION, GROWTH, PEROXYDASES.

ISEEP_4

# STUDY OF A RADIOACTIVE ELEMENT (RADON) OF HOT SPRINGS AND HOUSES IN TOURISTIC CITY OF SAREIN (NORTHWESTERN IRAN)

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**Aim:** Radon is one the most important radioactive elements which is created from decomposition of uranium and radium existing in the earth and might be found naturally in soil, air, and water. Radon concentration in the spring waters is directly proportional to their geothermal origin. Dissolved in the mineral waters, radon poses a threat to human health, although having some benefits. The objective of present study is to measure radon concentration in hot springs of Sarein (a touristic city northwestern Iran) as well as in the closed spaces of the city to evaluated the environmental impacts of the gas in the region studied.

**Method:** For the purpose of this study, in addition to measuring pH and Ec (using the radon extraction method), samples were collected in late winter from 9 hot springs with the temperature of higher than 40°C and one cold spring with the temperature of 15.5°C.

**Results and conclusion:** The results obtained from analysis of 9 mineral springs in Sarein indicate that the concentration of radon dissolved in the waters of the springs is between 9.7–139.8 bq/l this is lower than the standard limit, while its concentration in closed spaces of 25 selected residential locations, especially near to the hot springs, is higher than the standard limit.

**KEYWORDS:** RADON; SAREIN; HOT SPRING; TOURISTIC CITY; IRAN.

ISEEP_5

# THE EXAMINATION OF PROCESSES INVOLVING INTENSIFYING RECENT DUST STORMS IN IRAN

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**Aim:** This article examines processes involving development and extension of dust storms in Iran in recent years. Dust, as a factor of air pollution, is caused by a natural geographical process that appears during warmer seasons due to climatic changes and decrease of rainfalls in desert areas with scattered plant structure and low rainfall. It is one of the main characteristics of countries located on low geographical latitudes like Saudi Arabia, Iraq, and Iran.

**Methods:** We've collected all available information about the dust, Iran and Iraq through satellite imagery and reports provided by different organizations in the past 20 years.

**Results and conclusion:** Due to appearance of this phenomenon in desert parts of the country, especially during the warmer seasons, Iran has always tried to prevent the negative environmental impacts of the phenomenon through mulching and development of plantations on the edge of deserts. Yet, in recent years, some processes in the Middle East have caused intensive and continuous dust storm in western, southwestern, and central regions of Iran. Examining time, location, and manner of occurrence of this phenomenon in the Middle East indicates that interference of numerous environmental factors like long-term wars in the region, improper and immethodical use of desert water resources, population growth, and development of industrial zones on the edge of jungles and pastures, besides the natural factors like long droughts, appearance of strong seasonal winds – especially Iraq's "northern" wind – and withering of marshlands and lakes, has caused development of dust centers during the past 20 years, intensifying dust storms in most parts of Iran.

**KEYWORDS:** DUST; IRAN; MULCHİNG; IRAQ; WAR.

ISEEP_6

# THE APPLICATION OF ARTIFICIAL NEURAL NETWORKS FOR THE PREDICTION OF WATER QUALITY OF POLLUTED SURFACE WATER

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**Aim:** The purpose of this paper is to develop a feedforward neural network model to predict future values of water quality parameters of Goksu River, Akgol and Paradeniz Lagoons in Goksu Delta.

**Method:** This paper presents a new approach using an Artificial Neural Network technique that could be an alternative methodology against conventional statistical techniques. In this study, surface water pollution parameters were measured and analyzed in a statistical manner in order to identify the current pollution status.

**Results:** Eutrophication is a world-wide environmental issue. The nutrient loading was compared with the allowable and excessive loadings given by Vollenweider. Trophic status of lagoons was determined. Forecasting models are getting popularity today to point out the non-linear relationships of historical data.

**Conclusion:** Mersin province is located in Mediterranean Region of Turkey. Goksu Delta exists in Silifke district of Mersin province. Surface water quality continues to decline for several reasons including mainly massive settlements. Pollution sources in Delta are mainly the uncontrolled agriculture and unplanned constructions. In order to prevent the increasing pollution in the region, Goksu Delta is accepted as a special protection area by Ramsar Convention. Reasons of the environmental pollution and resources that are responsible of the pollution were reviewed.

**KEYWORDS:** ARTIFICIAL NEURAL NETWORKS, EUTROPHICATION, GOKSU DELTA, NON-LINEAR MODELLING, SURFACE WATER POLLUTION.

ISEEP_7

# POLLUTION OF SELECTED HEAVY METALS IN SEDIMENT CORES OF ANZALI WETLAND, NORTHERN IRAN

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**Aim:** Heavy metals that are natural constituents of the earth crust play an important role in human life. A number of these elements are biologically essential and are introduced into aquatic environments as wetlands by various anthropogenic activities. The Anzali wetland that located in southern margin of the Caspian Sea and is subdivided into four subbasins, play important role in region's geography and economy but unfortunately over the past years, this wetland due to its especial geographical location continuously has suffered from pollutions in which human is the main causes of them, so that in recent decades with speedy increase of population and urban and industrial development its pollution rate has increased qualitatively and quantitatively and various events over and over have been revealing the presence of exclusive pollutions in this wetland. The aim of this study is to depict the spatial distribution of heavy metals (Zn, Cu, Pb and Cd) within surface and deep sediments of Anzali wetland and investigation the pollution rate of these elements and the probable sources from which they have been introduced into above mentioned area, by use enrichment factor (EF).

**Methods:** In this study, we sampled 21 stations in the wetland. An each site a core, 60cm long was taken and was analyzed for physico-chemical parameters such as pH, %LOI, $\%CaCO_3$ and four selected heavy metals concentrations for two parts of cores (0-30cm and 30-60cm) that were measured after acid digestion by AAS method.

**Results and conclusion:** The results show the wetland sediments have fine grain texture (sandy silt) and grain size decreases to the west as well as from top to the bottom of the cores, changing to silty-clayey and clay. These sediments with pH>7 contain %LOI ringing from 0.5-11% that changes from east to the west of the wetland. Concentration of Zn and Pb in these sediments is lower but Cu and Cd concentration are higher when compared with standard values. The highest value of Cd and Cu elements has been measured in Sheyjan (eastern) subbasin. Due to high mobility, Cd value is high in the deeper sediments of the cores. The results of heavy metal enrichment factor (EF) value and cluster analysis show that the high values of Cu are correlated to natural and geological sources and there are two possible sources of Cd anthropogenic and industrial activities in this area.

**KEYWORDS:** HEAVY METAL; ANZALİ WETLAND; SEDİMENT; ENRİCHMENT FACTOR (EF); IRAN

ISEEP_11

# SOLID WASTE MANAGEMENT OF TUNCELI CITY CENTER AND EFFECT OF POPULATION

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**Aim:** The purpose of this study, urban solid waste management of the city of Tunceli, the population was to evaluate the degree of impact. to propose practical solutions that can benefit the city\'s solid waste management.

**Methods:** the total amount of solid waste and the amount recovered from solid waste, chi-square test was applied. The population of the central province of Tunceli and the amounts recovered from solid waste, correlation analysis was applied.

**Results:** Between the total amount of solid waste and the amount recovered from solid waste, there was statistically significant differences. Between the population of the central province of Tunceli and the amounts recovered from solid waste, There was high positive correlation

**Conclusion:** According to the results from the solid waste separation process, a maximum of 3% of the total amount of solid waste, recovered to a maximum amount of solid waste. according to the years between the amount of solid waste recovered at the level of 5% importance. Accordingly, \"no significant difference between the amount of solid waste per year has occurred\" will be accepted. The population of the city center of Tunceli and the amount of solid waste collected from solid waste storage area, a high positive correlation was found.

**KEYWORDS:** RECOVERY, SOLID WASTE, SOLID WASTE MANAGEMENT, POPULATION, MEDICAL WASTE

ISEEP_12

# HEAVY METAL DETECTION IN CRAYFISH AROUND KEBAN DAM LAKE IN TUNCELI, TURKEY

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**Aim:** This research involves field study and laboratory experiments conducted with goverment office of Agriculture in Tunceli. It is dealed with water quality and heavy metal uptake by edible crasyfish.

**Methods:** The heavy metals are detected in crayfish (Astacus Leptodactylus) between 2006-2010 around Keban Dam Lake. During the research the water quality parameters also determined. The amount of Arsenic(As) ,Cadmium (Cd), Cupper (Cu), Mercury (Hg), Lead (Pb),Zinc (Zn) were detected. The highest amunt of Zn were detected in 2006 while the lowest detected in 2009.

**Results:** The amount of As, Cd and Pb were under the detection limit in 2009. Therefore the amount of Arsenic was under 0.003 mg/kg while Pb concentration was under the 0.01mg/kg in 2007. Arsenic has the lowest concentration while Zn has the highest values during the time intervals. Although the detection of these amount of the heavy metal concentration, all samples were suitable to eat according to the legistlation of edible standarts in Turkey.

**Conclusion:** Although the detection of these amount of the heavy metal concentration, all samples were suitable to eat according to the legistlation of edible standarts in Turkey.

**KEYWORDS:** CRAYFISH, ASTACUS LEPTODACTYLUS, HEAVY METAL, KEBAN DAM LAKE.

ISEEP_13

# REMOVAL OF REACTIVE RED 120 ON *CHARA CONTRARIA*: APPLICATION OF KINETIC, EQUILIBRIUM, AND THERMODYNAMIC STUDIES

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**Aim:** The aim of this study was to investigate the potential use of dried biomass of *Chara contraria* for the sorption of Reactive Red (RR) 120 from aqueous solution as functions of particle size, adsorbent dosage, pH regimes, initial dye concentration, and contact time in the batch system.

**Methods:** The zero point charge (pHzpc) of the macro-alga was determined by using powder addition method. The infrared spectrum of unloaded and dye-loaded adsorbents was obtained by the use of FTIR-ATR. The functions of particle size (>500–125 µm), adsorbent dosage (0.5–4.0 g L-1), initial pH regimes (pHi 1–4), initial dye concentration (50–800 mg L-1), and contact time (0–360 min) on the adsorption were studied.

**Results:** Sorption value significantly increased with decreasing in the particle size, adsorbent dose, and pH regime.The pHzpc of *C. contraria* was found as pH 7.9. Rapid sorption was observed during the first 90 min of contact time. The sorption behavior was well described by Logistic model. The thermodynamic studies indicated that this system was spontaneous and exothermic nature of adsorption. The desorption value of RR 120 loaded *C. contraria* was significantly increased, when pH value increased from pH 8 to 11.

**Conclusion:** The results revealed that *C. contraria* is potentially low-cost adsorbent for the sorption of RR 120.

**KEYWORDS:** ADSORPTION; *CHARA CONTRARIA*; REACTIVE RED 120; MODELING

ISEEP_14

# EVALUATION OF SUSTAINABILITY IN "RURAL SETTLEMENT" QUALITIES DURING THE PRECONSTRUCTION PROCESS FOR ENERGY PURPOSE DAMS PROJECTS YUSUFELI DAM

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**Aim:** Within the field of study, to perform environmental analyses regarding the rural settlement areas; •Rural settlement qualities at the current state •The categories of impacts which may be posed on the probable rural settlement qualities in the post-project period •Within the pre-construction phase, to put forward the available working model •In regard with the topic, to create a model which is closer to the ideal model •By performing assessments within the frame of created model, to shed a light on the implementation process.

**Methods:** Yusufeli Dam Project Area has been selected as the field of study. Find below the criteria which are proved to be most effective in the selection of field of study; •The project area covers the dense rural settlement areas, •The project area, with respect to the qualities, has been holding the characteristics which display the regional culture •It has been effective to include the main project in the pre-construction process wherein the stepwise preventive measures are supposed to be taken. The findings which are associated with the rural settlement area that takes place in the field of study, have been acquired through the below listed methods; oKnowledge depending on the literature, photographs taken and observation conducted on the field of study. oFace to face interviews held with the authorized officials and people of region. oRelevant reports were obtained by the different substudy steps.

**Results:** The projects related to the water resources utilized for generating energy, within the frame of factors such as nearness and farness to the project area, were listed according to the significance levels of environmental impacts posed on the rural settlement areas. It is found out that the important impacts had been posed on the landscape qualities and social circle. The impact categories related to the topic are as such: Direct, staying for a long term, permanent, irreversible, It is seen that the sustainability of rural settlement areas will not be possible in the region if no preventive steps are taken to this end. The working model at the current state, is exhibited. The studies needed to be done in the working model, and the timing deficiencies are put forward.

**Conclusion:** The projects related to the water resources which give rise to the occurrence of significant impacts in the rural settlement areas, are seen generally aimed at generating energy. The reasons for the development of these projects, are associated with the factors defined below; •Planning works are aimed at generating energy (Rural area development is taken as a goal for the dams to be utilized for irrigation purposes.) •Implementation of these projects in the regions of weighted rural settlement areas. •Topographic conditions. The present model was created in the course of two phases which covered the pre-construction main project planning and pre-construction process, and the target was set as

to provide the two phased integration of studies which are conducted towards the sustainability of rural settlement areas. It is tried to put into light those plans and projects to be developed at two phases and also the other elements such as the field studies, timing process, pertinent bodies and organizations.

**KEYWORDS:** SUSTAINABILITY IN QUALITIES FOR RURAL SETTLEMENT, PRE-CONSTRUCTION PHASE, ENERGY PURPOSE DAMS

ISEEP_15

## THE PHYTOTOXIC EFFECTS OF OLIVE OIL AND MILK INDUSTRIAL WASTEWATER ON *ELODEA CANADENSIS*

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**Aim:** Aquatic plants absorb elements through roots and shoots and in water quality studies they may be useful biomonitors. Phytotoxic effects of olive oil and milk industrial wastewater on E. canadensis were investigated.

**Methods:** The phytotoxic effects were determined by morphological and anatomical experiments. Three morphological traits; main shoot length, number of lateral shoots and cumulated length of lateral roots were measured, leaf and shoot anatomy were determined. Cross sections of the shoots and leaves were taken and treated with flouroglycine in investigation of anatomical features. And also chlorophyll and carotenoid content in leaves were determined.

**Results:** Both the olive oil and milk industrial wastewater treatments significantly ($P < 0.001$) affected the growth of lateral roots of *E.canadensis*. The morphology of the plants was also significantly affected by the treatments. The contents of chlorophylls in the plants were significantly affected by olive oil industrial wastewater but the content of total carotenoids in the plants was not significantly different between treatments of wastewater samples.

**Conclusion:** In conclusion results indicate that E. canadensis is more sensitive to olive oil wastewater than milk industrial wastewater. The milk industrial wastewater was considerably less toxic but its inhibitory effect was also relatively strong.

**KEYWORDS:** *ELODEA CANADENSIS*, WASTEWATER, PHYTOTOXIC, CHLOROPHYLL, CAROTENOID

ISEEP_16

# PEOPLE LIVING INTHE COUNTRYSIDE ON THE LAKE AND IN THE CENTER OF CITY OF BURDUR COMPARE THE ENVIRONMENTAL PERCEPTIONS

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BURDUR ANADOLU SAĞLIK MESLEK LISESI

**Aim:** Connection with nature, not direct connection with the ongoing nature of the rural and urban areas of life, the perception of nature and environmental awareness of individuals to determine whether the effect on.

**Methods:** The project group meeting and review of the literature on the subject of research was done. Suggested that the various problems and we have developed our hypothesis. In order to test the hypothesis, including problems in Burdur lakes including questions about the \"general environmental awareness\" in the name of a questionnaire prepared. The second part of this survey, the \"environmental perception\" part of the NEP scale-standardized questionnaire about environmental interest. A total of 124 people applied to the city center and rural surveys and statistical analysis using SPSS software graphical results shed

**Results:** Applied to the villages and the city center, according to results of a survey of environmental perception and awareness of environmental consciousness we see statistically significant differences could not be found. As a result, urban and rural areas in terms of environmental awareness and environmental perception and awareness has been concluded that a similar opinion. Urban-rural differ significantly in terms of three questions (the lake water is a natural point for the withdrawal of the village are the result of expanding agricultural lands, The withdrawal of agricultural land in the village of lake water, economically beneficial to expanding settlements, Plant and animal species living in the vicinity of Lake Burdur in past years have observed a decrease in) of the responses support our hypothesis. Nature is related to the observed behavior is determined by short-term benefits.

**Conclusion:** In this case informed people about the wide variety of environmental resources and environmental protection, the high level of consciousness was related to possible environmental changes.

**KEYWORDS:** ENVIRONMENTAL SOCIOLOGY, BURDUR LAKE, ENVIRONMENTAL PERCEPTION, ENVIRONMENTAL POLLUTION

ISEEP_19

# REFLECTIONS OF RELATIONSHIPS BETWEEN ART AND DESIGN ON CONTEMPORARY ARCHITECTURE AND FRANK O.GEHRY

BERNA KAYA OKAN

ÇANKIRI KARATEKIN ÜNIVERSITESI, GÜZEL SANATLAR FAKÜLTESI, HEYKEL BÖLÜM BAŞKANI, ÇANKIRI

**Aim:** Together with the industrial revolution, urban spaces was born in need of a conscious trend. These places, which for many artists in an effort to integrate art with environment, reflecting her/his beliefs, ideas, ideals. The environmental efforts of the contemporary architect-artist, variates from the formation in nature to the announcement of existence of herself/himself in the city and to integrate people in art. In this way, the architect-artist with the help of the creative power to change the purpose of life seeks to influence in the functional environment. Today, artists would like to integrate the Art with city planning and architecture. Thus, providing functional environment with creative power, only can the balance will be established. Artificial environments are established with the intersection and contiguity of physical, technical and aesthetic circles. Functional areas which are left to free human ability are to balance the stifling pressure of the fonctional environment. If one can eradicate the sovereignty of it, that is if one can reform technological environment in her/his own total creative potential, the more it can be humane in those environments which includes intensive mechanical elements. Based on these considerations, samples of his creations of environments in contemporary architecture and his long-standing design for tomorrow, Frank O. Gehry as one of the most important architects of contemporary architecture, will be given.

**Methods:** Architecture deals with all areas of contemporary technology and science. Today, by designing their creations to look almost like a sculpture, architects, are in search for mutual influence and connections of intricacy between science and art and try to find different methods of approach. Samples of other architectures and artist-architects related to this subject will be given and discussed as by giving examples of Frank O. Gehry \'s sketches made for the ongoing projects, his computer-aided drawings, photos, materials, models of his early works and more recent and detailed models of his works

**Results:** Such that the similarities between the contemporary science of ecology and sybernetic and of visual arts, to mention that architecture has become not only to meet the housing needs, but emerges in even where this functionality is exceeded.

**Conclusion:** Such that the similarities between the contemporary science of ecology and sybernetic and of visual arts, to mention that architecture has become not only to meet the housing needs, but emerges in even where this functionality is exceeded.

**KEYWORDS:** ARCHITECTURE, SCULPTURE, FUNCTIONAL ENVIRONMENT, ARCHITECTURE, ART

ISEEP_20

# CONSERVATION STUDIES FOR THE *OPHRYS LYCIA* (KAŞ ORCHID, LYCIAN ORCHID)

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**Aim:** The conservation action plan has been defined in order to reach of critically endemic *Ophrys lycia* (Kaş Orchid, Lycia Orchid) species to future generations.

**Methods:** The studies will be conducted under four main headings. Field Studies: The detailed field studies will be conducted on distribution of species during the flowering period. To provide a sustainable conservation, \"Special Protection Area\" will be constituted. Ecological Studies: To carry out studies on the ecology of the species for the identification of human-induced threats that affect the current and future generations of the species. Educational Studies: The local people and the future of the region, namely students will be informed for the conservation of species via meetings and nature education in the Ağullu Elementary School. Media studies: To achieve widespread impact in the project results via making a documentary, film, photography and internet.

**Results:** As a result of the project it is aimed that to conserve *Ophrys lycia* for the benefit of future generations.

**Conclusion:** A conservation action plan has been defined by Association for the Conservation of Antalya Orchids and Biodiversity (CAOB). Project has been prepared with valuable contributions of the region\'s five public institutions the project is affiliated with.

**KEYWORDS:** ANTALYA, CONSERVATION, *OPHRYS LYCIA*, ORCHIDACEAE.

ISEEP_25

# REMOVAL OF LEAD (II) ION FROM AQUEOUS SYSTEM BY DRY BIOMASS, LIVE AND HEAT-INACTIVATED SCENEDESMUS QUADRICAUDA ISOLATED FROM FRESH WATER (APA DAM LAKE)

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**Aim:** Today various organisms are increasingly used to remove toxic heavy metals from waters. In particular, studies in which various species of hydrophilic organisms are used for metal removal report various results.In this study, Scenedesmus quadricauda which has wide distribution in natural waters was used.

**Methods:** The alga sample used in the study was isolated from Apa Dam Lake (Konya/Turkey) and was reproduced in culture. After the pure culture obtained, the removal of Lead in water was examined in three different conditions of the organism. In the stages of study, direct living organism, inactivated biomass and dead biomass were used, respectively. The rate of Pb ion in the water was diluted down to 0,1-2 mg/lt so that the amount of Pb ion measured can match with the measuring range of the spectrophotometer used. At stabile temperatures, the pH was kept between 6 and 8. The measurements were conducted periodically: every six hours for four days.

**Results:** As a result, the highest biosorption was in inactive biomass, which is followed by dead biomass and living organisms. Moreover, it was also found out that this species is very effective in the removal of heavy metal.

**Conclusion:** Experiments were performed to characterize the biosorption of lead from water using Scenedesmus quadricauda, a common green algae.

**KEYWORDS:** LEAD (II) REMOVAL; BIOSORPTION; BIOREMEDIATION; HEAVY METALS

ISEEP_26

# FIRE SPREAD IN LITTER FUELS OF CALABRIAN PINE (*PINUS BRUTIA* TEN.) IN TURKEY

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**Aim:** Objective of this study was to investigate line and point surface fire spread in calabrian pine (Pinus brutia Ten.) plantation stand.

**Methods:** A total of thirty five line and eleven point-source fires were burned under varying weather, topography and fuel loading conditions in calabrian pine (*Pinus brutia* Ten.). it was also investigated rates of point source fire spread depend on time (1 min, 3 min, 5 min, 10 min and 15 min.) Relationships between rate of fire spread, and fuel, weather and topographical conditions were determined with correlation and regression analyses.

**Results:** Rate of fire spread ranged from 0.3 to 3.4 m min-1 in line fires. In 1 min, 3 min, 5 min, 10 min and 15 min of point-source fires, rate of fire spread ranged from 0.6 to 2.6 m min-1, from 0.9 to 2.0 m min-1, from 0.8 to 2.02 m min-1, from 0.9 to 2.1 m min-1 and from 0.7 to 1.6 m min-1 respectively. Surface fuel loading ranged from 0.190 to 0.690 kg m-2 for line fire and from 0.300 to 0.472 kg m-2 for point-source fire.

**Conclusion:** Results showed that rate of fire spread was closely related to the wind speed for line and point-source fires. This study provides useful data to characterize the variation in surface fire characteristics in this fuel type. The results of this study will make important contributions to planning of prescribed burning and decreasing of fire hazard.

**KEYWORDS:** PINE LITTER, SURFACE FIRES, FIRE SPREAD, LINE FIRE, POINT FIRE, CALABRIAN PINE, TURKEY

ISEEP_27

# HISTOLOGICAL ANALYSIS OF ACUTE TOXICITY OF 2,4-DICLOROPHENOXY ACETIC ACID IN OVARY OF ZEBRAFISH

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**Aim:** Plant growth regulators are the chemicals that are found in plants and produced synthetically. In agricultural applications, plant hormones use minor quantities for fix the problems. If the high dose is given, it's believed that, plant hormones can threat the health. In our research we chose 2,4 diclorophenoxyacetic acid which is an auxin, used in agricultural applications. Auxins are the group which used most popularly in plant growth regulators. In our study, different doses of 2,4 diclorophenoxyacetic acid are given to zebrafish and ovarium tissues are observed histomorphologically.

**Methods:** We generated 1 control and 3 experiment group from the stock solution. The experiment carried out in 20 litre capacity complete glass aquarium at 24 ± 1 oC water temperature. After 5 days application, fishes were dissected. Histomorphological changes of the ovarium was investigated under light microscope (we chose Bouin as fixative and Hematoxylin&Eosin as dye).

**Results:** A decrease the number of oocytes in zebrafish ovarium was observed when compared with control group. Many deformed and underdeveloped oocytes were detected. It was observed an increase number of atretic oocytes.

**Conclusion:** It was deduced that acute doses of 2,4 diclorophenoxyacetic acid decelerates oogenesis st fishes.

**KEYWORDS:** 2,4 DICLOROPHENOXYACETIC ACID, OVARIUM, ZEBRAFISH, HISTOPATHOLOGY

ISEEP_28

# IMPACTS OF USAGE OF THE SOIL ORGANIC LAYERS OF NATURAL FOREST ECOSYSTEMS IN PRIVATE NURSERIES

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**Aim:** In this study, it was aimed to investigate forest ecosystem topsoil and organic matter demand in the private nurseries.

**Methods:** First, the impact of soil layers (litter, humus and A-horizon) removal on the forest ecosystems through scientific publications on the topic. Second, the demand of growing medium and material mixture for the seedlings in the nurseries was determined by questionnaire technique. During this process, not only present trend has taken into consideration but also past and future trends.

**Results:** Soil organic layers and topsoil in the natural forests are very important components of these ecosystems. Either permitted or not, the topsoils have been removed from the forest ecosystems to be used as a growth material in the nurseries.

**Conclusion:** For the sustainability of the nurseries and the forest ecosystems, some suggestions were given to the nursery and the State forest enterprises.

**KEYWORDS:** GROWING MEDIUM, NURSERY, SOIL ORGANIC HORIZON, FOREST SOIL REMOVAL

ISEEP_30

# ASSESSMENT OF ARSENIC AND SELENIUM CONCENTRATION WITH CHLOROPHYLL CONTENTS OF SUGAR BEET (*BETA VULGARIS* VAR. *SACCHARIFERA*) AND WHEAT (*TRITICUM AESTIVUM*) EXPOSED TO MUNICIPAL SEWAGE SLUDGE DOSES

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**Aim:** The present study was conducted to assess the suitability of sewage sludge amendment in soil for *Beta vulgaris* var.*saccharifera* (sugar beet) and *Triticum aestivum* (wheat) by evaluating the arsenic and selenium accumulation and physiological responses of plants grown at 10, 25 and 50% sewage sludge amendment rate.

**Methods:** Plants were grown with three types of sewage sludge treatments (and a control treatment) for the pot experiments (5 replicates each treatment). In this study, air dried and well grounded sewage sludge was uniformly mixed in the soil. Wagner pots (1/5000) were filled with 3 kg of soil. Treatment 1 (T1) consisted of 90% soil and 10% sewage sludge. Treatment 2 (T2) consisted of 75% soil and 25 % sewage sludge. The composition of Treatment 3 (T3) was 50% soil, 50% sewage sludge, and 100% soil served as the control treatment (T0). Proportions determined by preliminary experiments. Seeds of both plants were grown in seed beds without any sewage sludge treatment. After a 30 d growth period, plants were carefully removed and washed, and then dried. Metal contents of Dried samples were analyzed by using ICP-MS.

**Results:** Sewage sludge amendment was modified the physico-chemical properties of soil, thus increasing the availability of heavy metals in soil and consequently with higher accumulation in plant parts. The chlorophyll contents increased after the sewage sludge treatments except for 50%. Sewage sludge amendment led to significant increase in As and Se concentrations of soil. Heavy metal accumulation in the soil after the treatments did not exceed the limits for land application of sewage sludge recommended by the US EPA. The increased concentration of heavy metals in soil due to sewage sludge amendment led to increases in heavy metal uptake and leaves and root concentrations of As and Se in plants as compared to those grown on unamended soil. Accumulation was more in roots than shoots and leaves for most of the heavy metals. Concentrations of As and Se were more than the permissible limits of national standards in the edible portion of sugar beet and wheat grown on different sewage sludge amendments ratios.

**Conclusion:** The study concludes that sewage sludge amendment in soil for growing sugar beet and wheat may not be a good option due to risk of contamination of As and Se.

**KEYWORDS:** SUGAR BEET, WHEAT, SEWAGE SLUDGE, HEAVY METAL, SOIL CHARACTERISTICS, CHLOROPHYLL

ISEEP_31

# PHYTOREMEDIATION OF ARSENIC BY *NASTURTIUM OFFICINALE* (WATERCRESS) FROM WATER IN THE PRESENCE OF EDTA

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**Aim:** This investigation was made to examine the role of EDTA in improving phytoremediation of the arsenic by *Nasturtium officinale* and plant growth on chromium added water.

**Methods:** A pot study was used to examine the effects of amendments such as EDTA on the growth potential, uptake and mobilization of As by watercress (*Nasturtium officinale*) in contaminated soils at three levels of EDTA (2, 4, 8 mmol kg-1 dry soil). EDTA resulted in more solubilization of As in soil.

**Results:** According to results obtained, EDTA significantly reduced the plant growth and dry biomass. The treatment of EDTA increased the As uptake and synergistic effect was found and remarkable increase in As uptake into plants was observed. EDTA increased the As uptake but declined the biomass; subsequently the total As accumulation was decreased in plant. N.officinale accumulated high As concentration in plant at EDTA of 10-4 after 15 d growth. The increase was determined at photosynthetic pigment contents in leave tissues of N.officinale treated with low As concentrations, while high As concentration resulted in decrease.

**Conclusion:** These data suggest that N.officinale is very promising species for the decontamination of As +3 contaminated soil. Its phytoextraction potential was significantly enhanced by the addition of EDTA.

**KEYWORDS:** PHYTOREMEDİATİON, MACROPHYTE, ARSENİC.

ISEEP_38

# TOXICITY TESTING OF COBALT AND COPPER USING THE MOUSE BONE MARROW MICRONUCLEUS ASSAY

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**Aim:** To investigate the genotoxic potentials of two heavy metals cobalt and copper by using micronucleus assay in bone marrow cells of mice.

**Methods:** The three different concentrations of cobalt (11.2, 22.5 and 45 mg/kg) and copper (1.17, 2.35 and 4.70 mg/kg) were injected intraperitoneally to female and male mice for 24 and 48 hours. Mitomycin C and distilled water were used as positive control and negative control, respectively. The animals were sacrificed, the bone marrow cells were flushed out with fetal calf serum, centrifuged, smears were prepared, fixed with methanol and stained with May Grunwald and Giemsa.

**Results:** Both of these heavy metals induced a significant increase in frequency of micronucleated polychromatic erythrocytes at different concentrations in both female and male mice for 24 and 48 hours when compared with the control. Furthermore the significant reduction for the polychromatic erythrocyte/normochromatic erythrocyte ratio at different concentrations was observed in bone marrow cells which were treated with copper for 24 and 48 hours. No reduction of the polychromatic erythrocyte/normochromatic erythrocyte ratio was observed both 24 and 48 hours time periods after all the doses of cobalt tested as compared to the negative control.

**Conclusion:** Copper may have genotoxic and cytotoxic effects due to induction in frequency of micronucleus and reduction in polychromatic erythrocyte/normochromatic erythrocyte ratio in bone marrow cells of mice. Whereas cobalt only has gentoxic effects in mice bone marrow.

**KEYWORDS:** COBALT, COPPER, HEAVY METAL, MICE, MICRONUCLEUS ASSAY

ISEEP_39

# THE STUDY ON THE REMOVAL OF NITROGEN, PHOSPHOROUS, AND HEAVY METAL IN THE LEAKAGE WATER SAMPLED FROM KAYSERI WASTE DUMPING SITE BY MEANS OF PHYTOREMEDIATION METHOD IN THE LABORATORY SCALE

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**Aim:** In this study, the treatment of polluter parameters in the leakage water sampled from Kayseri Waste Dumping Site was conducted by the phytoremediation with using Myriophyllum spicatum. Leakage water was given to wetland plant as irrigation water and the water need of the plant was provided by this leakage water. It was aimed that the negative effects of leakage water from Waste Dumping Site to the environment were minimized and treated by plant in the system.

**Methods:** Leakage water was given to wetland plant as irrigation water and the water need of the plant was provided by this leakage water. The plant, whose heavy metal amount in their structure had been known in the beginning, was uprooted at the end of this study. And then, heavy metal accumulation in the roots and leaves/stem of plant were calculated in terms of mg/kg dry weight.

**Results:** Removal efficiency of the average BOD5, COD, TKN, and TP concentrations was studied according to hydraulic retention times and the ratios were found as 68.49%, 64.54%, 93.79%, and 61.99% respectively.At the end of the study, Myriophyllum spicatum provided the metal removal for Cu, Pb, Ni, and Mn in the leakage water as the ratio of 94.00%, 66.45%, 61.5% and 62.2% respectively.

**Conclusion:** This pilot study can be a good example for the removal of polluters of leakage water sourced from all kind of waste dumping sites.

**KEYWORDS:** LEAKAGE WATER, PHYTOREMEDIATION, MYRIOPHYLLUM SPICATUM, HEAVY METAL ACCUMULATION

ISEEP_43

# COMPARISON OF LEAD UPTAKE AND ITS EFFECT ON CHLOROPHYLL, PROLINE AND ANTIOXIDANT ENZYME ACTIVITY IN *LEMNA GIBBA* AND *GROENLANDIA DENSA*

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**Aim:** An experiment was carried out to study the heavy metal accumulation and its effect on biochemical parameters in *Lemna gibba* and *Groenlandia densa* grown under lead stress (0 - 20 mg Pb L-1).

**Methods:** Heavy metal treatment was continued for four days, by applying Hoagland\'s solution containing 0.05, 0.5, 5, 10, and 20 mg L-1 Pb prepared using lead nitrate.

**Results:** The results showed that Pb contents in plants increased with increasing Pb supply levels and reached a maximum of 142.82 mgg-1 DW at 0.5 mgL-1 Pb treatments for *L. gibba* and 47.57 mgg-1 DW at 5 mgL-1 Pb treatments for *G. densa*. The level of photosynthetic pigments decreased with increasing Pb concentration, however, the level of soluble protein increased. At the same time, the level of malondialdehyde increased with increasing Pb concentration. These results suggested an alleviation of stress that was presumably the result of antioxidants activities increased linearly with increasing Pb levels.

**Conclusion:** It is concluded that *L. gibba* and *G. densa* have a high level of Pb tolerance and accumulation. We also found that moderate Pb treatment alleviates oxidative stress in plants, while the addition of higher amounts of Pb (10 - 20 mgL-1).

**KEYWORDS:** LEAD, *LEMNA GIBBA*, ANTIOXIDANT.

ISEEP_44

# ANTIOXIDANT DEFENSE MECHANISM IN *LEMNA GIBBA* UNDER CADMIUM STRESS

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**Aim:** In this study, an experiment was carried out to study the process of stress adaptation in *Lemna gibba* grown under cadmium stress (0-20 mg Cd L-1).

**Methods:** Heavy metal treatment was continued for four days, by applying Hoagland\'s solution containing 0.05, 0.5, 5, 10, and 20 mg L-1 Cd prepared using cadmium nitrate.

**Results:** The level of photosynthetic pigments and soluble proteins decreased only upon exposure to high Cd concentrations. At the same time, the level of malondialdehyde (MDA) increased with increasing Cd concentration. These results suggested an alleviation of stress that was presumably the result of antioxidants such as SOD, CAT, GR, GST and APX, which increased linearly with increasing Cd levels. In addition, the proline content in *Lemna gibba* increased with increasing cadmium levels.

**Conclusion:** These findings suggest that Lemna is equipped with an efficient antioxidant mechanism against Cd induced oxidative stress which protects the plant's photosynthetic machinery from damage. We also found that moderate Cd treatment (0.05-5 mg.L-1 Cd) alleviated oxidative stress in plants, while the addition of higher amounts of Cd (10-20 mg.L-1) could cause an increasing generation of ROS, which was effectively scavenged by the antioxidative system.

**KEYWORDS:** CADMIUM, *LEMNA GIBBA*, ACCUMULATION, ANTIOXIDANT

ISEEP_45

# ROCK BLASTING EFFECTS ON ENVIRONMENT DURING THE FOREST ROAD CONSTRUCTION ON MOUNTAINOUS TERRAIN: A CASE STUDY FROM EASTERN BLACK SEA REGION OF TURKEY

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**Aim:** The aim of this study was to investigate actual forest road construction and rock blasting technique and to determine its effects on forest stand and environment.

**Methods:** Spatial measurement and observation method was used to determine direct environmental effects of actual blasting techniques, such as flying rock, ground vibrations etc., were measured during the forest road construction.

**Results:** Some brief results are; 1- instead of transport the rock and soil material excavated by excavator have been pushed down to the hill slope, 2- Drilling and blasting technique primitive and this caused flying rock, ground vibration, air blast and dust and poisonous gas emition effects.

**Conclusion:** Both excavations by excavator and rock blasting methods and equipment need to be revised and reorganized on the basis of environmental criteria.

**KEYWORDS:** FOREST ROAD, ROCK DRILLING-BLASTING, ENVIRONMENTAL EFFECTS, TURKEY

ISEEP_46

# ON THE EFFECTS OF THE INDIAN CRESTED PORCUPINE, *HYSTRIX INDICA* (KERR, 1792), ON THE PLANTS IN A NATURAL HABITAT IN SOUTH-EASTERN ANATOLIA

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**Aim:** Possible ecological effects on the plant existence in the habitat of the Indian Crested Porcupine, *Hystrix indica* (Kerr, 1792), have been investigated in a South-eastern Anatolian population.

**Methods:** In the study area which consists of about two square kilometers has been monitored during the relevant seasons of two subsequent years, focusing on feeding behavior of the species. For this aim, (1) possible nesting cavities or shelters, (2) feeding places with pathways used, (3) feeding plants, and (4) the affected plant species have been determined. Sample spots of excavated and undisturbed areas have been compared in terms of plant diversity and their abundance.

**Results:** At the study area, Indian Crested Porcupine forage not only for agricultural products as fruits and vegetables, but also for underground organs of several plants. While taking out tubers and bulbs, especially those of Biarum carduchorum, pits were excavated up to 25 cm in depth. As a consequence of digging process, some plants in flowering stage were destroyed. On the other hand, soil, organic material and nourishments are accumulated in the pits. Additionally, seeds dragged by wind, rain or animals are settled into these well ventilated cavities. By this way, suitable environments arise for germination and growing of several plant species.

**Conclusion:** Plant species in sample spots dug by *H. indica* may be affected both negatively and positively. Existence of porcupines seems to be beneficial for the plants that flower, and thus, produce seeds in a comparatively earlier period. Pits dug by porcupines are suitable places especially for germination of relatively large, air-borne seeds.

**KEYWORDS:** INDIAN CRESTED PORCUPINE, HYSTRIX INDICA, SOUTH-EASTERN ANATOLIA, DIGGING, FEEDING, PLANT DIVERSITY

ISEEP_47

# USING NATURAL RESOURCES AROUND SAPANCA LAKE

MEFKÜRE GÜLER

IL ÇEVRE VE ORMAN MÜDÜRLÜĞÜ SAKARYA

**Aim:** Sapanca Lake, originally an extension of Izmit Gulf towards Adapazarı, is now a fresh water lake in the Marmara Region. The lake has long been a resevoir for Adapazarı area; it also hold various functions and values as to forests surrounding it as well as wildlife and agriculture.

**Methods:** In this study, attempt is made to ascertain the opinions and expectations around the lake about the use of the natural resources of the people who benefit from those resources. For this purpose, the community is thought in seven categories each surveyed seperately.

**Results:** Results indicate that all categories hold similar opinions in favor of protection of Sapanca Lake as community resevoir, protection and development of natural beaties as well as wildlife and biodiversity. Survey also consist of several personal questions regarding age, gender, education, annual income and income source. Same of these personal traits correlate significantli with the answers as to the use of the natural resources, while others do not.

**Conclusion:** It is concluded that a "Basin Management Association" need to be created in order to use within a unified and multi-dimensional basin management frama the natural resources arounding the lake. It is suggested that this be the principal decision-maker on managing the basin.

**KEYWORDS:** WATERSHED MANAGEMENT, NATURAL RESOURCES MANAGEMENT

ISEEP_49

# GENOTOXIC EFFECTS OF TWO LIPID PEROXIDATION PRODUCTS IN THE DROSOPHILA SMART ASSAY

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**Aim:** Lipid peroxidation occurs during frying in edible vegetable liquid oils of food components. Because of the discontinuation to drinking-water, sea or river waters directly of lipid peroxidation products formation the resulting frying of oils that provide a significant contribution to the contamination of sea water and river water, both in the water column and sediments, resulting in a potential ecotoxicological risk. For this aim, we used for the genotoxic effects of two lipid peroxidation products in vivo conditions in Drosophila SMART assay.

**Methods:** The SMART assay in *D. melanogaster* has been designed to detect the genotoxic damages in a rapid an inexpensive way in one generation. Importance of SMART assay is to be in in vivo system and the metabolic machinery of Drosophila cells similar to mammalian cells.

**Results:** The results showed that 4-HHE recombinogenic activity for total spots in 0.5 mM concentration while showed mutagenic activity exposure to 1 mM concentration for total spots of 4-HHE in Drosophila. On the other hand, 1 mM concentration of 4-ONE has recombinogenic effects in Drosophila.

**Conclusion:** These in vivo results contribute to increase the genotoxicity database on the 4-HHE and 4-ONE.

**KEYWORDS:** LIPID PEROXIDATION; 4-HYDROXY HEXENAL; 4-OXO-2-NONENAL; SMART; DROSOPHILA MELANOGASTER

ISEEP_50

# POTENTIAL OF BIOMASS RESIDUES AS A RENEWABLE ENERGY SOURCE: ARDAHAN CASE STUDY

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**Aim:** The increasing interest in the recuperation of the biomass coming from organic residues, associated with its energetic use as sustainable source is a subject that has been widely discussed. In this paper the potential of biomass as agricultural and animal residues for energy production in Ardahan City of Turkey is evaluated.

**Methods:** The methodology that was used in this study comprises the assessment of the energy potential of all agricultural and animal residues generated in Ardahan, based on the amount of each of them. The energy equivalent of the all residues those are subject to biogas production is calculated from the energy ratio of each kind of residue. The total amount of bioenergy potential has been estimated using the average production values of the years 1992–2009.

**Results:** As a result, it was calculated approximately total of 73 ktoe/year from animal residues and 13 ktoe/year from crop residues as an energy potential.

**Conclusion:** Agricultural and animal residues contain organic compounds those have to be evaluated as an alternative energy source for sustainability and mitigation of greenhouse gas (GHG) emissions. As agricultural biomass energy potential is less than animal residue biomass energy potential in Ardahan cofermentation may also be evaluated to get more efficient usage of all biomass potential.

**KEYWORDS:** BIOMASS POTENTIAL, AGRICULTURAL AND ANIMAL RESIDUE, RENEWABLE ENERGY SOURCE, GHG, COFERMENTATION

ISEEP_51

# REMOVAL OF METHYLENE BLUE (A CATIONIC DYE) FROM AQUEOUS SOLUTION BY ADSORPTION ONTO PINE NEEDLES

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**Aim:** Pollutions caused by industrial wastewaters, especially dyes have become a common problem for many countries.Various techniques have been employed for the removal of dyes from wastewaters. Adsorption has been found to be superior to other techniques for wastewater treatment in terms of initial cost, simplicity of design and ease of operation. In this study, the ability of an unconventional bio-adsorbent, pine (Thuja orientalis) needles for the adsorption of methylene blue (MB) from aqueous solution was investigated.

**Methods:** Batch adsorption experiments were carried out as a function of pH, adsorbent mass, initial dye concentration and temperatures.

**Results:** Maximum removal of MB was found to occur at initial pH 5.0. Adsorption capacity increased from 84.46 to 99.73 mg/g with an increase in temperature from 20 to 45 °C at 200 mg/L of initial MB concentration. The adsorption of MB increased with increasing temperature indicating endothermic nature of the adsorption process. Obtained results were analyzed by the Langmuir, Freundlich, Temkin and Harkins–Jura equation using linearized correlation coefficient at different temperature. Adsorption data were modelled using the first and second-order kinetic models. Thermodynamic parameters such as ΔH°, ΔS° and ΔG° were calculated. The adsorption process was found to be endothermic and spontaneous. Also, the nature of the possible pine needles and MB interactions was examined by the FTIR technique.

**Conclusion:** Pine needle, an inexpensive and easily available material, was found to very effective to remove MB from aqueous solutions.

**KEYWORDS:** METHYLENE BLUE; ADSORPTION; ADSORPTION KINETICS; THERMODYNAMIC; ADSORPTION ISOTHERMS.

ISEEP_52

# MOLECULAR CHARACTERIZATION OF THE YIGILCA HONEY BEE (*APIS MELLIFERA* L.) ECOTYPE FOR GENETIC CONSERVATION

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**Aim:** A population of honeybees in Yıgılca province of Duzce city in Western Black Sea region of Turkey is an important subject of genetic conservation efforts. The present study analyzed the genetic structures of Yıgılca honeybee population and four reference populations using 27 microsatellites loci to characterize the endemic population and suggested further genetic conservation strategies.

**Methods:** A total of 98 colonies were sampled from five different localities. Twenty-five polymorphic microsatellite loci were analyzed. Multiplex PCR reactions were performed when the annealing temperature and the $MgCl_2$ concentration coincided. The reactions were done with fluorescent labeled primers and separated on a DNA automated sequencer (ABI310, Applied Biosystems). The exact test for Hardy-Weingberg equilibrium, genotypic linkage disequilibrium and genetic structure were computed with GenAlex6.3 and GENEPOP version 1.2 programs.

**Results:** Gene flow (Nm) values (0.02-1.113) were found to be lower than 2 between Yıgılca and reference populations. Three microsatellite loci were found to be informative for characterizing the Yıgılca population. High allelic ranges and high divergence depending on Fixation index (Fst) (0.415-0.545) indicated that Yıgılca honeybee was different ecotype.

**Conclusion:** The results obtained from microsatellite data indicated that Yıgılca honeybee populations still have a natural genome worth of being protected for conservation. Genetic diversity is assurance of the future. Such results could be useful for the monitoring of Turkish honey bees and conservation of native populations.

**KEYWORDS:** CONSERVATION, HONEY BEE, MICROSATELLITE, YIGILCA-DUZCE.

ISEEP_55

# A STUDY OF GENETIC VARIATION IN CRITICALLY ENDANGERED PLANT *AMSONIA ORIENTALIS* DECNE. BY USING RAPD MARKERS

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**Aim:** *Amsonia orientalis* Decne. (Apocynaceae) is a medical plant which has very restricted distribution only in west of Turkey and east of Greece on the world. Because of containing various alkaloids this species has anticancerogenic and antitumour effects. The plant is known to have a narrow distribution in three localities in Balıkesir and one locality in Istanbul. Genetic variability within and among 4 known natural populations of this plant was investigated by using RAPD markers.

**Methods:** *A. orientalis* Decne samples were collected from three localities in Balıkesir (Paşaalanı, Gaziosmanpaşa, Adnanmenderes) and one locality in Istanbul (Ömerli). The sampled leaves were stored at -80°C until DNA extraction. Genomic DNA was extracted from 0.1-0.2 g powdered leaf tissue by using a DNeasy Plant Mini Kit (Qiagen). A set of 40 random 10-mer primers was used, after amplification reactions, PCR products were seperated on a %2 agarose gel and digitally photographed with UVP gel documentation system. Pair wise genetic distance between samples was calculated using POPGENE package version 1.32.

**Results:** Among the 40 primers used in this study 38 primers generated reproducible, informative and easily scorable RAPD profiles and more than 20 primers revealed polymorphic bands.

**Conclusion:** The observed genetic variations suggest that as many populations as possible should be considered in any planned in situ or ex situ conservation programs for this critically endangered plant species.

**KEYWORDS:** AMSONIA ORIENTALIS, GENETIC DIVERSITY, RAPD, CONSERVATION
ACKNOWLEDGEMENT: THIS STUDY IS FUNDED BY THE PROJECT KOU BAP 2009/50.

ISEEP_57

# TRACE ELEMENT LEVELS IN DIFFERENT TISSUE OF PRUSSIAN CARP (*CARASSIUS GIBELIO*)

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**Aim:** Prussian carp namely *Carassius gibelio* (Bloch, 1782), is non-native species not only for European inland water but also in Turkey. The purpose of this research was to quantify the accumulation of trace elements in various tissues in C. gibelio which were collected from Lake Taşkısığı.

**Methods:** The concentration of Al, B, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Se and Zn were examined in lake water and some tissues (gill, liver, muscle,skin, fin and head) of C. gibelio (n=25, age=2-4) samples were collected between August 2008 and July 2009 from lake Taşkısığı. Metals were determined by ICP-OES (Varian 720 ES). In addition, the correlation and statistical significance of the relationship between the trace elements concentration of the lake water and different tissues of the C. gibelio were evaluated using Pearson\'s correlation coefficient.

**Results:** In Lake Taşkısığı boron had the highest concentration and Hg, Se and Zn the lowest concentration in water samples. Different tissues of C. gibelio showed different capacities for accumulating trace elements. The highest average Cd (0.029 mg kg-1) and Pb (0.036 mg kg-1) concentrations were found in the muscle and Al (0.076 mg kg-1), Mn (0.041 mg kg-1) were found in the head. The highest average Hg (0.040 mg kg-1) concentrations were found in the head and fin. The highest Cr and Zn levels were found skin and gill, respectively. B, Cu, Fe, Ni and Se levels were determined in liver tissue higher than the other tissues. It was found that the relation between; Fe level in water and in muscle ($P < 0.05$, $r = 0.325$); Al level in water and in gill ($P < 0.05$, $r = 0.309$); Cd level in water and in liver ($P < 0.05$, $r = 0.313$); Cr level in water and in liver ($P < 0.05$, $r = 0.340$); Cr in water and in skin ($P < 0.05$, $r = 0.307$) Ni in water and in liver ($P < 0.05$, $r = 0.409$) were directly proportional while the relation between the Fe level in water and in fin ($P < 0.01$, $r = -0.245$); Pb in water and gill ($P < 0.01$, $r = -0.277$); Cu in water and in skin ($P < 0.01$, $r = -0.281$) were inversely proportional.

**Conclusion:** This study has shown that trace elements quality of Lake Taşkısığı water is good, due to all of the elements were under the limit of the critical value when compared with Turkish Water Pollution Control regulations. All trace element levels were found in *C. gibelio* tissue's below the permissible limits.

**KEYWORDS:** LAKE TAŞKISIĞI, TRACE METALS, CARASSIUS GIBELIO

ISEEP_58

# EVALUATION OF DIETARY INCLUSION OF SUNFLOWER SEED MEAL ON MACRO AND TRACE MINERAL CONTENTS OF CARP (*CYPRINUS CARPIO*)

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**Aim:** Due to the expanding market for organic aquaculture, the use of potential protein sources for fish diets is a punch line in recent days. Therefore, our study was aimed to determine the feasibility of sunflower seed meal (SFM) inclusion to fish diets, focusing on mineral content of both diets and fish flesh.,

**Methods:** The feeding trial was conducted for 12 weeks at Ankara University, Çifteler Rainbow Trout Culture and Research Station. Carp (Cyprinus carpio L. 1758) with mean body weight of 993.82±11.68 g were randomly selected and stocked to twelve 500 l tanks with eight carp each, providing triplicates for every diet. The experimental diets were formulated as isonitrogenous and isocaloric with inclusion levels of SFM at 0% (control), 15%, 30% and 45%, for an alternative protein source. The detection of macro and trace mineral composition of experimental diets and edible parts of carp was performed by ICP-AES.

**Results:** The mean values of phosphorus (P), potassium (K), magnesium (Mg) and zinc (Zn) obtained from the diets containing SFM increased significantly ($p<0.05$) compared to control corresponding to increasing level of SFM, nevertheless calcium (Ca) and sodium (Na) values were on the contrary ($p>0.05$). There were no significant differences ($p>0.05$) among the dietary treatment groups in terms of P, Ca, Na and Mg with respect to fish flesh. However, the mean values of K and Zn showed significant alteration ($p<0.05$) between the treatment groups and control.

**Conclusion:** Our study demonstrated that the diets containing graded levels of SFM revealed some remarkable differences on mineral content of the experimental diets. However, these results did not affect the mineral content of fish flesh.

**KEYWORDS:** CARP, CYPRINUS CARPIO, SUNFLOWER SEED MEAL, MINERAL CONTENT

ISEEP_60

# BIRD NAMES IN THE BALLADS AND THEIR INTENDED USE

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**Aim:** The birds that have a significant function in the natural balance have been discussed in the art due to their appearance, voice and ability to fly. It is possible to see the birds in many art branches such as painting, sculpture and music. Ballads are one of the most significant elements in Anatolian folklore. The people express their sadness, yearning and happiness through ballads. There are also living creatures among the objects used to express the emotions. The emphasis of the birds among the animals in the ballads is interesting.

**Methods:** In this study, the birds mentioned in the ballads and the fact that for what purpose the names of these birds are used was researched. With this purpose, 4500 ballad lyrics in the repertoire of Turkish Radio and Television Corporation (TRT) were scanned; the bird names mentioned in them were chosen and examined.

**Results:** At the end of the examination, it was found out that all of the singing birds are generally perceived as a nightingale; the birds in general, in the size of white stork and flamingo are perceived as a crane; the wild ducks and similar birds in general are perceived as a duck (sometimes shelduck); raptors are perceived as a hawk, an eagle, a goshawk and a falcon.

**Conclusion:** From a general point of view, in the ballads, the raptors were attributed the emotion of love; ducks, the beauty; the raptors, admiration; migratory birds, longing. In some ballads, the ability of the birds to fly was admired; in some ballads, bird name was only used to complete the verse and the rhyme.

**KEYWORDS:** BALLAD, BIRD, CRANE, DUCK, NIGHTINGALE

ISEEP_61

# AVIAN MIGRATION PHENOLOGY, POPULATION SIZE AND CLIMATE CHANGE IN VAN LAKE BASIN

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**Aim:** The aim of this study was to determine the effects of climate chance process on distribution, fenology (migration, breeding, feeding, residing) and demographic dynamics of birds that residing and breeding at Van Lake Basin.

**Methods:** This database was collected, evaluated and composed from findings of ornithological researches have been carried out for about fifteen years at Van Lake Basin. Climatic change in the area during last fifty years was evaluated. Line transects and Point counts methods were used to determine population size.

**Results:** On the base of observations carried out in the years 1998-2010 at Van Lake Basin the total number of bird species recorded was 142 in 1998; 183 in 2006 and 195 in 2008. According to recent counts in Van Lake Basin, 213 bird species have been determined. Their residence status is as follows: 77 residents, 18 winter visitors, 89 migrants and 29 transit migrants. It was detected that some migratory birds had a tendency to change their arrival and departure terms. At the end of the study period they were noticed to arrive earlier and to depart later than at the beginning. Additionally, it was detected that the numbers of native species have increased.

**Conclusion:** Results show that the climate of Van Lake Basin is now warmer than it has been in at least 50 years. In addition, frequency of cold days (mean temperature below 0 $^{0}$C), particularly during March and November, has declined and winters becoming substantially warmer. All of these aspects of climate change are likely to impact on birds. Spring phases have advanced up to two weeks in the Basin. Another important factor to increase bird species in the basin, the wetlands of other regions have drying in summer and birds species comes from these region. As a results, It was concluded these changes observed in the investigated area during the last decades result from a tendency of a warming up of climate in the basin.

**KEYWORDS:** CLIMATE CHANGE, BIRDS, MIGRATION, POPULATION SIZE, VAN LAKE BASIN.

ISEEP_62

# MIGRATION AND ENVIRONMENT PROTECTION: THE ECOLOGICAL REASONS AND CONSEQUENCES OF RESETTLEMENTS

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**Aim:** to show difficult interdependence of natural factors and the social development, proving in migration.

**Method:** The comparative analysis of the data of social practice of last years is used.

**Results:** migration – the difficult global process frequently caused by natural, technogenic accidents, leads to population redistribution in concrete territories that, in turn, causes loading on environment. Migration acts in the modern world of growth of a population, economic and social crises as the factor of change of ecological profiles of regions.
In 2011 has occurred a lot of natural, technogenic and the social disasters which have caused considerable migrations in the separate countries and in the world as a whole. Earthquake in Japan and the followed failure at nuclear station have led to mass resettlement of people from the places amazed with radiation. As a result of national excitements there was many thousands a migratory stream from the North Africa and the Near East to Europe. In migrations difficult communication of the person and the nature proves: on the one hand, natural factors compel people to change a place of the residence, to search for new territories of arrangement; on the other hand, resettlements become sometimes excessive loading on environment of the country of arrival, conduct to occurrence of environmental problems, to degradation of water sources, ground resources, wood riches. Recently new problems in this sphere were designated also. Transition to an information technology has made unnecessary the industrial productions, many cities where large factories earlier took places, today are thrown, people are compelled to search to themselves for application in other places, and the nature these territories it is necessary to "overwork" anew. Progress in agriculture has superseded millions hands from this sphere, has caused new migratory movement from continental, agricultural moving – to oceans, in cities that promoted formation of additional risks for people. Today intraterritorial natural accidents (a tornado or earthquakes) do not lead to such serious consequences, as a tsunami or typhoons. Contrary to expectations, technical progress has not made mankind more protected from natural cataclysms, on the contrary, we became we remain same not protected before forces of the nature, as before.

**KEYWORDS:** MİGRATİON, ENVİRONMENT PROTECTİON

ISEEP_63

# A STUDY ON MICROFLORA IN ORAL AND CLOACAL OF FRESHWATER TURTLES (*EMYS ORBICULARIS* LINNAEUS, 1758 – *MAUREMYS RIVULATA* VALENCIENNES, 1833) FROM KAVAK DELTA (CANAKKALE)

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**Aim:** Deltas are reservoirs for important plant and animal species and have a vital role in maintaining sustainability of ecological balance. In addition, because of anthropogenic pressure they are recognized as natural habitat of pathogenic microorganisms and infectious diseases caused by these bacteria are dangerous to aquatic animal's health and could potentially affect several species as well those are endangered. This study aims that determined microflora of freshwater turtles (*Emys orbicularis* Linnaeus, 1758 and *Mauremys rivulata* Valenciennes, 1833) and sensibilities of these turtles against isolated pathogenic bacteria. In the other hand the investigations conducted to characterize diseases causative agents and their risks to animal and human health are difficult to carry out, especially due some turtle species.

**Methods:** In the present investigation we evaluated the occurrence of some pathogens from swabs collected from oral and cloacal of total 50 adult *Emys orbicularis* (Linnaeus, 1758) and *Mauremys rivulata* (Valenciennes, 1833). In addition to these pathogens some physicochemical (pH, temperature, electrical conductivity, dissolved oxygen) and microbiological (total coliform, feacel coliform and total viable counts) parameters of freshwater were investigated.

**Results:** The results showed isolates were characterized being *Vibrio sp*. and *Proteus sp*. the main pathogens isolated from *Emys orbicularis* and *Mauremys rivulata* and microbial diversity of freshwater turtles considerable compared to collected wetlands. However there were correlation between microbiological parameters and pathogen organisms.

**Conclusion:** These data appoint the importance of epidemiological surveillance and microbiological monitoring and reinforce the need to implement environment protection programs especially related to near threatened turtle species (*Emys orbicularis*).

**KEYWORDS:** *EMYS ORBICULARIS*, *MAUREMYS RIVULATA*, MICROBIOLOGICAL PARAMETERS, *VIBRIO SP.*, *PROTEUS SP.*

ISEEP_64

# ISOLATION AND MONTHLY VARIATION OF SULFUR CYCLE BACTERIA FROM TWO FRESHWATER SOURCES IN CANAKKALE, TURKEY

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**Aim:** Qualitative monthly distributions of sulfate-reducing bacteria in the freshwaters of Biga and Saricay streams were investigated in relation to certain physico-chemical parameters (pH, temperature, dissolved oxygen, BOD5, Electrical conductivity).

**Methods:** Saricay and Biga streams were particularly studied periodically for every month during October 2007 – September 2008. In studying of Saricay and Biga streams, various parameters indicating pollution has been measured in the sample taking from definite stations. These parameters are temperature, dissolved oxygen (DO), biochemical oxygen demand (BOD5), pH, electrical conductivity (EC). Most probable number of sulphate-reducing bacteria (35oC – 55oC) by using the multiple tube fermentation technique was also determined.

**Results:** The results showed the mean average value (mean ± SD) of the Sarıcay and Biga streams were noted as temperature 17.377± 0.199oC; 15.533 ± 0.199oC, dissolved oxygen (DO), 7.17 ± 0.650 mg/L; 8.332 ± 0.253 mg/L, biochemical oxygen demand (BOD5), 170.4 ± 50.3 mg/L; 136.60 ± 2.51 mg/L, pH, 7.7018 ± 0.0325; 7.5078 ± 0.0427, electrical conductivity (EC) 18.50 ± 2.33; µS/cm 869.93 ± 3.72 µS/cm, sulphate-reducing bacteria (35oC) 8450 ± 2444 MPN/100 mL; 8167 ± 1018 MPN/100 mL and sulphate-reducing bacteria (55oC) 2286 ± 769 MPN/100 mL; 2717 ± 605 MPN/100 mL, respectively. Furthermore in both streams sulphur cycle bacteria Thiobacillus thioxidans, T. ferrooxidans, T. denitrificans, T. thioporus isolated.

**Conclusion:** The number of these bacteria determined what kind of pollutants are found and level of pollution Saricay and Biga Streams. This situation showed sustaining of high sulphite pollutant in both streams.

**KEYWORDS:** SARICAY, BIGA STREAM, SULPHATE-REDUCING BACTERIA, PHYSICO-CHEMICAL PARAMETERS

ISEEP_65

# DISTRIBUTION AND ABUNDANCE OF THE BACTERIA INVOLVED IN THE NITROGEN CYCLE IN SARICAY AND BIGA STREAMS (CANAKKALE, TURKEY)

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**Aim:** Saricay and Biga streams containing pollutions from various sources is a great role in pollution this fresh water resources. This study exhibited correlation between nitrogen cycle bacteria and physico-chemical parameters of freshwaters (Saricay and Biga streams) for explaining pollution resources.

**Methods:** In the present investigation water samples were collected from three different sites of the Saricay and Biga streams in the months of October 2007 – September 2008 for the analyzing some physico-chemical parameters and isolation nitrate and nitrite reducing bacteria. Most probable number of denitrificating and ammonifying bacteria by using the multiple tube fermentation technique were determined. Physico-chemical parameters were compared with the standards and determined correlation between physico-chemical parameters and distribution nitrogen cycle bacteria.

**Results:** The results showed the mean average value (mean ± SD) of the Saricay and Biga streams were noted as temperature 17.377± 0.199oC; 15.533 ± 0.199 C, dissolved oxygen (DO), 7.17 ± 0.650 mg/L; 8.332 ± 0.253 mg/L, biochemical oxygen demand (BOD5), 170.4 ± 50.3 mg/L; 136.60 ± 2.51 mg/L, pH, 7.7018 ± 0.0325; 7.5078 ± 0.0427, electrical conductivity (EC) 18.50 ± 2.33; µS/cm 869.93 ± 3.72 µS/cm, ammonification bacteria 15708 ± 499 MPN/100 mL; 25022 ± 3930 MPN/100 mL and denitrification bacteria 21500 ± 5087 MPN/100 mL; 18628 ± 1870 MPN/100 mL, respectively. On the other hand, some nitrite and nitrate bacteria were also isolated in Saricay and Biga streams.

**Conclusion:** Abundance of denitrificating and ammonifying bacteria in Saricay and Biga streams showed high nitrogen pollutant levels in these freshwater resources.

**KEYWORDS:** SARICAY, BIGA STREAMS, NITROGEN CYCLE BACTERIA, PHYSICO-CHEMICAL PARAMETERS

ISEEP_66

# IMPACT OF INORGANIC NUTRIENTS ENCRICHMENT ON PHYTOPLANKTON GROWTH ALONG THE COASTAL AREAS OF TURKEY

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**Aim:** In recent decades rapid and uncontrolled industrial developments and urbanization on the coastal zone of Turkey have given rise to intensive pollution in the coastal waters. Large inputs of nutrients have resulted in eutrophication in the enclosed bays and shallow waters having distinctly different biochemical properties. The aim was to understand which nutrient element primarily controls primary production in selected hot points and sensitive areas along the NE Mediterranean, Marmara and Black Seas.

**Methods:** Experiments were conducted on the native phytoplankton community as a series of nutrient enrichment bioassays to assess the relationship between increased concentrations of inorganic nutrients and phytoplankton growth in the polluted and reference points visited seasonally in 2009-2010 by using the 14C bioassay technique with 24-hr incubation period.

**Results:** In the P-depleted NE Mediterranean and Aegean hot points and sensitive areas, phosphorus primarily limit algal production whereas nitrogen (or N+P combination) is the potential limiting element in the P,N polluted coastal waters of Izmir and Edremit bays. In the two-layer Marmara Sea ecosystem (low DIN/PO4 ratio in the water column) are N+P potential limiting nutrients; but primarily N is P-polluted bays. Though Black Sea open sea has very N/P ratios, phosphorus is the potential limiting nutrient in the coastal waters due to large nutrient inputs by major rivers and precipitations with high N/P ratios.

**Conclusion:** Results of this study shows that it is very significant to determine the optimum treatment technology for Nitrogen (N) and Phosphorus (P) removal sourced from residential areas by taking into account limiting nutrients parameter of recieving coastal areas. By using this urban wastewater investment strategy, more ecologic and cost-effective solution can be developed by desicion makers and implementing organisations.

**KEYWORDS:** LIMITING NUTRIENTS; EUTROPHICATION; MEDITERRANEAN; MARMARA SEA; BLACK SEA

ISEEP_67

# INVESTIGATION OF GENOTOXIC ACTIVITY AND LONGEVITY OF COBALT CHLORIDE AND POTASSIUM DICHROMATE IN THE *DROSOPHILA MELANOGASTER*

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**Aim:** Metals are important environmental pollutants. Cobalt chloride ($CoCl_2$) and potassium dichromate ($K_2Cr_2O_7$) are widely distributed in both terrestrial and aquatic environments. Via water and soil may enter the food chain. Therefore, human are exposed, include consumer products and industrial wastes. Many organ systems are affected by metals which target specific biochemical processes and membranes of organelles and cells. For this purpose, as two metals namely, $CoCl_2$ and $K_2Cr_2O_7$ were evaluated for longevity on the Oregon-R strain of Drosophila and genotoxic effects in the somatic mutation and recombination tests (SMART) of Drosophila melanogaster following standard procedures.

**Methods:** The Oregon-R strain of *D. melanogaster* was used as a test strain for the effect of longevity. The SMART assay in *D. melanogaster* has been designed to detect the genotoxic damages in a rapid an inexpensive way in one generation. Importance of SMART assay is to be in in vivo system and the metabolic machinery of Drosophila cells similar to mammalian cells.

**Results:** Both metals clearly a dose-depend decrease the incidence of longevity while showed genotoxic activity both $CoCl_2$ and $K_2Cr_2O_7$ in Drosophila.

**Conclusion:** These in vivo results contribute to increase the genotoxicity and longevity database on the $CoCl_2$ and $K_2Cr_2O_7$.

**KEYWORDS: KEYWORDS:** LONGEVITY; COBALT CHLORIDE; POTASSIUM DICHROMATE; SMART; *DROSOPHILA MELANOGASTER*

ISEEP_68

# PHYTOTOXIC AND GENOTOXIC EFFECTS OF WATER SAMPLES TAKEN FROM EAST CHANNEL OF KOCAELI ON *VICIA FABA* AND *ZEA MAYS*

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**Aim:** In the water ecosystems, many studies are being carried out in order to identify the damage caused by the polluting parameters. Large quantities of industrial wastewater and municipal sewage are drained into the East Channel without detoxification treatment. Thus it is aimed to investigate the phytotoxic and genotoxic effects of water samples taken form East Channel of Kocaeli on some plants with economic value.

**Methods:** Water samples were obtained from the middle part of East Channel (Kocaeli). The seeds of *Vicia faba* and *Zea mays* were treated with three different concentrations of water samples (40 %, 80 %, 100 %) and control groups were germinated in distilled water. The phytotoxic effects were determined by morphological and anatomical experiments, genotoxic effects were determined by cytological experiments. Leaf and shoot anatomy, seed germination percentages, mitotic index, mitotic abnormalities, chlorophyll and carotenoid contents were determined.

**Results:** Several deformations were observed in leaves of treated plants. Root lengths were increased in treated groups of *V. faba* and decreased in treated groups of *Z. mays*. All the concentrations used caused several abnormalities in mitotic cell divisions and decreased the mitotic frequency in the root tip cells. Micronucleus, chromosomal bridges, laggard chromosome, polar slip and lack of cytokinesis and some other abnormalities were observed in different phases of mitosis.

**Conclusion:** These results will provide determination of pollution extent using model organisms in investigation of water pollution in Kocaeli and will also demonstrate the toxic effects of these water samples on the plants with economic value.
Acknowledgement: This study is funded by the project KOU BAP 2009/40.

**KEYWORDS:** *VICIA FABA*, *ZEA MAYS*, PHYTOTOXIC, GENOTOXIC, EAST CHANNEL (KOCAELI)

ISEEP_70

# THE EFFECTS OF RAINBOW TROUT CAGE CULTURE ON WATER-SEDIMENT QUALITY IN INLAND WATERS, TURKEY

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**Aim:** In Turkey, rainbow trout (Oncorhynchus mykiss Walbaum, 1792) is the most common species cultured in both land-based raceways and cages accounting an annual production of 75 657 t in 2009. The aim of this study was to summarise some recent studies being more widespread in Turkey's inland waters, with respect to the impacts of rainbow trout cage farms on water-sediment quality.

**Methods:**

**Results:** Aquaculture production will certainly continue to be one of the most viable methods to supply population's increasing demands of animal proteins. Intensive fish culture has an increasingly prominant impact on the aquatic environment generally called eutrophication in two ways; the water surrounding cages as well the benthos and the rivers receiving aquaculture effluent. There are various aquaculture production systems around the world, comprising ponds, tanks, raceways, and cages or netpens. Cage aquaculture is the most used production system of several freshwater and marine organisms. The impact of cage aquaculture on the aquatic system via two mechanisms are fish faecal wastes and waste feed particles which settles to the bottom of the production area and deposits to make sediment organically rich and consequently some negative impacts on the water quality and the benthic community can be observed. Besides this, some respiratory wastes like ammonia and dissolved phosphorus advanced from waste feed and fecal wastes may have some negative effects concerning the excess quantity of nutrients in the water column and the sediment.

**Conclusion:**

**KEYWORDS:** CAGE CULTURE, RAINBOW TROUT, WATER QUALITY, SEDIMENT CHARACTERISTICS

ISEEP_71

# MONITORING OF RECREATIONAL SEA WATER QUALITY IN ANTALYA

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**Aim:** In this study, the effects of meteorological parameters, population and tourism activities to microbiological sea water quality were researched.

**Methods:** For this purpose, meteorological parameters, population growth, tourism potential and microbiological sea water analysis results were obtained from Turkish State Meteorological Service, Turkish Statistical Institute and Local Health Authority. The collected data include the results of April to October month's values of 2006-2010 periods. After the evaluation of these parameters the relationship between them was investigated. The increase in microbiological pollution of sea water for five years period was examined.

**Results:** As a result in a five years period an increase in indicator bacteria level was seen generally. It is worthy of note that meteorological parameters affect sea water quality. In addition the impact of people to pollution is much more reasonable.

**Conclusion:** Coastal tourism is a very important source of income in Antalya. For sustainable usage of coastal areas management of these areas has to be taken into consideration and pollution prevention strategies should be determined.

**KEYWORDS:** TOURISM, MARINE RECREATIONAL WATER QUALITY, CLIMATE FACTORS

ISEEP_72

# EFFECTS OF ATENOLOL ON EMBRYONIC DEVELOPMENT OF SEA URCHIN *ARBACIA LIXULA*

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**Aim:** In this study the affects of atenolol on sea urchin (*Arbacia lixula*) embryo development was evaluated.

**Methods:** Sea urchin embryos were exposed to increasing concentration of Atenolol (1,25, 2,5, 5, 10, 20, 40 ppm) under static conditions. Embryotoxicity was assessed on 72 h-old pluteus larvae under light microscope.

**Results:** According to obtained results, an increase in larval malformations as skeleton deformities at the pluteus stage were observed and the calculated EC50 for embryotoxicity was 66,93 mg/l.

**Conclusion:** Beta adrenergic receptor antagonist drugs (beta blockers) are widely used in treatment of hypertension and in other cardiovascular diseases and also used in treatment of childhood migraine. In U.K and France the annual consumption of Atenolol for a person is 0.63 and 0.3 g respectively. Atenolol can be found in surface waters, wastewaters and even in ground waters up to µg/l levels. Physiochemical measurements are not enough for the assessment of environmental impacts of chemicals or pollutants. Toxicity tests with the organisms can be useful tools in environmental studies. As the embryonic stage is more sensitive to pollutants and other stressors, experiments on the embryos are important for assessing the environmental effects of pollutants the embryonic stage of organisms is important both for ecosystem health and for future of the population. Atenolol has several developmental effects on sea urchin (*Arbacia lixula*) embryos.

**KEYWORDS:** BETA BLOCKERS, ATENOLOL, SEA URCHIN, EMBRYOTOXICITY

ISEEP_76

# FLOOD FORECASTING FOR THE RIVER ÇUBUKLU

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**Aim:** The number of floods has increased over recent decades in all over the world because of the effects of global climate changes. The flood risk seems to rise globally in the next years. The impacts of the floods are appalling for social and economic lives. The flood can quickly destroy accumulated development gains, in terms of damage and losses to infrastructure and other assets. Moreover, many people may be affected in a negative way and some people may lose their lives because of it. Some diverse factors increase the frequency and intensity of the flood adverse effects. These factors are destruction of forests, excessive urbanization, insufficient buildings and water management systems, lack of risk consciousness and information, lack of flood prevention systems, inadequate flood early warning system.

**Methods:** The flood risk map was prepared using Mike 11 and Mike 21 software. The work started by collection of all data which were necessary for flood estimation model. There are two main groups of data (survey data and hydrology data) that mainly used in model.

**Results:** It is impossible to intervene in the natural meteorological conditions. In order to decrease the adverse effect of the flood, meteorological conditions must be estimated and analyzed. Inappropriate land use, deforestation, illegal construction in stream beds, erosion, uncontrolled urbanization and similar issues bring about flood in most part of the world.

**Conclusion:** In this study, a flood forecasting model of the river Çubuklu in Istanbul is presented.

**KEYWORDS:** FLOOD, MIKE11, MIKE21,GIS,ÇUBUKLU RIVER

ISEEP_78

# PHYTOPLANKTON GROWTH AND MICROZOOPLANKTON GRAZING RATES IN IZMIR BAY (EASTERN AEGEAN SEA–TURKEY)

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**Aim:** The aim of this study is to investigate the dynamics of phytoplankton and to determine the effects of grazing on the productivity after the wastewater treatment plant began to treat.

**Methods:** In 2004 39 cruises were conducted at two stations (Yat Limani, Cigli) in Izmir Bay. Dilution experiments were carried out. POC, Chl a concentrations were measured to calculate Primary Productivity.

**Results:** Microzooplankton grazing rate did not exceed phytoplankton potential growth rate during whole year, except in three weeks in Çigli and one week in Yat Limani. But differences between gross growth rate (μ(N-)+g+) and potential growth rate were evident in two stations and they were referenced to weak nutrient limitation. Chl a biomass removed daily exhibited distinct patterns among stations, but they ranged from 0,0 %d-1 to 100%d-1 in both stations. Chl a production removed daily reached to around 160 %d-1 in three weeks in Çigli and two weeks in Yat Limani. Net primary productivity did not exceed 100 μgC/L day in whole year. But net Primary productivity decreased to negative values in nine weeks in both stations.

**Conclusion:** Although weekly investigations does not exist in literature, grazing and growth rates were compared to the reparts in coastal water. Our results were compared to the reports in coastal waters and discussed.

**KEYWORDS:** DILUTION EXPERIMENTS, AEGEAN SEA, IZMIR BAY, COASTAL WATER, GROWTH RATE, GRAZING RATE

ISEEP_79

# THE RELATIONSHIPS BETWEEN N:SI:P MOLAR RATIO AND COASTAL MARINE PHYTOPLANKTON IN IZMIR BAY (EASTERN AEGEAN SEA–TURKEY)

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**Aim:** This study aimed that to determine effects of the N:P:Si ratios to coastal phytoplankton groups in Izmir Bay on a weekly basis after activated the Big Channel Waste Water Treatment project.

**Methods:** Nutrients and Chl-a levels were analyzed from sea water which were taken from 0,5,10 m and bottom depths of the Gulf of Izmir on a weekly basis between 2003-2004 (Strickland, Parsons 1972; Wood 1975). Also, the groups of phytoplankton were identified with microscope.

**Results:** As a result, the average N:P, Si:P, Si:N and C:Chl a ratios were 4.20±0.40, 4.19±0.56, 1.25±0.17; 0.32±0.05, 3.40±0:39, 4:3±0.67; 1.78±0.27, 0.25±0.03 and 3.02±0.33; 4:56±0.59, 1.81±0.21, 0.32±0.05 for the Station 1, 2, and 3, respectively.

**Conclusion:** The emergence of processes acting on Reactive Phosphate and TIN in different times reveal a great difference onto the temporal distribution of these two nutrients in the Inner part of Izmir Bay. Thus, indirect evidences about these processes have been obtained from the nutrients and their rates of distribution.

**KEYWORDS:** N:P, SI:N, SI:P, IZMIR BAY.

ISEEP_81

# ECOLOGICAL FEATURES OF SPECIES OF THE GENUS LINUM L. IN THE FLORA OF UKRAINE.

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**Aim:** To characterize ecological features of the genus *Linum* L. in the flora of Ukraine.

**Methods:** Ecological characteristics of flax species given according to synphytoindication method and ecological scales, accepted in \"Ecoflora of Ukraine\"(2000).

**Results:** The flora of Ukraine counts 23 species of the genus *Linum*. Most species are characterized by wide ecological amplitude. By altitude distribution plain (11) and mountain (8) species dominate, only *L. extraaxillare* is subalpine. Concerning soil moisture variability most of species are hemihydrocontrastophiles (19), in relation to the soil moisture - submezophytes (15), to the total soil salinity regime - eutrophs (15), to the carbonates contents of the soil - hemicarbonatophiles (12), to the mineral nitrogen contents of the soil - heminitrophiles (17), to the soil aeration - subaerophiles (21), and to the soil acidity profile - neutrophiles (22). In general, species of the genus do not show a clear peculiarity to chemical composition and structure of the soil, they grow mainly on carbonate soils, seldom on sandy and sabulous soils, loess and chernozem, outcrops of different stratum.

**Conclusion:** It was found that an important role in biomorphological, anatomical and physiological characteristics and differentiation of Linum genus play edaphic factors such as soil moisture, soil acidity, soil trophicity, carbonate and nitrogen contents of the soil.

**KEYWORDS:** *LINUM*, ECOLOGY, FLORA OF UKRAINE

ISEEP_86

# ROLE OF BLACKBIRDS (*TURDUS MERULA*) ON BIOLOGICAL CONTROLS OF COMMON PINE SAWFLY (*DIPRION PINI*)

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**Aim:** Common Pine Sawfly (*Diprion pini*) is an major pest on pine species (*Pinus spp*.), where the larvae may cause growth reductions due to defoliation by the larvae. It is a native of Europe. As the larvae grow, they remain together and feed from the tip of a needle to the base. The larvae feed on older foliage and move from branch to branch as they strip the needles. Especially young pine trees can be entirely defoliated. We study in a project that aim at answering the blackbirds are effective on biological control of common pine sawfly larvae.

**Methods:** This study has been performed in 2007-2010 years on Meşelik Forest in Eskişehir. We have monitorized 18 blackbird nests by using high definition video cameras on nest tops as a new method.

**Results:** When we analyzed video and photograpic data from 12 nests, We saw blackbirds parents fed their nestlings with common pine sawfly on high percentage (over %70 in 12 nests).

**Conclusion:** *Diprion pini* caused extensive defoliation to European Black Pine (*Pinus nigra*) in especially newly reforested areas. Common pine sawfly have been controlled conventionally using traps and lures, and a polyhedrosis-virus (*Borrelinavirus diprionis*) is an important mortality factor, especially at times of high population densities. The virus kills young larvae (L2/L3), but usually older instars are affectedBut this methods are low effective on outbreaks. Suppression of sawfly populations by insecticides is usually successful. However, consideration should be given to conserving natural enemies (small mammals, birds, insects) through minimal insecticide use and preservation of hardwood pond stands around pine plantations. This study shown that blackbird may be reducing and regulating factor the outbreaks of common pine sawfly.

**KEYWORDS:** *DIPRION PINI*, COMMON PINE SAWFLY, *TURDUS MERULA*, *PINUS NIGRA*

ISEEP_91

# THE RELATIONSHIP BETWEEN UNIVERSITY STUDENTS' VIEWS TOWARD NUCLEAR PLANTS AND ENVIRONMENTAL LITERACY

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**Aim:** This research was realized as descriptive and cross-sectional study to determine the relationship between university students' views toward nuclear plants and environmental literacy.

**Methods:** The sample of research is included 383 students who attended on the day at university and selected to be predicted voluntary principles by disproportional cluster sampling method. The data was collected with "Information Form", "Views toward Nuclear Plants and Usage of Nuclear Energy Scale" and "Environmental Literacy Scale". The data was analyzed on SPSS 17.0 package program and and significance level was set as .05.

**Results:** It was found that 51,0% were studying Faculty of Education, 18,6% were studying Faculty of Environment Engineering, 30,4% were studying Nursing Faculty, 66,2% were female, their average age was 22,46±1,35, 15,5% were a member of environmental organization. The average "Environmental Literacy Scale" points of the students were examined according to faculty, it was determined that the highest average was Nursing Faculty (161,32±17,98). The average "Views toward Nuclear Plants and Usage of Nuclear Energy Scale" points of the students were examined according to faculty, it was determined that the highest average was Nursing Faculty (69,41±11,17). There is a positively significant correlation between university students' views toward nuclear plants and environmental literacy (r=,142 p< 0,015).

**Conclusion:** The results of the research showed that students' environmental literacy was positively increasing while students' views toward nuclear plants had been affected/changed. According to research results will recommended of research it is suggested; educational activities must be configured to support students' environmental awareness.

**KEYWORDS:** NUCLEAR PLANTS, NUCLEAR ENERGY, ENVIRONMENTAL LITERACY, UNIVERSITY STUDENTS

ISEEP_92

# ENVIRONMENTAL DESTRUCTION WITH CYANIDE: ASSESSING THE PROCESS FROM THE POINT OF BERGAMA-OVACIK EXAMPLE

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**Aim:** As negative effects of using cyanide in producing gold has appeared, important steps are being taken to stop producing gold although a contradictory process is being faced in developing countries as Turkey. The aim of this study is to find answer(s) why producing gold is not quit despite international laws, all kinds of legal regulations and the harm given to the ecology in Turkey.

**Methods:** In this study, firstly, literature review on this subject is determined, and then producing gold and studies in Turkey are focused on. Since economic and legal dimensions of the subject are in the centre, the steps taken are searched both internationally and in Turkey. The data gained through inductive method is assessed critically. Contrary ideas are also given as much as possible in dialectic perspective.

**Results:** Soil pollution within environmental pollution, gold production, state of stocks and methods, effects of gold production with cyanide and the process in the world, lawlessness process in Bergama-Ovacık area, the progress in Turkey and the reason why Turkish soil are chosen are the results of this study.

**Conclusion:** Despite the geographic dispersion and the technology use capacity, the production of gold with cyanide is moving to the developing countries via international companies.

**KEYWORDS:** CYANIDE, GOLD, ENVIRONMENTAL POLLUTION, BERGAMA-OVACIK, LAW

ISEEP_93

# ENVIRONMENT-FRIENDLY SUSTAINABLE INTERIOR DESIGN

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**Aim:** Nowadays, due to disturbing of rapid alteration in natural environment, everybody is aware that environment is under a threat dramatically increasing. Growing world population, rapid development industry and development environmental variations in relation to consumption of sources in the environment depend on technology have also changed ecologic balance of our world. Rapid increasing in buildings that are throw down the gauntlet to environment in place of environment-friendly buildings together with developing person, discomformity in the environment and results of this have noticed. Together with this, term of 'sustainability' have begun to show itself also design field like in the every field in current periods. Because of this, sustainable interior design designing comply with nature, its environment and occupant have also attained importance.

**Methods:** In this study, today's sustainable interior designs will be considered under titles as functionality, energy usage and material selection.

**Results:** Sustainable interior design criteria by means of various analysis methods will be considered and so a study that can be obtained input future designs will be realized.

**Conclusion:** Sustainable interiors that are environment-friendly and provide energy saving, use efficient its area with material selection with respect to nature, protect human healty comfort should be designed so that future generations can continue their life at least possibilities of today.

**KEYWORDS:** ENVIRONMENT, SUSTAINABILITY, INTERIOR, DESIGN, MATERIAL

ISEEP_95

# A SURVEY OF ANATOMICAL ADAPTATIONS IN ROMANIAN HALOPHYTES. TOWARDS AN ECOLOGICAL INTERPRETATION

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**Aim:** Our work aims for establishing some correlations between anatomical features and their ecological significance in halophytes species.

**Methods:** A number of 50 halophytes species were collected from heterogeneous salinized areas from Romania, during 2004-2011. Cross-sections through vegetative organs were made; the sections were stained with carmine red and green iodine, and finally fixed into glycerol-gelatin. The permanent slides were finally examined with a light microscope and micrographs were taken using a digital camera.

**Results:** Halophytes display a large range of anatomical features. We focused on those adaptations with ecological value. Succulence was observed either in halophytes vegetating in dry salinized habitats (xero-halophytes), either in species from wet salty areas (hygro-halophytes). In the first case, succulence plays a water storage function, while in the second case it may contribute to assuring the erect position in taxa with less developed stereome (Salicornia, Suaeda). Salt secreting structures were also evidenced, either as salt hairs (bladders) in Atriplex and Halimione species, either as salt glands, in Limonium species. Bulliform cells were noticed in several species; they act as motor cells, being involved in rolling the leaves during drought stress. Kranz anatomy is a feature related with C4 photosynthesis, which we found especially in Chenopodiaceae species.

**Conclusion:** In all investigated species, there is a clear correlation between the nature and intensity of anatomical adaptations and polymorphic environmental factors.

**KEYWORDS:** HALOPHYTES, SALINE ENVIRONMENTS, ECOLOGICAL VALUE

ISEEP_100

# WIND EROSION AND THE IMPORTANCE OF LAND CONSOLIDATION ON PROTECTING FARMLAND THREATENED BY WIND EROSION IN TURKEY

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**Aim:** The aim of this paper is to reveal the importance of land consolidation in order to reduce the threat of wind erosion in Turkey.

**Methods:** Karaman Yollarbaşı project and other land consolidation projects in Konya and Karaman provinces were compared in terms of compliance to create windbreaks. The direction of field blocks was investigated whether perpendicular to the prevailing wind direction on block plans of the projects. The problems and solution options are discussed in Yollarbaşı project.

**Results:** 506,000 hectares (ha) of land area are affected by wind erosion in Turkey. Wind erosion is one of major environmental and agricultural problems in central and south east Anatolia. This regions are characterized by scanty vegetation cover, low precipitation and the dry climatic conditions. The establishement of windbreaks to reduce wind erosion is a prominent measure. The allocation of plantation areas is the main problem in cultivated agricultural areas in Turkey.

**Conclusion:** Only a single row tree was be able to be planted because enough space is not allocated along field block boundaries in Yollarbaşı Project. If the establishement of windbreak or shelterbelt is put into practice within land consolidation project, the problem will be able to be solved.

**KEYWORDS:** WIND EROSION, LAND CONSOLIDATION, CENTRAL ANATOLIA, WINDBREAK OR SHELTERBELT

ISEEP_102

# A CARYOLOGICAL STUDY ON TWO SPECIES OF *CENTAUREA* L. (ASTERACEAE) SECTION PHAEOPAPPUS FROM TURKEY

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**Aim:** Turkey is the most important centre of speciation of *Centaurea*, with many narrow endemic species. The rate of endemism of this genus is about %60. Diagnosis of *Centaurea* taxa is difficult so karyological and molecular studies is also very important for dianosis in addition to morphological features. Phaeopappus section has four taxa but in Turkey it was recorded three taxa. *Centaurea stapfiana* and *Centaurea albonitens* are belonging to Phaeopappus section. *C. stapfiana* (Hand.-Mazz.) is endemic to Turkey. *C. albonitens* Turrill was distributed in Turkey, Iran and Azerbaijan. The aim of this research is to found the chromosome number and detailed karyomorphological measurements for these species.

**Methods:** Chromosome counts and morphologies were made on somatic metaphases using the squash technique. Root meristems from germinating seeds collected in the wild were used. The root meristems are pretreated with a solution of α-monobromonaftalin before fixation. Three hours is a suitable period of pretreatment at room temperature. The material was fixed in absolute alcohol: glacial acetic acid (3:1) for 24 h at +4 0C. Before staining, they were hydrolyzed with 1 N hydrochloric acid (HCl) for 1 h at 60 °C. After hydrolysis they were transferred to distilled water for five minutes. Before stain, preparations were squashed. The preparations stained with %5 Giemsa (prepared with Sorensen' buffer) for three minutes. Preparations were made permanent by DPX. Digital photographs for chromosome count and morphology were taken using Olympus microscope BX51.

**Results:** In this research, karyotype analyses of two species in the genus *Centaurea* were made. Both of these species are diploid with 2n=18 chromosomes. The basic chromosome numbers is x=9 in both. Haploid chromosome lengths are 27.76 µm in C. stapfiana and 35.90 µm in C. albonitens. The chromosome formula is 3sm+2m+2sm+2m in C. stapfiana. Also, chromosome lengths are between 4.49 and 1.71 µm. In C. albonitens, chromosome lengths are between 5.65 and 2.92 µm, and the chromosome formula is 5sm+1m+3sm.

**Conclusion:** Chromosome lengths and detailed analyses for *Centaurea stapfiana* and *Centaurea albonitens* investigated here are given. Garcia-Jacas et al. in 1998 and Duran et al. in 2008 reported *C. albonitens* has 2n=18 chromosomes. Duran et al. also presented karyotype formula 7m+2sm and haploid chromosome lengths 14,79 µm. In this study we also found same chromosome number but we established karyotype formula 5sm+1m+3sm and haploid chromosome lengths 35,90 µm for *C. albonitens.* With respect to *C. stapfiana* Uysal et al. in 2009 only reported chromosome number 2n=18 and we also found same. There are no any detailed chromosome analyses for *C. stapfiana.* In our research we represented detailed chromosomes analyses for the first time for *C. stapfiana.*

**KEYWORDS:** *C. ALBONITENS*, *C. STAPFIANA*, KARYOTYPE

ISEEP_103

# EVALUATING LOCATIONS OF FOREST FIRE FIGHTING TEAMS BY USING GIS TECHNIQUES

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**Aim:** This study aims to evaluate locations of fire fighting teams for three Forest Enterprise Directorates (Kahramanmaraş, Göksun and Andırın) in Kahramanmaraş. Fire sensitivity degrees are I., II., and III. degrees in these directorates, respectively.

**Methods:** Network Analysis tool of GIS was used to determine the forested areas that can be reached by fire fighting teams in critical response time. Productive forests and coppice forests were evaluated separately. In road network system, each link represents road section with its associated travel time.

**Results:** The results indicated that 34% of the forested areas can be reached by forest fire fighting teams in critical response time. For productive forests and coppice forest in the study area, this figure was 35% and 24%, respectively. It was also found that fire fighting teams can reach 26%, 14%, and 95% of the forested areas which are sensitive to forest fires in I., II., and III. degrees, respectively.

**Conclusion:** Overall conclusion suggested that forest fire fighting teams can not reach all of the forested areas in the study area on time, considering critical response times. This result indicated that current locations of the fire fighting teams should be evaluated and new fire fighting teams should be established in the area.

**KEYWORDS:** FOREST FIRES, FIRE FIGHTING TEAMS, NETWORK ANALYSIS, GIS

ISEEP_104

# EVALUATING FOREST FIRE RISK WITH LANDSAT ETM+ DERIVED LAND SURFACE TEMPERATURE IN SAMANDAĞ, TURKEY

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**Aim:** Turkey is one of the Mediterranean countries most affected by forest fires. Therefore, it is very vital to identify forest lands that possess potential risk in order to fight forest fires effectively. This study aims to evaluate forest fire risk with Landsat ETM+ Derived Land Surface Temperatures (LST), which is one of the important parameters required for a wide range of environmental analysis.

**Methods:** In this study, a Landsat 7 ETM+ scene has been used to retrieve LST and land use/land cover (LULC) maps. Forest Enterprise Chief of Samandağ has been chosen as the study area due to the fact that it has one of the most fire-prone area in Turkey. Besides, the relations between LST distribution and locations of historical fire events were analyzed for the study.

**Results:** The results from LST distribution indicated that forest lands exposed relatively lower temperatures comparing with surrounding land use types. The temperatures were considerably higher (31.25-36.47 °C) at the locations of past forest fires.

**Conclusion:** The overall conclusion drawn from these results suggested that the LST distribution was highly related to the specific locations of past forest fires. Therefore, satellite-derived LST map can significantly help to identify the areas carrying potential risk for forest fires.

**KEYWORDS:** FOREST FIRES, FIRE RISK, LAND SURFACE TEMPERATURE, REMOTE SENSING, GIS

ISEEP_105

# ENVIRONMENTAL FRIENDLY SOLUTIONS FOR MANURE MANAGEMENT PROBLEMS IN TURKEY

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**Aim:** Livestock manure is an important material to support both soil fertility and crop growth, also regulates soil structure. On the other hand, manure has become an important pollutant for environment because of inadequate management practices. The increasing size of farm operations at various places in our country and the expanding residential land use in rural areas has greatly increased environmental concerns over nuisance odours and the potential for water and soil pollution. With good manure management practices, proper storage facilities, and adequate separation distances between non-compatible land uses, most environmental problems can be avoided. Manure management encompasses manure collection, storage, transport and land application. The goal of manure management must be to maximize the soil amending value of manure and minimize the potential for environmental degradation. This study explains the required technical cautions for environmental pollution prevention in manure management practices in Turkey.

**Methods:** Manure management practices, regulations and legal applications in European Union have been given. Problems faced into manure management practices and several researches results in Turkey have been mentioned. Manure management alternatives, system components and proper applications for Turkey have been explained with considering the previous studies and basis of knowledge.

**Results:** Technical cautions and constructive suggestions have been explained to solve the problems mentioned.

**Conclusion:** Existent manure management conditions and required regulations and practices for pollution prevention in Turkey have been summarized.

**KEYWORDS:** ENVIRONMENT, MANURE MANAGEMENT, TURKEY

ISEEP_106

# EFFECTS OF DELTAMETHRIN AND/OR THIACLOPRID INSECTICIDES ON THYROID HORMONE LEVELS IN THE RAT SERUM

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**Aim:** The aim of this study was to investigate the effects of deltamethrin and thiacloprid exposure on levels of plasma free triiodothyronine (T3) and thyroxine (T4) in the Wistar albino rats.

**Methods:** Rats were orally gavaged to single dose of deltamethrin (15 mg/kg), thicloprid (112.5 mg/kg), or deltamethrin + thicloprid (15 + 112.5 mg/kg) for 24 hour or to deltamethrin (3 mg/kg/day), thicloprid (22.5 mg/kg/day), or deltamethrin + thicloprid (3 + 22.5 mg/kg/day) for 30 days. Serum determinations of T4 and T3 were performed by Electrochemiluminescence Immunoassay (ECLIA).

**Results:** Thiacloprid and mixture of deltamethrin and thicloprid for 30 days significantly increased the plasma T3 and T4 levels.

**Conclusion:** These results suggest that exposure to these insecticides may be responsible of increasing T3 and T4 serum hormone levels, therefore supporting the hypothesis that these insecticides act as endocrine disorder in humans.

**KEYWORDS:** DELTAMETHRIN, THIACLOPRID, THYROID HORMONES, WISTAR RAT

ISEEP_109

# CORRESPONDENCE BETWEEN ENVIRONMENTAL CONDITIONS AND ANATOMICAL ADAPTATIONS IN MEDITERRANEAN HALOPHYTES

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**Aim:** In this work, our intention is to discuss the relationships established between environmental factors and anatomical adaptations in halophytes from Mediterranean salt marshes.

**Methods:** We investigated the anatomy of vegetative organs in 30 halophytes collected from Spain during July-November 2010. The cross sections were stained with carmine red and green iodine, and finally fixed into glycerol-gelatin. The permanent slides were examined at the end with a light microscope and micrographs obtained using a digital camera.

**Results:** Our results suggest that here is a reliable correlation between the intensity of environmental factors (soil salinity and humidity, temperature) and relevance of anatomical features. Thus, the best adapted halophytes (euhalophytes) show the most efficient anatomical and ecological strategy to cope with extreme conditions occurring in saline habitats. For instance, chenopods species (Sarcocornia, Arthrocnemum, Salicornia, Halocnemum, Suaeda, Halimione) are succulent and this may be related to dilution of salts occurring in excess. Other species have secretory devices: salt hairs (Atriplex, Chenopodium, Halimione) or salt glands (Limonium, Frankenia, Tamarix, Aeluropus, Spartina). Contrarily, halophytes exposed to less harmful conditions display adaptations gradually reduced as importance and intensity.

**Conclusion:** Halophytes select different anatomical and ecological strategies in accordance with the intensity of environmental factors in a Mediterranean salt marsh.

**KEYWORDS:** HALOPHYTES, MEDITERRANEAN CLIMATE, ADAPTATION, SURVIVAL

ISEEP_110

# HEAVY METAL ACCUMULATION IN BLUE CRAB (*CALLINECTES SAPIDUS* RATHBUN, 1896) INHABITING KOYCEGIZ LAGOON

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**Aim:** This study was carried between June 2009 and June 2010 to determine heavy metal accumulation in Blue crab (*Callinectes sapidus* Rathbun, 1896) inhabiting Köyceğiz Lagoon System.

**Methods:** To determine the heavy metal accumulation in Blue crab the tissue samples from muscle, hepatopancreas, gills and shell of blue crab were taken. The samples were analyzed in ICP-AES after dried in microwave unit.

**Results:** According to obtained results, in the muscle and hepatopancreas tissues, highest Zn accumulation were observed with a mean of 43, 98 µg/g and 55,20 µg/g respectively. In gill tissue, mean highest accumulation was observed at Fe with 173, 07 µg/g while the mean highest accumulation in shell tissue was at Mn with 106,87 µg/g levels. The accumulation of investigated heavy metals in muscle tissue was in order as; Zn > Cu > Fe > Mn > Cr > Pb > Ni > As > Cd > Hg > Se. In gill tissue the order of accumulation of the investigated heavy metals was as; Fe > Cu > Zn > Mn > Ni > Cr > Pb > As > Cd > Hg >Se. In hepatopancreas tissue the order of he accumulation of the investigated heavy metals was Zn > Cu > Fe > Mn > Cr > Ni > Pb > Cd > As > Se > Hg while it was; Mn > Fe > Zn > Cu > Cr > Pb > Ni > As > Cd > Hg > Se in shell tissue.

**Conclusion:** According to the obtained results of the study which was carried out in Köyceğiz Lagoon System, intensive heavy metal pollution was not determined in present situation but the possible pollution potential was determined for future.

**KEYWORDS:** HEAVY METAL ACCUMULATION, BLUE CRAB, KÖYCEĞIZ LAKE

ISEEP_111

# INVESTIGATION OF HEAVY METAL LEVELS IN ECONOMICALLY IMPORTANT FISH (*MUGIL CEPHALUS* L.) FROM KÖYCEĞIZ LAGOON SYSTEM (TURKEY)

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**Aim:** Köyceğiz Lake Lagoon System is an important tourism center and an efficient agricultural region with its surroundings. Approximately 40 fish samples were collected seasonally from September 2009 to July 2010 from the Köyceğiz Lagoon.

**Methods:** Heavy metal (Cd, Cr, Cu, Fe, Mn, Ni, Pb, Zn, Al, Hg, As, Se) concentrations were measured in the muscle, gill and liver in *Mugil cephalus*. The concentrations of heavy metals were determined by using ICP-AES.

**Results:** Results indicated that Fe and Zn were found in autumn the fish liver, while Al, Fe, and Zn were observed in winter the fish gills but in spring Mn were found highest in fish gills.

**Conclusion:** According to Turkish food codex, heavy metal concentrations especially Cd and Pb in muscle tissues were markedly above the permissible levels.

**KEYWORDS:** HEAVY METAL ACCUMALATION, *MUGIL CEPHALUS*, KÖYCEĞIZ LAGOON SYSTEM

ISEEP_112

# DETERMINATION OF THE SEASONAL CHANGES ON TOTAL FATTY ACID COMPOSITION AND Ω3/Ω6 RATIOS OF CARP (*CYPRINUS CARPIO* L.,1758) MUSCLE LIPIDS IN KIZILIRMAK RIVER (TURKEY)

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**Aim:** This study aimed at determining the influence of seasons the total fatty acid composition and ω3/ω6 ratios of carp muscle lipids in Kızılırmak River between November 2009 and October 2010.

**Methods:** This research was carried out in Kızılırmak River (38° 32' 54,21'' N, 34° 55' 24,66'' E) (110 km southeast of Ankara) which is the longest river of Turkey (1355 km). Carp is the main species for the freshwater fisheries which is widely distributed in nearly all fresh waters of Turkey. Muscle sample was directly taken from the area underneath the dorsal fin. The saponifiable lipids were converted to their methyl esters by using the standard boron tri-fluoride-methanol (BF3) method. Fatty acids methyl esters were analyzed on a HP Agilent 7890A model gas chromatograph equipped with a flame ionization detector and fitted with a HP-88 capillary column (100 m, 0.25 mm i.d. and 0.2 µm film thickness).

**Results:** In the present study, saturated fatty acids (SFA) (winter-summer); monounsaturated fatty acids (MUFA) (autumn-summer) and polyunsaturated fatty acids (PUFA) (summer-autumn) levels were found to be 23,007-29,231 g/100g; 25,706-30,565 g/100g; 38,873-49,680 g/100g in carp, respectively. Palmitic acid (PA) in SFA's 12,523 (winter)-19,837 (summer) g/100g; Oleic acid (OA) in MUFA's 18,054 (winter)-19,643 (autumn) g/100g and docosahexaenoic acid (DHA) in PUFA's 5,220 (summer)- 17,908 (autumn) g/100g; linoleic acid (LA) 0,943 (autumn)-4,378 (kış) g/100g; eicosapentaenoic acid (EPA) 6,398 (spring)-9,887 (winter) g/100g arachidonic acid (AA)5,704 (winter)-8,585 (autumn) g/100g were the most abundant fatty acids. The ratio of ω3/ω6 fatty acid composition's ranged from 0,935 (summer) to 1,460 (autumn).

**Conclusion:** Polyunsaturated fatty acids (PUFA) were found to be higher than saturated (SFA) and monounsaturated fatty acids (MUFA). According to these results, the fatty acid composition and ω3/ω6 fatty acids ratio in the muscle of carp were significantly influenced by season.

**KEYWORDS:** FATTY ACID COMPOSITION, Ω3/Ω6 RATIO, *CYPRINUS CARPIO*, KIZILIRMAK

ISEEP_113

# ENVIRONMENTAL EFFECTS OF LAND CONSOLIDATION STUDIES – ASSESSMENT OF TURKEY

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**Aim:** The main purpose of the land consolidation is to regulate scattered pieces and corrupted shapes of agricultural land, to plan road systems between parcels and settlements for making an economic agricultural management, and to project irrigation and drainage systems, landscape grading, soil conservation and amendment for taking advantages at the highest level of agricultural lands. In addition, to modernize for improving the farmers living environment, to locate the proper expanding area of rural settlements, and also to prepare the rural settlement reconstruction plans. During these studies, sustainable plans should be made and required measures should be taken for improving the rural environment and prevention of nature. The aim of this study is to make an assessment of the rural environment and land use changes before and after status of land consolidation applications by giving examples of the land consolidation studies in Turkey.

**Methods:** Statement of agricultural lands, current land use issues and their environmental effects in Turkey have been mentioned with datas and maps. Changes before and after status of land consolidation practices and ecological stabilities are summarized in various regions of Turkey. Factors should be considered during the land consolidation studies have been emphasized for environmental protection.

**Results:** In terms of the sustainability of the nature, the environmental changes summarized before have been evaluated. Required cautions to prevent the natural resources such as water and soil have been explained.

**Conclusion:** Current land use and land consolidation studies effects on the environment and problems faced after and before practices have been summarized. It has been highlighted that the importance of environmental protection during the land consolidation studies.

**KEYWORDS:** LAND CONSOLIDATION, ENVIRONMENT, TURKEY

ISEEP_114

# THE ROLE OF ECONOMIC FACTORS ON THE ECOLOGICAL CORRUPTION AND PROTECTION

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**Aim:** This study aims to show that “economic power” is one of the most important factors onto ecological corruption. Otherwise, it can be used effectively on industrialization and ecological protection.

**Methods:** Industrial activities play quite a big role on emergence of ecological problems and becoming more dangerous with each passing days. Developing and growing economic power lies on the basis of industrial activities. In today\'s world order, economic models allow the growth of heavy industries, especially in terms of environmental risks. On the other hand, people facing with very serious problems such as the global warming, climate changes, disappearance of living species and need to take a series of measures to protect the ecological scheme. Projects of the ecological protection are very costly, so “economic power”, which emerged on environmental pollution and ecological corruption, must be used for the protection of ecological balance.

**Results:** This dilemma shows us every uncontrolled and unplanned moves cause that very big problems for mankind. For example, classical treatment methods of wastewaters- including high organic matters- may not be sufficient anymore. As a result, advanced treatment methods, called the third stage, started to be implemented and very costly treatment plants were built for protecting the environment. Similar situations are also applied in the soil and air pollutions prevention activities.

**Conclusion:** All of these show that cleaning and protecting works of contaminated environment are more costly than industrialization.

**KEYWORDS:** ECOLOGY, ECONOMIC POWER, ENVIRONMENTAL POLLUTION, PROTECTION

ISEEP_115

# URBAN WASTEWATER MANAGEMENT ALONG COASTAL AREAS OF TURKEY: REIDENTIFICATION OF HOT SPOTS & SENSITIVE AREAS, DETERMINATION OF ASSIMILATION CAPACITIES BY MONITORING AND MODELLING AND DEVELOPMENT OF SUSTAINABLE URBAN WASTEWATER INVESTMENT PLANS

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**Aim:** Aims of this study are to update/review "Hot Spots (HS)" and "Sensitive Areas (SA)" of the coastal zone of Turkey according to international conventions; to determine the risk of eutrophication and to develop coastal ecosystem models for the priority areas; to determine optimum treatment technology for urban wastewaters.

**Methods:** In the context of this study, HS's were determined by assessing land based sources pollution and received water characteristics. Besides this, hydrodynamic and ecosystem models have been operated by using Delft 3-D model for Izmir and Mersin Bays. To develop and validate this model, detailed biological physical and chemical monitoring studies have been made for two years seasonally for both bays. After that, optimum urban wastewater treatment investment plan has been prepared for all coastal settlements of Turkey.

**Results:** Izmir, Edremit, Mersin, Iskenderun, Bandırma and Gemlik bays and Samsun City coastal areas were determined as HS's and HA's due to intensive human activity pressures and/or coastal water eutrophication risk. By using the results, tertiary treatment applications were suggested for the settlements with equivalent population higher than 10.000 in urban wastewater treatment investment plan prepared at the end of the project.

**Conclusion:** This project provided the use of newest concept, idea and technologies in order to protect ecosystem in our coastal regions and to reduce the wastewater input from land based sources by integrating the assessments of human activities environmental pressures on coastal areas and coastal waters as received waters.

**KEYWORDS:** COASTAL SENSETIVE AREA; HOT SPOT; EUTROPHICATION; URBAN WASTE WATER TREATMENT, INVESMENT PLAN

ISEEP_116

# INVESTIGATION OF HEAVY-METAL RESISTANCE IN THE ISOLATED BACTERIA FROM ALIAGA SHIP DISMANTLING ZONE AT THE AEGEAN SEA, TURKEY

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**Aim:** Ship dismantling process entails a series of risky tasks and as a depot of hazardous substances presents one of the important threats to the ambient environment. In this study, we have examined isolation of bacteria from marine sediments from ship dismantling area in the Aliaga coast (Aegean Coast).

**Methods:** The samples were collected from eight stations. Sediment samples were diluted and inoculated on Zobell and R2 Agar medium. Thirteen isolates were isolated and identified by phylogenetic analysis using 16S rDNA sequences. These strains have been investigated in respect of the minimum inhibitory concentrations (MICs) of heavy metals (Hg, Cu, Cd, Cr, Zn, Co, Ni) and susceptibility of some antibiotics (ampicillin, tetracycline, chloramphenicol, vancomycin, gentamicin and tobramycin).

**Results:** All the isolates were identified as Bacillus species. The MICs of heavy metals was different for each strain but the general order of resistance to the metals was found to be Ni > Co > Cu > Zn > Cr > Cd > Hg and the toxic effects of these metals increased with increasing concentration. It can be concluded that all isolates were sensitive to Hg but were highly resistant to Ni and Co. It was found that the strains were sensitive to chloramphenicol and tetracycline.

**Conclusion:** This present study revealed that most of the selected isolates belonged to the genera Bacillus which can be referred to metal toxicity indicators. High level of co-existence of metal and antibiotic resistance observed in the isolates could possibly indicate the presence of plasmids and/or transposons encoding genes linked to both resistances.

**KEYWORDS:** SHIP-DISMANTLING ZONE, HEAVY-METALS, BACILLUS SPP., MARINOBACTER SPP., AEGEAN SEA

ISEEP_117

# HISTOPATHOLOGICAL CHANGES IN TESTIS OF THE SWORDTAIL FISH, *XIPHOPHORUS HELLERI* (PISCES: POECILIIDAE) EXPOSED TO DELTAMETHRIN

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**Aim:** This experiment was done in order to how to have an effect Deltamethrin, incorporate into aquatic ecosystem as a result of agricultural activity on the testis tissue of swordtail fish.

**Methods:** Two series of experiment was carried out and total 60 swordtail fish was used. Then low (0.2 ppm) and high (0.4 ppm) sublethal dose of Deltamethrin that is pesticide kind of pyretroid was added into habitat of fishes. After waiting fishes in this environment for 72 hours, different fixative (%10 Formalin and Bouin) and Hematoksilen & Eosin was researched with stain method in the level of light microscope by obtaining tissue of Swordtail fishes.

**Results:** it is observed that low dose of Deltamethrin in the testis of swordtail doesn't generate structural defect characteristicly. Degeneration was observed doing seminifer tubules and reducement was observed in the number of mature sperm depends on increasing of dose.

**Conclusion:** In conclusion of experiment, it was determined that contamination of pesticide affect the qualitfy of sperm significantly.

**KEYWORDS:** DELTAMEHTRIN, TESTIS, HISTAPATHOLOGY, SWORDTAIL FISH

ISEEP_118

# RISK ASSESSMENT OF METAL POLLUTION FOR MELEN BASIN (TURKEY) ECOSYSTEMS

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**Aim:** Melen Basin, located in West Black Sea Region, very close to Istanbul and main industrial centres, is a strategic basin with 2238 km2 drainage area. The basin holds an important water capacity. It serves like a lifejacket to produce water to nearby areas. Also its predominant green vegetation and biodiversity makes the basin even more important. The water quality in the basin and particularly metal content of these waters has a potential to damage severely the ecosystem. The main purposes of this study are to determine pollution levels and risks of the metals harmful to the ecosystem, to suggest solution proposals and to contribute the sustainable management for similar basins.

**Methods:** In nine sample points, selected to represent main water supplies which characterize the basin, water samples were collected according to standard procedures. The water samples were filtrated to determine dissolved metal content. The dissolved portion was analysed with ICP (Inductively Coupled Plasma). The possible pollution points to produce metal pollution in the basin were determined.

**Results:** The analysis results in the main water supplies showed that it is possible to determine, in their dissolved form, probable harmful metals to human and animal life like arsenic, manganese, iron, cadmium and molybdenum in the ecosystem. Industrial facilities located nearby to basin were investigated and the facilities that may have a potential effect were determined. According to these results we conclude that human and animal life is under metal pollution threat and necessary measures must be taken

**Conclusion:** Even in local cases, metal accumulation in waters and soils affects via food chain all the ecosystem cycle. The importance of water and the need for eliminating these harmful metals from the waters are evident. Comprehensive pollution reports must be executed and pollution points must be monitored progressively. Pollution must be monitored periodically in main supplies and continuous pollution forecasts, using relevant models must be applied. According to these results purification points must be determined and suitable purification technologies must be used

**KEYWORDS:** MELEN BASIN, METAL, POLLUTION

ISEEP_121

# HPV INFECTION CU HPV IN SOME HUMAN POPULATIONS FROM THE NORTH-EASTERN ROMANIA

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**Aim:** Explanation of some epidemiological aspects regarding the causality, the natural history specification, thee prognostic, vaccination prevention and protection measures for the HPV infection.

**Methods:** The data were collected from municipal hospitals and NGOs from the north-eastern Romania and regarded women, HPV infection confirmed cases. We used the Babes-Papanicolau coloration method for analysed smears. Our statistical analyse followed the infection level, the age groups and the social environment.

**Results:** The HPV infection incidence increased during the last years in the investigated territory. We found a smaller percentage for the rural area than in the urban area. Regarding the age groups, we recorded two peaks, one for the women under 25 years old, the second one for the women older then 50 years.

**Conclusion:** It is necessary one better campaign for the prevention through national programmes of vaccination and screening for the threatened population.

**KEYWORDS:** HPV INFECTION, STATISTIC ANALYSE, INCIDENCE

ISEEP_122

# DETERMINATION OF THE SEASONAL CHANGES ON TOTAL FATTY ACID COMPOSITION OF PIKE (ESOX LUCIUS L., 1758) MUSCLE LIPIDS IN KIZILIRMAK RIVER (TURKEY)

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**Aim:** It was aimed to determine the seasonal variations in the total fatty acids composition of Pike's (Esox lucius) muscle lipids living in Kızılırmak River between November 2009 and October 2010.

**Methods:** The study area location was the district of Köprüköy in Kırıkkale province (38° 32' 54,21''N, 34° 55' 24,66'' E). The river studied is 1355 km long, and it is one of the important water source of the region it flows. Additionaly, its fish populations is also of a great importance. The lipids were extracted by chloroform / Methanol (v/v) and after methylation process they were analuyzed by GC with FID dedector (HP 7890A) fitted 60 m of capiller column. The results were identified by using 37 mixed standard fatty acids specimens.

**Results:** The highest levels of the saturated (SFA), mono unsaturated (MUFA), and poly unsaturated fatty acids were found to be as 28.581 g/100g (summer), 35.534 g/100g (summer), and 44.836 g/100g (spring), respectively. Palmitic acid was the dominant SFA in both season with the levels of 15.188-18.950 g/100g, while oleic acid was representing the MUFA (12.511-18.345 g/100g). The level of PUFAs were higher than that of both SFA and MUFA in all seasons studied. Docosahexaenoic acid (DHA), linoleic acid (LA), eicosapentaenoic acid (EPA), and arachidonic acid (AA) were mot abundant PUFAs. The levels of DHA, LA, AA, and EPA were 6.761 (summer)- 15.136 (autumn) g/100g, 1,146 (summer)-2.715 (autumn) g/100g; 6.796 (winter)-7,974 (autumn) g/100g, 7.447 (winter)-12.432 (autumn) g/100g, respectively in the pike's muscle. On the other hand ω3/ω6 ratio was at the lowest level in summer (0.988) and highest in autumn (1.388).

**Conclusion:** The results showed that DHA and PUFA levels of pike's muscle increased remarkably in autumn. It could be because of this season is a preparatory period for spawning activity occurs in winter. It was observed that their levels decreased in winter. This is an indication that the fatty acids composition of pike's muscle was significantly influenced by both spawning and season. On the other hand, it is a good source for PUFAs like DHA, LA, AA, and EPA.

**KEYWORDS:** FATTY ACID COMPOSITION, PIKE, SEASONAL VARIATION, ESOX LUCIUS, KIZILIRMAK RIVER

ISEEP_123

# FINANCING OF ENVIRONMENTALLY FRIENDLY AGRICULTURAL PRODUCTION: ECO-FINANCING AND APPLICATIONS IN TURKEY

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**Aim:** The growing global economy and providing the capital necessary to get a place has become a regular event for producers that livelihood with agriculture. Traditional production during periods of widespread, intensive input use on making the increase in production was essential. Countries\' effort towards industrialization, agriculture-industry interaction with the growing pollution, has accelerated to adopt environmentally friendly production models. Countries with application of purchasing and financing, have adopted policies to give priority to agriculture production structure compatible with the environment. In this way, \"agriculture eco-finance\" concepts have been noted. At this research, generally two situations will be analysis. One of them is how it can be reduced the environmental damage of agriculture with eco finance, and other is how it can be realized and developed environmentally sensitive agricultural production.\"

**Methods:** In the study, financing of eco-related activities and projects of public institutions will be evaluated. In addition applications of some banks and environmental organizations will be examined. An example might be used in publications and events related institutions and organizations.

**Results:** In Turkey, at the support of environmentally friendly agricultural production is a funded low-interest loan such as organic agriculture, good agriculture, protection of agricultural land for environmental purposes, modern irrigation system. In this regard, there are contributions the use of public resources in addition to private sector credit institutions and non-governmental organizations too.

**Conclusion:** Eco-finance growing the world and Turkey has revealed the sensitivity of agriculture to the environment. Awareness of the producer and consumer increases by environmentally friendly production. Eco-finance is important production continuation that usage of sustainability of resource and development of eco-finance is required.

**KEYWORDS:** AGRICULTURE, PRODUCTION, ENVIRONMENT, ECONOMY, FINANCE

ISEEP_125

# DETERMINATION OF POLLEN CONTAMINATION LEVEL IN A CLONAL SEED ORCHARD OF *PINUS BRUTIA* TEN. WITH THE AID OF CHLOROPLAST SSR (CPSSR) MARKERS

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**Aim:** Pollen flow from undesirable sources into seed orchard (contamination) is one of the important factors that affects adaptability and genetic quality of produced seeds. In this study, pollen contamination level was estimated in a *Pinus brutia* clonal seed orchard, by screening the 30 clones from the seed orchard with the aid of cpSSR markers.

**Methods:** Microsatellite analysis was performed on both maternal and embryo tissues of seeds collected from seed orchard and megagametophyte tissues of seeds or needles collected from close natural stand. Six cpSSR loci were analyzed.

**Results:** Twenty-three alleles and 36 combinations referred to as haplotypes were detected. Haplotypic diversity in the clones was 0.849. Eighty-seven embryos among the 300 analyzed had no compatible male parent within the seed orchard and their real male parents were considered to be located outside the seed orchard. Microsatellite-based paternity analysis revealed that the contamination rate (m) is 0.393. Background pollination at this level will cause losses in predicted genetic gains by 20%.

**Conclusion:** Our findings are valuable for the assessment of the seed orchard function. It may be worthwhile to use pollen management strategies or to manipulate pollination environment to decrease pollen contamination and increase the genetic quality of seeds produced.

**KEYWORDS:** *PINUS BRUTIA*, POLLEN CONTAMINATION, SEED ORCHARD, GENE FLOW, CHLOROPLAST MICROSATELLITE MARKERS.

ISEEP_126

# A PRELIMINARY RESEARCH ON HEAVY METALS ACCUMULATED IN LIVER AND MUSCLE TISSUE OF SEAHORSE (*HIPPOCAMPUS HIPPOCAMPUS*) CATCHED FROM TIREBOLU COASTS (GIRESUN, EASTERN BLACK SEA)

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**Aim:** The aim of research, heavy metals (Zn, Pb, Cu, Cd) on livers and muscles tissue of seahorse (*Hippocampus hippocampus*) is to determine accumulation levels

**Methods:** The 20 died seahorse individuals were collected from regional fishermens, Tirebolu coasts in Novamber 2010. Standart length (SL, mm), weigth (W, g), liver and muscle dry weigth were measured in all the samples. Tissue samples kept in 70% alcohol were digested by HNO3/HCLO4 (2:1v.). And determinations of heavy metals were carried out by Metrohm 797 VA computrace voltameter in DP-ASV mod. Results were calculated as ppm (mg/gr).

**Results:** In all fish samples, mean of standart length was calculated as 78±19.68 mm, mean weigth was 2.02±0.34 g. The highest level of Pb, Zn, Cu, Cd were found in muscle tissue indescending order and their values were 1750,6;197,4;121,32;1,568 ppm respectively.

**Conclusion:** The heavy metals in tissue of liver exceeded permissible levels in Turkish Fodd Codex (2002-63) in some of the samples. Causes of higher levels in tissues of seahorse were attribuited to atmospheric sources like fosil fuoil consumption and to territorial sources as mine reservoirs (Cu,Pb,zn).

**KEYWORDS:** SEAHORSE, HEAVY METAL, ACCUMULATION, TIREBOLU, EASTERN BLACK SEA

ISEEP_127

# ORNITHOLOGY - IMPORTANT ELEMENT IN ECOLOGICAL EDUCATION IN ROMANIAN SCHOOLS

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**Aim**: In the past few years the need to preserve biodiversity increased. We noticed this trend among the pupils from some romanian schools, next to their interest for birds. This led us to the conclusion that a new course should be introduced in the curriculum – ornithology.

**Methods**: To accomplish our aim, we started by projecting a handbook and the teacher's curriculum for this course where are described all the contens that will be teached, the methods that will be used in order for the children to develop the established skills.

**Results**: As members of the Romanian Ornithological Society, we managed to introduce ornithology in the curriculum but only as an elective course. At the end of this course, the pupils where able to identify a bird by it's song or appearance, to determine the impact of human activities on birds and to find solutions to protect these organisms.

**Conclusion**: After only two years of teaching this course, we observed some major changes in the children's behavior towards nature. This calls for it's transformation into a mandatory course, in order for this changes to occur to a larger number of people.

**KEYWORDS:** ORNITHOLOGY, ECOLOGICAL EDUCATION

ISEEP_128

# TIME-ACTIVITY BUDGETS OF WHITE-HEADED DUCKS (*OXYURA LEUCOCEPHALA* SCOPOLI, 1769) WINTERING AT BURDUR LAKE, TURKEY

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**Aim:** Diurnal time-activity budgets of White-headed Ducks were investigated with respect to sex and and temporal environmental variables to document behavioral responses to winter conditions and nutritional requirements at Burdur Lake where the largest winter concentrations ocur.

**Methods:** Scan Sampling and Focal Sampling methods were used to estimate diurnal time budgets of White-headed ducks at 4 coastal observation station in Burdur Lake during 2008-2010. Each site was visited during each of 3 equal diurnal periods (morning, afternoon, evening) once a month. Behaviors of males and females were recorded separately in randomly selected focal flocks during 1140 sessions. We categorized behaviors as feeding, resting, locomotion and comfort. The frequency of occurrence of these behaviors exhibited different time periods in the population were determined. We identified sex differences with independent t-test and diurnal period differences with ANOVA. To determine correlations between behavior and environmental variables, we used Tukey test.

**Results:** We found that on average, White-headed ducks spent most of the diurnal period by resting. During the day they spent %61 of time resting, %22 feeding, %12 comfort and %5 in locomotion. Resting peaked in the middle of day while feeding was observed frequently in evening and morning. Time use did not differ significantly between sexes. However, it was detected that more time was spent feeding during windy days as wave-height increased.

**Conclusion:** The individuals displayed different behaviors to balance their body temperature and to protect their energies in different periods of the day. They performed especially resting and comfort behaviors in the middle of day which temperatures were highest. High feeding performance in windy days might be explained by high prey availability with high tides and increased water circulation.

**KEYWORDS:** BEHAVIOR, DIURNAL PERIOD, TIME-ACTIVITY BUDGETS, WINTERING, BURDUR LAKE.

ISEEP_130

# MONITORING OF SOME BIRDS' BREEDING COLONIES IN THE PRUT RIVER BASIN (ROMANIA)

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**Aim:** We follows to estimate the dinamic of some herons, but also, terns breeding colonies present on some fisheries ponds and dam lakes from the Romanian side of Prut River basin in order to propose management measures to preserve the biodiversity in these areas.

**Methods:** We used directly observations by binoculars and telescope, visiting colonies for birds\' counting during the breeding season in two important Nature 2000 network SPAs from the Prut River basin: Carja-Mata-Radeanu-Roscani, respectively, Jijia and Miletin Ponds. Our study began in 2004 and go on.

**Results:** We recorded 205 bird species, 117 of it being breeding birds in the investigated areas. We paid our attention to the groups of herons, egrets, spoonbills (*Ardeidae* and *Threskiornithidae*), but also, for terns (Sternidae) following the dinamic of species included in the Annexe 1 of Birds\' Directive Botaurus stellaris, Ixobrychus minutus, Egretta garzetta, Ardeola ralloides, *Ardea alba, Ardea purpurea, Nycticorax nycticorax, Plegadis falcinellus, Platalea leucorodia, Chlidonias hybridus.*

**Conclusion:** Our data permit us to propose ecological and fiendly fisheries' management in order to increase the suitable habitats for these bird groups and other ones present in the area.

**KEYWORDS:** BIRDS, BREEDING COLONIES, MONITORING, PRUT RIVER

ISEEP_131

# THE EFFECT OF PH, DOC AND INORGANIC CARBON ON OZON/HYDROGENPEROXIDE TREATMENT FOR REDUCTION OF THM PRECURSORS

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**Aim:** Purpose of this study; removal of THM's emerged during disinfection of water by Ozone / Hydrogenperoxide (O3/H2O2) method and exploration of its effects on water quality parameters like Dissolved Organic carbon, inorganic carbon and pH.

**Methods:** Analysis are applied to Ozone / Hydrogenperoxide process different concentration of DOC, Ct and pH. Sentetic waters containig humic acid are used this analysis. Applied to Trihalomethane Formation Potantial (THMFP), dissolved organic carbon concentration (DOC), dissolved ozone concentration (O3)s and dissolved hydrogenperoxide concentration analysis. During THMOP experiments, potantial of water to form chloroform taken as base ad Standard Method 5710 (APHA, AWWA, WPCF 1989) is used as method of analysis. CHCl3 formed after 7 days incubation time, according to EPA Method 551.1. "GC-ECD", pentane and liquid extraction used for analysis. Dissolved Ozone analysis are performed according to Indigo Method expressed by Bader and Hoigne. Measurements of Hydrogenperoxide are carried out by the method of "Peroxidase/N,N diethyl –p-phenylene-diamine (POD/DPD) that can measure H2O2 at low concentrations and not sensitive to organic matters (Badder and Hoigne, 1988)

**Results:** In the O3/H2O2 system removal of THMFP is seen to be decreased from % 87 to % 66 as DOC concentration one of water parameters increases from 1.63 mg/l to 4.43 mg/l. In same system, when situation is changed from being absence of inorganic carbon in solution to increment of Inorganic carbon to 2 mM and 4 mM resulted in THMFP concentration decreased to % 86, % 56 and % 34. This results show that removal efficiency of THMFP decreases as concentration of Inorganic carbon increases. In addition when pH increases between 5 and 9 and increase in catalytic conversion of O3 and H2O2, less quantity of THMOP is detected.

**Conclusion:** By O3/H2O2 system removal of THM precursors adversely affected when concentrations of water parameters DOC and Ct are more. In addition, with increase of value of pH, less amount of THM formation is observed. In removal of THM precursors, although treatment of O3/H2O2 is observed at high efficiency at basic pH and nötr chlorination efficiency is decreased with chlorination at basic chlorination.

**KEYWORDS:** OZONE/HYDROGEN PEROXIDE, THM PRECURSORS, DISSOLVED ORGANIC CARBON, INORGANIC CARBON, PH.

ISEEP_132

# THE EFFECT OF PLANNING PROCESS ON CULTURAL AND NATURAL PROPERTIES THAT MUST BE PROTECTED; BODRUM EXAMPLE

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**Aim:** In this bulletin, the effect of cultural properties like soil, water, air which are the common value of humanity and environment on people and their speculations as well as pursuing protection of sources for human future and their balanced usage, and the effects of planning, defined as decision for physical environment planning intended to make human to live in healthy environments on cultural and natural properties is aimed.

**Methods:** This bulletin, which will also be supported with visual materials, will be discussed taking benefit of findings gained from determinations that have been made in the area for Revision Reconstruction Plan for Protection in 2000s, transformation period of traditional Bodrum houses in urban protected site. In the bulletin, for that reason, natural and cultural values that the peninsula have, and its formation process, the relations of peninsula people in planned and unplanned periods with these values will be dealt with.

**Results:** In order to feature the historical identity of the city and to develop the cultural and natural properties within the scope of protection, it has been envisaged to make the city salubrious by targeting 12 pieces of Urban Design Areas (UDA) to be presented for public service and designed integrally.

**Conclusion:** Nature and cultural tourism that started in 1970s in the peninsula, as a result of tending to sea tourism as a mass tourism after 1980s, these negative situations could not have been obviated because of the fact that regulations for protection of natural and cultural values coincided with pressures on structuring in the area at the same time. In protection planning, it is required to make top decisions considering the data from the bottom not from the upper scales, at least in collaboration.

**KEYWORDS:** BODRUM PENINSULA, PLANNING, CULTURE AND NATURAL HERITAGE, CONSERVATION, ECOLOGY

ISEEP_134

# ESTIMATION OF ALTITUDINAL GENETIC VARIATION IN *PINUS SYLVESTRIS* L. POPULATIONS IN TRABZON BY RAPD MARKERS

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**Aim:** *Pinus sylvestris* is the most widely distributed member of the Pinaceae family in the world. The most southern populations of *P. sylvestris* lie in Turkey. The purpose of this study was to determine altitudinal genetic variation in *P. sylvestris* populations in Trabzon with the help of RAPD primers.

**Methods:** Cones were gathered from 149 trees in 5 different populations from sea level to 2250 meter. RAPD analysis was performed on megagametophyte tissues of seeds. Six RAPD primers were analyzed.

**Results:** A total of 37 loci were found in the analyzed five populations in six primers. The mean proportion of polymorphic loci was 95.7%. Genetic diversity parameters; mean number of alleles per locus was 1.96, effective allele number was 1.55, Shannon's information index was 0.493. The mean Nei (1973)'s gen diversity value was 0.328. According to Gst results, high proportion of genetic diversity (94.6%) was within populations.

**Conclusion:** The results of our study suggest that middle elevation population represents higher genetic variability and have greater adaptability than the populations from much lower and/or higher elevations. Populations with higher genetic variation have potential for adaptation to a changing environment. Therefore, the mid-elevation populations should be given a high priority in forest tree breeding, selection and for in situ conservation activities in the region.

**KEYWORDS:** ALTITUDINAL VARIATION, *PINUS SYLVESTRIS*, RAPD, ADAPTATION.

ISEEP_135

# THE USE OF ENVIRONMENTAL POLICY INSTRUMENTS IN TURKEY

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**Aim:** Environmental problems continue to grow worldwide. Policy alternatives to address these problems solve into two general categories: command-control and market-based economic instruments. The principle aim of this paper is to examine what kind of instruments is used in Turkey and to evaluate the effectiveness of these instruments.

**Methods:** Firstly, we will review the main categories of environmental instruments, both command and control instruments and market-based economic instruments. In order to evaluate the effectiveness of these instruments, we will identify the main characteristics of each category and demonstrate the weaknesses, strengths and limitations of these policy instruments. Secondly, we will analyse the environmental policy instruments used in Turkey and try to interpret the effectiveness of these instruments. We will conclude by giving some suggesstions of the effective environmental policy instruments for Turkey .

**Results:** The results of this study show that majorly command-control instruments as tax and duties are used as environmental policy instruments in Turkey. These instruments are not used effective since they are designed with treasury income purposes rather than environment protection.

**Conclusion:** The instruments of environmental policy should be designed with environmental purposes and their effectiveness should be increased by legal arrangements. Besides using some marked-based instruments is also important. In this framework, in order to limit the use of natural resouces, emission and production of environmentally hazardous goods new taxes, deposits and repayment systems should be generated, wastes should be dissolved with minimum contamination effects.

**KEYWORDS:** INSTRUMENTS OF ENVIRONMENTAL POLICY, COMMAND-CONTROL INSTRUMENTS, MARKED-BASED INSTRUMENTS.

ISEEP_137

# RECYCLING OF PYRITE ASH WASTE

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**Aim:** Roasting waste, called pyrite ash (or pyrite cinder), is both hazardous environmentally and contains in high ratio iron. Although iron content of pyrite ash is 60-65% approximately, it can not be used as an iron ore in blast furnace because of its impurities such as Cu and S. Therefore, it is necessary to recovery such as the metal such as Cu containing pyrite ashes being waste and also to send away an harmful element such as S. After realizing this operation, briquetting from pyrite ash will be suitable. In addition, it is necessary to use as a blast furnace feed of pyrite ash.In this study, it has been aimed to prepare briquet or pellet, from pyrite ash forming huge heaps in plant land, which can be used for the production of iron in the blast furnace, and in addition to this, to recover metal such as copper and to removal sulphur. This study in which pyrite ash from Bandırma Borax and acid Plants of Eti Mine Enterprises General Menagement l be used will be performed in two stages.

**Methods:** In first step of the work, ammonia and oxygen have been selected as leaching reagent for the leaching of copper and sulphur in the ash of pyrite. On the leaching yield of sulphur and copper, effects of parameters such as ammonia concentration, total pressure, pressure of oxygen, solid to liquid ratio and leaching time have been investigated.In the second stage, pyrite ash, exposed to leaching, have been briquetted using binder. $Ca(OH)_2$ and $(NH_4)_2CO_3$ have been selected as binder. On the yield of briquet, effect of parameters such as $Ca(OH)_2$%, $(NH_4)_2CO_3$ and press strength have been investigated.

**Results:** In first step, under the optimum condition, the yield for leaching of sulphur and copper were found as 97,71% and 48,77% respectively. In the second stage, at the optimum condition, pyrite ash has been agglomerated. Briquets with crushing strength of 278 kg/cm2 could be obtained which were suitable for use as a blast furnace feed in the iron production industry. For leaching of copper and sulphur, ½ 25 and for briquetted 23 factorial experimental design method have been used.

**Conclusion:** In first step, under the optimum condition, the yield for leaching of sulphur and copper were found as 97,71% and 48,77% respectively. In the second stage, at the optimum condition, pyrite ash has been agglomerated. Briquets with crushing strength of 278 kg/cm2 could be obtained which were suitable for use as a blast furnace feed in the iron production industry. For leaching of copper and sulphur, ½ 25 and for briquetted 23 factorial experimental design method have been used. Active models have been found from obtained results for leaching and briquetted systems.

**KEYWORDS:** PYRITE, PYRITE CINDER, LEACHING, BINDING, BRIQUET

ISEEP_138

# PROTECTION OF THE ENVIRONMENT IN TERMS ON MOTOR VEHICLES TAX

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**Aim:** Taxes have an important role to make positive effects on protecting environment. In the study, examine tariff and tax on motor vehicles in various countries be compared the situation in Turkey and try make solutions will be positively related to the environment. Protection of the environment in terms on motor vehicles tax The main and the oldest historical purpose of taxes is financial (fiscal) goal. This purpose implies that taxes, must provide adequate funding represents for public expenditures and to meet the level of public spending. In addition. Throughout history, argued that taxes should be neutral and should not affect the decisions, attitudes, behavior of individuals\'. However, due to the economic crisis of 1929-1930 taxes, especially in the last century has evolved into an interventionist character. Taxes can be adopted through the intervention in economic life. In addition, through taxes, social, cultural, and even ensure the environmental impacts have been noted. Purpose of taxes is no longer only financial but also non-financial (extra-fiscal) purposes are put into implementation. In this context, create a positive impact on the environment in terms of size, can be helpful in taxes. Direct effects on the environment can be made by taxes as carbon tax. Motor vehicle tax tariff has a big role in creating a positive effect on the environment protection by keeping taxes low on vehicles which are less polluting in the environment. **Methods:** This is a tax law study. Examine the other countries\' motor vehicles tax. Than the results are compared withTurkish system.
**Results:** Use of environmentally friendly and less polluting vehicles can be encouraged by re-sheduled the tariff of Motor Vehicles Tax.
**Conclusion:** Protection of the environment in terms on motor vehicles tax. The main and the oldest historical purpose of taxes is financial (fiscal) goal. This purpose implies that taxes, must provide adequate funding represents for public expenditures and to meet the level of public spending.In addition. Throughout history, argued that taxes should be neutral and should not affect the decisions, attitudes, behavior of individuals\'. However, due to the economic crisis of 1929-1930 taxes, especially in the last century has evolved into an interventionist character. Taxes can be adopted through the intervention in economic life. In addition, through taxes, social, cultural, and even ensure the environmental impacts have been noted. Purpose of taxes is no longer only financial but also non-financial (extra-fiscal) purposes are put into implementation. In this context, create a positive impact on the environment in terms of size, can be helpful in taxes. Direct effects on the environment can be made by taxes as carbon tax. Motor vehicle tax tariff has a big role in creating a positive effect on the environment protection by keeping taxes low on vehicles which are less polluting in the environment.

**KEYWORDS:** TAX, ENVIRONMENTAL TAXES, MOTOR VEHICLES TAX

ISEEP_139

# USING AN ENVIRONMENTAL FRIENDLY ENERGIES – A BIOGAS CASE STUDY

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**Aim:** In terms of environmental and human health, a lot of serious problems faced like as water pollution, odour, flies and epidemic diseases. Having produced biogas with handling methane gas by anaerobic fermentation of organic wastes, sewage sludge output has been more valuable than organic wastes for using with various purposes. For this reason, biogas is the best energy type for utilization in rural areas. Producing energy from livestock wastes and utilizing the proses output material to improve the soil structure in agricultural lands will both decrease the environmental damage and contribute the national economy. Although biogas has been an important renewable energy in the world, it is not widespread practice in Turkey. In this study, the economical benefit for cattle breeding enterprise in which Ankara, Polatlı is analysed and proper biogas and cogeneration systems are designed.

**Methods:** Daily waste amount has been calculated by considering the farmstead activities, livestock capacities, basis of knowledge and previous studies. Cost of cogeneration and biogas systems have been determined.

**Results:** Economical benefits for farmers have been explained by using the biogas systems.

**Conclusion:** Finally, it has been emphasized that the common biogas systems are more economical than one enterprise's utilization. Thus, the damage of livestock wastes to the environment will be decrease, too.

**KEYWORDS:** BİOGAS, MANURE, ENVİRONMENT

ISEEP_140

# WATER QUALITY OF LAKE BURDUR WETLAND AND BOZÇAY RIVER

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**Aim:** Burdur lake has been considered as a Ramsar Site since 1994. The aim of the study is to demonstrate water quality trends of Lake Burdur wetland and Bozçay stream which is one of the most important streams fed Burdur Lake.

**Methods:** We will introduce the water quality data between 2005-2008 and discuss the quality trends and the impact on the wetland. We will also discuss Bozçay water quality as an irrigation water. Water quality data include Na, K, Mg, Ca, CO3, HCO3, SO4, Cl and B. The water quality data obtained from General directory of Electrical Power Resources Survey and Development Administration (EIE).

**Results:** Results: Flow rate of Bozçay changes between 0.820-0.052 m3/s. While the lowest rates were observed in August-September, the highest rates were observed in December-November. Electrical conductivities (EC)of Bozçay River were 1.092-0.642 dS/m, highest in May and June. At all sample sites and times, Boron concentrations were lower than 1 ppm. The water is high in bi-carbonate and Ca plus Mg. Water of Lake Burdur is rich in all parameters observed. Especially, Na and SO4 content are very high. EC of the water is 30-31 dS/m.

**Conclusion:** Although, having high Ca+Mg and CO3 content makes Bozçay's water calcareous, water quality of Bozçay River is quite suitable for irrigation. It has low in B, Cl and SAR. Water quality of the river is suitable for irrigation and attracts the growers. Flow rate data shows that river's flow rate diminishes in irrigation season. Consequently, one of the most important feeder of Lake Burdur is cut almost 80% plus high evapotranspration rate make the lake lack of water.

**KEYWORDS:** BURDUR LAKE, BOZÇAY, WETLAND, IRRIGATION WATER QUALITY

ISEEP_146

# INVESTIGATION OF THE PRODUCTION OF BORON CONTAINING FERTILIZER FROM WASTE BORON GYPSUM

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**Aim:** Turkey is the country in the world that has the largest boron reserves. Boric acid and boron containing products are produced from boron ore by using this advantage. Various wastes are occuring during the production of these products. Approximately 3 tons of boron gypsum is occured per tons of boric acid produced from concentrated colemanite. There have been boric acid factories in Bandırma which is a town of Balıkesir and Emet which is a town of Kütahya named Eti Mining Enterprises and approximately 200 thousand tons of boric acid is obtained annually. Boron gypsum, which occurs during the boric acid production and contains 4.5% B2O3, usually stored in the open field. Each time new storage areas are needed, certain costs are consumed for storage process and also large areas are occupied. The most appropriate solution for this problem is the economical and effective assessment of boron gypsum. In this way, the boron gypsum not only will be used as raw material and also removed from the nature. The aim of this study is to prepare a fertilizer from boron gypsum which is applicable for all agricultural crops grown in any type of soil.

**Methods:** Kinetics Methods and Optimisation methods

**Results:** The fertilizers having N, P, S and Ca in its composition was investigated. With the help of the data obtained from this study, fertilizers containing an important nutrient for plants, including phosphorus, nitrogen, sulfur, calcium and boron, will be produced from the waste which is harmful to the environment and has large storage costs. Thus, by assessing the boron gysum waste as fertilizer it will be gained to the economy and also a waste will be eliminated.

**Conclusion:** The fertilizers having N, P, S and Ca in its composition was investigated. With the help of the data obtained from this study, fertilizers containing an important nutrient for plants, including phosphorus, nitrogen, sulfur, calcium and boron, will be produced from the waste which is harmful to the environment and has large storage costs. Thus, by assessing the boron gysum waste as fertilizer it will be gained to the economy and also a waste will be eliminated.

**KEYWORDS:** GYPSUM, BORON GYPSUM, FERTİLİZER, WASTE

ISEEP_148

# TURKEY FORESTRY OF EXTERNALITY CONCEPT AND ECOTOURISM ACTIVITIES

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**Aim:** Primarily the concept of externalities will be examined as atheoretical. Then ecotourism activities which positive and negative externalities of Turkey forests / forestry will be discussed.

**Methods:** In this paper, externalities subject is analyzed and in content of Artvin- Camili Biosphere Reserve Area is used as data. Questionnaires were inquired both before and after the ecotourism activities. Data will be analyzed through descriptives, Chi-Square, paired T tests, and Wilcoxon analyses.

**Results:** In the turkey forest /forestry, positives and negative externalities are very important issue. Solution of these issues ecotourism should use as a tool.

**Conclusion:** For natural environment, in the determination externalities, ecotourism can contribute to the sustaining the natural and cultural values while it offers participation of local people in tourism activities.

KEY WORDS: FOREST VİLLAGERS, EXTERNALİTY, TOURİSM, ECOTOURİSM, FOREST-FOREST

ISEEP_149

# GENETIC COMPARISON OF *PINUS BRUTIA* TEN. POPULATIONS FROM DIFFERENT ELEVATIONS BY RAPD MARKERS

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**Aim:** The aim of the present study is to investigate genetic variation within and among six natural populations of *P. brutia* Ten. from two altitudinal transects with the aid of RAPD markers.

**Methods:** Sixty individuals from each of six (totally 360) populations at Duzlercami common-garden test site was screened by nine RAPD (Randomly Amplified Polymorphic DNA) primers. Genetic diversity parameters were calculated by the software POPGENE version 1.31.

**Results:** A total of 32 loci were found in the analyzed six populations for nine primers. The mean proportion of polymorphic loci was 100%. Genetic diversity parameters; mean number of alleles for each loci was 2.0, effective allele number was 1.71, Shannon's information index was 0.58. The mean Nei (1987)'s gen diversity value was 0.4. According to Gst results, high proportion of genetic diversity (95-99%) was within populations.

**Conclusion:** Our results showed that all genetic diversity parameters were relatively higher among the middle and upper-middle elevation populations than the lower and higher elevation populations. Also, the results indicate that natural selection operates on different directions on *P. brutia* populations growing at different elevations and have genetic variation slightly associated with seed source elevation. Therefore, for forestry practices such as selection of seed sources, determination of seed transfer zones and genetic resource conservation programs, the best populations should be defined with strong emphasis the consideration of elevation gradients.

**KEYWORDS:** ALTITUDINAL VARIATION, LOCAL ADAPTATION, TURKISH RED PINE

ISEEP_150

# ENVIRONMENTAL CONTRIBUTIONS OF NATURAL TEXTILES TO THE TEXTILE POLLUTION

SAFIYE SARI

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**Aim:** Since the second half of the twentieth century- in paralel with the rapid population growth and industrial developments- both local and global environmental problems have begun to emerge. Especially the developing international companies heading for the eastern countries, which have cheap labor, strengthen the textile industry, but at the same time that causes environmental pollution. There is no wonder that preventing this pullution gives responsibilities to the environment (with the effect of large–scale production) we live in and human beings who have responsiblities for transfering the environment to the future generations. The purpose of this study is to find alternative solutions and provide environmental contribution to the textile endustry by increasing the use of natural textile surfaces that increases ecological awareness which can be entegrated into the enviroment and ecological problems of our environment which is damaged by textile wastes

**Methods:** Statistical Results, Photo and Schema, Visual Presentation, Data Analysis.

**Results:** This study is to find alternative solutions and provide, environmental contribution to the textile endustry, Clean Production Technologies, Reduce the amount of waste, Recycling of Textile wastes, Disposal of waste without harming the environment, Prevention of the Textile- Pollution, Environmental Management.

**Conclusion:** Increas the use of natural textile, Prevention and reduction of pollution proseses, Acceleration of the effective application of environmental gains, Environmental Standards in the Textile Sector, Promotion of Cleaner Production Technologies will not disrupt the ecological balance, Implementations of cleaner production strategies in Textile production

**KEYWORDS:** TEXTILE, ENVIRONMENTAL POLLUTION, NATURAL TEXTILES

ISEEP_151

# FRESHWATER ICHTHYODIVERSITY AND ITS CONSERVATION IN IRAN

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**Aim:** Iran is considered as a center for the origin of many species. The wide ranges of geographical and geological conditions coupled with the climatologically diverse environments provide this enormous diversity. Iran lies in the Palearctic zoogeographical realm bordering the Oriental and African ones so of considerable interest in this respect. Northern and western Iran is considered as part of Irano-Anatolian biodiversity hot spot which contain many centers of local endemism. This paper presents diversity of Iranian freshwater fishes including endemics, exotics and transplanted species and the status of fish conservation. **Methods:** This paper has been compiled from examination of ichthyological collections in Iran, Europe and North America and extensive field expeditions from 1976–2010. **Results:** The confirmed freshwater fishes of Iran comprise 202 species in 104 genera, 28 families, 17 orders and 3 classes found in 19 different basins. There are also 23 species whose presence in Iranian waters needs confirmation by specimens. The most diverse order is the Cypriniformes with 120 confirmed species (59.4%) followed by Perciformes with 28 species (13.9%), Cyprinodontiformes (10 species, 5.0%), Clupeiformes (9 species, 4.5%), Salmoniformes (7 species, 3.5%), Mugiliformes and Siluriformes each with 6 species (3.0%), Acipenseriformes (5 species, 2.5%), Gasterosteiformes (3 species, 1.5%), and 8 other orders each with one species (0.5%). New species are still being discovered, 7 described in 2009, while others are being resurrected from synonymy, newly recorded from Iran, or exotic species newly established. Some taxonomic problems remain and are commented on briefly. Thirty-nine endemic species (19.3%) in 6 families and 23 exotic species (11.4%) in 8 families are listed here. At present, many factors, including climate changes and increasing risks of desertification, over-consumption of freshwater resources for irrigation, industry and domestic uses due to population growth, introduction of new technologies, pollutions, dam construction, intensive aquaculture as well as inadequate policies are affecting this diversity. Establishment of protected areas, environmental impact assessment, native fish farming, fish stocking, fish sperm cryofreezing, banning of fishing during the breeding season, participation of nongovernmental organizations (NGO) in conservation programs, increasing attention of media to wildlife conservation and research on the native fishes are the major efforts towards the freshwater fish conservation in Iran. **Conclusion:** Due to its zoogeographic location, Iran is a country highly rich in ichthyodiversity with high level of endemicity and a part of biodiversity hot spot, hence its biodiversity conservation is highly recommended.

**KEYWORDS:** ICHTHYODIVERSITY, HOT SPOT, CONSERVATION, IRAN

ISEEP_152

# AN INVESTIGATION ON VARIATION IN NATURE ATTITUDE AND ACKNOWLEDGE OF STUDENTS BY NATURE EDUCATION: A CASE STUDY ON BIRDS

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**Aim:** Nature Education is the process that should starts from preschool time to higher education. In this process, activities about nature education must be done with active students attendance. Eventually, it will be achieved when the students are internalized nature. Our goal in this study was to determine variation in attitude and acknowledge of the students from 6. class at primary school by nature education at campus of Akdeniz University.

**Methods:** The semi experimental pattern via pre- and post tests with control group was applied in the study. In this pattern, 45 students for experimental and 40 students for control groups were constituted by importial designation and measurements were taken from both groups before and at the end of the education. Required data to test research sub questions were collected from nature attitude scale and open ended questions which are related to birds. Seminars about birds and nature conservation, birdwatching and ringing activities, hanging artificial nests to check nesting behaviour, posters and drawings about birds were carried out all together to improve students knowledge during the education process. All obtained data were analyzed using SPSS v.11.0 for Windows. Significance was set at $P<0.05$ for all statistical tests. For each test, degrees of freedom (df) and significance levels are reported. All results are presented as mean ± standard error (SE).

**Results:** It was determined in this study that nature attitute and knowledge of the students were affected by the applied nature education activities. There was important significant differencies ($P<0.05$) were found between experimental and control groups both to nature attitude and knowledge on birds. These results showed that different learning processes e.g. joining and making nature activities could act important benefits to the students to learn more information about living environment and nature.

**Conclusion:** The knowledge signification in the memory, encoded to the long term memory and recalling is depend on being a part of process. Unfortunately, fundemental indoor teaching methods are inadequate to saving environmental conscious, and therefore, need to enhance outdoor activities to beter nature education.

**KEYWORDS:** ENVIRONMENTAL EDUCATION, NATURE ATTITUDE, BIRDS, PRIMARY EDUCATION

ISEEP_153

# THE HELMINTH FAUNA OF STRIPE NECKED TURTLE (*MAUREMYS RIVULATA*) (TESTUDINATA: BATAGURIDAE) WHICH DISTRIBUTES IN ANTALYA AND IN THE VICINITY OF ANTALYA

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**Aim:** Studies about wild life helminthes intends to prove the biodiversity to understand the relation between living organisms and their ecosystem and nowadays to determine the contamination levels in an ecosystem where the hosts are living. In this study, helminthes of *Mauremys rivulata* (Valenciennes, 1833) which is distributing in the centre and in the vicinity of Antalya were investigated. The internal organs where the helminthes were found and the density of the helminthes were detected. With these studies our aim is to recognize biotic and abiotic ecosystem of *Mauremys rivulata* in another aspect.

**Methods:** Twenty individuals belong to *Mauremys rivulata* species were collected from center of Antalya, Boğazkent, Kumluca and Patara between March 2009 and October 2010. These samples were dissected in the laboratuary and all the organs were searched by stereomicroscope for helminth species.

**Results:** Total 1731 helminthes were found in 18 turtles, the infection rate is 90%. The number of helminthes per turtle is 86,55. Six helminth species; Telorchis stossichi, Patagium lazarewi, Polystomum ocellatum, Serpinema microcephalus, Spironoura armenica and Spiroxys contortus and some larvae of Digenea and Nematoda were also found.

**Conclusion:** Polystomum ocellatum is the new record for freshwater turtles, living in Turkey and Spiroxys contortus is new record for *M. rivulata*, living in Turkey. None helminth larvae were reported from turtles from Turkey till now too. Most polluted location was Kumluca Alakır Stream and most of the helminthes were found in the individuals from Kumluca (763).

**KEYWORDS:** *MAUREMYS RIVULATA*, HELMINTH, ANTALYA.

ISEEP_154

# THREATENED SPECIES OF MACROALGAE AND PHANEROGAMS IN FETHIYE MARINE PROTECTED AREA (MUĞLA, TURKEY)

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**Aim:** This research objective was to: document the patterns of threatened species of macroalgae and phanerogams in marine habitats around the Fethiye Bay. This paper provides the results of a taxonomic survey and biogeographical distribution of the protected species in this area.

**Methods:** In the frame work of *T. trochanter*, *S. acinarium* and *C. nodosa* were observed along the coast of Fethiye Bay (between 360 40' 45'' N, 280 48' 69'' E and 360 32' 27'' N, 290 07' 29'' E). The specimens were collected by skin diving and SCUBA diving at depths ranging from 0,10 to 35 metres. Thalli were air-dried or preserved in buffered 5 % formaldehyde in seawater for further observations. The parts of algae were treated for stereo light microscope. Specimens are deposited in the Herbarium of Faculty of Aquatic Sciences and Fisheries at Akdeniz University (Turkey).

**Results:** Marine flora of Fethiye Specially Protected Area (Muğla, Turkey) was investigated between 2008-2009. Three depth zones (0-6m, 6-18m and 18-35m) were separately screened in 82 stations by diving. 192 taxa were identified. The distribution patterns of the protected species, such as *Titanoderma trochanter* (Bory de Saint-Vincent) Benhissoune, Boudouresque, Perret-Boudouresque & Verlaque, *Sargassum acinarium* (Linnaeus) Setchell and *Cymodocea nodosa* (Ucria) Ascherson were figured out and the factors affecting their distributions were determined using ArcGIS mapping.

**Conclusion:** Unhealthy assemblages of *Titanoderma trochanter* disruptions in the unity of the assemblages were observed in certain stations with high organic load (residential zones, anchoring sites of the daily boats and coves with streams). Considerable amount of cyanobacteria colonies were observed on the *Cymodocea nodosa* leaves near fish farm and the sewage treatment system, adversely affecting the quality of the meadows. On the other hand, *Cymodocea nodosa* meadows in confined coves were found to be highly damaged because of anchoring of the daily touristic boats. However, no thrpogenic effects were detected on the populations of *Sargassum acinarium*, which inhabits deeper waters, usually below 25-30m of depth.

**KEYWORDS:** MARINE PROTECTED AREA, FETHIYE, THREATENED SPECIES, *TITANODERMA TROCHANTER*, *SARGASSUM ACINARIUM*, *CYMODOCEA NODOSA*.

ISEEP_156

# THE IMPORTANCE OF GALA LAKE NATIONAL PARK (EDIRNE/TR) FOR EUROPEAN POPULATION OF THREE SWAN (*CYGNUS SSP.*) SPECIES

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**Aim:** This study was carried out in order to determine importance of Gala Lake National Park for the European populations of three Swan species (*Cygnus olor*, *Cygnus cygnus* and *Cygnus columbianus*).

**Methods:** The counting were realized within the scope of the study between November 2009 and February 2010 where was in Gala Lake and its surroundings as totally 21 $km^2$ research area.

**Results:** 11 200 Mute Swan (*Cygnus olor*), 970 Whooper Swan (*Cygnus cygnus*) and 16 Tundra Swan (*Cygnus columbianus*) individuals were counted during the study in the research area. When the results of counting is compared with European swans population size, it spring on that approximately % 6 Mute Swan and % 4 Whooper Swan of European population wintering in Gala Lake and its surroundings.

**Conclusion:** It was concluded that Gala Lake and its surroundings are one of the most important overwintering area for European population of three Swan species.

**KEYWORDS:** GALA LAKE, *CYGNUS SPP.*, TURKEY, EUROPE

ISEEP_158

# EVALUATION AND CHARACTEIZATION OF MEDICAL WASTE MANAGEMENT OF ARDAHAN IN TURKEY

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**Aim:** Evaluation with the rapid globalizing world, management and transport of wastes from medical institutions are becoming important. Especially waste management of health care organizations is a special concern area for prevention of communicable diseases. The aim of this study is evaluate the medical waste management plans of Ardahan city in Turkey, within characterizing the dangerous, pathogenic factors from wastes of health institutions and municipal solid wastes which have high potential of contamination risks

**Methods:** Pathological medical waste which consists of cutters, and poses is a big problem in Ardahan province which is at the eastern border of Turkey. The surveys and statistical analysis were done through formal and informal interviews and field observations with nurses, hospital administrators, doctors, and cleaning workers

**Results:** Hospital medical waste quantities reached about 63.25 kg/year according to the Government Office of Environment and Forestry in 2006. The medical wastes of the state hospital was about 4.50 kg / year and 16.85 kg of the Posof and Gole respectively in 2006. The medical wastes were 30 kg/day for the state hospital, 8 kg/day for the military hospital , 10 kg/day for the Posof State Hospital and 12 kg/day for the Gole State Hospital. According to 2008-2011 data, the amount of medical waste was about 70,627 kg/year

**Conclusion:** In this study the solutions about the medical waste management problems were discussed and new recommendations were explained. The collection ways and disposal of medical and other hazardous household waste management were considered with the statistical analyzes and surveys

**KEYWORDS:** ARDAHAN, EVALUATİON, HAZARDOUS WASTE, WASTE MANAGEMENT, MEDİCAL WASTE MANAGEMENT

ISEEP_159

# HEAVY METALS IN YENIÇAĞA LAKE AND ITS POTENTIAL SOURCES: SOIL, WATER, SEDIMENT, AND PLANKTON

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**Aim:** Yeniçağa Lake is located at 976 m above sea level in the Western Black Sea region in Turkey (40º 47´ N, 32º 02´ E). The quality of surface water of Yeniçağa Lake has diminished over the last decades as a result of increased anthropogenic factors. Today another important environmental threat for the lake is the artesian wells that its water discharges through creeks or superficial drainage into the lake and it has rich with heavy metals. The objective of the study was to designate of distribution and accumulation of heavy metals (Al, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Mo, Cd, Sn, Ba, Pb) in the water, sediments, plankton of Yeniçağa Lake and its potential sources (creeks, sewage, artesian well, soil).

**Methods:** Water, sediment and plankton sampling was carried out from March 2008 to February 2009 as monthly intervals at three stations in Yeniçağa Lake. The sampling strategy was designed to cover all significant water courses and their bottom sediment. This included all significant sources which fed into Yeniçağa Lake, e.g. Kuzuviran and Deliler creeks, municipal wastewater, artesian wells water and soil. Element analyses were performed by ICP-MS.

**Results:** Results showed that the trace and toxic elements (Al, As, Mn, Pb, Fe) concentration in lake water and/or its feeding sources were above the recommended water standards (WHO, EC, EPA, TS-266). It was also found that the maximum accumulation of the heavy metals iron, aluminum, manganese, zinc and barium in the sediment of Yeniçağa Lake. The results obtained in plankton in Yeniçağa Lake showed that aluminum, iron, manganese, zinc, and barium was most accumulated elements in the plankton.

**Conclusion:** The accumulation order of trace metals were Fe> Al> Mn> Zn> Ba> Ni> Cr> As> Cu> Pb> Co> Mo> Sn> Cd in the lake, creeks sediment and soil samples. The similar results suggest that the accumulation of heavy metals in the sediment is a natural process. Metals accumulated in the lake are naturally mixed from the soil. However, the presence of heavy metals in the analysis of artesian well water and sewage reveals that the transportation occurs also from the groundwater to the lake.

**KEYWORDS:** HEAVY METALS. BİOACCUMULATİON. ICP-MS. YENİÇAĞA LAKE

ISEEP_160

# OPTIMIZATION OF PROCESSPARAMETERS FOR REMOVAL CR (VI) BY HYPNUM CUPRESSIFORME USING RESPONSE SURFACEMETHODOLOGY (RSM)

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**Aim:** This study was conducted to optimize the process parameters for removal Cr(VI) by Hypnum cupressiforme using Response Surface Methodology (RSM). The main aim of this work was to find optimum biosorption condutions of Hypnum cupressiforme for the removal of chromium ions from their aqueous solution.

**Methods:** Response Surface Methodology, RSM , consists of a group of empirical techniques devoted to the evaluation of relationship existing between a cluster of controlled experimental factors and measured responses according to one or more selected criteria. The optimization of process parameters was carried out by considering different ranges of variables ,such as sorption time, sorption temperature, initial ion concentration, sorbent dosage, and mixing rate with Response Surface Methodology (RSM), a statistical optimization, by using MINITAB software. RSM is a collection of statistical techniques for designing experiments, building models, evaluating the effects of factors and searching for optimum conditions of factors for desirable responses.

**Results:** From the optimization for removal Cr (VI) by Hypnum cupressiforme, optimum values were determined as 760 mins. sorption time, 30mg/L initial ion concentration, 0,01 mg/100mL biosorbent dosage, temperature of 40°C and mixing rate of 107min-1.

**Conclusion:** The obtained results indicate that Hypnum cupressiforme has relatively a high biosorption capasity for the treatment of wastewater contaminating with chromium ions. , Optimization for removal of Cr(VI) from aqueous solution by response surface methodology shows that the optimums amount adsorbed is 84,918 mg/g and this value is significantly higher

**KEYWORDS:** BIOSORPTION, OPTIMISATION, RESPONSE SURFACE METHODOLOGY

ISEEP_161

# SOME PATHOGENIC PROPERTIES OF *E. COLI*, *E. FAECALIS* AND *E. FAECIUM* STRAINS ISOLATED FROM WILD DUCKS AND GULLS

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**Aim:** This study was performed isolation of bacteria from faces some duck and gull species in free living in Van Lake Basin and determination of different pathogenic and virulence factors of E. coli and Enterococcus species. **Methods:** Fecal samples from all animals were collected using sterile swabs and were brought to the laboratory for further processing. Samples were directly inoculated on EMB, MC, Bile Esculin and blood agar plates. Suspected colonies were selected and identified with BD Phoenix automotive microbiology systems (Becton Dickinson, USA) using Gram negative and Gram positive panels. E. coli strains were examined by competitive EIA test kit for ST, by RPLA kit for LT, by latex agglutination test for O157 serotype, by tube agglutination test for H7 serotype, by commercial Duopath® GLISA verotoxin test kit for VT1 and VT2. E. faecium and E. faecalis strains were examined with clumping test for AS, by streaking bacterial cultures on Todd Hewitt agar supplemented with 5% of horse blood for production of cytolysin, in gelatinase test medium containing 3% gelatin for gelatinase production. **Results:** Totally 357 feces were examined containing of 126 shoveler (*Anas clypeata*), 92 common pochard (*Aythya ferina*), 80 black headed gull (*Larus ridibundus*) and 59 yellow-legged gull (Larus michahellis). Thirty nine (10.9%) bacteria were isolated and identified from feces samples as 23 (6.4%) Enterococcus faecium, 9 (2.5%) Escherichia coli, 7 (2%) Enterococcus faecalis. Nine E. coli strains were examined for some properties such as O157:H7 serotype, VT1, VT2, ST and LT. Two E. coli strains (22.2%) were positive in terms of O157 serotype. Positive strains were belong to Anas clypeata and Aythya ferina duck species. All E. coli isolates were found to be negative for H7 serotype, VT1, VT2, ST and LT. When evaluated virulence factors of Enterococcus isolates; 18 of 23 (78.3%) E. faecium strains were positive for gelatinase, 4 (17.4%) for cytolysin, 2 (8.7%) for aggregation substance (AS), 4 of 7 (57.1%) E. faecalis isolates were positive for gelatinase, 4 (57.1%) for cytolysin and 1 (14.3%) for AS. Three of E. faecium strains were found to be positive for both gelatinase and cytolysin, 1 gelatinase and AS; one of E. faecalis isolate was gelatinase, AS and cytolysin, 1 was gelatinase and cytolysin. **Conclusion:** Pathogenic properties were not determined in E. coli strains, but two strains belonged to O157 serotype. Nonetheless, virulence factors were stated in Enterococcus species. It was concluded that, Enterococcus species might be potentially human pathogenic.

**KEYWORDS:** WILD DUCK, GULL, E. COLI, E. FAECIUM, E. FAECALIS, PATHOGENIC PROPERTIES

ISEEP_162

# TRACE METAL LEVELS AND THEIR SEASONAL VARIATIONS IN THE TISSUES OF FISH (*CYPRINUS CARPIO* L., 1758) FROM YENIÇAĞA LAKE, TURKEY

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**Aim:** Yeniçağa Lake (40º 47 N´, 32 º 02´ E) is located in the western Black Sea region of Turkey. It is a shallow, endorheic, eutrophic lake with a maximum depth of 5.2 m and a surface area of 1800 ha. The quality of the surface water of Yeniçağa Lake has diminished over the last decades as a result of increased anthropogenic factors. The lake continuously receives significant amounts of nutrient rich water from two main creeks (Kuzuviran and Deliler) due to the direct discharge of untreated domestic wastewater into the creeks. Furthermore, untreated municipal wastewater, nutrient rich water from a slaughterhouse located on the eastern coast of the lake, and water rich with heavy metals from artesian wells are the major factors increasing the pollution level in the lake. *Cyprinus carpio* fished from Yeniçağa Lake has been an important protein source for the people living in the region over recent decades. Taking into account the metal content already found in the lake and its potential sources, an accumulation of metals in fish tissue was anticipated. Therefore, in the present study, we characterized heavy metal levels in the gill, muscle, and liver tissues of carp from Yeniçağa Lake on a seasonal basis and assessed the level of concentrations in terms of safety for human consumption. **Methods:** Forty specimens of fish species were collected from Yeniçağa Lake during four consecutive seasons from March 2008 to February 2009 with fishnets. The concentrations of some metals (Al, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Mo, Cd, Sn, Ba, and Pb) were determined by ICP-MS in the muscles, gills, and liver of the carp to study heavy metal load in the tissues, bioaccumulation factor, and seasonal variations. **Results:** Concentrations of Zn, Al, Fe, and Cu in particular were very high in the tissues studied. The distribution pattern of Al, Cr, Ni, Cu, As, Mo, Cd, Sn, Pb followed the order liver>gill>muscle, while this pattern was determined as gill>liver>muscle for Mn, Fe, Cu, Zn, Ba. The Bioaccumulation Factor (BAF) of Cu, Zn, and Al was remarkably high in all the investigated tissues, and was calculated in the muscle tissues to be 1.26 for Al, 186.3 for Cu, and 1.56 for Zn. In general, concentrations of the heavy metals tested were observed to be higher in spring and summer and lower in autumn and winter.

**Conclusion:** According to the international guidelines for human consumption, the levels of Fe and Cu in all tissues, and the levels of Zn and Pb detected in the liver and the gills of the carp were higher than the maximum permitted concentrations outlined in the guidelines.

**KEYWORDS:** YENIÇAĞA LAKE, HEAVY METAL, BIOACCUMULATION FACTOR, SEASONAL VARIATION, *CYPRINUS CARPIO*

ISEEP_163

# PRELIMINARY OBSERVATIONS ON THE SIZE DISTRIBUTION OF THE *JANUA PAGENSTECHERI* QUATREFAGES, 1865 (SERPULIDAE, POLYCHATEA) IN RELATION TO THE FLORA IN ANTALYA BAY, TURKEY

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**Aim:** The aim of the present work is to be informative for better understanding of *Janua pagenstecheri* Quatrefages,1865's tube morphology in association to *Cystoseira compressa* (Gerloff & Nizamuddin), *Corallina elongata* (Ellis & Solander) and *Pedobesia simplex* (Meneghini ex Kützing) assemblages.

**Methods:** Samples of *J.pagenstecheri* were collected by free diving from the supralittoral of the inner bay of Antalya. Underwater photographs were taken, floral pieces were picked out and tube diameters of 30 random samples were measured. One-way ANOVA test was used to compare the differences between the tube sizes in serpulid populations distributed on the vegetal cover.

**Results:** Three macroalgae are dominated seaweeds in the study area. All three had different thallus structure. The flat spiral tubes of the serpulid were smallest on *P. simplex* while the largest were located on *C. compressa*. Abundancy, but narrow size range was found on *C. elongata*. Anatomical structure of the plants seems to have a primary role.

**Conclusion:** The outcomes of the results of this preliminary study suggest some hypotheses that could be tested in the future. Firstly, whether environmental rather than genetic factors are primarily responsible for the size differences observed between the three populations is to be tested. Another probable explanation should be investigated for any different preferential behaviour of the juveniles in the presence of different macroalgae.

**KEYWORDS:** SERPULID, *CYSTOSEIRA COMPRESSA*, *CORALLINA ELONGATA*, *PEDOBESIA SIMPLEX*, TUBE MORPHOLOGY

ISEEP_164

# ASSESSMENT OF A SHALLOW MONTANE LENTIC ECOSYSTEM (LAKE GÖLCÜK, IZMIR, TURKEY) USING BENTHIC COMMUNITY DIVERSITY.

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**Aim:** The aims of these study can be listed as: (a) to describe the intra-annual and spatial variability in benthic communities, (b) to relate possible community changes to environmental conditions and (c) to evaluate the responses of the lake's ecological status on community indices.

**Methods:** The macroinvertebrate benthic community of a shallow Mediterranean lake (Lake Gölcük, Izmir, Turkey) was studied. The benthic assemblage was sampled seasonally at six sites during a period of 2 years (June 2008–March 2010). Additionally, hypolimnetic water quality variables were monitored over the same period at each site.

**Results:** The benthic fauna of Lake Gölcük was found to be very limited with a total of 16 species belonging to four taxonomic groups. The oligochaete community comprised 96.72 % of the total benthic fauna. *Potamothrix hammoniensis* was the dominant benthic species and represented more than 72% of the total benthic fauna. *Chironomus plumosus* was the most abundant chironomid species contributing with about 2.78% of the total benthic fauna. Almost all the benthic species showed the same intra-annual seasonal pattern, with peak population densities during spring except *P. hammoniensis* which predominated during the whole sampling period. Water depth, electrical conductivity and water temperature seemed to be the main environmental factors affecting community indices.

**Conclusion:** Benthic communities are affected by human disturbances in Lake Gölcük shifting their composition to more tolerant taxa, reflecting also the eutrophic to hypertophic character of the lake.

**KEYWORDS:** LENTIC ECOSYSTEMS, MACROINVERTEBRATES, DIVERSITY, SHALLOW LAKE, EUTROPHICATION

ISEEP_165

# AGRICULTURAL ENGINEER AND ENVIRONMENTAL EDUCATION

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**Aim**: In terms of ecology and environmental problems, today\'s important issue is protecting the environment. Agriculture is also affected by environmental problems by pollution; unconscious use of pesticides and fertilizers in rural areas, pesticide residues, water pollution, improper soil tillage, soil erosion, desertification, salinization, destruction of organic matter and micro-organisms disrupt and pollute the environment.

**Methods**: In this context, as a result of the survey administered in accordance with the data obtained from Namik Kemal University, Faculty of Agricultural Sciences students in 2011; environmental education training, participation in seminars and conferences held on environment, environmental organizations, membership status, participation in the activities of these organizations, environmental interests and sensitivities in secondary education, higher education and non-school environmental education are discussed.

**Results**: In this study, three-quarters of agricultural science students are not receive environmental education after secondary education, not participate in environmental activities, not a member of environmental organizations, not participate in the activities of these organizations, but more than three-quarters of these students are interested in environment, sensitive to the environment and there are differences between genders was found.

**Conclusion**: Because of insufficient environmental education it is a known fact that people are often inefficient in solving environmental problems. Therefore agricultural engineers working in rural areas are very important in environmental education.

**KEYWORDS:** ENVIRONMENTAL EDUCATION, ENVIRONMENTAL CONSCIOUSNESS, ENVIRONMENTAL SENSITIVITY AND PARTICIPATION

ISEEP_166

# LEVANT VOLES (*MICROTUS GUENTHERI* (DANFORD AND ALSTON 1880)) PREFER SOUTHERLY-FACING SLOPES IN AGRICULTURAL SITES AT HATAY, TURKEY

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**Aim**: In this study, *Microtus guentheri*, which is widespread in the Hatay region, which is a town/province in south-eastern Anatolia in Turkey, was investigated. Its preferred habitat type and characteristics (exposure, slope etc.) were studied. Our findings are presented with the aim of determining the ecological preferences of the Levant Vole at Hatay.
**Methods**: In this study, *Microtus guentheri*' preferred habitat type and characteristics (aspect, slope etc.) were studied. 234 (113 ♀♀; 121 ♂♂) individuals were caught as dead and 118 (52 ♀♀; 66 ♂♂) as living, then living individuals were tagged, measured, and released. The samples were taken from the various habitats found within the province of Hatay (Turkey), during June-August 2010. **Results**: Respectively, among the 234 dead and 118 living voles, 112 (47.86%) and 53 (44.92%) were from agricultural areas, 103 (44.02%) and 56 (47.46%) from roadsides near to agricultural areas, 19 (8.12%) and 9 (7.63%) were caught in grasslands. In the sample of 234 dead and 118 living voles, 158 (67.52%) and 73 (61.86%) were caught in areas with slopes of 31-60°. In those areas with slopes of 0-45°, there were strong positive correlations between the capture frequency in traps and the slope (rsnaptrapping=0.911; $p<0.0001$ and rlivetrapping=0.897; $p<0.001$). On the other hand, a very strong negative correlations were found between capture frequency and slope for the areas with slopes of 46-90° (rsnaptrapping= -0.933; $p<0.002$ and rlivetrapping= -0.874; $p<0.002$). Most of the individuals in traps (nsnaptrapping= 171; 73.08% and nlivetrapping=84; 71.19%) were captured on south, southeast, and southwest exposures, but did not differ between east and west. Also, the highest mean temperature were found on slopes of 30-60° in the south-facing sites. Moreover, there are significant positive correlations between altitude of sites and frequency of capture in snaptraps and Sherman livetraps (rsnaptrapping=0.941; n=6; p=0.001, rlivetrapping=0.903; n=6; p=0.001, respectively). So, while altitude of sites increase, trapping success and population density (rdensity=0.938; n=6; p=0.001) are on the increase. **Conclusion**: As a result, building burrow systems in areas exposed to the sun is a type of behaviour selected during the process of evolution which gives the species significant advantages. The fact that mostly, the burrow systems in the areas that were studied were made in fields with southerly exposure supports the idea that this behaviour was adaptive. Furthermore, the burrow systems made on slopes which provide the greatest amount of exposure to the sun between sunrise and sunset also have comparatively low levels of humidity. Few burrow systems were made, and therefore few voles caught, on the slopes with the least exposure to the sun (North, Northeast and Northwest).

**KEYWORDS:** *MICROTUS GUENTHERI*, HATAY, PREFERENCES, EXPOSURE, SLOPES

ISEEP_167

# *MICROTUS SUBTERRANEUS* (DE SELYS-LONGCHAMPS, 1836) (MAMMALIA: RODENTIA) AT THE EIGHT LOCALITIES IN THE WEST MEDITERRANEAN REGION OF TURKEY

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**Aim**: *Microtus subterraneus*'s well-known distribution in the South of Turkey, there were only recording so far from Elmalı county in Antalya. In this study, additional records for M. subterraneus (de Selys-Longchamps, 1836), which were trapped from the eight localities.

**Methods**: This research is based on 84 (27 ♀♀; 57 ♂♂) dead individuals, caught from intersecting fields of agriculture, non-dense shrubs, and water-wise habitats found within the 1- Yazırbeli (11 (4 ♀♀; 7 ♂♂)), 2- Avlanbeli (17 (5 ♀♀; 12 ♂♂)), 3- Elmalı (5 (3 ♀♀; 2 ♂♂)), 4- Göğübeli (8 (2 ♀♀; 6 ♂♂)), 5- Yayla Esenköy (5 (2 ♀♀; 3 ♂♂)), 6- Bekçiler (7 (3 ♀♀; 4 ♂♂)), 7- Söğüt (21 (7 ♀♀; 14 ♂♂)), 8- Kızılcadağ (10 (1 ♀♀; 9 ♂♂)) during July-September 2007.

**Results**: In this study, additional records for M. subterraneus (de Selys-Longchamps, 1836), which were trapped from the eight localities; Yazırbeli, Avlanbeli, Elmalı, Göğübeli (Gübeli), Yayla Esenköy, Bekçiler, Söğüt, and Kızılcadağ on the Taurus, West Mediterranean Region of Turkey, is reported along with their morphological measurements and karyological features and some ecological characteristics of the localities. These are the first records for M. subterraneus from these seven localities (except elmalı county).

**Conclusion**: In addition, these records are the only records from the region for many years. Therefore, the species distributional range is extended to the South and North Taurus Mountains in Western of Mediterranean Region of Turkey.

**KEYWORDS:** *MICROTUS SUBTERRANEUS*, COMMON PINE VOLE, NEW LOCALITIES, DISTRIBUTION, TAURUS

SEEP_168

# SIBLING VOLES (*MICROTUS LEVIS* (MILLER, 1908)) PREFER SOUTHERLY-FACING SLOPES IN HABITATS AT THE SIDE OF YAZILI LAKE/MERSIN, TURKEY

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**Aim**: In this study, *Microtus levis*, which is narrowspread in the Mersin region, which is a province in middle-Mediterranean Region in Turkey, was investigated. Its preferred habitat type and characteristics (exposure, slope etc.) were studied. Our findings are presented with the aim of determining the ecological preferences of the Sibling Vole at Mersin.

**Methods**: In this study, *Microtus levis*'s preferred habitat type and characteristics (aspect, slope etc.) were studied. 94 (35 ♀♀; 59 ♂♂) individuals were caught as dead and 33 (18 ♀♀; 15 ♂♂) as living, then living individuals were marked, measured, and released. The samples were taken from the side of Yazılı Lake in province of Mersin (Turkey), during July 2010 to August 2010.

**Results**: Respectively, among the 94 dead and 33 living voles, 65 (69.15%) and 25 (75.75%) were from juncus vegatations at the near side of Yazılı lake, 29 (30.85%) and 8 (24.24%) were caught in tall and wet-grasslands. In the sample of 94 dead and 33 living voles, 71 (75.53%) and 20 (60.60%) were caught in areas with slopes of 31-60°. In those areas with slopes of 0-45°, there were strong positive correlations between the capture frequency in traps and population density and the slope (rsnaptrapping =0.94; $p<0.0001$, rlivetrapping=0.79; $p<0.01$ and rpopulation density=0.91; $p<0.0001$). On the other hand, a very strong negative correlations were found between capture frequencies and population density for the areas with slopes of 46-90° (rsnaptrapping= -0.88; $p<0.0001$, rlivetrapping= -0.98; $p<0.000001$ and rdensity=-0.92; $p<0.0001$). Most of the individuals in traps (nsnaptrapping= 77; 81.91% and nlivetrapping=28; 84.84%) were captured on south, southeast, and southwest exposures, but did not differ between east and west. Also, the highest mean temperature were found on slopes of 30-60° in the south-facing sites. Moreover, there are significant positive correlations between altitude of sites and frequency of capture in snaptraps and Sherman livetraps (rsnaptrapping=0.79; $p=0.02$, rlivetrapping=0.88; $p=0.01$, respectively). So, while altitude of sites increase, trapping success and population density (rdensity=0.93; $p=0.001$) are on the increase.

**Conclusion**: As seen in this study, for the southfacing fields, as the degree of slope increases to 30-60 degrees, the difference between the day and night-time temperature decreases. The fact that the highest temperatures were found on slopes between 30 and 60 degrees is in accordance with the most favored slope preferences determined in this study. As a result, building burrow systems in areas exposed to the sun is a type of behaviour selected during the process of evolution which gives the species significant advantages. The fact that mostly, the burrow systems in the areas that were studied were made in fields with

southerly exposure supports the idea that this behaviour was adaptive. Furthermore, the burrow systems made on slopes which provide the greatest amount of exposure to the sun between sunrise and sunset also have comparatively low levels of humidity. Few burrow systems were made, and therefore few voles caught, on the slopes with the least exposure to the sun (North, Northeast and Northwest).

**KEYWORDS:** *MICROTUS LEVIS*, MERSIN, YAZILI LAKE, ECOLOGICAL PREFERENCES, EXPOSURE, SLOPES

ISEEP_170

## KINETIC MODELING OF SULFATE CONCENTRATIONS OF UZUNCAYIR DAM LAKE WATER SAMPLES

TURGAY DERE, NUMAN YILDIRIM, DURALI DANABAS, NURAN CIKCIKOGLU YILDIRIM, AYTEN OZTUFEKCI ONAL, GÜLSAD USLU, ERHAN UNLU,NILGÜN TAYHAN, SEVAL DANABAS, CEMIL ERGIN

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**Aim**: the aim of this study, kinetic modeling of seasonal changing sulfate concentrations of the Munzur the river, the river Pulumur, and Uzunçayır Dam Lake.

**Methods**: 10 sampling stations have been identified.For each station, in January, March and May, sulfate concentration was measured. For 120 days, every station, changing the concentration of sulfate, has been considered as the first-order reaction kinetics.

**Results**: Accordingly, the reaction constant k: 4,10 * 10-3 day-1 were calculated. According to the calculated reaction constant, the final sulfate concentration of each station are calculated.

**Conclusion**: For 10 stations, at the end of four months, changes in sulfate concentrations shown to be identified with first-order reaction kinetics.

**KEYWORDS:** DAM LAKE, KINETIC, MODELING, SULFATE.

ISEEP_171

# CONSUMER PREFERENCES AND GENDER DIFFERENCES FOR FRUIT TEA AND HERBAL TEA

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**Aim**: The main purpose of this study is to determine the purchase decision process of fruit tea and herbal tea growing market in Turkey and to examine the consumer behaviors purchase and consumption trends among young educated university students. Besides, this study is to help the growers, producers and marketing companies, intended to guide consumer behavior, market targeting, market segmentation, strategic marketing, product diversification, product positioning and production planning issues.

**Methods**: For this purpose, survey administered to 300 students chosen by chance for face to face interview at Namik Kemal University in April. The obtained data were analyzed on computer. Varieties of fruit tea and herbal tea consumed by the students, where they have provided, when and how often they consume, packaging, variety and quality characteristics, etc were asked.

**Results**: According to the some results; female students most preferred herbal teas; male students gave higher ratings for fruit teas, 62% of female students consumed linden, 76% of the students preferred to buy cardboard box packaging, 17% of students preferred to buy fruit tea and herbal tea from herbalists, 69% of students preferred fruit tea and herbal tea in winter and 67% of students consumed fruit tea and herbal tea in the evening hours of the day.

**Conclusion**: As a result of the research; findings related to factors that influence consumers' purchasing behavior and profiles have been obtained. The context of the research findings determined; female students consumed fruit tea and herbal tea more than male students. Branded products are preferred in particular, seasonal consumption changes seen and concluded that fruit tea and herbal tea are consumed more for health care. Another finding; income increases increasing the purchased amount of fruit tea and herbal tea. Results also show the importance of evaluating consumer preferences and gender differences among consumers to develop new herbal tea and fruit tea varieties.

**KEYWORDS:** FRUIT TEA, HERBAL TEA, TEA MARKETING, TEA CONSUMPTION, GENDER DIFFERENCES, CONSUMER PREFERENCES.

ISEEP_172

# BACTERIAL LEACHING OF IRON ORE BY ACIDITHIOBACILLUS FERROOXIDANS

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**Aim**: The bacterial reduction of iron ore has been made by Acidithiobacillus ferrooxidans strain r4A1FC2B3. By using the bacteria r4A1FC2B3, it was studied that the affects of particle size, ore concentration and fertilization concentration upon the bacterial reduction of iron ore.

**Methods**: In the experiments the bacteria species obtained from acidic underground wastewaters Acidithiobacillus ferrooxidans has been used. The bacteria that to be used in experiments, used by Kocadağıstan (2007) with the use of modified medium of 9K33 of 9K medium Acidithiobacillus ferrooxidans species r4A1FC2B3 bacteria has been used.

**Results**: At the end of the bacteria count by using microscopic method it has been determined that the average bacteria count was 2,321x 106 piece/mL. With the increase of bacterial concentration the Fe(III) value that is being solved in the solution is increasing. At the end of the 14th day for 5 ml/L bacterial concentration the Fe(III) concentration is 3500 mg/L, 10 mL/L bacterial concentration 4000 mg/L, 15 mL/L bacterial concentration 4100 mg/L and for 20 ml/L bacterial concentration for 4200 mg/L has been obtained. After then bacterial adaptation was assumed to be completed and Fe(III) ions started to be reduced to Fe(II) ions.

**Conclusion**: As a result of the dissolution of the ore in the acidic environment and the Fe(II) ions has been oxidized to Fe(III) by the bacteria in the environment, Fe(III) ions are being created and then with the help of the bacteria the Fe(III) ions are reduced to Fe(II). As a result of the experiments the dissolution of the Fe(III) ions in has been maximized at the end of the 14th day and the reduction of Fe(III) into Fe(II) by the r4A1FC2B3 bacteria was very slow.

**KEYWORDS:** BACTERIAL LEACHING, IRON ORE, THIOBACILLIUS FERROOXIDANS, REDUCTION

ISEEP_173

# THE REMOVAL OF HEAVY METAL IONS FROM AQUATIC MEDIUM USING A MODIFIED NATURAL MATERIALS

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**Aim**: In this study, Ni and Cr ion adsorption was investigated by using chemically modified apricot kernel shells.

**Methods**: Modification methods to improve the adsorption capacity of heavy metal removal were investigated. The structure of the apricot kernel shells before and after modification was determined by FTIR, SEM and zeta potential analysis. HCl, NaOH, H2SO4 and Fenton reactives were used for modification processes. In addition, kinetic, isotherm and thermodynamic parameters were studied for HCl, NaOH and Fenton modified apricot kernel shells. Additional costs resulted from the applied modification processes were calculated and compared with the classical methods.

**Results**: Removal efficiencies changed with heavy metal concentration in water sample and increased up to 90 %. Adsorption capacities were found between 2 mg/g and 100 mg/g according to type of adsorbent and modification methods. As a result, it was revealed that adsorption capacities and costs of adsorbents were compatible with conventional adsorbents.

**Conclusion**: As a result, the adsorption capacity of apricot kernel shells can compete with conventional adsorbents and apricot kernel shells can be used in the heavy-metal waste-treatment economically.

**KEYWORDS:** MODIFICATION, HEAVY METALS, ADSORPTION, APRICOT KERNEL SHELL, ISOTHERM, KINETIC, THERMODYNAMIC

ISEEP_175

# EFFECT OF TRAFFIC NOISE ON NEST-BOX USE BY CAVITY NESTING BIRDS – PRELIMINARY RESULTS

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**Aim**: As demand for transportation networks increases, road and construction noise will increase as pervasive disturbances in many avian habitats. This study examined the effect of traffic noise on occupancy and nest success of secondary hole nesters in nest boxes.

**Methods**: The experiment was conducted in Janowskie and Polichna Forests (south-eastern Poland) in 2011. Our the study plots were located along motorway nr 19. 196 new nest boxes were hung out on the tress along twelve 480 m long transects perpendicular to the motorway. The distance between nest boxes was 30 m. The hole-nesting bird species composition on study plots was assessed using the point count method. We sampled sound levels and habitat characteristics along twelve transects perpendicular to the motorway. Activity of predators was recorded by use digital trail cameras.

**Results**: Sound levels gradually decreased with distance from the motorway. The most common species detected in nest boxes was Great Tit *Parus major*, we also recorded the clutches of Blue Tits *Cyanistes caeruleus*, Coal Tits *Periparus ater* and Pied Flycatchers *Ficedula hypoleuca*. Occupancy rate of nest boxes was low for all species combined. The nest boxes were visited by various species of raptors.

**Conclusion**: We discuss how high traffic noise levels can influence on avian populations.

**KEYWORDS:** AMBIENT NOISE, NEST-BOX OCCUPATION, REPRODUCTIVE SUCCESS

ISEEP_177

# MACROCYCLIC FLUORESCENT PROBES FOR CU (II) METAL ION

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**Aim**: To synthesize the best fluorescent probe for metal pollution.

**Methods**: Experimental Procedure: The procedure is to a stirred solution of mono-quaternary ammonium salt of glyoxal-bridged cyclen compound in ethanol, was added slowly sodium borohydride and the solution was stirred at room temperature for 30 min. before being heated to reflux for 1.5h. The solution was left to cool to room temperature, excess NaBH4 was decomposed with water, and the solvents were removed. The pH of the solution was adjusted to 14 by KOH, and extracted with benzene to take the resulting compound into organic phase. After collecting organic parts, they were dried over MgSO4. And side-bridged compounds were obtained in a same procedure. In the synthesis of these compounds excess amount of sodium borohydride was used, nearly 25-fold by mole, but in the synthesis of cyclen-extented anthracene compound, it was used 30-fold to reduce the double bond of Schiff base part, as well.

**Results**: In this work, we aimed to synthesize two novel anthracene based fluorescent probes and compare their metal-binding properties with Cu(II). For the compounds cyclen-anthracene, cyclen-extended anthracene, and their Cu(II) complexes, the fluorescence measurements were performed by Luminescence Spectrometer. Paramagnetic metal ions such as Cu(II) quench the fluorescence of their ligands. Herein, we observed the magnitude of the quenching reduced by an increased distance between the fluorophore and the chelated metal ion.

**Conclusion**: As a result, lowest distance between the fluorophore group and cyclen makes compound the best probe for metal ion recognition.

**KEYWORDS:** CYLEN, FLUORESCENCE

ISEEP_179

# THE EXPANDING SITUATION OF AROMATIC PLANTS IN TEKIRDAG, TURKEY

AZIZ ŞATANA

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**Aim**: The aim of this study is to diagnose the species and expanding areas of the aromatic plants in the rich plant flora of Mountain Isıklar (Ganos) of Tekirdag, which has a special micro climate and to determine the vegetative and generative qualities of these plants. Thus, this study is significant in terms of presenting biodiversity enabling both coastal tourism and mountain tourism.

**Methods**: Tekirdag City is in the noth-east of Turkey, in the North of the Sea of Marmara and in the Thrace Region. The Mountains Tekir, which spread beginning near Kumbağ in parallel with the Sea of Marmara and end in Gelibolu Peninsula in Canakkale's boundaries, are the city's most important mountains. The highest point of the city's earth is Mountain Ganos in the Mountains Tekir, which is 945 m high. In this study, aromatic plants were gathered in the different points and ridges of Mountain Ganos during three years (2008, 2009 and 2010) between May and September, their places were detected, and their species were determined.

**Results**: According to the results; rose hip (*Rosa canina* L.), sumac (*Rhus coriaria* L.) and sloe (*Prunus spinosa* L.) were detected between Kumbag and Yenikoy, which is 10 km long. There is st. John's wort (*Hypericum spp*. L.) along the line of Kumbag and Ucmakdere, sage (*Salvia officinalis* L.) between Gazikoy and Ucmakdere, melisa (*Melissa officinalis* L.) betweenYenikoy and Kumbag, thyme (*Thymus vulgaris* L.) in all of Mount Ganos, which spreads from Kumbag to Sarkoy, eastern leopard's-bane (*Doronicum oriantale* L.), eastern blue wood (*Anemone blanda* L.) and sweet violet (*Viola odarata* L.) on the slopes of Nisantepe, which is 650 m high, that overlook the sea, snowdrop (*Galanthus elwesii* L.) in the region of Ormanlı-Dolapdere, genista (*Spartium junceum* L.), sumac (*Rhus corriaria* L.), caper (*Capparis ovata* L.) and yellow hornpoppy (*Glaucium flavum* L.) on the slopes of the region of Guzelkoy and Gazikoy that overlook the sea.

**Conclusion**: Mount Işıklar (Ganos), which is one of the most important natural areas of the Thrace Region, has a rich nature in terms of aromatic plants. It is necessary to protect this nature and to discover new aromatic plants.

**KEYWORDS:** AROMATIC PLANTS, BIODIVERSITY, FLORA, GANOS, TEKIRDAG

ISEEP_180

# BIOACTIVE SUBSTANCES IN *HYPERICUM PERFORATUM* POPULATIONS FROM TEKIRDAG AND CANAKKALE, TURKEY

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**Aim**: The chemical qualities of *Hypericum perforatum* L., known as st. John's wort, were investigated in such two different locations as Tekirdag and Canakkale, and the differences of bioactive substances were presented.

**Methods**: This study was gathered at the full flowering period of the plant in June 20th 2010 in the locations of Tekirdag (Kumbag), in the northwest coast of the Sea of Marmara, and Canakkale (Lapseki), and the chemical analyses were made. In the chemical analyses, the bioactive substances of the plant were investigated. These substances were Chlorogenic acid, Rutin, Hyperoside, Apigenin-7-O-glucoside, Quercitrin, Quercetin and Hypericin.

**Results**: According to the data obtained; the highest Chlorogenic acid (0.78 mg/g DW), Rutin (0.50 mg/g DW), Hyperoside (15.02 mg/g DW), Apigenin-7-O-glucoside (15.02 mg/g DW), Quercetin (2.71 mg/g DW) were detected in Kumbag. The highest Hypericin (2.98 mg/g DW) and Quercitrin (2.68 mg/g DW) were detected in Lapseki.

**Conclusion**: According to the results in this study; it has been estimated that *Hypericum perforatum* populations, along the coast in the northwest of the Sea of Marmara, include different amounts of bioactive substances in different locations, depending upon environmental factors.

**KEYWORDS:** *HYPERICUM PERFORATUM*, ST.JOHN'S WORT, BIOACTIVE SUBSTANCES, TEKIRDAG, CANAKKALE

ISEEP_181

# CR AND CO CONTENTS OF SUGAR BEET IN ALCALI SOILS

AZIZ ŞATANA

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**Aim**: The aim of this study is to estimate Cr and chrome Co metals that are accumulated through soil and irrigation water in the sugar beet, which is produced in the alcali soil whose pH is high.

**Methods**: This study was conducted in 2010 in Merkez Town, related to Hayrabolu Town of Tekirdag, which is present in the Thrace Region, and in Umurbey, Cıkrıkcı, Susuzmusellim and Lahana villages. The trials in the all locations were irrigated with water coming through drainage channel of the Karaidemir Dam. They were made with 3 repetitions in 25 x 45 sowing density with 6 rows parcels with 13.5 m2. Sugar beet was harvested in all the locations in November 18th 2010, and the leaves and beets of the plants were analyzed for Cr and Co metals.

**Results**: According to the results of the analysis; the highest content of Cr in the leaves was estimated as 4.626 mg/kg in Susuzmusellim, and the highest content of Cr in the beet was estimated as 0.067 mg/kg in Lahana. The highest content of Co in the leaves was estimated as 8.264 mg/kg, and the highest content of Co in the beet was estimated as 0.944 mg/kg in Lahana.

**Conclusion**: In Hayrabolu, it is understood that Cr and Co have accumulated by means of soil and irrigation in the sugar beet produced in the alcali soil whose pH is high but that these heavy metals are not at the toxic level. It is concluded that this situation does not threaten environment and human health.

**KEYWORDS:** SUGAR BEET, CHROME, COBALT, ALCALI, HEAVY METAL

ISEEP_184

# THE EFFECTS OF WILDFIRES ON THE BIODIVERSITY OF THE LAND SNAILS

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**Aim**: The wildfires are a naturally occurring event in ecosystems of Mediterranean Basin. These fires impact natural animal and plant communities by direct mortality during fire and by changes in post-fire habitat structure. Animal responses to fires vary largely depending on ecological strategies, with limited mobility that increases vulnerability to fires. Land snails are an appropriate group in which post-fire recovery evaluates, mainly because they dwell on vegetation and litter, have low mobility and are sensitive to changes in vegetation structure due to their dependence on moisture.
**Methods**: Contemporary literature evaluated for this purpose.
**Results**: The species responses to fires vary greatly, depending on life histories, species-specisific differences in habitat requirements and functional traits of the relevant groups. In terms of the land snails; species richness and abundance in living individuals vary greatly between the years after the fires whatever the fire regime, fire numbers and fire intervals. After fire, even though the land snails being not very abundant, they are largely diversified, with xerophilic species, mesophilic species and shade-loving species according to their habitat preferences and requirements. Therefore, whatever fire intervals, the land snail communities show a high recovery from fire disturbance. Because many land snails possess various biological aptitudes, such as diapause, estivation, quiescence, and self-fertilization and their life cycle exhibits diverse, with an annual or a biennial, some species have high phenotypic plasticity and their abundance can increase rapidly. Besides, water content of humus, vegetation, and thickness of litter within burned sites have greatly affected the post-fire survival rate of land snails.
**Conclusion**: After fire although species abundance is drastically reduced, species richness and biodiversity are preserved. The high resilience of land snails after fire may result from their biological, ecological and ethological aptitudes. However, life span and breeding season of some groups, especially of birds, have greatly changed for various reasons. Thus, they are subject to changing environmental conditions and their resistance to these changings may weaken. More recently, the number of fires has increased for various reasons in our country and many thousands of hectars of forests and areas have greatly affected by these fires, thereby suffering their invertebrate and vertebrate groups from these ones.

**KEYWORDS:** FIRE, LAND SNAILS, MEDITTERANEAN, TURKEY, BIODIVERSITY.

ISEEP_185

# DEGRADATION C.I. REACTIVE YELLOW 81 BY US/UV/ZNO HETEROGENEOUS OXIDATION PROCESS: EFFECT OF SYSTEM PARAMETERS

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**Aim**: The degradability of an azo dye, represented by Reactive Yellow 81 (RY81), by heterogeneous sonophotocatalytic oxidation process was investigated using simultaneous irradiation of short wave UV-C at 254 nm and power ultrasound at 20 kHz in the presence of a heterogeneous catalyst (ZnO) in this study.

**Methods**: The degradability of an azo dye, represented by Reactive Yellow 81 (RY81), by heterogeneous sonophotocatalytic oxidation process was investigated using simultaneous irradiation of short wave UV-C at 254 nm and power ultrasound at 20 kHz in the presence of a heterogeneous catalyst (ZnO) in this study.

**Results**: Effect of various system parameters i.e. pH, ZnO dose, H2O2 and inital dye concentration were examined on the dye degradation by heterogeneous sonophotocatalytic oxidation process (US/UV/ZnO). It was assessed the effect of soluble gas (N2, O2 and air) on the dye degradation to overcome degassing and to enhance the ultrasonic cavity formation.

**Conclusion**: Dye degradation efficiency was evaluated by the abatement in the visible absorbance region. It was found that the decolorization followed non-typical pseudo-first order kinetics, characterized by stabilization of the rate to a non-zero plateau. In two hours oxidation time, almost complete decolorization and partial mineralization were accomplished as 95% and 43.5%, respectively with the rate of 0.0380 min-1.

**KEYWORDS:** REACTIVE YELLOW 81, HETEROGENEOUS AOPS, ULTRASONIC OXIDATION, UV IRRADIATION.

ISEEP_186

# FIRST OCCURENCE OF THE GENERA *NANHERMANNIA* AND *RHYNCHOBELBA* (ACARI: ORIBATIDA) IN TURKEY

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**Aim**: Mites are described as hemiedaphic in terresterial ecosystems, in other words they are one of the organisms living in organic matter and raw humus and providing partial decomposition of these organic matters. Oribatid mites are one of the richest groups of acari with approximately 10.000 described species around the world. Hitherto approximately 150 species of oribatid mites were recorded from Turkey. They live in forest, deserts, tundra, freshwater, sea and they play an important role in decomposition, nutrient cycle, soil formation and dispersion of fungal spores. This study carried out for detremination of *Nanhermannia* and *Rhynchobelba* genera which are not recorded from Turkey perviously.

**Methods**: Mites were collected in soil and litter samples from Düzce province and extracted using a Berlese funnel apparatus. They were fixed and stored in 70% ethanol. Mites were sorted from the samples under a stereomicroscope and mounted on slides in modified Hoyer's medium or 35% lactic acid. Drawings were made with the aid of a camera lucida attached to a compound microscope. All measurements are given in micrometers (µm). Examined materials are deposited in the Acarological Collection of author, Sakarya University, Sakarya, Turkey.

**Results**: This is the first record of genera *Rhynchobelba* and *Nanhermannia*. In the present study, a new species Rhynchobelba ozkani and a new record Nanhermannia nana are described by scanning electron microscopy investigation.

**Conclusion**: The new species *Rhynchobelba ozkani* differs from the other species of the genus *Rhynchobelba* by the shape of rostrum, body dimensiones, lenth and shape of sensillus and type of rostral seta. General features of the newly recorded species *Nanhermannia nana* are in accordance with previously studies.

**KEYWORDS:** ACARI, ORIBATIDA, NEW SPECIES, *RHYNCHOBELBA*, *NANHERMANNIA*, TURKEY

ISEEP_187

# *AMEROBELBA DECEDENS* BERLESE, 1908 (ACARI; ORIBATIDA), A NEW RECORD FOR THE TURKISH FAUNA

NURTEN ŞIMŞEK, ŞULE BARAN

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**Aim**: The characteristic features, the figures and SEM photographs for *Amerobelba decedens* Berlese, 1908 recorded for the first time from Turkey, have been given on the basis of specimens collected from Sakarya province.

**Methods**: Mites in soil and litter samples taken from Sakarya province were extracted using a Berlese funnel apparatus. They were fixed and stored in 70% ethanol. Oppiid mites were gathered from the samples under a stereomicroscope, and mounted on slides in modified HoyerÕs medium and 35% lactic acid. Drawings were made with the aid of a camera lucida attached to a compound microscope. All measurements are given in micrometers (µm).

**Results**: Up to date there is no record for the species of genus *Amerobelba Berlese*, 1908 from Turkey. By the present work genus *Amerobelba* is thus represented by 1 species in Turkey.

**Conclusion**: Up to date there is no record for the species of genus *Amerobelba* Berlese, 1908 from Turkey. By the present work genus *Amerobelba* is thus represented by 1 species in Turkey. In spite of a large number of species (about 10.000) are known around the world, Information on the oribatid species of Turkey is mainly resticted data (150 species). This study support an additional infarmation far Turkish mite fauna.

**KEYWORDS:** ACARI, ORIBATIDA, *AMEROBELBA*, NEW RECORD, TURKEY

ISEEP_188

# EFFECT OF SEASON ON THE FATTY ACID COMPOSITION IN THE LIVER TISSUE OF *CHONDROSTOMA REGIUM*

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**Aim**: The present study was carried out to examine the effect of seasonal changes on the fatty acid profile in the liver tissue of *Chondrostoma regium* in living Karakaya Dam Lake (Turkey, Malatya).

**Methods**: *Chondrostoma regium* samples were captured from Karakaya Dam Lake. All fish were sexually mature female. The total lipid was extracted with chloroform-methanol (2:1, v/v) by the method of Folch et al. [1957] as previously described [Christie, 1990]. Non-lipid contaminants were removed by washing with 0.88% KCl solution. Fatty acids in the lipid extracts were converted into methyl esters by means of 2% sulphuric acid (v/v) in methanol. The fatty acid methyl esters were extracted three times with n-hexane. Then the methyl esters were separated and quantified by gas chromatography and flame-ionization detection.

**Results**: A total 27 different types of saturated and unsaturated fatty acids were found in the liver tissue of C. regium. The total saturated fatty acid ration ranged from 23.94 % (winter) to 28.86 % (spring). Within these components the major fatty acids were C16:0 and C18:0. The total monounsaturated fatty acid ration ranged from 28.25 % (spring) to 41.09 % (winter) with C16:1 and C18:1 the prominent monounsaturated fatty acids (MUFA). The total polyunsaturated fatty acid ration ranged from 24.91 % (autumn) to 34.73 % (spring) with C22:6 and C20:5 the prominent polyunsaturated fatty acids (PUFA). The EPA / DHA rations ranged from 0.72 % (winter) to 1.24 % (autumn).

**Conclusion**: This research showed that ecological and physiological factors are effective on the fatty acid composition in the liver tissue of *C. regium*.

**KEYWORDS:** FATTY ACID COMPOSITION, LIVER TISSUE, SEASONAL CHANGES, *CHONDROSTOMA REGIUM*, KARAKAYA DAM LAKE.

ISEEP_189

# BIRD ATLAS OF THE KAS KEKOVA SPECIALLY PROTECTED AREA IN TURKEY

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**Aim**: The goal of this study is to make the Bird Atlas for Kas Kekova region Specially Protected Area where is located in the south of Antalya province in Turkey.

**Methods**: The whole study area was divided into 25 UTM squares whose dimensions are 2.5×2.5 km for this study. Each 2.5×2.5 km squares were surveyed during the breeding and migration season between October 2008 and June 2010.

**Results**: Distribution maps for each bird species were formed. Total of 97 bird species of 13 orders and 34 families were recorded. There are 51 species of birds occur in the Kas – Kekova region all year round. 34 species are summer visitors. 3 species are winter visitors. 9 species are migrants and visit the site during the migration and breeding seasons. The bird species that were frequently seen in the study area were: *Apus melba* (Alpine Swift), *Falco naumanni* (Lesser Kestrel), *Garrulus glandarius* (Jay), *Parus major* (Great Tit), *Streptopelia decaocto* (Collared Dove), *Lanius senator* (Woodchat Shrike). According to the conservation criteria of the IUCN; *Larus audouinii* (Audouin\'s Gull) and *Coracias garrulus* (Roller) are near-thteatened (NT) and *Falco naumanni* (Lesser Kestrel) ıs vulnerable (VU).

**Conclusion**: Since the site has never been surveyed before, the data collected is very important to make an assessment for the birds of the area.

**KEYWORDS:** BIRD ATLAS, KAŞ-KEKOVA SPECIAL PROTECTED AREA, IUCN

ISEEP_190

# THE FLORA OF THE BURDUR LAKE SURROUNDINGS

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**Aim**: To determine Flora of the Burdur Lake surroundings.

Methods: This study was conducted between 2009 and 2011, during which time 1005 plant samples were collected. Taxonomic identifications were made by comparing the samples of Ankara University Herbarium (ANK) and Gazi University Herbarium (GAZI).

**Results**: The research area is in the C3 square according to Davis's Grid system. After the identification of the specimens, the total flora was determined to consist of 465 plant species belonging to 70 families and 275 genera. The richest family was *Compositae* (*Asteraceae*) and the richest genus is *Centaurea* L. The endemism rate of the 465 taxa was 10,53 % ( 49 taxa). The phytogeographic elements are represented was follows; Irano-Turanian 55 (% 11,83), Euro-Siberian 23 (% 4,95) and Mediterranean elements 40 (% 8,60). Of the species we sampled, 289 (% 62,15) were widespread and unknown.

**Conclusion**: Research area takes part in Irano-Turanian phytogeographic region in point of phytogeographic. However the number of taxa and percentage of the Iran-Turanian element (56 taxa, % 12,04) is almost by half the proportion with the Mediterranean element number and percentage of taxa (98 taxa, %21,70) and the state that the *Quercus coccifera* L. is a characteristic plant for the Mediterranean vegetation demonstrates that the environment of Burdur Lake as its observation region is a transition region between these two phytogeographic areas. Also the reason for occurence in high rate of widespread and unknown elements is thought to be originated that the research area is at the intersection of Mediterranean, Irano-Turanian and Euro-Siberian phytogeographical region.

**KEYWORDS:** FLORA, LAKE BURDUR, BURDUR

ISEEP_191

# EVALUATION OF THREAT CATEGORIES OF THE ENDEMIC PLANTS OF THE BURDUR LAKE SURROUNDINGS

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**Aim**: To determine to the flora of the Burdur Lake surroundings endemic taxa and their threat categories.

**Methods**: This study based on the vegetation field survey between 2009 and 2011 is done fort he purpose of the Burdur Lake surroundings.During the plant vegetation seasons, 1005 plant samples were collected. Taxonomic identifications were made by comparing the samples of Ankara University Herbarium (ANK) and Gazi University Herbarium (GAZI). The threat categories of the endemic species of Burdur Lake surroundings were determined and evoluted according to “Red Data Book of Turkish Plants”, which was prepared by using IUCN criteria.

**Results**: Totaly 49 endemic taxa from 16 families at species, subspecies or variety levels ocur in flora of the surroundings of the Burdur Lake. A total of 49 plant taxa were determined as endemic (10,53 % of all taxa). Highest ratios of endemic taxa were from families Boraginaceae ( 20,41 %) and Labiatae ( 16,33 %). Phytogeographic elements among endemic taxa were listed as Irano-Turanian ( 40,8 %), Mediterranean ( 30,6 %), while phytogeographic origin of 28,6 % of endemic taxa were widespread and unknown.. As endemic taxa and their threat categories are evaluated, 2 species was found tp in critically endangered, 3 endangered, 5 in vulnerable, 3 in near threatened, 35 in least concern and 1 in data dificient according to IUCN criteria.

**Conclusion**: Distribution areas of endemic plants of Burdur Lake surroundigs must conserve for ecological characteristics and importance of this area. We hope this study will contribute to future biodiversity invontories, monitoring end conservation studies on rare and endemic plants of Turkey.

**KEYWORDS:** ENDEMIC, ENDEMISM, FLORA, LAKE BURDUR, BURDUR

ISEEP_193

# I AM PROTECTING THE ENVIRONMET

MERYEM EBREM

SADI GÜLÇELIK SPOR SITESI ÖZEL ENKA OKULLARI ISTINYE ISTANBUL

**Aim**: Theme: Sharing the Planet An inquiry into rights and responsibilities in the struggle to share finite resources with other people and with other living things; communities and the relationships within and between them; access to equal opportunities; peace and conflict resolution. We studied the unit under the above theme. Central Idea: There is interaction between human beings and the living things in ecosystems. Inquiry Lines: Ecosystems Impact of human beings and acts of nature on ecosystems. Ways to protect ecosystems Activities: We started the unit with the GEMS activity "School Yard Ecology." We placed the data we collected on a sketch map of the school campus. We recorded changes on a daily basis. Students participated in a tree planting activity with the support of the PTA. In addition to the joy of planting trees, students also had a chance to explore the contributions of trees to ecosystems. Following planting trees, students picked litter, focusing on the importance of keeping environment clean. We studied different types of ecosystems. In order to explore the water ecosystem closely, we had a one day overnight camp in Turkuazoo Aquarium. The event was first of its kind in Turkey. Why organizing a camp in turkuazoo aquarium? The goals of the activities offered as part of the "Water Ecosystems Program" were to help students learn about water systems that cover a large part of the Earth, and to help them consolidate their understanding of the factors that affect both food chain and water ecosystem as well as to help them understand the importance of conservation of ecosystems. Students engaged in inquiries about ecosystems. They went on a field trip to Atatürk Arboretum. Students showed their learning by creating posters. They came up with slogans for their posters. Also, they made drawings related to the topic.

**Methods**: We started the unit with the GEMS activity "School Yard Ecology." We placed the data we collected on a sketch map of the school campus. We recorded changes on a daily basis. Students participated in a tree planting activity with the support of the PTA. In addition to the joy of planting trees, students also had a chance to explore the contributions of trees to ecosystems. Following planting trees, students picked litter, focusing on the importance of keeping environment clean. We studied different types of ecosystems. In order to explore the water ecosystem closely, we had a one day overnight camp in Turkuazoo Aquarium. The event was first of its kind in Turkey.

**Results**: Students showed their learning by creating posters. They came up with slogans for their posters. Also, they made drawings related to the topic.

**Conclusion**: Students gained more understanding about their roles on protecting the ecosystems and nature.

**KEYWORDS:** ENVIRONMET, AQUARIUM, ECOSYSTEMS, FOOD CHAIN

ISEEP_194

# REMOVAL OF CATIONIC DYE (BASIC YELLOW 51) FROM AQUEOUS SOLUTION USING AGRICULTURAL WASTE-RICE HUSK

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**Aim**: This study aimed at investigating the feasibility of using rice husk, a solid agricultural waste, abundantly available in Turkey, for the adsorption of a cationic dye, Basic Yellow 51. Methods: Batch adsorption studies were conducted to evaluate the effects of contact time, initial dye cocentration, adsorbent dose and pH for the removal of dye at temperature of 22oC. The experimental data were analysed by two different types of linearized Langmuir isotherm and Freundlich isotherm.

**Results**: The experimental data fitted well with the Langmuir model with a maximum adsorption capacity of 38.76 mg/g. A single–stage batch adsorber design of the adsorption of Basic Yellow 51 onto rice husk has been studied based on the Langmuir isotherm equation.

**Conclusion**: Pseudo first and second order kinetics models were tested with experimental data and pseudo second order kinetics was the best for the adsorption of Basic Yellow 51 dye by rice husk with coefficients of correlation R2>>0.9901 for all initial Basic Yellow 51 concentration. The results demostrated that the rice husk is effective for the adsorption of Basic Yellow 51 from aqueous solutions.

**KEYWORDS:** SORPTION, RICE HUSK, BASIC YELLOW 51, EQUILIBRIUM, KINETICS, PROCESS DESIGN

ISEEP_195

# SEX BIASED BREEDING SUCCESS AND OFFSPRING SEX RATIOS OF GREAT TIT (*PARUS MAJOR*) POPULATION IN RED PINE FORESTS SOUTH-WESTERN TURKEY

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**Aim:** To determine the offspring sex ratios and breeding success of females and males among a Great tit population by using molecular sexing.

**Methods:** We used 183 wooden nest boxes that are located in Lütfi Buyukyildirim Research Forests (BUK), which are located 35 km northwest of Antalya, during 2010 breeding season between Marc to July to determine sex biased breeding success and offspring sex ratios. Three feathers were collected from each nestling, unhatched eggs and death nestlings were taken to DNA extraction using phenol/chloroform following digestion with proteinase K. Molecular sex identification was performed using P8 and P2 primers. We compared the observed numbers of males and females with the number of each sex expected under sex ratio equality using a chi-square test.

**Results:** Male hatchling success was 87.3 ± 2.7 and female was 92.5 ± 2.5. Male fledgling success was 91.2 ± 2.5 and female was 95.6 ± 1.3 General breeding success (% of fledglings over the clutch size) was 87.1 ± 2.6 for males and 89.3 ± 2.7 for females. Primary sex ratio was 54 % male: 46 % female, hatchling sex ratio was 52 % male: 48 % female, fledgling sex ratio was 53 % male: 47 % female. The results indicated that primary ($x^2$ = 0.7, $p$ > 0.05), hatching ($x^2$ = 0.1, $p$ > 0.05) and fledgling ($x^2$ = 0.3, $p$ > 0.05) sex ratios did not differ significantly from unity (1:1).

**Conclusion:** We found that female breeding success higher than male and unhatched eggs were male biased. Approximately equal number of females and males (0.53/0.47) fledged and we found balanced sex ratios that may imply stabile population structure. However we had limited sample size and long term future work need to understand population's sex ratio evolution and how natural selection act of on population.

**KEYWORDS:** PARUS MAJOR, SEX RATIO, MOLECULAR SEXING, CHD GENES, ANTALYA.

ISEEP_196

# EFFECTS OF NUCLEAR POWER PLANT ACCIDENTS ON BIODIVERSITY AND AWARENESS OF POTENTIAL NUCLEAR ACCIDENT RISK NEAR THE EASTERN BORDER OF TURKEY

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**Aim**: To assay affects of Nuclear Power Plant (NPP) accidents on biodiversity and to point out the Metsamor nuclear Power Plant (MNPP) accident risk in Eastern Armenia near the eastern border of Turkey.

**Methods**: Contemporary literature evaluated for this purpose.

**Results**: NPP accidents affect on animals and plants several ways such as increased mutation rates, developmental abnormalities and morphologic, physiologic, genetic disorders and also reduced adult survival, reproduction suggests etc. Several studies that were conducted on MNPP indicated the combination of design (old technology and unsatisfactory safety measures) and location (exposed to severe seismic waves) of MNPP demonstrated a high possibility of accidents.

**Conclusion**: Previous studies indicated that NPP accidents cause permanent damage to biodiversity. The question is whether we are ready for nuclear accidents. Recent publications indicate that if an accident happens at MNPP, all of Turkey might influence in 10 days. Because of this reason we need to have an urgent action plan and take the necessary precautions for this possible catastrophe.

**KEYWORDS:** NUCLEAR POWER PLANT, NUCLEAR ACCIDENT, NUCLEAR RISK, METSAMOR

ISEEP_197

# FEEDING STRATEGY OF RUMINANTS AND ENVIRONMENTAL IMPACT

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**Aim**: Understanding the digestive physiology of the ruminants and how dietary components affect efficiency of modifications in the rumen, intestine and the digestive tract as a whole is a key to proper feeding management. Feeding strategy of ruminants combined with their digestive strategies could be of an advantage when it is takes into account for the losses of nutrients in feces and urine by the manure. The objective of this paper is to review the literature in respect to protein nutrition and nitrogen both metabolism and utilization in ruminants with an emphasis on the form in which N is excreted.

**Methods**: We studied many experiments with different ratio of carbon and nitrogen and found how to change it in the manure. The relationship between nitrogen intake and nitrogen balance was obtained. Regression analysis was used to describe the relationships between nitrogen intake and excretions by feces, urine and milk.

**Results**: The results convincingly show a direct correlation between nutrition and composition of manure. Optimal feeding strategy for optimal composition of the manure safe for the environment depends on complexity of factors.

**Conclusion**: Excess excretion of N in feces and urine poses an environmental problem. Manure could provide very useful information on the digestibility of the animal diet. Nitrogen losses with urine and feces are approximately 63% and 37% of all losses respectively.

**KEYWORDS:** RUMINANT, NUTRITION, FEEDS, EVALUATION, DIGESTION, MANURE

ISEEP_198

# LICHENS OF KURŞUNLU WATERFALL NATURAL PARK AND THE EFFECT OF URBANIZATION ON LICHEN BIOTA OF THE PARK'S SURROUNDING AREA

ÖZGE TUFAN ÇETIN

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**Aim**: Lichens are bioindicator organisms that are very sensitive to changes in environmental conditions and they are used in many research studies with these aspects. Kurşunlu Waterfall is one of the rare natural park in the urban area of Antalya Province in Turkey that was lost its natural structure by environmental changes such as increasing human population, pollution of receiving environments, destruction of vegetation in the process of urbanization. In this study, the aim is to determine the lichen diversity of Kurşunlu Waterfall with the surrounding area and to detect the effects of environmental changes that is a result of the urbanization to the lichen biota of the area.

**Methods**: The Kurşunlu Waterfall with surrounding parts, approximately 2064 ha area, was investigated. Lichen samples were collected from choosen localities and determinated with respect to different floras, monographs and relevant papers.

**Results**: From Kurşunlu Waterfall Natural Park totally 49 lichen taxa were identified. Only five of determined taxa were found in urban part of the area.

**Conclusion**: This result points out that a significant amount of lichen species was lost due to environmental changes and sustainable urbanization could not be applied in this parts of Antalya Province.

**KEYWORDS:** LICHENS, URBANIZATION, KURŞUNLU WATERFALL NATURAL PARK, ANTALYA, TURKEY

ISEEP_199

# EFFECTS OF CARBOXIN ON CATALAZ ENZYME ACTIVITE IN RAINBOW TROUT (*ONCORHYNUS MYKISS*)

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**Aim**: In this study assessed the effects of exposure to carboxin on the antioxidant defense system of rainbow trout (Oncorhynchus mykiss).

**Method**: Extracts from each tissue were prepared from each individual in according to Wiegand et al. (2000) with modifications. Sample were homogenized by KH2PO4 (30mM, pH=7,3) buffer. And than homogenates were centrifuged at 13000 rpm, 2 hours, 4 °C. Antioxidant enzyme activities CAT concentration was determined on the supernatants according to Beutler (1984).

**Results**: In the present study, it was observed that there were differences ($P < 0.05$) between the enzyme activities determined in the control group for CAT enzyme activity. The level of CAT increased during the exposed period and reached to 67.88±0.39, 63.79±1.42, 62.36±0.55, 37.39±1.10 from 15.49±1.99, 12.01±1.05, 11.41±1.20, 14.87±1.11 (The results are expressed as mean of 4 fishes ± SD.). There was a significant effect of Carboxin on the level of catalaz enzyme activity and this pesticide exposure significantly increased the activity of CAT in rainbow trout hepar ($p < 0.05$).

**Conclusion**: Many classes of environmental pollutants may exert toxicity related to oxidative stress and can cause oxidative damage in fish. In the present work, carboxin caused oxidative stress in the rainbow trout and CAT enzyme took part in protection against carboxin toxicity.

**KEYWORDS:** CARBOXIN, RAINBOW TROUT, TOXICITY, ANTIOXIDANT ENZYME, CAT

ISEEP_200

# SYNTHETIC PYRETHROID RESISTANCE IN HOUSEFLY, *MUSCA DOMESTICA* L. (DIPTERA: MUSCIDAE), FROM THE SOLID WASTE COLLECTION FACILITY OF VARSAK, ANTALYA

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**Aim**: The housefly, *Musca domestica* L. (Diptera: Muscidae), is a serious public health pest that a mechanical vector of many human pathogens. Due to its high reproductive rate, this fly has rapidly developed resistance against various insecticides. Among these insecticides synthetic pyrethroids such as cypermethrin, cyphenothrin, deltamethrin, permethrin are recommended by the WHO for control of houseflies. The aim of the present study was to determine the resistance of house fly population from the solid waste collection facility of Varsak, Antalya against some commonly used synthetic pyrethroids.

**Methods**: The resistance/susceptibility status of the tested population was determined for each insecticides according to WHO criteria. The knockdown times (KDt50 and KDt90) and the mortality rates of test insecticides were evaluated using the residual contact method.

**Results**: The resistance to cypermethrin and cyphenothrin was found the house fly population in the solid waste collection facility of Varsak, Antalya when compared with the susceptible population from WHO.

**Conclusion**: To reduce insecticide resistance in solid waste collection facilities, all integrated methods should be used for control of houseflies.

**KEYWORDS:** *MUSCA DOMESTICA*, RESISTANCE, SYNTHETIC PYRETHROIDS, WASTE COLLECTION

ISEEP_201

# TWO NEW RECORDS TO THE SUCTORIAN CILIATE FAUNA OF TURKEY *DENDROSOMA RADIANS* (EHRENBERG, 1837) AND *HELIOPHYRA ROTUNDA* (HENTSCHEL, 1916)

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**Aim**: In this study, two remarkable suctorian ciliate, *Dendrosoma radians* and *Heliophyra rotunda* were studied in details.

**Methods**: All the samples for this study were collected from lakes by using 10 µm plankton net and artificial substrates. Morphological characters were identified by live observation and observation with impregnation methods. The species were defined by the evaluation of morphometric measurements and counts which were performed digitally by IM50 image manager system and Q- win measurement program. Illustration of the specimens were by free-hand sketchs and micrographs.

**Results**: *Dendrosoma radians*, size in vivo up to 4mm height, irregularly shaped body directly attach to the substrate posteriorly, fingerlike actinophores arise from body with capitat shaped single bundle tenctacles at their ends. Macronucleus irregular in shape with broad ramifications. Several randomly located contractile vacuoles in cytoplasm. Heliophyra rodunta, disk shaped body 50-60 µm size in vivo. Distinct tentacles bundled, up to 100 µm length and distally bubble shape to spherical. Macronucleus disk shape and almost centrally located. Approximately 10-12 disorganised contractile vakuoles.

**Conclusion**: The present study reports two new species for the Turkish Ciliate Fauna, adding taxonomic details from original drawings and pictures, and adds geographic distribution of these species.

**KEYWORDS:** ANATOLİA, CİLİOPHORA, NEW REPORT

ISEEP_202

# NOTES ON *HOLOSTICHA PULLASTER* (MUELLER, 1773) (PROTOZOA: CILIOPHORA) FROM TURKEY

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**Aim**: It is aimed to give the morphological and morphometrical details of *Holosticha pullaster*, from different localities of Turkey.

**Methods**: All the samples for this study were collected from lakes by using 10 µm plankton net and artificial substrates. Morphological characters were identified by live observation and observation with impregnation methods. The species was defined by the evaluation of morphometric measurements and counts which were performed digitally by IM50 image manager system and Q- win measurement program. Illustration of the specimens were by free-hand sketchs and micrographs.

**Results**: Holosticha pullaster, size in vivo 70X25 µm, shape elliptical, posterior and anterior ends rounded; two macronuclear nodules almost at the center; contractile vacuole distinctly subequatorially located. Somatic ciliary rows straight; pronounced midventral, one right and one left marginal cirral rows; 3 frontal, 1 buccal, 7-10 almost J-shaped transverse cirri on ventral side. No caudal cirri on dorsal side.

**Conclusion**: The present study reports a urostylid ciliate, *Holosticha pullaster*, to the Turkish Ciliate Fauna, adding taxonomic details from original drawings and pictures, and adds geographic distribution of this species.

**KEYWORDS:** ANATOLİA, CİLİOPHORA, UROSTYLİDAE

ISEEP_205

# THE AFFECTS OF ENVIRONMENTAL SENSITIVITY AND CONSCIOUS ON PURCHASING BEHAVIOURS OF CONSUMERS (A CASE STUDY OF TOKAT PROVINCE)

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**Aim**: In this study, it is aims to investigate the effects on purchase behavior of consumers\' awareness of the environment and environmental problems.

**Methods**: The main material of the study is the data obtained from consumers living urban area of Tokat province via face to face interview. By using the data obtained from consumers, the relationships between the purchasing behavior of consumers and the environmental sensitivity will be statistically tested with appropriate analysis methods.

**Results**: The study is continued.

**Conclusion**: The study is continued.

**KEYWORDS:** PURCHASING BEHAVIOURS OF CONSUMERS, SENSITIVITY LEVEL, CONSCIOUS LEVEL, ENVIRONMENTAL PROBLEMS

ISEEP_206

# STOPOVER ECOLOGY OF SOME MIGRANT SPECIES ON THE BLACK SEA COAST IN THE KIZILIRMAK DELTA

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**Aim**: This study examined the autumnal stopover patterns of some migratory passerines in the Kızılırmak delta Cernek Ringing Station, Samsun, from 2003 to 2005.

**Methods**: Species of different migratory and feeding habits are compared. A total of 358 recaptures of the Blackcap (*Sylvia atricapilla*), Garden Warbler (*S. borin*), Reed Warbler (*Acrocephalus scirpaceus*), Marsh Warbler (*A. palustris*), Nightingale (*Luscinia megarhynchos*) and Thrush Nightingale (*Luscinia luscinia*) were mist-netted and handled according to the South-East European Bird Migration Network (SEEN) standards.

**Results**: The mean weight changes were higher in Sylvia spp. as compared to Acrocephalus and Luscinia spp. The recapture rate was the highest in the Nightingale (%17.6) but the mean weight increase was the lowest. The stopover duration differed among the species. The mean stopover length was highest in the Nightingale (12 days) and lowest in the Blackcap (5.4 days), but were similar within each genus.

**Conclusion**: Results indicate that migratory birds use Cernek location as refuelling station during the autumn migration and their fat level and body mass increase, but differ according to feeding and migrating habits. The conservation of long-distance migratory songbirds is complicated by their life history characteristics. Events during migratory stopovers may have significant consequences in determining the population status of migratory songbirds. Knowledge of intraspecific variation in migration strategies is important for effective conservation of stopover habitats.

**KEYWORDS:** STOPOVER ECOLOGY, BIRD MIGRATION, KIZILIRMAK DELTA

ISEEP_207

# DETERMINING THE FIELD OF SOLID WASTE POLLUTION BY USING RESISTIVITY METHOD

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**Aim**: The purpose of this research, Ring (Istanbul) and Hamamboğazı (Aksaray), solid waste storage fields that make up the environmental risk due to contamination of groundwater pollutant areas to determine the span element. Accordingly, the wrong location and the irregular surface of the storage due to leakage of water to penetrate to the depths and gas accumulations could by detecting the most important goal of the research is.

**Methods**: In this study, the polluting element in order to determine areas of propagation-resistivity vertical electrical sounding (DES) method is applied. Symmetrical full-Schlumberger electrode array technique applied to study in the electric field generated by the transmitter electrodes were measured in the potential distributions. Resistivity profiles were measured in the study area, the vertical relationship between the depth direction.

**Results**: As a result of these studies, solid waste to minimize the impact of environmental damage in the geophysical (resistivity) survey the results obtained are as follows. According to this;
1. Solid waste areas, the risk of pollutants that make up the vertical direction and lateral expansions of the regions have been identified.
2. Research in the field due to the accumulation of methane and other gases could lead to a possible explosion and fire can be concluded that a condition exists. In the event of such a risk to be drained of gases can be determined location.
3. As a result of studies, aquifer storage areas free for the effects of nutrition in the resistivity-depth parameters were obtained for the two-dimensional cross-sections.

**Conclusion**: Determination of pollution zones.

**KEYWORDS:** SOLID WASTE, RESISTIVITY, ENVIRONMENTAL POLLUTION, AQUIFER

ISEEP_208

# PHYTOPLANKTON SPECIES COMPOSITION OF RIVA RIVER (ISTANBUL, TURKEY)

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**Aim**: The aims of this study was to determine the relationships between certain physical and chemical variables and the seasonal dynamics of phytoplankton assemblages in Riva River.

**Methods**: Some physical and chemical parameters and determination of phytoplanktonic taxa has been done according to standart technics and methods.

**Results**: As a result, The composition and montly variations of phytoplankton of Riva River were studied using samples collected from four stations between March 2006 - February 2007. The flora consisted of 93 taxa belonging to the Bacillariophyta (61 taxa), Cyanophyta (9 taxa), Chlorophyta (15 taxa), Conjugatophyta (4 taxa) and Euglenophyta (4 taxa). The Bacillariophyta was the dominant form of algal flora. *Cyclotella ocellata* (Pantocsek.), *Synedra acus* (Kützing.), *Synedra ulna* (Nitzsch) Ehr, *Nitzschia palea* (Kütz.) W. Smith, *Gomphonema parvulum* (Kütz.) were the most frequent taxa in the algal flora.

**Conclusion**: According to the study , both water quality and phytoplanktonic taxa of Riva River has beeen identified that it is in the the most polluted water quality.

**KEYWORDS:** RİVER, WATER QUALİTY, PHYTOPLANKTON

ISEEP_209

# SEASONAL DYNAMICS OF HOUSE DUST MITE POPULATIONS OF EASTERN REGION OF TURKEY (BITLIS, MUŞ)

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**Aim**: The aim of this study was to determine the seasonal dynamics of house dust mite populations of lakeside, lowland and high-altitude settlements regions.

**Method** :This study was carried out in six houses from three settlements; two from lakeside (Bitlis, Tatvan), two from lowland (Muş, Hasköy) and two from high-altitude regions (Muş, Hasköy, Dağdibi village) from May 2010 to April 2011. For these investigations, the houses were vacuumed approximately once a month during a year. Dust samples were collected with a portable vacuum cleaner and were brought to the laboratory for diagnostic to calculate numbers of mites in the per 1 g dust.

**Results**: In this study mites were found in all dust samples. 1167 mites were isolated from 72 dust samples. The average number of mites ranged from 25 to 2470/g. of dust. 11 mite species were determined. The most prevalent species of mites was *Dermatophagoides pteronyssinus*.

**Conclusion**: *D. pteronyssinus* is most frequent house dust mite in Eastern Region of Turkey (Muş, Bitlis). The mite number was higher in lakeside settlement which has dense humidity.

**KEYWORDS:** HOUSE DUST MITES, SEASONALITY, *D. PTERONYSSINUS*, BITLIS, MUŞ

ISEEP_210

# BIRD RINGING RESULTS OF BOĞAZKENT RINGING STATION, ANTALYA, TURKEY

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**Aim:** Boğazkent is one of the important stopover site for migratory birds and also over 80 species breed at Boğazkent. This study aimed to determine the migration phenology of migrants, especially long-distance migrants and to understand yearly and long-term changes on populations and/or species.

**Methods:** This study have been started 2009 spring. Spring ringing studies done between 15$^{th}$ March and 30$^{th}$ April, autumn seasons between 20$^{th}$ August and 10$^{th}$ October. We used to catch birds 16 mist-nets, which set up near Köprüçay river along the bushes. Birds were aged and sexed by plumage colouration according to Svensson (1992), measured maximum wing length to the nearest 0.5 mm after Svensson (1992) and weighed to the nearest 0.1 g.

**Results:** Between 2009 and 2011 (for 2011 only spring data used) 3353 birds from 62 species were caught. In 2009 1171 birds from 44 species (both spring and autumn), in 2010 1183 birds from 51 species (both spring and autumn) and in 2011 only spring season 754 birds from 40 species were captured. The most catched birds are Barn Swallow (*Hirundo rustica*), Reed Warbler (*Acrocephalus scirpaceus*), Blackcap (*Sylvia atricapilla*), Sedge Warbler (*Acrocephalus schoenobaenus*) and Yellow Wagtail (*Motacilla flava*), respectively.

**Conclusion:** We recorded 196 bird species from 48 families in observation results. In previous study, 213 bird species determined at Boğazkent (Erdoğan et al.. 2002). 24 new bird species were recorded and totally 237 bird species were recorded at Boğazkent. 16 bird species of the avifauna are A.1.2 criterion of the Türkiye Red Data Book List, and 2 bird species is B.1.2 criterion. Boğazkent, located in Belek Special Protection Area, must be protected for two main sensitive features: 1) one of the important stopover area for migrants, specially long-distance migrants, before or after to fly over the Mediterranean, and 2) at Boğazkent over 80 bird species breed and most of them must be under protection.

**KEYWORDS:** RINGING, BIRD, STATION, BOĞAZKENT, PROTECTION.

ISEEP_211

# BREEDING STUDY OF SPUR-WINGED LAPWING (*VANELLUS SPINOSUS*) AT BOĞAZKENT, ANTALYA, TURKEY

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**Aim:** Spur-winged Lapwing distribute most part of the continent Africa, only east part of the Mediterranean (Turkey and Greece) and Middle East (Israel, Lebanon, Iraq, Syria etc.). Turkey, Greece and Middle East population of this species are sommer visitor, the other populations are resident. Boğazkent is one of the important breeding area in Turkey. We aimed to determine and understand the breeding biology of this species and its breeding success.

**Methods:** This study have been done 2009-2011 breeding periods. Observations started beginning of March twice or three times a week to determine the migration phenology. Beginning of April continue to observations their breeding behaviours. Second half of April and following May and June were breeding periods. Adults try to catch on their nests after finding nests. Adults were sexed by spur length, measured maximum wing-, tail-, body-, tarsus length to the nearest 0.5 mm after Svensson (1992), bill-, middle toe and nail-, and both right and left spurs length to the nearest 0.1 mm and weighed to the nearest 1 g. Eggs width and length measured to the nearest 0.1 mm and weighed to the nearest 0.1 g.

**Results:** Between 2009 and 2011 (for 2011 only spring data used) 176 birds (88 pairs) counted. In 2009 52 birds (26 pairs), in 2010 60 birds (30 pairs) and in 2011 64 birds (32 pairs) were counted. Besides, in 2009 17 nests, in 2010 27 nests and 2011 35 nests were found. Clutch size was generally 4, but also 2, 3 or 5 eggs (only 2 nests).

**Conclusion:** The predation risk is very high during both breeding and feeding periods. Hooded Crow, dogs and Fox are the most predators. Besides, human activities, especially plough of the fields effect the destruction of the nests or pairs leave the nests. This species is under threaten and breeding areas of Spur-winged Lapwing must be protected. To protect and to raise the breeding success, the preventions must be executed against to predators and also during ploughing may be people mmuch more carefully.

**KEYWORDS:** SPUR-WINGED LAPWING, BREEDING, BOĞAZKENT, PREDATION, PROTECTION.

ISEEP_212

# DOES MEDITERRANEAN AN IMPORTANT BARRIER FOR LONG-DISTANCE MIGRATORY PASSERINES?

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**Aim:** Between breeding and wintering areas, birds spend far more of their time and energy at stopover sites. Stopover ecology has taken a major role in building up an understanding of how bird migration is organised. Boğazkent is one of the important stopover site for migratory birds. The location of Boğazkent is one of the sample to investigate the stopover time and energy intake before Mediterranean in autumn migration or after long flight over Mediterranean in spring. We aimed to determine and understand the difference between migration seasons both spring and autumn and the importance of South Turkey coasts for migratory birds.

**Methods:** This study have been done 2009-2010 both spring and autumn migration. We studied on Wheatears (*Oenanthe spp.*). Birds were trapped with spring traps baited with mealworms, *Tenebrio molitor*, throughout the daylight period from the beginning of March to end of May for spring and beginning of September to end of October for autumn migration periods 2009 and 2010. Birds were aged and sexed by plumage colouration according to Svensson (1992), measured maximum wing length to the nearest 0.5 mm after Svensson (1992) and weighed to the nearest 1 g. Fat score was estimated on a nine-class (Kaiser 1993) and size of the breast muscle on a four-class scale (Bairlein 1994). Each bird was marked with an individual combination of one aluminium and split colour-rings. We calculated Lean body mass, Arrival fuel loads and Departure fuel loads of each ringed birds.

**Results:** We trapped totally 340 Wheatears in 2009 and 2010; 175 Northern Wheatear (*O. oenanthe*), 103 Isabelline Wheatear (*O. isabellina*) and 55 Eastern Black-eared Wheatear (*O. melanoleuca*). 215 of 340 ringed birds could be observed and recorded last weight before departed; 122 Northern Wheatear, 53 Isabelline Wheatear and 40 Eastern Black-eared Wheatear. Stopover duration was only Northern Wheatear differer between spring and autumn migration period (Northern Wheatear: 2009 spring N=48, Mean=1.88 ±1.55, 2009 autumn N=23, Mean=4.30±1.99, T=-5.16, P=0.00 ; 2010 spring N=24, Mean=1.63 ±0.65, 2010 autumn N=27, Mean=5.52±1.81, T=-5.09, P=0.00 ; Isabelline Wheatear: 2009 spring N=15, Mean=2.80 ±4.80, 2009 autumn N=13, Mean=5.08±3.40, T=-1.46, P=0.156 ; 2010 spring N=14, Mean=1.79 ±0.98, 2010 autumn N=11, Mean=4.18±1.47, T=-4.66, P=0.00 ; Eastern Black-eared Wheatear: 2009 spring N=13, Mean=2.62 ±0.65, 2009 autumn N=7, Mean=2.57±0.79, T=-2.75, P=0.02 ; 2010 spring N=9, Mean=1.44 ±0.73, 2010 autumn N=11, Mean=2.55±1.21, T=-2.51, P=0.02).

**Conclusion:** The result of this study clearly demonstrate differences in the strategies of migration and stopover in different migration period. Models dealing with optimality in bird migration predict that such stopovers should last until enough fuel is stored to reach the next stopover site if the birds are minimizing energy expenditure during migration. If birds are under time pressure to arrive earlt to find good breeding territories, fuel deposition rate and depaeture fuel load are important. Mediterranean plays an important role to take a decision to depart for migrannts. In spring, birds fly over the sea from Africa, their wintering areas, and stay short time to rest and store enough energy, so continue their flight to the next stopover site. On the other hand, in autumn before Mediterranean, they need more energy store to fly over the sea.

**KEYWORDS:** WHEATEARS, OENANTHE SPP., STOPOVER, MEDITERRANEAN, BARRIER.

ISEEP_213

## COMPARISION OF TOURIST PERCEPTIONS ABOUT THE ENVIRONMENTAL ATTRIBUTES IN A MASS TOURISM DESTINATION

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**Aim:** It is aimed to compare some substructure and superstructure attributes of the destination and behavioral intentions of the visitors in Side-Manavgat area, Antalya which is one of the most popular mass tourism destinations in Turkey.
**Methods:** A structured survey was conducted at the destination in August-November periods of 2007-2010. Totally 9037 visitors from four countries (Germany, the Russian Federation, the United Kingdom, and the Netherlands) participated to the survey.
**Results:** Tourist perceptions about the environmental attributes at the destination as well as some substructure and superstructure factors were compared for four years of period by time series. Results showed that overall means of the "environmental cleaning"; "cleaning of the public toilets" and "side roads & night lighting" issues were lower than other attributes or factors in four years. The most favoured factor was the "general hygiene of the hotel" for all nationalities. Remainder attributes had average means in general. Authors measured to means of four items (satisfaction, value, recommendation, re-purchase) for identifying the behavioral intentions of the tourists, without relating them to their perceptions about the environmental attributes and other factors.
Conclusion: The overall satisfaction of the tourists from the environmental attributes and substructure/superstructure factors of the destination influence to their behavioral

intentions. Therefore, in the future studies, it is adviceable to analyse direct and indirect influences of those variables on tourists' behavioral intentions.

**KEYWORDS:** DESTINATION ATTRIBUTES, ENVIRONMENT, TOURISM

ISEEP_214

## ECOLOGICAL AND TAXONOMIC MEANS OF HAIR MEASUREMENTS OF EUROPEAN HARES (*LEPUS EUROPAEUS* PALLAS, 1778) FROM ANATOLIA, EUROPE, NORTHISRAEL, AS WELL AS OF CAPE HARES (*L. CAPENSIS* L., 1758) FROM SOUTH ISRAEL

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Aim: Phylogenetic relationships among hares from Europe, parts of the Middle East and North Africa suggest still cohesive gene pools, despite regional differentiation. This would be in line with the hypothesis of conspecificity of these hares. However, those hares differ markedly in their external appearance, e.g., in their fur characterinstics.
Methods: We performed discriminant analyses (DA) of 7 metric hair variables of 49 adult-sized hares (22 Anatolian, 11 central European, 16 Israel hares). The variables (length of color zones, diameters of cross sections) were measured using a microscope, a scanner and a computer. Twenty hair samples per hare (from the central of dorsal part) were taken. Two different methods were used by the measuring the different hair characters: 1) the larger measurements (macro measurements, i.e., pigment zone lengths) were scanned with a ruler (0,1 mm precision), and the scanned images were used to measure hair length and the pigment zones for the smaller measurements (micro measurements) the same hairs that were used for macro-measurements were fixed with glue on a piece of balsawood, and cross sections were achieved using a razor blade. Microscope slides were prepared and cross sections were measured using a millimetric ocular. For DA all metric variable were expressed in percent of respective total hair length and ln arcsin square root transformed.

Results: DA results indicate that macro measurements are not concordant with taxonomic relationships. Perhaps they are considerably affected by diverse environmental parameters. Contrary, micro measurements are more related to taxonomic units. According to the DA of cross section variables form distinct clusters for hares from Anatolia, south-east Anatolia, north Israel, and south Israel, whereas the values for brown hares from Europe are scattered across those of Israeli and Anatolian hares.

Conclusion: The mean width (Dia.mid) of the hair cross section diameter is closely related with the annual ambient temperature: in cooler regions the cross section is more elongate, whereas it is more triangular in warmer and hot regions. Perhaps this variation in shape is associated with regulation of the body temperature, because the thick hairs are less light translucent than the thinner hairs.

**KEYWORDS:** *LEPUS EUROPAEUS*, HAIR MEASUREMENTS, ANATOLIA, ECOLOGY

ISEEP_215

## BIODETERIORATION OF ANCIENT MONUMENTS BY FUNGI

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**Aim:** In this study the fungal diversity and deterioration on historical monuments were investigated. The Aspendos Ancient City (Antalya/Turkey) in Mediterranean Region was chosen as study area, because of its outstanding historic and artistic value and the large variety of monuments.
**Methods:** The sample collection, isolation, morphological and molecular characterizations were done according to literatures. Samples were collected in January, April, August and in October between 2009-2010.
**Results:** From a total of around 108 samples 42 fungal strains were isolated, and could be assigned to 8 different genera (*Coniosporium*, *Capnobotryella*, *Massarina*, *Mycocalicium*, *Phaeococcomyces*, *Phoma*, *Rhinocladiella*, *Sarcinomyces*).

**Conclusion:** The observations of the rock surfaces clearly demonstrate that there is a strong positive correlation between the fungi and the alteration of the rock surfaces.

**KEYWORDS:** BIODETERIORATION, BLACK FUNGI, ASPENDOS, TURKEY, MONUMENT

ISEEP_218

# DIOXINS AND DIOXIN-LIKE PCBS IN IMPORTED RAW AND PROCESSED FISH AND SHELLFISH SAMPLES IN TURKEY

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**Aim:** The goal of this study was to get more insight in the levels of dioxins and dioxin-like PCBs in raw and processed fish and shellfish samples imported from various countries to Turkey.

**Method:** Totally 16 fish and shellfish samples were collected between 2009-2011. For each species edible parts of the individual samples were pooled, homogenized and analysed accordingly. For dioxins and dioxin-like PCBs determination, fat extraction was followed by clean-up via Power-Prep equipped with jumbo silica, mixed bed silica, alumina and carbon columns. Measurement for dioxins and dioxin-like PCBs were done on GC-HRMS system at 10000 resolution. Congeners were quantified according to isotope dilution.

**Results:** The samples analysed covered a wide range of fish and shellfish related products including canned fish and processed fish (smoked and breaded). Concentrations of total dioxins and, total of dioxins and dioxin-like PCBs, as TEQ, in fish and shellfish samples, ranged from 0.06 to 0.40 pg $TEQ_{(1998)}$ $g^{-1}$ wet weight and from 0.07 to 0.84 pg $TEQ_{(1998)}$ $g^{-1}$ wet weight, respectively.

**Conclusion:** Concentrations of dioxins and dioxin-like PCBs were below the EU regulation (EC No:1881/2006) limits in all of the samples analysed, with higher concentrations being found in products based on oily fish.

**KEYWORDS:** FISH, SHELLFISH, DIOXINS, DIOXIN-LIKE PCBS

ISEEP_219

# TWO NEW HYPOGEOUS ASCOMYCETE RECORDS FOR TURKISH MYCOBIOTA

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**Aim:** The aim of the current study is to make a contubution to mycobiota of Turkey by adding new hypogeous fungi taxa.

**Method:** The fungi materials were collected from Karaman province (Turkey) during routine field trips. Relevant morphological and ecological properties were recorded and they were photographed in their natural habitats. Thereafter macroscopic and microscopic investigations were carried out in laboratory. The identified specimens were deposited at the herbarium of Ankara University (ANK).

**Results:** In this study, Two hypogeus ascomycete truffles, *Picoa juniperi* Vittad. and *Terfezia claveryi* Chatin, are recorded from Turkey for the first time. Short diagnosis, photographs of ascocarps and microphotographs of asci and ascospores of the species are provided for each taxon.

**Conclusion:** *Terfezia* and *Picoa*, mycorrhizal hypogeus ascomycete genera, are called desert truffles in the order Pezizales. They are known to ocur in arid to semi arid regions in some of the coastal countries of the Mediterranean basin. Seven hypogeus Ascomycete truffle taxa have so far been registered from Turkey.
With the current study, two species (*Picoa juniperi* and *Terfezia claveryi*) are added to Turkish mycobiota and the number of Turkish Ascomycete truffle taxa increased to nine.

**KEYWORDS:** ASCOMYCOTA, HYPOGEOUS FUNGI, BIODIVERSITY, NEW RECORDS

ISEEP_220

# HEAVY METAL CONTENTS ON SOME *CORTINARIUS* (PERS.) GRAY (*CORTINARIACEAE*) TAXA FROM TURKEY

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**Aim:** Identification of heavy metals on some *Cortinarius* species and to reveal their ecologic importance.

**Method:** ICP-AES method was used.

**Results:** The concentrations of Pb, Cd, Mn, Cu, Ni, Ag, Cr, Ta, V, Bo, Ba, Bi, Co, Tl, and In were analysed on wild *Cortinarius* (Pers.) Gray taxa [*C. subvalidus* Rob. Henry, *C. elagantior* (Fr.) Fr., *C. flavopallidus* (M.M.Moser) M.M.Moser, *C. melanotus* Kolchbr and *C. sulphureus* Lindgr] from Turkey by ICP-AES equipment.

The highest Al, and Fe concentrations were determined as 4691 and 3143 $mg.kg^{-1}$ on *C. elegantior,* respectively. The highest Cr, Cu, and Zn concentrations were determined as 46.29, 44.27 and 70.29 $mg.kg^{-1}$ on *C. melanotus,* respectively. Boron concentration was only detected as 9.82 $mg.kg^{-1}$ in *C. subvalidus* which the highest Bi level was also detected as 6.97 $mg.kg^{-1}$. The Tl, V, B, Ba, Co, and on concentrations were not detected in studied mushroom samples.

**Conclusion:** Results were compared with WHO/FAO guide line. The heavy metal contents of fungi play an important role in determining the ecological characteristics of the mushrooms.

**KEYWORDS:** CORTINARIUS, HEAVY METALS, CENTRAL ANATOLIA, TURKEY.

ISEEP_221

# SOME ELEMENT (AS, MN, FE, K, NA, P) CONTENTS ON TRICHOLOMA (FR.) STAUDE (TRICHOLOMATACEAE) TAXA FROM CENTRAL ANATOLIA, TURKEY

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**Aim:** Identification of some elements on Tricholoma genus.

**Method:** ICP-AES method was used.

**Results:** The concentrations of lead As, Mn, Fe, K, Na, P, and Zn were analysed on wild edible Tricholoma (Fr.) Staude taxa [T. orirubens Quél, T. imbricatum (Fr.) P.Kumm, T. columbetta (Fr.) P.Kumm, T. cedretorum (Bon) A.Riva, T. anatolicum Dogan & Intin] from Turkey by ICP-AES equipment.

The highest K, Mn and Na concentrations were determined as 65266, 113 and, 3450 mg.kg-1 on T. orirubenis respectively. The highest Fe and P concentrations were determined as 3215 and 10883 mg.kg-1 on T. columbetta. The highest As level was determined as 1020 mg.kg-1 on T. anatolicum.

**Conclusion:** Elements were compared with WHO/FAO guide line. It was determined that certain elements in different levels on fungi are important for human health.

**KEYWORDS:** TRICHOLOMA, ELEMENT CONTENTS, CENTRAL ANATOLIA, TURKEY.

ISEEP_222

# A NEW RECORD FOR TURKISH BRYOFLORA, *BRYOERYTHROPHYLLUM RUBRUM* (JUR. EX GEH.) P.C. CHEN (POTTIACEAE, BRYOPHYTA)

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**Aim**: The work aims to contribute to the Bryoflora of Turkey by adding a new record.

**Method**: The study materials were collected from Akdağ Mountain (Amasya). The specimens were dried in shadowy and ventilated conditions. Identification was performed with the help of the literature. The voucher sample was preserved as a reference specimen in the herbarium of Ankara University (ANK).

**Results**: As a result of this study, *Bryoerythrophyllum rubrum* was added as a new record for the Bryoflora of Turkey. A short description, images, geographical position, ecology and distribution of this species are also provided in the study.

**Conclusion**: B. rubrum can be similar to other members of Genus Bryoerythrophyllum with regard to its macroscopic appearance, but its microscopic features are very useful for the identification of the species. B. rubrum can be overlooked because of the similarity to B.recurvirostrum, since both having recurved leaf margins. But B. rubrum can easily be distinguished from B.recurvirostrum with its long acuminate leaf apex. With this study, *B. rubrum* is the first time reported for Turkish Bryoflora, which is the third determined species of the genus *Bryoerythrophyllum* P. C. Chen in Turkey, and with this the standing moss taxa of Turkey is increased to 763.

**KEYWORDS:** BIODIVERSITY, BRYOPHYTA, NEW RECORD, AMASYA, TURKEY

ISEEP_223

# IN VITRO ANTIMICROBIAL SCREENING OF *CERENA UNICOLOR* (BULL.) MURRILL (POLYPORACEAE FR. EX CORDA)

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**Aim**: The aim of this study is to determine the antimicrobial activity of *Cerena unicolor* ethanolic extract against 20 bacterial and 1 fungal strains.

**Method**: *C. unicolor* samples which were collected from Abant, TURKEY (AKATA, 2398) were extracted with ethanol. Extracts were investigated for *in vitro* antimicrobial activity against a wide range of strains including *Enterococcus faecium*, *Enterococcus durans*, *Listeria monocytogenes* ATCC 7644, *Enterobacter aerogenes* ATCC13048, *Salmonella enteritidis* ATCC 13075, *Enterococcus faecalis* ATCC 29212, *Staphylococcus carnosus* MC1.B, *Escherichia coli* CFAI, *Salmonella typhimurium* SL 1344, *Klebsiella pneumonia*, *Streptococcus agalactiae* DSMZ 6784, *Staphylococcus epidermidis* DSMZ 20044, *Bacillus cereus* DSMZ 31, *Salmonella infantis*, *Salmonella kentucky*, *Staphylococcus aureus* ATCC 25923, *Pseudomonas aeruginosa* ATCC 27853, *Escherichia coli* ATCC 25922, *Bacillus subtilis* ATCC 6633 and *Candida albicans* ATCC 10231 by using the disc diffusion method.

Results: It is observed that ethanolic extract of *C. unicolor* has antimicrobial activity against several gram positive microorganims tested. The results were supported with tables and figures.

**Conclusion**: As a result of the study, it could be concluded that ethanolic extract of *C. unicolor* is active against several microorganisms but its antimicrobial activity is notable especially against *B. cereus* DSMZ 31, *S. carnosus* MC1.B and *S. epidermidis* DSMZ 20044.

**KEYWORDS:** CERENA UNICOLOR, ANTIMICROBIAL ACTIVITY, ANTIMICROBIAL SCREENING, ETHANOLIC EXTRACT

ISEEP_224

# HEAVY METAL CONCENTRATIONS IN TISSUES OF HOUSE SPARROW (*PASSER DOMESTICUS*, AVES) COLLECTED FROM YATAĞAN THERMAL POWER PLANT AND ANTALYA, TURKEY

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**Aim:** Bioindicators are useful for monitoring pollution loads in ecosystems. In order to find out the pollution effect of a thermal power plant, samples were collected from power plant polluted and non-polluted areas.

**Method:** Concentrations of 10 selected metals were measured in kidney, liver and muscle samples of 42 House Sparrows.Tissue samples were dried for about 24 h in a Christ LDC-1 freeze dryer. Copper, lead, cobalt, mercury, arsenic, zinc, cadmium, chromium, manganese, nickel concentrations (Cu, Pb, Co, Hg, As, Zn, Cd, Cr, Mn, Ni) in the samples were analysed by an inductively coupled plasma optical emission spectrometry system.

**Results:** We found mean tissue concentrations of some metals to be significantly higher in sparrows from the polluted area when compared to tissues from the non-polluted site. The liver mean concentrations of Cu (35.85 ± 17.22 mg kg-1) and Zn (101.76 ± 26.38 mg kg-1) were significantly higher and concentrations of Ni (0.43 ± 0.49 mg kg-1) were significantly lower in sparrows from the polluted area ($p<0.05$). The concentration of Cu was significantly higher in muscle and liver compared to kidney at the polluted site. Gender did not seem to influence residue levels, of the elements studied, among sparrows with the exception of kidney cobalt concentrations; which were higher in female sparrows than in males ($p<0.05$, $t = -2.409$).

**Conclusion:** The results clearly show that the mean tissue concentrations of some metals are significantly higher in sparrows from the polluted site, compared to that of the non-polluted area. Birds can be used as a reliable bioindicator species for monitoring programs, as they can act as adequate local monitors for contaminant levels.

These results have just published in Bulletin of Environmental Contamination and Toxicology "ALBAYRAK T, MOR F. 2011. Comparative tissue distribution of heavy metals in House Sparrow (*Passer domesticus*, Aves) in polluted and reference sites In Turkey. Bulletin of Environmental Contamination and Toxicology 87 (4): 457-462"

KEYWORDS: HOUSE SPARROW, PASSER DOMESTİCUS, YATAĞAN THERMAL POWER PLANT, TİSSUE HEAVY METAL LEVELS, BİOİNDİCATOR SPECİES.

ISEEP_227

# INVASIVE SPECIES

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**Aim**: Invasive species, or invasive exotics, is a nomenclature term and categorization phrase used for flora and fauna, and for specific restoration-preservation processes in native habitats, with several definitions. Any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem; and whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species have a major impact on Antalya environment, threatening our unique biodiversity and reducing overall species abundance and diversity. This study focuses on invasive alien species that threaten native biodiversity and covers all taxonomic groups from micro-organisms to animals and plants in all ecosystems and in Antalya.

**Method**: This study included; How to identify Invasive species, How to effect invasive species our enviroment, Invasive species in the World, Invasive species in Antalya, How to Control Invasive Species, How to Report Invasive Species.

**Results**: An invasive species is a non-native species (including seeds, eggs, spores, or other propagules) whose introduction causes or is likely to cause economic harm, environmental harm, or harm to human health. The term "invasive"; is used for the most aggressive species. These species grow and reproduce rapidly, causing major disturbance to the areas in which they are present. In this study also included some Impact from invasive species; Ecological impacts, Genetic pollution, Economic impacts (Benefits, Costs, Economic opportunities, Agriculture, Forestry, Tourism and recreation, Health impacts)

Common invasive species traits include: The ability to reproduce both asexually and sexually; Fast growth; Rapid reproduction; High dispersal ability; Phenotypic plasticity (the ability to alter one's growth form to suit current conditions); Tolerance of a wide range of environmental conditions (Ecological competence); Ability to live off of a wide range of food types (generalist); Association with humans; Other successful invasions

**Conclusion**: Invasive species damage the lands and waters that native plants and animals need to survive. They hurt economies and threaten human well-being. Invasive species, if left uncontrolled, can and will limit land use now and into the future. The longer we ignore the problem the harder and more expensive the battle for control will become. Finnaly we offer that in this study What can I do about Invasive species?

ISEEP_228

# CONSERVATION AND MONITORING OF SEA DAFFODIL (*PANCRATIUM MARITIMUM*) AT BELEK AND PATARA SPECIAL ENVIRONMENTAL PROTECTION AREAS IN TERMS OF BIOLOGICAL DIVERSITY

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**Aim**: This study covers the distribution and inventory of Sea Daffodil (Pancratium maritimum) at Belek and Patara Special Environment Protection Areas. The primary purpose of the study is to investigate the distribution and inventory of Sea Daffodil (Pancratium maritimum) in Belek and Patara Special Environmental Protection Areas (SEPAs). In addition, the study plans to determine the "limiting" and "threatening" factors (biotic and abiotic) that lead stresses on development and distribution of the species. The study also aims at studying certain population properties (population size, distribution frequencies of individuals, habitat fragmentation etc.) and reproductive biology (stages in flowering, fruiting, seed setting) of the species in the study areas. The purpose of the study also includes determining climatic features of both regions in relation to growth and distribution of the species. The relationships between Pancratium maritimum and other plant species were also included in the study. Finally, the study aims at determining the threatening factors on Sea Daffodil and to develop strategies and suggestions for in-situ and ex-situ conservation, restoration and reproduction of the species. The study also plans to identify certain localities and sample quadrats where additional monitoring, observation and experimentation on the species could be carried out to maintain its survival through the future generations.

**Method**: In order to investigate the distribution pattern of the species, our research team performed an intensive land screening on foot along the coastal zone, both in Belek and Patara SEPAs. On the sand dune habitats where Sea Daffodil grows, we measured the width and length (in meters) of localities. At the same time we determined the number of Sea Daffodil individuals and associating plant species at each locality. We pursued the following procedure to estimate the number of individuals in an area: In small localities (i.e., smaller than about 30x50 m), we directly counted the number of individuals in the area. In larger localities, however, we estimated number of individuals by taking sampling quadrats (sizes of 10m x 20m). Depending on the size of a given locality, the number of sample quadrats in each locality ranged from 1 to 3. First, we counted the number of Sea Daffodil individuals within each quadrat. Then, based on the number of individuals in the given quadrat in a given locality, we estimated the total number of individuals within the relevant locality by interpolation. We periodically took photos of some Sea Daffodils in certain localities so that the phenology of the plants could repeatedly be observed and monitored during the succeeding visits. The fruits and seeds were also collected from some plants to be used in research activities in the following growing season. The data collected from the field on Pancratium maritimum were transformed into the computer and analyzed statistically by

using SAS computer programs. The graphs were also drawn by using the same computer programs. Climatic data were obtained from the nearest meteorological stations (for Belek SEAP from Manavgat ve Serik, for Patara SEPA from Kaş and Fethiye). The data were evaluated to draw climatograms and and other related climatic diagrams. Biotic and abiotic "limiting factors" that threaten the distribution and development of the species in the study regions were determined. We suggested various measures to prevent these factors in the study regions. The study covers the important population characteristics (such as population size, number of individuals, frequency distributions, habitat fragmentation...) of the species in the area. Developmental phenology and reproductive biology of the species were studied. Specifically, timing of flowering, fruit and seed maturation were determined. We also determined the agents that contribute to the pollination and seed dissemination of the species. From the nearest meteorological stations in the respective study regions (both Belek and Patara), we obtained and evaluated the climatic data (temperature, air moisture etc.). Based on the evaluation of these data, we made interpretations as to the most suitable climatic requirements of the species.The data that we collected on the species in relation to their interaction with other plant species (co-existence, competition etc.) were evaluated in view of the principles of plant sociology

**Results**: Biotic and abiotic "limiting factors" that threaten the distribution and development of the species in the study regions were determined. We suggested various measures to prevent these factors in the study regions. The study covers the important population characteristics (such as population size, number of individuals, frequency distributions, habitat fragmentation...) of the species in the area. Developmental phenology and reproductive biology of the species were studied. Specifically, timing of flowering, fruit and seed maturation were determined. We also determined the agents that contribute to the pollination and seed dissemination of the species. From the nearest meteorological stations in the respective study regions (both Belek and Patara), we obtained and evaluated the climatic data (temperature, air moisture etc.). Based on the evaluation of these data, we made interpretations as to the most suitable climatic requirements of the species.The data that we collected on the species in relation to their interaction with other plant species (co-existence, competition etc.) were evaluated in view of the principles of plant sociology

**Conclusion**: We suggested various measures as to in-situ and ex-situ conservation, restoration and propagation strategies of the species. In order to be able to pursue further studies and monitoring on the species, we proposed that certain quadrats that we identified in the field should be assigned and preserved. Additional studies on these quadrats are of significance importance in terms of survival of the species through the future generations.We also provided information on the general distribution areas of the species in Turkiye. Finally, based on the available information, we suggested the steps and strategies for the conservation of Pancratium maritimum in the study areas

KEY WORDS: CONSERVATION, MONITORING, BIOLOGICAL DIVERSITY, SEA DAFFODIL, PANCRATIUM MARITIMUM, BELEK AND PATARA SPA

ISEEP_229

# CONSERVATION AND MONITORING OF SERIK PEAR (*PYRUS SERIKENSIS*) AT BELEK SPECIAL ENVIRONMENTAL PROTECTION AREA IN TERMS OF BIOLOGICAL DIVERSITY

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Aim: This study covers the distribution and inventory of Serik pear (Pyrus serikensis) at Belek Special Environmental Protection Area. The primary purpose of the study is to investigate the distribution and inventory (GPS records, number of individuals an so on) of Serik pear (Pyrus serikensis) in Belek Special Environmental Protection Area (SEPA). In addition, the study aims at determining the features of the habitats where the species thrive. The study also aims at determining the "limiting factors" that influence development and distribution of the species, and developing strategies to prevent and/or overcome these negative factors. The study aims to study population properties (population size, diameter and height distribution frequencies of individuals, habitat fragmentation etc.) and reproductive biology (stages in flowering and fruiting) of the species in the study area. The purpose of the study also includes determining climatic features (based on such climatic data as air temperature, humidity and rainfall, which were obtained from the nearest meterorological stations) of the region in relation to growth and distribution of the species. The relationships between Pyrus serikensis and the other plant species in view of plant sociology (co-existing species, competing species etc.) were also included in the study. The study aims to determine the threatening factors of Serik pear and to develop strategies and suggestions for in-situ and ex-situ conservation, restoration and reproduction of the species. In addition, the study aims at identifying certain localities and sample quadrats where additional monitoring, observation and experimentation on the species could be carried out to maintain its survival through the future generations. In summary, the purpose of the study is to perform inventory on the numbers and distribution of the species in Belek Special Environmental Protection Area, and to develop strategies and suggestions for the conservation and monitoring of the species in the region.

Method: In order to investigate the distribution pattern of Pyrus serikensis species, the research team performed an intensive land screening on the study area. We used copies of maps (1/25000 scale) during our field study. We drive by a car throughout the study area, using the village roads, farm roads and other tracks where a car can pass through. On many places we had to park the car and walk several hundreds meters through the fields, along the property borders, streams and irrigation canals in the study area. In every habitat where we could reach, we measured the diameters and heights of each tree that was taller than 50 cm in height. We recorded GPS values of each tree on field notebook, and marked the each locality on the copies of maps we had. By this way, we avoided repetitive measurement of trees on the same locality that was visited on previous days. The diameters of the trees were measured at about 40 to 50 cm from the ground level by a diameter tape that was scaled on stem circumference. We called this level from the ground as the "knee height" (dkh), in contrast to the diameter at breast height (dbh) used in forestry [we used

dkh instead of dbh because Serik armudu stems had forks frequently starting from the 40 to 50 cm above the ground level, we found it more informative to measure dkh instead of dbh] . We measured tree heights by a telescopic height pole. In addition to GPS records, we took photos of some trees in certain localities so that the phenology of trees could repeatedly be observed and monitoired during the succeeding visits. The fruits and seeds were also collected from the same trees to be used in research activities in the followşng growing season. The data collected from the field on Pyrus serikensis were transformed into the computer and analyzed statistically by using SAS computer programs. The graphs were also drawn by using the same computer programs. Climatic data that covers at least 23 years of observations were obtained from two nearest meteorological stations (Manavgat ve Serik). The data were evaluated to draw climatograms and and other related climatic diagrams.

Results: We determined the main habitats where the species grow in the study area. In addition, biotic and abiotic "limiting factors" that threaten the distribution and development of the species in the study area were determined. We suggested various measures to prevent these limiting factors in the study region. The study also covers the important population characteristics (such as population size, number of individuals, frequency distributions of plants in terms of theirs heights and diameters, frequency distribution in terms of habitats, relationships between height and diameters, distribution localities based on latitudes and longitudes...) of the species in the study region. Developmental phenology and reproductive biology of the species were also observed. Specifically, timing of flowering, fruit and seed maturation were determined. We also determined the agents that contribute to the pollination and seed dissemination of Pyrus serikensis. From the nearest meteorological stations in the study area, we obtained and evaluated the climatic data (temperature, air moisture etc.). Based on the evaluation of these data, we elucidated the most suitable climatic requirements of the species.
Conclusion:The data that we collected on the species in relation to their interaction with other plant species (co-existence, competition etc.) were evaluated in view of the principles of plant sociology. Based on such information, we suggested various measures as to in-situ and ex-situ conservation, restoration and propagation strategies of the species. In order to be able to pursue further studies and monitoring on the species, we proposed that certain quadrats that we identified in the field should be assigned and preserved. Additional studies on these quadrats are of significance importance in terms of survival of the species through the future generations. Finally, based on the available information gathered both from the literature and the field, we suggested the steps and strategies for the conservation of Pyrus serikensis in Belek region.

KEY WORDS: CONSERVATION, MONITORING, BIOLOGICAL DIVERSITY, SERIK PEAR, PYRUS SERIKENSIS, BELEK SPA

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# A MODEL SUGGESTION FOR SUSTAINABILITY EDUCATION: ECOLOGICAL NUTRITIONS EDUCATION

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**Aim**: The uninformed use of food sources on earth has an important contribution to environmental destruction's reaching to an extent which may threaten the sustainability of the life on earth. Therefore, understanding the ecologic impacts of nutritions patterns and based on this understanding, establishment of nutritions habits complying with sustainable life has gained a special importance. Hence, the present study aims to develop an educational model to be employed in formal education to impart nutritions patterns complying with ecologic cycles to young generations.

**Method**: The model suggested in the present study is designed for students at the period of elementary education. In the model, in which eating habits are associated with ecologic processes, "consistency", "sufficiency" and "efficiency" principles of sustainability are adopted as the basic parameters. The content of the suggested model consist of modules "biological diversity and nutrition chain", "food chain from field to table", "chemical accumulation in nutrition chain", and "sustainable life and consumption patterns".

**Results and Conclusions**: In the world, with the increasing importance attached to environment protection and sustainability in environment education, resource use has gained special importance. In this respect, consumption (nutritions) education has become one of the most outstanding areas of environment education. However, in environment education processes followed in our country, there is a lack of research and models which may have help to raise people's consumption awareness. Hence, the model suggested in the present study based on ecologic understanding is believed to make great contributions to theoretical and applied works in the field of sustainability education.

KEYWORDS: SUSTAINABLE EDUCATION, ECOLOGICAL NUTRITION, ECOLOGICAL NUTRITION EDUCATION

ISEEP

# KARYOTYPE ANALYSIS IN TWO ENDEMIC SPECIES OF CENTAUREA L. (ASTERACEAE) SECTION CYNAROIDES FROM TURKEY

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**Aim**: Centaurea L. (Asteraceae) is one of the largest genera in Turkey, with many narrow endemic species. Karyological and molecular studies are also very important for diagnosis of this genus. Centaurea sclerolepis and Centaurea kurdica are endemic species and belonging to Cynaroides section. The aim of this research is to determine detailed karyomorphological measurements for these endemic species.

**Methods**: Chromosome counts and morphologies were made on somatic metaphases using the squash technique

**Results**: In this research, karyotype analyses of two endemic species in the genus Centaurea were made. Both of these species are diploid with 2n=18 chromosomes. The basic chromosome numbers is x=9 in both. Haploid chromosome lengths are 28,98 µm in C. sclerolepis and 29,57 µm in C. kurdica. The chromosome formula of C. sclerolepis is 5m+4sm. Also, chromosome lengths are between 2,41 and 4,45 µm. In C. kurdica, chromosome lengths are between 2,23 and 4,60 µm, and the chromosome formula is 4m+5sm.

**Conclusion**: Uysal et al. 2009 and Romaschenko et al. 2004 reported C. sclerolepis and C. kurdica have 2n=18 chromosomes. There are no detailed chromosome analyses for these species. In our research we represented detailed chromosomes analyses for these species for the first time.

KEY: C. SCLEROLEPİS, C. KURDİCA, KARYOTYPE

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