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BOOK of ABSTRACTS

GREEN DEVELOPMENT,
INFRASTRUCTURE, TECHNOLOGY

International Conference

**GREDIT 2016
– GREEN DEVELOPMENT,
INFRASTRUCTURE, TECHNOLOGY**

BOOK OF ABSTRACTS

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In memoriam
1947 – 2016



Fokion K. Vosniakos, MSc, PhD, PhD (hc), PhD (hc), PhD (hc)

Date of Birth: 06/03/1947 in Thessaloniki, Greece

Nationality: Greek

Academic Background

1974–1975 Research and Teaching Assistant, University of Saskatchewan, Physics Dept., Saskatoon, Sask., Canada.

1975–1977 Research and Teaching Assistant, University of Manitoba, Physics and Mathematics Dept.,
Winnipeg, Man., Canada.

1977–1978 Special Academic Instructor in the Dept. of Physics at University of Manitoba.

1978–1979 Teacher of Physics for GCE (A-LEVEL) at the College of Advanced Education.

1979–1986 Associate Professor at the School of Technological Applications of T.E.I. of Thessaloniki.

1986–today Full Professor of Science Dept. of Alexander Technological Education Institute of Thessaloniki. Director of Research Laboratory of γ -spectroscopy.

1986–2006 Head of Science Department of Alexander Technological Education Institute of Thessaloniki.

1998–2005 President of Study Selection Program “Environmental Technology” of Alexander Technological Education Institute of Thessaloniki.

2005–2007 Deputy Director of the Master’s Degree Program: “Environment – New Technologies” (2005–2010) Alexander Technological Education Institute of Thessaloniki.

Summary of Research

The consequences of a potential nuclear accident in a Nuclear Power Plant (NPP) as marine releases to the Eastern Mediterranean countries are considered. The types of accident considered span the range of accidents already identified for existing NPP. The assessed consequences are compared with those of the accident at Chernobyl (Ukraine) through a mathematical model. Measurements have been made in Mediterranean waters, in different depths in order to identify the vertical distribution of the radioactivity transfer. The study has been realized between 1998–2002.

The radioactivity transfer from soil to plants and consequently to food chain has been examined immediately after the Chernobyl accidents (26 April 1986) in Ukraine. More than 2,000 soil samples from Greece and Bulgaria have been measured for anthropogenic radioactivity due to the Chernobyl accident, in comparison to natural radioactivity. Simulation experiments on radioactivity transfer from contaminated milk to dairy products have been realized. Also, similar experiments with fresh water fish has been done in order to identify the radioactivity transfer from contaminated aquatic environment to its living resources. Finally, the radioactivity transfer has been examined as a function of climatological changes in Balkan region. The work still it is on progress and currently teams are involved with the radioactivity from construction materials and metal scrap. In addition teams examine their emission indoor and their impact to public health.

Education

- **Bachelor of Science**
 - Major: Physics Department
 - University Name: Aristotle University of Thessaloniki - Greece
- **Master of Science**
 - Major: Nuclear Physics (“Proton Elastic Scattering at Large Angles”)

- University Name: Manitoba University (Canada); Postgraduate Studies department
- **Doctor of Philosophy**
 - Major: Nuclear Physics (“Studies on the Radioactive Transfer in Air, Soil, Plants, Foods”)
 - University Name: University of Ioannina, Department of Chemistry, Greece

Used Research Techniques

- Gamma ray spectroscopy
- Radon measurements
- Cyclotron Physics
- Linear accelerator Physics
- Van der Graaf accelerator Physics

Journals, books and research activities

He has more than **180 publications** in international journals and more than **20 books in the field of Physics, Nuclear Physics and Radioecology** (the latest one, is in 2012: **“RADIOACTIVE TRANSFER IN ENVIRONMENT AND FOOD”** by SPRINGER). He has coordinated and participating to more than **45 national and international research projects**.

Honor & Awards

- **Scholarship** of the University of Saskatchewan (Canada), 1974 - 1975
- **Scholarship** of the University of Manitoba (Canada), 1975 - 1977
- Visitor-Professor in **EURATOM JRC Ispra**, Italy, 1984 – 1986
- **Professor Honoris Causa of the Faculty of Industrial Chemistry** of the University Polytechnic of Bucharest, Romania (Unanimously Decision of the Professors, May 2001)
- **Doctor Honoris Causa** of University of Belgrade, Yugoslavia, 2001
- **Doctor of Philosophy of Agricultural University of Plovdiv**, Bulgaria, 2002

➤ **Doctor Honoris Causa** of University "1st December 1918" of Alba Iulia, Romania, 2009

➤ President of **Balkan Environmental Association – B.EN.A (Scientific Non-Governmental Organization)** (1999 – today).

➤ Co-Editor of **FRESENIUS ENVIRONMENTAL BULLETIN** (1990–today).

➤ Founder Editor in Chief of **JOURNAL OF ENVIRONMENTAL PROTECTION AND ECOLOGY (JEPE)** (2000 – today).

➤ **Doctor Honoris Causa** of Ovidius University of Constanta, Romania (5 Oct. 2012)

➤ President of **Environmental Committee of Alexander T E I of Thessaloniki** (2010 – today).

➤ President of **Advisory Board** of **PERSEUS** (FP7, 2012 – 2016).

➤ Honorary Professor of the Faculty of **Natural Sciences** of **University of Shkhodra-Albania** (2013).

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INVITED LECTURES AND KEY SPEAKERS



WORLD ENERGY ISSUES AND ADVANCED NUCLEAR FUSION

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ABSTRACT. The analysis of the world's energy needs shows them in historical growth, with the highest per capita demand concentrated in the developed countries. Future predictions are all consistent in predicting a trend towards growing energy demands, depletion of fossil fuels, security of supply issues, and increasing environmental concerns. The current energy economy based on fossil fuels is not sustainable in the long term. Alternatives must be concrete, and able to withstand the economic, environmental and social issues that provide the current boundary conditions.

Just one general solution to the energy problem does not exist. Rather, there are sets of solutions, appropriate to specific local contexts, including a mix of energy sources and technologies, to guarantee a real lasting and sustainable energy development. In the twenty-first century energy is no longer just a technical issue. In science, the discipline that studies energy has rapidly expanded its sphere of competence. The addressing the issue of energy means now talking about environment, climate, development and sustainability, social issues. However, the vastness of the problem should not lead to a too generalized approach: a broad view is essential, but it must be accompanied by the implementation of technological solutions, of two different types:

1. Simple solutions that aim to reduce the growth of energy needs in developing countries, focusing on efficiency, savings and conversion, and that will lead to the reduction of social and geographical disparities in its availability and its use.

2. Most advanced technological innovation, aimed to seek new sources of energy and high-tech energy-intensive approach, in developed countries. The Role of nuclear energy – here – depends on the “essential question”: “Seeing that nuclear energy is one of the elements in the debate on tackling climate change and energy autonomy, how can the World Community find a solution to the problem of nuclear waste,

reinforcing nuclear safety and developing research into reactors of the future, and fusion power?”

Nuclear Fusion is a candidate as a long-term energy solution, for developed countries. A plasma fusion can be fueled by different kinds of isotopes. The Deuterium-Tritium (DT) reaction is the main actually pursued. DT has some drawbacks however, since neutrons originating from the reaction cause material activation inside the reactor and tritium is a radioactive material.

The advantages of Deuterium-Helium-3 plasmas of advanced fusion reactors appear evident.



The major advantage is the absence of neutrons (unlike in the DT reaction). A second advantage of a DHe3 reactor is that direct conversion of the produced energy can be achieved without the use of the standard refrigeration and thermal energy conversion to electricity system, as in fission and DT fusion reactors. Detailed investigations by NASA show that obtaining He3 from the moon surface is technically feasible and economically viable. DHe compact high-magnetic field tokamak studies show that no environmental problems arise from such devices, from the radiological point of view. No emergency plan and countermeasures like evacuation and sheltering are necessary. The DHe3 fusion cycle offers strong safety advantages and could be the ultimate response to the environmental requirements for future nuclear power plants.

Key words: Nuclear energy, nuclear fusion, nuclear power plants

E-WASTE AND THE ENVIRONMENT

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ABSTRACT. Electronic waste, or e-waste, is high-tech trash that includes: televisions, computer monitors, mice, Computers, iPods, keyboards, printers, scanners, fax machines, and cell phones. In other words, anything digital that's no longer being used. The cause of e-wastes are the Rapid and continual technological improvement, average lifespan of computes and advancement in wireless technology, The number of obsolete PCs (2012) exceeded the number of new PCs shipped, More than 500 million computers became obsolete by 2012, resulting in 12.64 billion kilos of plastic and 3.10 billion kilos of lead, In E.U. 38000–55000 PC are thrown out daily, In E.U. 68% of the consumers are keeping unwanted PCs in their homes. All these have some negatives effects to our daily life and especially have direct impact on the Environment. Direct and indirect impact on other living creature for all these reason that papers provides and recommends some points and suggestions that should be addressed by governments and to be taken very seriously.

Key words: e-waste, recycling, high-tech, public health

GREEN INFRASTRUCTURE – ECOLOGICAL NETWORKS INTEGRATION OF ENVIRONMENTAL VALUES IN LAND USE PLANNING

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ABSTRACT. Providing subsistence, shelter and basic daily needs for more than 7 billion people is a heavy burden on the natural resources worldwide. Conservation and pollution prevention while utilizing the natural resources without compromising the needs of the future generations is the key for sustainability of development. In this regard, main task of the current generations is to benefit from their physical land and natural resources in an environment-friendly, “Green” manner in order to provide their future generations a better quality of living conditions to further their developments. Developed countries of today are indebted their economic wealth to rapid growth in their industrial activities in the last four decades. Community service infrastructures and industrial activities heavily rely on utilization of natural resources; namely, energy (oil, gas and coal), metallic and non-metallic minerals, forestry and agriculture. Even though there is no globally accepted performance criteria to characterize the environmental quality at country level it is a common perception that the environmental quality is relatively better in the developed countries compared to the developing countries. Despite its vital role in sustainability of development, industry, especially the mining and chemical manufacturing activities continue to have the perceived negative image in the communities and are accused of not being “Environment-Friendly – Green Enough”. However, it should be born in mind that, there is no clear definition for “How Green is Green”. In recent years “Green Infrastructure” has become synonymous of “ecological networks” and a buzzword in European biodiversity policies. Building up of a Green Infrastructure needs smart and integrated approaches to spatial planning and to ensure that natural resources are utilized and land is turned into areas capable of providing multiple other functions for nature and society. In this regard, ensuring an harmony between the community needs and the existing environmental values becomes a major task in land-use planning. In doing so, communicating the good

deeds of man-made interventions on land and mineral resource use activities should also be a main task of these ecological networks. In this presentation, a conceptual review of community infrastructure projects along with applicable resource conservation, pollution prevention and site reclamation/rehabilitation approaches will be presented and the “**How Green is Green?**” question will be discussed.

Key words: Green Infrastructures, Sustainable Development,
Ecological Networks

AIR POLLUTION FROM TRANSPORT IN URBAN AREAS – CASE STUDY SKOPJE

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ABSTRACT. Skopje is located in the north of the Republic of Macedonia, in the center of the Balkan Peninsula. The city is built in the Skopje valley, oriented on a west-east axis, along the course of the Vardar River. The valley is approximately 2 km wide and it is limited by several mountain ranges to the North and South. The City of Skopje stretches on more than 33 km, but it is only 10 km wide.

Skopje is approximately 245 m above sea level and covers 570 km². The urbanized area only covers 337 km², with a density of 65 inhabitants per hectare. The City of Skopje comprised 510.000 inhabitants, whereas the sole urban area only comprised 450.000 inhabitants.

The Vardar River, which flows through Skopje, is at approximately 60 km from its source. In Skopje, its average discharge is at 51 m³/s, with a wide, amplitude depending on seasons, between 100 m³/s in May and 20 m³/s in July. The water temperature is comprised between 4.6°C in January and 18.1°C in July. Several rivers meet the Vardar within the city boundaries. The largest is the Treska River, which is 130 km long. Skopje valley is rich very with underground water with temperature around 5°C. Water treatment plants are progressively built, but a large share of polluted water is still discharged into the Vardar River.

After the very strong earthquake in 1963, the citizens of Skopje have become experts in determining the strength of earthquakes, because after the first strong, the restraint of ground occurred further 2000 weaker quakes. Immediately after the earthquake every citizens from Skopje could have said how strong was it is power according to Richter scale, and then announcements from Seismological Laboratory coincided 100 % with their "expert sense" – for a measure of the strength of earthquake.

Today in 2015, Citizens from Skopje became experts for sense of PM10 pollution.

Today it is 320 (micrograms per cubic meter). Yesterday as about 580th, and there is not a mistake and official statement confirm their precise observation. For the citizens of Skopje there is not a need for laboratory. They became the best “instruments” for measuring the concentrations of PM₁₀ particles.

Skopje on 26. 06. 2014 was on the first place in Europa. Macedonia is on first (worst) place on the list of World bank. Pollution of the air with PM₁₀ reach nearly 1000 ppm which is 20 time, more than normal for urban areas and about 200 days/year it is above the limits.

Republic of Macedonia has the most polluted air in Europe and air pollution for years is over European standards, specific the World Bank. The country is the first in the list of the bank when it comes to exposure to the citizens of air pollution with particulate matter. Just behind us is Serbia, followed by Romania, Bulgaria and Malta. But the report further stated that Macedonia is in fifth place according to annual deaths caused by air pollution or the PM₁₀ particles.

The findings of the World Bank indicate that the solid particles are responsible for more than 1,350 deaths a year, but thousand lost workdays – an economic cost of 253 million Euros a year or 3.2% of GDP. Too early mortality occurs from cardiopulmonary diseases and lung cancer. In 2011, the level of contamination by solid particles was primarily responsible for 485 new cases of chronic bronchitis, 770 hospital admissions and 15,200 emergency visits. With the reduction of PM₁₀ and PM_{2.5} to European limits will prevent more than 800 deaths and a number of lost workdays, which will realize savings in health care costs of 151 million Euros a year.

Key words: air pollution, transport, urban areas

URBAN ZONES AND TOXIC WASTE

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ABSTRACT: Industrial production using the technologies from the last period of 20th century always generates waste. A substantial part of such waste has the properties of hazardous waste since it contains substances which have a harmful effect on human health and the environment.

Industry is often located close to urban zones (towns/cities). As towns and cities grew, and moving the industry became impossible due to too expensive infrastructure, it so happened that industry is now too close to or even within the urban zone. As these are old technologies and because monitoring is still in its initial stage (!), such position leads to the exceptionally negative impact of industrial facilities on populated settlements, and to the pollution of surface and ground waters, air and soil.

Key words: toxic waste, environment, urban zone

RENEWABLE ENERGY STORAGE – THE KEY TO MORE SOLAR AND WIND ENERGY

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ABSTRACT. Solar and wind energy are stochastic, weather dependent and subject to daily and seasonal changes. Other renewable energies (RE) are available more continuously, but do not have the potential to cover a significant part of our national energy needs. In order to assure a continuous supply of energy to the country, the gaps of solar and wind energy must be compensated for by appropriate energy storage systems.

There are a lot of methods to store different types of energy, but they all have their advantages and disadvantages. E.g. heat is easily to be stored in water tanks, much cheaper than electricity – but heat is for heat use only, not for computers, electric drives and lights. Electricity storage in batteries is expensive, but prices have gone down drastically. Electricity can also be stored in pump storage dams and in a non-electric way by change of user behaviour (demand side management, DSM).

Daily storage of heat and electricity is always feasible, weekly storage sometimes seasonal storage is normally much too expensive. But indirect heat and electricity storage in form of biomass is feasible even on a seasonal scale.

This paper discusses the different possibilities of RE storage for Germany, a country in the middle of its energetic transition.

Key words: renewable energy, solar energy; wind energy, storage energy

ORAL SECTION

1

AIR – WATER – SOIL POLLUTION, RISK ASSESSMENT – SUSTAINABLE DEVELOPMENT



**FAST AND COMPREHENSIVE ANALYSIS OF PESTICIDES
IN SURFACE WATERS BY UHPLC-HIGH RESOLUTION
AND HIGH MASS ACCURACY HYBRID LINEAR
ION-TRAP-ORBITRAP MASS SPECTROMETRY**

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ABSTRACT: The widespread use of pesticides for agricultural and non-agricultural purposes has resulted in the presence of their residues in various environmental matrices. Pesticide contamination of surface waters has been well-documented worldwide and constitutes a major issue that gives rise to concerns on a local, regional, national and global scale. Pesticide residues reach surface water mainly through agricultural run-off. Both parent pesticides and metabolites may exert a toxic action in organisms of freshwater systems, whenever the concentration of a compound is sufficient to trigger such effect. Hence, the analysis of pesticide residues in a variety of environmental matrices is necessary to ensure their safety and quality about health standards [1]. In that direction, the use of high-resolution mass spectrometers (LC-HRMS), and especially Orbitrap technologies, enables the acquisition of a theoretically unlimited number of species by means of accurate mass measurements in full-scan mode. This allows obtaining the elemental composition of acquired ions, useful for identification of targeted and untargeted compounds, metabolites, or transformation products [2]. The Orbitrap mass analyzer was first described in 2000 [3] and has now reached the status of a mainstream mass spectrometry technique. In this study, the analysis of a variety of pesticide residues by means of high mass accuracy hybrid linear ion trap-Orbitrap mass spectrometer (LTQ-Orbitrap-MS) is investigated. The identification of the positive findings is accomplished with the data from accurate masses of the target ions, based on the full-scan exact mass measurement of $[M+H]^+$ ions, along with retention time data and characteristic on-source fragment ions. The above-mentioned procedure was evaluated in order to be applied for the estimation of the

pollutant load and its seasonal distribution in natural waters of the Prefecture of Epirus (Aracthos and Louros rivers, Amvrakikos gulf), N.W. Greece. The results obtained confirm that high-resolution mass spectrometry is a helpful and reliable tool for the identification and quantitation of pesticide residues, providing at the same time high accuracy.

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Key words: Pesticides, LTQ Orbitrap, Surface waters

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o1-02 – Key speaker

**SAFETY AND SECURITY CONCEPTS
IN CHEMICALS MANAGEMENT**

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ABSTRACT. Chemicals are integral matters of all components of environmental media, from air, soil and rocks and also they are the necessities for human survival/sustainability of life and development. Chemicals are also present in the nature, from gases in the atmosphere to water, inorganic and organic natural resources and plants and living species. In addition to their use in natural forms, numerous kinds of chemicals are produced synthetically for use in our daily lives.

On the other hand, in as much as they are vital for human life, chemicals do carry inherent risks for human life and environment quality which require special safety management practices to minimize their risks to the workers, users and environmental media.

From the industry point of view, chemicals are specialty commodities that require special management administration to protect information on process know-how, trade secrets, assure safety in handling and transportation/storage along with physical protection against theft and misuse/sabotage threats.

Safety is a term defining the measures to take precautions and measures to protect subjects from the negative effects of potentially harmful events, while Security covers the physical measures to assure application of safety measures from misconduct or willful intervention of others. Therefore, unsecured safety measures do not necessarily serve the purpose.

In this presentation, distinction between Safety and Security concepts will be reviewed and importance of Security concept to compliment Safety practices applicable to safer management of chemicals will be discussed.

Key words: Safety, Security, Chemicals Management

o1-03 – Key speaker

**SEASONAL CORRELATION OF INDOOR RADON
CONCENTRATION IN TOWNS OF NORTHERN GREECE**

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ABSTRACT: Seasonal correlation of indoor radon measurements have been performed in dwellings in Thessaloniki, Serres, Drama and Arnea during winter and summer period. Radon measurements were performed using mainly EIC (Electret Ion Chambers) so as to estimate integrated radon concentration over a long time period. In Thessaloniki, more than 30 dwellings were monitored. The geometric mean estimated in Thessaloniki was 85 Bq/m^3 , whilst the arithmetic mean was $89 \pm 28 \text{ Bq/m}^3$ during summer period. For the winter period the geometric mean was estimated at 127 Bq/m^3 and the arithmetic mean was $141 \pm 66 \text{ Bq/m}^3$. In Serres, more than 20 dwellings were monitored. The geometric mean estimated in Serres was 75 Bq/m^3 and the arithmetic mean equal to $88 \pm 44 \text{ Bq/m}^3$ during summer period. For the winter period the geometric mean was estimated at 81 Bq/m^3 and the arithmetic mean at $97 \pm 55 \text{ Bq/m}^3$. In Drama more than 12 dwellings were monitored. The geometric mean estimated was 140 Bq/m^3 , and the arithmetic mean equal to $152 \pm 68 \text{ Bq/m}^3$ during summer period. For the winter period the geometric mean was estimated at 157 Bq/m^3 and the arithmetic mean at $169 \pm 59 \text{ Bq/m}^3$. In Arnea, Chalkidiki, 9 dwellings were monitored. The geometric mean was estimated at 105 Bq/m^3 and the arithmetic mean at $117 \pm 74 \text{ Bq/m}^3$ during summer period. For the winter period the geometric mean was estimated at 172 Bq/m^3 and the arithmetic mean at $184 \pm 77 \text{ Bq/m}^3$. Only two houses from the monitored towns had radon concentrations above 300 Bq/m^3 , one during summer and the other during winter in Drama and Arnea respectively. The 300 Bq/m^3 is the reference levels for the annual average activity concentration proposed by European Commission. Correlation of results is being observed depending on seasonal variations of radon. It has been observed that in winter period, as expected, radon concentrations are higher than in summer one. House ventilation conditions play significant role in radon

concentration (e.g., doors, windows, open or closed). As a matter of fact, the above factors play significant role in radon variations even during a day period.

Key words: Radon, Mean Value

o1-04

KOSOVO COAL ASH A POLLUTANT AND ADSORBENT FOR ORGANIC AND INORGANIC POLLUTANTS

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ABSTRACT: Republic of Kosovo, for the abundance of its natural resources, takes relatively high place in the register of the world's richest countries and the most prevalent resource is lignite type coal. Lignite type coal in Kosovo was extensively used in electricity power plants and at a time in Lurgy Gasification Process. Unfortunately the exploitation of lignite was done without respect to environmental capacity of the country and almost has created an environmental bomb for population.

The aim of this paper was to investigate adsorbent capacity of Kosovo coal ash for removal of organic and inorganic pollutants in water samples. The availability and its adsorption characteristics have made this adsorbent an alternative media for the removal of heavy metal ions in water samples. As comparison, we've also used bentonite as an adsorbent for organic and inorganic pollutants. From the physical-chemical properties of Kosovo coal ash it was expected that metal ions would be adsorbed from silicon, alumina and iron oxides or the influence of a combination of these oxides. It is assumed that the predominance of alkaline components (CaO and MgO) in Kosovo coal ash, will also affect precipitation of some metal ions. The analysis of experimental results shows that the adsorption of metal ions was relatively fast and attained equilibrium in relatively short time. Efficiency of coal ash in removing heavy metal ions was nearly 100%, while the efficiency of bentonite was nearly 85%.

Key words: coal ash, bentonite, adsorbent, equilibrium, pollution, lignite, power plants

NO_x EMISSIONS FROM HEAVY FUEL OIL BOILERS

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ABSTRACT: Nitrogen oxides NO_x (nitrogen oxide and nitrogen dioxide) are pollutants in ambient air and precursors for other air pollutants which have negative impact on the environment. Installations that use boilers with fuel oil as energy source, have problem in fulfilling limit values for nitrogen oxides (NO_x), according to Macedonian legislation, for stationary sources of emission into the air. Nitrogen oxides emissions from 22 different boilers that use light fuel oil as an energy source and 26 different boilers with heavy fuel oil as an energy source were tested in the period of 2009–2015. Measurements were performed with gas analyzer Testo 350XL/454. The results of emission measurements of nitrogen oxides, showed that limit values are completely satisfied for boilers that operate with light oil and are completely exceeded for boilers that operate with heavy fuel oil, without any distinction of condition of combustion related to excess of air and temperature of flue gases.

Key words: stationary source of emission, nitrogen oxides, boiler, light fuel oil, heavy fuel oil

o1–06 – Key speaker

CALCULATING PM AND NOX EMISSION FROM PUBLIC TRANSPORTATION: THE CASE OF SKOPJE

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ABSTRACT: Public transportation is the foundation of any developed city, having a major role in ensuring transport reliability and controlled traffic patterns, while having a positive effect towards environmental issues. Using the Tier 3 model developed by the European Environment Agency, this paper outlines the tail – pipe PM and NOx emissions from the two public urban transportation companies in Skopje, Macedonia. Namely, both the publicly owned company – JSP and the privately owned company – Makeskprez Prevoz were analysed and the results are shown hereinafter. In the end, this paper outlines the difference between higher and lower EURO emission standards in terms of pollution quantity deriving from urban bus transport.

Key words: Public transportation, pollution, emission PM, Skopje

o1-07

ENVIRONMENTAL IMPACT OF OIL PROCESSING INDUSTRY IN ALBANIA-CASE OF THE COMBINE OF OIL PROCESSING, BALLSH

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ABSTRACT: Industry Oil and Gas Processing in Albania is installed near main oil resources of the country. Region of Mallakastra (Ballsh) occupies an important place in this national asset, where there are the deposits of oil limestone, the Combine of Deep Processing of Oil, and the Plant of Lubricant Oils, in Ballsh. Deep Refinery Plant Oil, with a processing capacity of 1.25 million t yr⁻¹ crude oil, is introduced in use since 1978.

The development of the Industry of Oil Processing except the irreplaceable benefits in the national economy, had and has an environmental risk to soil, water, air and habitats where this industry is installed.

The purpose of this paper is to verify not only resources, factors and the effects of the current environmental pollution by the oil processing industry, but also to expose the possible alternatives of the rehabilitation of the pollution from the past and those in present.

We have chosen the region of Mallakastra like a region where live and generate negativity for the environment like the industry of the extraction and processing of oil.

Key words: crude oil, habitats, environmental impact, refining industry, sources of pollution

AIR QUALITY POLLUTION FROM TRAFFIC AND POINT SOURCES IN SKOPJE ASSESSED WITH DIFFERENT AIR POLLUTION MODELS

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ABSTRACT: The modelling of the air pollution is one of the techniques that can lead to better planning and making decisions from the authorities on the local, regional or even global scale. Air quality dispersion models can be used to provide information about the impact of individual emission sources or source categories on the air quality and to predict air quality as a result of changes in emissions, such as increase of traffic, emission control measures, etc. Dispersion models can be used to complement the data gained by monitoring as the spatial coverage of air quality information provided by monitoring is often limited. Air dispersion modelling could be used to estimate and predict the concentration of the pollutants in air using mainly emission and meteorological data. Air dispersion models include mathematical algorithms based on combination of physical and chemical parameters so that they can simulate the spread of pollutants in the air as well as the complex processes of air pollution creation. Dispersion modelling of air will allow the implementation of effective control of pollution as well as the development of strategy to reduce emissions of harmful substances that pollute the air. In this way, it will be possible to develop a plan to reduce the environmental pollution and satisfy the EU environmental air quality standards. In this paper, based on combination of few existing air pollution models, we will present, as a main contribution of this paper, the first this-kind of study for the city of Skopje. This study uses measurements for emissions of many physical and chemical parameters from traffic sources in order to produce the general picture of the pollution on annual level. Our system based on real time air pollution data acquisition is easily extendible to

national and trans-boundary levels. At the same time, this is the first step in building the real time decision (not only prediction) support system. Even though the input data required in the dispersion modeling still includes uncertainties, this modeling study can give valuable information on the air quality levels in different parts of Skopje.

Ky words: air pollution, traffic, Skopje

LEVELS AND SPATIAL DISTRIBUTION OF HEAVY METALS IN *ENTEROMORPHA* SP. FROM İZMİT BAY (TURKEY)

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ABSTRACT: This study was conducted to determine heavy metal levels in macroalgae (*Enteromorpha*) on four stations in the İzmit Bay. This purpose; Aluminum (Al), chromium (Cr), manganese (Mn), iron (Fe), cobalt (Co), nickel (Ni), copper (Cu), zinc (Zn), lead (Pb), Cadmium (Cd) and Barium (Ba) levels were determined as seasonally (February 2013 – November 2013). The results showed that the highest accumulations of heavy metals in algae were detected at station 1 with Al, Fe, Mn and at station 4 with Ba. Accumulation levels of heavy metals have been detected in the order Fe>Al>Ba>Mn>Zn>Cu>Cr>Pb>Ni>Cd>Co in *Enteromorpha* sp. additionally, the difference between the stations of the metal levels were examined by One-Way ANOVA test.

Key words: *Enteromorpha* sp., Heavy metals Environmental factors, İzmit Bay

ORGANOCHLORINE PESTICIDES CONCENTRATIONS IN SURFACE WATERS OF LAKES OF SHKODRA, OHRID AND PRESIPA

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ABSTRACT: Shkodra Lake is the largest lake in Balkan and is located on the border between Montenegro and Albania. Average depth is 7–10 m, while the maximal depth is 44 m. Lake Ohrid and Lake Prespa are situated in South-Eastern Europe, between Albania, Macedonia and Greece and they are both of tectonic origin. Lake Ohrid, situated between mountain ranges to the east and the west, is oligotrophic, deep (max. depth 288 m), large (surface area 358 km²). During the last decades the anthropogenic pollution is increasing significantly in the surrounding areas of these lakes. A survey for the determination of organochlorine pesticides (OCPs) was carried out in the period December 2013 – September 2014 in lakes of Shkodra, Ohrid and Prespa, A total of 24 surface water samples were collected along the lake in three seasons in eight sampling stations. The water samples were refrigerated at 4°C until chemical analyses. The samples were extracted by using L/L extraction. Gas chromatography equipped with micro electron-capture detector (GC- μ ECD) was the used technique for pesticide residue analyzes. Among the OCPs, HCHs, DDTs, heptachlor and HCB were the most dominant compounds in water. The total concentrations of OCPs ranged (1.1 – 2.1 μ g/L).

Key words: OCPs, lake, DDT, HCH, HCB

THE INFLUENCE OF THE OIL INDUSTRY IN THE CHANGE OF THE QUALITATIVE PARAMETERS IN THE WATERS OF RIVER GJANICA

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ABSTRACT: The source of river Gjanica is from mountain Shpiragu and it has got a length of 70 km, with a catchment area of 234.07 km². Its flows are characterized from big changes, during different seasons of the year, as well as multi-year period. They range from 0.146 to 124 m³/s.

In its valley are installed both of refineries that Albania has today in function. The Combine of the Deep Processing of the Oil, Ballsh and the Oil Refinery in Fier. Also along the shore of this river lie two of the most important sources of oil extraction, Visoka and Ballsh, too.

At a length of 41 km, starting from Ballsh until the meeting with the river Seman in Fier, are concentrated all of the industrial and urban emission, that influence in its pollution, while changing the physico-chemical nature of these waters until the destruction of the fauna and flora in it.

It is estimated that every month the river Gjanica are discharged about 13,000 to 18,000 m³ of liquid waste containing hydrocarbons, industrial chemicals and oils.

Monitoring the water quality of the river Gjanica to high levels of pollution, contains one of the main goals of this study.

Key words: river, contaminated water, physico-chemical parameters, oil industry, hydrocarbons.

CLIMATE CHANGE RISK ASSESSMENT METHODOLOGY FOR URBAN HISTORIC CENTERS

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ABSTRACT: Historic cities were developed based on environmental characteristic of the site and taking local climatic conditions into account. Present climate and future, predicted, climate change scenarios show a high impact on the economy and society but also on historic centers and their buildings. According to the scenarios, cities will have to face high and long lasting temperatures during summer, precipitation pattern change, intensification of local winds and more intense and frequent extreme events like draught, abundant precipitation or snowfalls and hailstorms. Present pattern of cities are not adapted to these factors and tend to be extremely vulnerable to environmental factors.

Identification of natural hazards and climate change risk assessment is absolutely necessary in order to reduce the vulnerability of historic urban centers and thereby increasing their resilience.

The main purpose of the study is to develop a complex risk assessment methodology, based on climate change vulnerabilities. The methodology was developed based on information collected in Oravita, a city located in the south-western part of Romania. The city was chosen due to the diversity of natural hazards and local environment that are starting to affect the historic urban center.

Key words: Risk assessment, Vulnerability, Methodology,
Historic urban centers, Climate change

LANDSCAPE ASSESSMENT MODEL FOR RURAL AREAS: MACKA-TRABZON CASE STUDY

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ABSTRACT: The rapid population growth, technological improvement and the expansion the boundary of urban have affected the natural and cultural landscape values of rural areas negatively. In this study, the rural area, located district of Mary Valley, Macka, Trabzon, which is under threat because of unplanned urbanization, is selected as a study area. This study area has one of the important national parks, cultural heritage points, historical trails, river falls, natural forest view, wildlife and endemic plants but the landscape values of Mary Valley have damaged because of the recently unplanned and unsustainable urbanization process.

This study aims to define the landscape character of Mary Valley to protect the environmental and historical values. To achieve this goal, is used landscape analysis and landscape assessment model. For the reach our goal, firstly, the natural and historical landscape data are collected, after that all data overlay through GIS by using landscape character analysis and assessment process. Then the landscape assessment model is created to determine the suitable areas for environmental conservation. Lastly, “very high-high-moderate “areas are offered the most important area for protection.

The method and results can a set a good example for the rural areas, which are under urbanization threat by protecting their environmental values in rural areas of Turkey.

Keywords: Environmental protection, rural area, GIS, landscape assessment, landscape analysis

ENVIRONMENTAL AND HUMAN HEALTH RISK ASSESMENT OF MERCURY FROM URBAN ENVIRONMENT

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ABSTRACT: The increased level of mercury in urban environment, especially in urban air, street dust as well as leaves can become a health threat to residents. In this work are presented the results for assessment of ecological and human health risk on mercury contamination in samples of leaves and urban dust from Iasi city. The comparative analysis of mercury in soil and respectively in leaf, for each sampling site, pointed out a significant correlation between the mercury content in both investigated environmental components. The main source of mercury content in soil, as well in vegetation, is the former municipal waste landfill, which is releasing an important quantity of mercury in the environment. Other source could be attributed to the intense road traffic in several areas located in overcrowded areas, mostly in road crossing and railway traffic. Ecological environmental risk induced by mercury was calculated according to the method proposed by Hakanson for both soil and vegetation. For soil, a quarter of the samples taken from intersections and area landfills indicated a moderate ecological risk, also recording the highest values of mercury, while the rest of the studied points indicated a minimum ecological risk. In case of vegetation, one sample was classified as moderate environmental risk class, corresponding to an intersection with intense traffic, while the other samples indicated a minimal ecological risk induced by mercury. Using a method recommended by US EPA, it was assessed the human health risk induced by mercury pollution on children and adults. The risk for children to be exposed is greater than for adults. Specifically, in this study it was observed that the risk is on average 9 times higher in the event of ingestion where as for skin contact is 1.5 and 1.7 times higher if the mercury is inhaled.

Key words: environment, human health, mercury, urban environment

MONITORING OF FIRE INDICATORS FOR UNDERGROUND LANDFILL FIRE RISK ASSESSMENT

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ABSTRACT: Waste disposal in landfills can lead to malodours, landfill gas accumulation, fires and explosions, greenhouse effect, surface and ground water pollution, soil pollution, vehicle noise, health risk for workers from various typical and atypical infectious diseases and diseases caused by air pollution, uncontrolled scattering of lightweight waste, and so on. Regardless of the lower fire incidence compared to other events, environmental risk and effects of fires are the most prominent, which warrants a special approach and an analysis of all the relevant parameters and their causes. The severity of the issue is reflected in the fact that there were 877 landfill (both sanitary and non-sanitary) fires in Serbia in 2015, while 70 (both sanitary and non-sanitary) of them broke out in the area of Niš waste management region (waste management region No 24) according to the data from the Serbian Emergency Management Sector, Ministry of Interior.

The aim of this paper is to propose a method for predicting or detecting landfill underground fires based on the monitoring and use of fire occurrence indicators. The monitored indicators are smoke and odours from the landfill, increased temperature in gas collection systems, occurrence of cracks, subsidence, or depressions, and changed concentrations of landfill gas components. The research was conducted during the summer, because that is when probability of landfill fire incidence is the highest. The research and measurements were conducted at the “Bubanj” non-sanitary landfill in Niš, operating since 1968.

Key words: monitoring, risk assessment, landfill fire, landfill gas, indicators

QUANTITATIVE SWOT ANALYSIS FOR ECOTOURISM: CALKOY-TRABZON CASE STUDY

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ABSTRACT: Calkoy High Plateau is a rural town on the north east coast of Turkey and it becomes the most modern and contemporary highland in Trabzon. The area has Cal cave and it is one of the longest caves of Black Sea Region with its 850 m reachable distance. In the last decade, and cave tourism gets more popular. However, recently, there are unsuitable infrastructure and lack of institutional environment problems.

The basic premise of this study is that ecotourism could be a more sustainable activity for Calkoy. Ecotourism is a well-known strategy for balancing development and preservation in ecologically rich areas that is also highly attractive for tourism. This study aims to define ecotourism criteria for Calkoy, and proposes an ecotourism strategy for this ecologically and culturally sensitive rural environment with two closes Natural Park. To reach our aim, one of the well-known multi-criteria decision making methods, Analytical Hierarchy Process (AHP), and factor analysis, are employed on the basis of the data derived from the surveys and interviews with locals and experts.

This study offers a framework to generate a priority ranking for ecotourism development in Calkoy. The methods and the findings can set an example for sustainable development of other rural zones in Turkey and other countries.

Key words: Cave, ecotourism, SWOT Analysis, Analytical Hierarchy Process, Calkoy, Trabzon

ORAL SECTION

2

**RENEWABLE ENERGY RESOURCES
AND MANAGEMENT OF NATURAL
RESOURCES**



E-GOVERNMENT IN FOREST ECOSYSTEMS THROUGH AN ONLINE DSS (DECISION SUPPORT SYSTEM)

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ABSTRACT: This paper presents the development of an online Decision Support System (DSS) in forest e-government in the context of sustainable development, sustainable use of natural resources and environmental protection. More specifically, it constitutes an important methodology tool for the forest ecosystem management in the Region of Epirus. It is presented a pilot version concerning the online DSS system for the Forest Service of Ioannina prefecture, in Epirus, Greece in terms of extensive tree disease mitigation. The development of the DSS consists of three main sections: the database, the user interface and the data processing and analysis system. The methodology of the DSS development consists of the following steps: primary data collection concerning the forest ecosystems of the study area using satellite orthophotomaps and fieldwork (geographical location, details of possible tree diseases, etc.), data quality control and processing. At this level, the user can report the results from the primary data. Some functions of the application is the geotagging, data search tool and spatial analysis tool. It is an open-source and fully customizable application. This online DSS is an appropriate tool for the Forestry Departments of the study area for a contribution to a better forest ecosystems management and monitoring. Furthermore, the cooperation among the research centers and institutes of the country would result in more effective forest e-government. The online DSS aims at the general public too and provides information about the forest ecosystems management and the benefits of the environmental protection. Finally, useful material is provided.

Key words: Decision Support System, E-government, Forest government, forest ecosystems management, Database, Web-based system

LIGHT-INDUCED FADING OF THE PHOTOSTIMULATED LUMINESCENCE SIGNAL FOR IRRADIATED HERBS AND SPICES

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ABSTRACT: Irradiation of herbs and spices is a special procedure for reducing the number of harmful microorganisms and toxins, replacing the use of pesticides and preservatives. Development of this technology for food preservation introduces the need of reliable and routine tests for detection of irradiated food. Luminescence may occur under natural and artificial light stimulation on which herbs and spices may be exposed during storage, leading to false-negative results and disabling their proper identification as irradiated or unirradiated. Studying the influence of light on the photostimulated luminescence response is crucial for enhancing consumers' confidence and safety.

By introducing a standard physical method for detection of irradiated herbs and spices by photostimulated luminescence (PSL), measurements of different samples, including paprika, guarana, green tea and parsley, have been undertaken and an analysis of the results has been done. Samples were kept under different light conditions for different periods of time, nine months at most. The optical bleaching of the PSL signal has been detected in all cases. The strong influence of light, natural and artificial, on the PSL signal was determined.

Key words: photostimulated luminescence, food, light-induced fading

EVOLVENT OF ADAPTIVE, INTEGRATIVE EDUCATION MODEL FOR RESOURCES PROTECTION IN MINISTRY OF DEFENCE OF THE REPUBLIC OF SERBIA

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ABSTRACT: The aim of this paperwork is grounded on development of an adaptive, integrative education model for resources protection, addressing the contemporary needs within Ministry of Defence of the Republic of Serbia. Quintessence of the paperwork towards to in-depth analysis of related, core terms: developed integrative model, improvement of existing model, nature of the resources that are subjects of protection and modalities of protection. Applied methodology consists of comparative analysis, statistical methods and multicriteria evaluation and assessment. Core determinants are specified by means of expert judgments method. Obtained results are intended to be used in further implementation process regarding developed model.

Key words: resources, protection, model, education, determinants, multicriteria assessment

MODIFIED LEAST SQUARE METHOD FOR MODELING IN FLOW DURATION CURVE FOR SMALL HYDRO POWER PLANTS DESIGN PURPOSES

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ABSTRACT: One of the main goals during design of Small Hydro Power Plants is calculation of the expected energy production and its installed capacity. For that purposed it is very important to have accurate data and well design model for calculation of inflow duration curve. This curve expresses the relationship between the inflow values and the frequency with which they happen or are exceeded in a specified period (usually a month or year). Modeling of the inflow duration curve is performed based on daily measures of the flow (m³/s) for the given location where small hydro power plants should be constructed. Furthermore, this curve is used for calculation of expected energy production and the energy production with the specified risk level.

In proposed paper method for modeling of Inflow Curve Duration based on the modified least square method will be presented. In the proposed model the inflow duration curve is modeled with 5-th order polynomial. The objective function should minimized sum of the square of the residuals between calculated and measured values. In order to take into account the maximum and minimum inflow for the specified period of the analyses additional constraints in form of linear equation will be added to the objective function. Finally, in objective function will be included integral equation for modeling the volume of water which could be used by HPP in the specified period.

Proposed model will be implemented for calculation of inflow curve duration for real small hydro power plant.

Key words: modeling, flow duration curve, small hydro power plants

IMPLEMENTATION OF RECP IN CEMENT INDUSTRY – USJE CEMENT PLANT CASE STUDY

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ABSTRACT: The concept of Resource efficient and Cleaner Production (RECP) is designed at the company level having a preventative approach aimed at improving the use of resources and reduce emissions to environment. Development of RECP indicators and sub-indicators is specific for different industries; there are also differences within the same type of industry depending on specific local requirements, working conditions and environment. Cement production relates to large amounts of raw materials and fuels on the input side and substantial carbon dioxide emissions on the output side. In that respect, saving energy and raw materials in the cement production process is one of the key elements of sustainability because it is equally important from environmental, economic and social point of view. RECP system comprises six absolute indicators, three for resource use (energy use, materials use and water use) and three for pollution (air emissions, waste water and waste). These absolute indicators are used to calculate three resource-productivity indicators (product output per unit of resource used) and three pollution-intensity indicators (emissions or waste generation per unit of product output). The overall goal of this research is to establish a baseline scenario and to monitor the progress in implementation of RECP system in Usje Cement Plant, using a pre-defined boundaries and set of RECP indicators adopted for cement industry. The key performance indicators for year 2012 are used as a baseline and the progress in RECP implementation is monitored in the next three years. The results of this research confirm that RECP acts as a catalyst to increase productivity and decrease pollution intensity in cement industry. Monitored RECP indicators should be seen as a common set, since they are interrelated to varying degrees. The most evident are interrelation between indicators for: (1) raw materials and energy use, and (2) energy and raw materials consumption and CO₂ emissions.

Key words: RECP Profile, resource efficient, cleaner production, cement industry, emission reduction

o2-06

LOSS OF LOAD PROBABILITY OF WIRELESS SENSOR NETWORKS POWERED BY PHOTOVOLTAIC CELLS

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ABSTRACT: Electricity consumption rate is one of the most constraining requirements for design and implementation of wireless sensor nodes. Analysis of electricity consumption and the reliability of the measurement system are the crucial factors in designing and development process of the sensor networks. Solar energy is certainly one of the most promising energy supply option. Equipped with photovoltaic cells, some of the operation becomes possible without frequent recharging and replacement of the batteries. That is why wireless sensor nodes have to keep energy in storage elements.

The reliability techniques concentrate on energy efficiency and are aimed to improve the life time of the network. In this paper is proposed model for estimation of the reliability of Wireless Sensor Network (WSN) supply with photovoltaic cells. Modeling of the Loss of Load Probability (LOLP) parameter defines the system performance per month.

In this work are analyzed different design, deployment and functional aspects of a reliable WSN. This paper proposes a model for evaluating the reliability of WSNs considering the battery level as a key factor. Also the paper analyzes reliability enhancement by existing fault tolerant methods in WSN and compares the performance of these techniques with the technique we developed.

Key words: sensor electricity consumption, loss of load probability, wireless sensor networks, reliability

o2-07

ECONOMIC EVALUATION OF GRID-CONNECTED PHOTOVOLTAIC PLANTS WITH VARIOUS TYPES OF SOLAR CELLS IN THE REGION OF R. OF MACEDONIA

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ABSTRACT: Having in mind the environmental and social advantages, installation of photovoltaic (PV) systems are supported by many financial mechanisms. This lead to a mass production and price decreasing of PV modules. The electricity cost from the systems are reaching the grid parity.

In this paper, an economic analysis of large scale PV plants is elaborated. For this Life Cycle Cost and Cost Analysis, are used. Analyses are carried out for PV plants consisted with modules with monocrystalline, polycrystalline and amorphous silicon, with installed capacity of 1 MWp. According to the capital investment, operation and maintenance costs within the systems' life cycle, discount rate, module degradation, the expected generation the region of Rep. of Macedonia; the electricity cost and the period of return of the capital investment, are calculated. The results show that the electricity cost is between 5.6 and 12 €cents/kWh, while the investment payback period is from 8.2 years to 9.9 years, depending on the PV module cell technology.

Key words: Photovoltaic plant, economic evaluation, solar cells technology, LCC Analyses, Cost Analysis

RISK ASSESSMENT IN SMALL HYDRO PROJECTS

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ABSTRACT: Small hydro power plants as investing projects are in an up-intensive trend worldwide as important part of renewable energy recourses. In the Republic of Macedonia there is a governmental bid for new small hydro power plants that are planed to be built under concession scheme. But the process of building a small hydropower plant is not so simple and is consisted of a couple phases which are subject to detail and careful analysis, identification, calculation and assessing the investment risk. The results of this analysis will be a contribution ahead, especially for private investors, to make a decision to built or not to built hydro power plant and to consider if it would be a profitable and successful project. In the paper a sensitivity analysis for risk assessment is performed under standard procedure for investment undertakings. Risks that appear here are related to the main features of economic and technical side of investment project such as: cost, schedule, manufacturing, delivering, testing, and putting into operation – as main steps in constructing and commissioning of small hydro power plant. All this leads us to conclusion to use certain techniques that will help us to value the risk as real as possible and hence to make the best decision for investing our worth money.

Key words: small hydro power plants, risk assessment

ECOTOURISM AS A SPECIAL TYPE OF SUSTAINABLE TOURISM

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ABSTRACT: Prevailing concept of ecotourism refers to the tourism activities that employ the kinds of sustainability that are economically viable, ecologically maintainable and socially equitable. Hence, ecotourism is considered a special type of sustainable tourism that aims at responsible use of natural, cultural and historical resources, and it simultaneously contributes to the local and national development and the protection of natural areas. Everyone agrees on the idea that ecotourism is a special form of sustainable tourism. However, scholarly explanations about the nature of ecotourism widely differ. This paper attempts to present a qualitative assessment by providing popular and alternative explanations about the nature of ecotourism. To do so, the existing general and unconventional literature/studies were used in order to provide their basic ideas about the nature of ecotourism. Their basic ideas, statements and criticisms lead to conclusion that ecotourism is a continuous process which requires business ethics and business practices that are based on environmental sustainability, as well as proper tourism policy, implementation, constant monitoring, existence of necessary preventive and/or corrective measures whenever necessary, as well as support and encouragement at local, regional and central levels. Finally, the paper poses valuable recommendations in the line of identifying effective framework for developing ecotourism within all stakeholders involved in tourism process.

Key words: Ecotourism; Sustainability; Prevailing views;
Alternative views.

EFFECTS OF MINERAL ADDITIVES ON THE PHASE FORMATION IN SELF-COMPACTING TYPE DECORATIVE CEMENT COMPOSITES

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ABSTRACT: The decorative cement mortars and concretes are composites representing an artificial imitation of the natural rocks. Their main advantage is better workability, while their key objectives are their durability and stability. For the purpose is necessary to use white Portland cement and mineral additives of white or color fine and coarse aggregates. These preparations show large differences in their structure in comparison to conventional cement.

We investigated the different types of cementitious composites based on White Portland cement and marble as additive. The prepared composites were investigated after 28 and 90 days of water curing, measuring some physical-mechanical properties such as density, compressive strength and porosity. The X-Ray powder diffraction analysis, FTIR measurements and SEM were used to identify the crystal structures and morphology.

The experimental data show that the cement composites with higher water content exhibit more variety of new-formed phases, like hydration products of C-S-H type. The structure of self-compacting type decorative mortars is so dense that there is no possibility of crystal hydrates development at late curing ages. The use of marble as filler leads to a partial inclusion of carbonate ions in the new-formed hydrated phases (carbo-aluminates).

Key words: White Portland cement, decorative mortar, cement hydration

COMPARATIVE PERFORMANCE OF BIODIESEL PRODUCED FROM VEGETABLE OILS WITH CONVENTIONAL FUELS

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ABSTRACT: Transportation systems diversification has been one of the driving forces for diversification of fuel sources, while increase of the vehicles' number and electricity demands in remote areas have played a key role. Exploitation of conventional fuels (like diesel and gasoline) nowadays has increased awareness for the future of our global economy due to the limited capacities of natural resources.

Use of blending of conventional fuels with biodiesels according to EU and International legislation has been in accordance with the demands to use these vehicles without the engine modifications. This situation leads to requirement of alternative fuels for engines. Biofuels including, bioethanol and biodiesel, have been introduced in main global markets like, USA, Brazil and EU. Biodiesel is the best alternative in the conditions of European countries to replace the conventional fuels, like the diesel in the diesel engine. Vegetable oils of soybean origin are the best alternative biofuels in the case of Albania, due to the arable lands. The main advantage of biodiesel compared to the conventional fuel is reduction SO₂ emissions to atmosphere due to their agricultural origin.

In this paper, the biodiesel physical-chemical properties have been studied for pure and blended fuels, in terms of performance and exhaust emissions in comparison to the petroleum diesel.

Key words: biodiesel, conventional fuels, performance, exhaust emissions, transesterification.

ORAL SECTION

3

**GREEN SMART CITIES / SOCIETIES
– GREEN ARCHITECTURE
AND LANDSCAPE DESIGN**



o3-01 – Key speaker

GREEN SMART CITIES- AN INTEGRATED APPROACH

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ABSTRACT: Nowadays more than half of Earth's population is in urban areas. In accord this generates a number of problems and challenges. The main problem that arises from this situation is based on energy consumption and CO₂ emissions because cities are responsible for three quarters of energy consumption and 70% of CO₂ emissions. The challenges are based on offering a good quality of life for citizens, on to ensuring appropriate socio-economic development year on year, while the opportunities can be seen in businesses becoming more efficient and innovative, to the reduction of crime through the use of ICTs in policing. It is obvious that ICT can contribute to the development of green smart cities if it is going to be used for the reduction of energy consumption and CO₂ emissions and if in parallel municipalities expand their services on their citizens' quality of life. This means that a "smart city" can be achieved through the development of urban and regional innovation eco-systems and through a speeding up of ICT applications. In this paper an integrated approach for a "smart city" is proposed.

Key words: ICT, Smart Cities, ICT and energy consumption, citizens' quality of life

o3-02 – Key speaker

**NUMERICAL STUDY OF INFLUENCE OF STREET CANYON
GEOMETRY ON PLUME DISPERSION AND POLLUTION
AT PEDESTRIANS' LEVEL**

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ABSTRACT: Large Eddy Simulation (LES) method of Fire Dynamic Simulator (FDS) software has been used to investigate the effects of building geometries on fire plume dispersion and atmospheric pollution under wind conditions. The simulations have been carried out for four separate cases of different street canyon configurations, commonly found in many urban areas. The results indicate that the street geometry is crucial for pollutant dispersion inside and over the canyons, because it affects the wind inflow into canyons; the interaction between wind flow at rooftops and in-canyons fire plume flow; and consequently, the generation, transport and dispersion of fire pollutants. The accumulation of pollutants at the pedestrian level mainly depends on the flow patterns inside canyons. The greater quantity of the air in canyons corresponds to a lower yield of CO and a bigger yield of CO₂ and vice versa. The results indicate also that the air pollution level in complex structures can be effectively investigated by FDS LES method. The results are applicable to air quality management in design of effective control strategies to reduce the pedestrians' level pollution, and for strategies of sustainable urban planning aimed to reduce the air pollution.

Keywords: Large eddy simulation, street canyon geometry, fire accident, wind flow, air pollution

o3–03

**EVALUATING CHILDREN GARDEN ENVIRONMENT,
UTILIZATION AND CONSUMER SATISFACTION,
FOCUS GROUP INTERVIEWS WITH FAMILIES
OF DISABLED CHILDREN**

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ABSTRACT: As landscape architects deal with the design of environments for children, the inclusion children with disabilities in their peers should be one of the principal goals of the design of natural settings. They often face problems while working on public playgrounds, parks and green landscapes largely due to the lack of adequate provisions to meet their special needs. The purpose of the present study is twofold: to investigate the different kinds of problems and specific needs of disabled children in natural settings such as parks and playgrounds in Ankara (Turkey), and to offer solutions in order to solve these problems. This study that is of case study type consists of parents, having orthopedic disabled children. Parents were investigated and interviewed in the research. The findings finally revealed that there was a necessary need to improve and construct equipped natural settings specialized for children with disabilities.

Key words: Disabled Children, Children Garden Environment,
Playgrounds, Ankara

o3–04

GREEN CITIES, URBAN HEAT ISLAND AND URBAN CLIMATE ADAPTATION

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ABSTRACT: Cities and urban planners need to plan and create more sustainable and resilient communities, make a plan for climate adaptation, preserve and create green space, adopt green building policies, engage the community in climate change planning process, approach climate change planning on a regional level.

The main risks and barriers in urban areas is the concept of the urban heat island. The concepts of urban development that is driven by economic and human development, creates new risks and uncertainties of the intensively populated cities. The effects of climate change is starting to show, with rising temperatures, increased precipitation and sea-level rise, that becomes risk of the landscape of cities. Climate change is shifting the fundamental rules of city urban planning. The Urban climate adaptation services have many risk barriers in urban areas, but overcoming that barriers can lead to results in urban environment. The urban areas will need to prevent climate change in the cities and they will need to focus on social, political, environmental and financial risks of urban infrastructure.

Key words: green citie, urban heat, urban climate adaptation

o3-05

EVALUATION OF SMALL SCALE CITY PARKS IN BALIKESIR BASED ON DEVELOPED ECOLOGICAL DESIGN CRITERIA

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ABSTRACT: Rapid development and expansion in technological field has expanded people's influence areas and create more dense pressure originated by human on the ecosystem. The areas observed most intense pressure in question are the urban areas whose ecosystem is changed almost completely by people. Population growth and dense housing experienced in urban areas especially in recent years has posed a serious threat for urban green areas. It has become necessary to take countermeasures with regard to sustainability of urban, natural and cultural resources. At this point, city parks, with numerous functions, have attracted attention as urban places played an important role on quality of life of citizens. With city parks which will be organized according to ecological design criteria it will be provided integration opportunity with nature to city dwellers. Besides, it can make lots of contribution such as decreasing the consumption of energy and natural source for park, using environmentally friendly technologies, increasing awareness about environmental protection, providing bio comfort and opportunity to live in a healthier environment.

The majority of urban green space is regulated as artificial fields detached from the overall cycle and nature, far from ecological concerns and incompatible with the physical conditions and cultural infrastructure in Turkey. This is are as which are formed without purpose of ecological and economic sustainability appears to be unconscious consumption areas in the world whose resources run out rapidly for the sake of creating magnificent scenes. In this concept, the study is built on integrating multi-faceted perspective of ecological design with design of small scale parks closer to the urban area and transferring the today's endangered resources to the next generation with protecting them.

The purpose of this paper is to develop a criteria set based on previous studies in literature to analyze small scale parks located in Balıkesir.

As a result of this study, thirty three criteria were conducted under three main headings. Then, selected parks were evaluated based on these criteria. The results show that small scale parks of Balikesir does not meet determined criteria.

At this point, developing a design approach brings the relation of human and nature forward and produces solutions to the ecological problems of the city is quite important while the existing design concept in the planning of green areas is changing. If the consequences of implementation of the small scale ecological parks, which will be planned with the framework of this understanding, in Balikesir and its contribution to the city in the sense of sustainability are considered, the development of the city in terms of economy and ecology will be much easier.

Key words: City Parks, Ecological Quality, Ecological Assessment

KANUNI CAMPUS – KARADENİZ TECHNICAL UNIVERSITY

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ABSTRACT: The purpose of this article, 2369 street furniture at the campus mentioned to the thesis study named “Generating a GIS-Based Campus Urban Furniture Information System (YEDBIS): Example of Kanuni Campus – Karadeniz Technical University” are to question the harmony statuses of space form, actual activity in space, space size, natural materials used space, usage density of space, surface materials of space, users, and the other of them. The harmony statuses of the street furniture were fixed by observation works and field determinations at the university campus. Findings obtained observations were recorded to identification cards by writing “0” value for disharmony, “1” value for partly harmony and “2” value for harmony. Then, the data were analyzed in YEDBIS, which is based on GIS.

The analysis results indicate that 2369 street furniture were found to be disharmony with space form, with surface materials of space, with natural materials used space and with other street furniture in space, and to be partly harmony actual activity in space, space size, usage density of space and users. Also, the regions and nearby around of the buildings at the campus where were disharmony, partly harmony and harmony of the street furniture were established by using YEDBIS.

Key words: GIS, YEDBIS, Identification Card, Street Furniture

ASSESSING THE AVIAN DIVERSITY OF THE URBAN GREEN AREAS: THE CASE OF BORNOVA, İZMİR

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ABSTRACT: Built-up areas mostly tend to expand over the natural areas so biodiversity of urban landscapes have become an important concern. Although most of the urban green areas (UGA) are small, scattered and comprise just a small portion of urban landscapes, they are still very diverse and rich in biodiversity that provides habitats for a variety of animals such as insects, vertebrates, mammals, and birds. As well as plant composition, the presence of vegetation layers, size, form, and color of plants in UGAs influence avian diversity and abundance. As birds are relatively easy to observe and somewhat sensitive to changes in habitats, they have been widely used for identifying and assessing biodiversity of urban landscapes.

Thus, the objective of this study is to look for correlations between avian diversity with vegetation density, vegetation diversity and canopy cover in the three large UGAs in the highly urbanized landscape of Bornova-Izmir, Turkey. It is important to state that avian diversity in UGAs is one of the less studied topics in Turkey. To accomplish this, bird and vegetation surveys have been conducted once a week for six months between September 2015 and February 2016. Ordinary least square regression analysis will be used to identify the influence of vegetation density, vegetation diversity and canopy cover over avian diversity in UGAs. The results of this study will be discussed further on the basis of the conservation of bird diversity in the context of planning and designing UGAs.

Key words: Avian diversity, urban green areas, regression analysis, Bornova

ULTRASONIC PULSE VELOCITY INVESTIGATION OF POLYPROPYLENE AND STEEL FIBER REIN FORCED CONCRETE

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ABSTRACT: UPV (Ultrasonic pulse velocity) method has been shown for some time to provide a reliable means of estimating properties and offers a unique opportunity for direct, quick and safe control of building damaged by earthquake, fatigue, conflagration and catastrophic scenarios. On this investigation hybrid reinforced concrete has been investigated by UPV method.

Hooked end steel fiber of length 50 and 30 mm was added to concrete in different proportion 0.025, 0.5, and 1 % by the volume of concrete. On the other hand polypropylene fiber of length 12, 6, 3 mm was added to concrete of 0.1, 0.2 and 0.4% by the volume of concrete.

Fifteen different mixtures have been prepared to investigate the relation between compressive strength and UPV values and also to investigate on the effect of volume and type of fiber on UPV values.

Key words: compressive strength, polypropylene fiber, steel fiber, ultrasonic pulse velocity, volume, type of fiber.

o3-09

PERCEPTION OF CYCLING IN TURKEY: EFFORTS, STRATEGIES AND CONTRIBUTIONS OF NGOS FOR GREEN CITIES

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ABSTRACT: Turkey has important habitat and landscape diversity, geomorphologic features, flora and fauna diversity, cultural and architectural features and highlights for ecotourism.

Recent years cycling along the whole country has become one of the most popular recreation facilities as well as most of the municipalities invest on cycling infrastructure. As many cities have ongoing efforts for developing cycling, NGOs living in concerning settlements try to contribute the system to be operated.

This paper will summarize the developing perception of cycling in Turkey via case studies of “Cycling Festivals” and the efforts of the government will be gathered and submitted in means of green infrastructure.

Key words: Cycling, Cycling Festivals, Green Infrastructure, Turkey

o3–10

A RESEARCH ON ÇANAKKALE CITY CENTRE'S INFRASTRUCTURE SUPPORTABILITY WITH GREEN INFRASTRUCTURE

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ABSTRACT: Green infrastructure usages are improving all over the World. It's support natural processes to improve water quality. Also, it is support to manage of water quantity by restoring the hydrologic function. The organized urban landscape managing storm water at its source, and reducing the need for additional gray infrastructure in many instances. The green infrastructure applications are designed to restore the hydrologic function. So, the urban landscape is managing rain water at its source and reducing or eliminating the need for gray infrastructure. One of the important issues of green in frastructure is to reduce rain water volume. Also it is reducing pollutant loads, stream bank erosion, and sedimentation. Green infrastructure applications include rain water management, climate adaptation, increasing biodiversity, healthy soils, better air quality, sustainable energy production and clean water supply. Green infrastructure applications can be integrated with streets, parking lots, and landscaped areas. It provides an extremely important contribution to the city's green infrastructure use. Green infrastructure is an important and power tool for water management of an urban area. Çanakkale city centre is located in Dardanelles coast and Sarıçay River passes through in its. In this situation, the study is researching of implementation and development facilities of green infrastructure of Çanakkale city centre.

Key words: urban landscape, green infrastructure, infrastructure, water managements.

o3–11

RESIDENTS' PREFERENCES OF RIVERINE LANDSCAPE AFTER STREAM ENHANCEMENT AND RESTORATION, CASE STUDY: BEYKOZ STREAM/ ISTANBUL

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ABSTRACT: Efforts to restore rivers are increasingly concerned with the social implications of landscape changes. However, the fundamental issue of how people make sense of local riverine environments in the context of restoration remains poorly understood. This research examines resident's perceptions and preferences after changes and restoration performed on the Beykoz River in the north of Istanbul. In this paper, landscape of the river is evaluated based on interviews with 16 local residents who were old enough to contemplate and compare the changes of the stream over time. The main factor considered in this research is scenic beauty which is included the condition of riverine vegetation, river channel morphology; opportunities and activities in stream riverine, and finally some aspects of sustainability. The results indicate some landscape issues posed by changes and restorations done over the stream which are mainly low quality of water, poor vegetation, less amount of water, lack of accessibility to the stream. Moreover, the results of interviews show the role stream in social and political life of the local residences in the past and current time. Finally, after assessing all factors, some suggestions are supposed to mitigate the problems and fulfill the residence's preferences.

Key words: Riverine landscape, Residents' preference, Restoration, Beykoz

o3–12

NANOTECHNOLOGY FOR SUSTAINABLE GREEN BUILDINGS

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ABSTRACT: Construction Industry is the largest single contributor to the environmental problems, with the construction, operation, and maintenance of buildings. The potential contribution to sustainability makes nanotechnology one of the key technologies in green building area. Nanotechnology can be used for design and construction processes in many areas since nanotechnology generated products have many unique characteristics. Recent developments in various areas of nanotechnology show significant promise in addressing many of these challenges. Research and developments have demonstrated that the application of nanotechnology can improve the performance of traditional construction materials, such as concrete and steel. Applications in the construction industry include use as fire retardants, high performance insulation, protective coatings, equipment lubricants, structural integrity enhancement and monitoring, photovoltaics, stronger tensile cables, and self cleaning or heat absorbing windows.

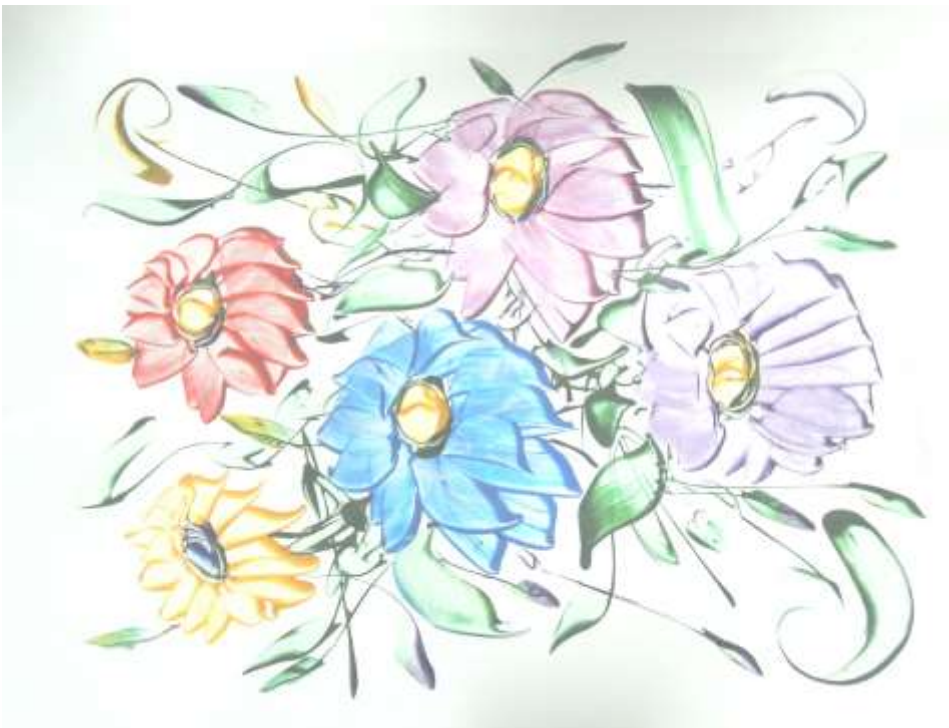
Nanomaterials are poised for widespread use in the construction industry, where they can offer significant advantages for a variety of applications ranging from making more durable concrete to self-cleaning windows. However, as of yet nanotechnology has not made a significant impact on the construction industry. This study classifies the application areas of nanomaterials for green buildings. Specific objectives of this research are to better understand nanotechnology in the context of construction and to evaluate existing applications in nanotechnology and research in progress for specific development and application to construction. The need for nanotechnology in the construction sector is emphasized.

Key words: Nanotechnology, Green Buildings, Sustainability, Nanomaterials, Green Building Design

ORAL SECTION

4

**AGRICULTURE, AGROECOLOGY,
FOOD QUALITY SAFETY, LEGAL
FRAMEWORK, PUBLIC HEALTH –
ENVIRONMENTAL MEDICINE**



NEW SOIL SAMPLING METHOD FOR INCREASED VOLUME OF SOIL SAMPLE

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ABSTRACT: Conventional soil sampling usually considers sample weight of 2 kg per 4–5 ha area, which means that representative sample in relation to soil mass up to 30 cm depth, is presented through the ratio 1:10000000. New sampling method changes the ratio to 1:625000, thus increasing amount of sampled soil 16 times with assumption that such sample better describes investigated area. Moreover, new soil sampling probe can be used for precision farming purposes where the central point of the probe ring is positioned with precision of ± 1 cm and represented with 4, 8 or 16 samples taken in 50 cm radius from the center. Soil probe prototype was tested in different soil types and in different parts of Croatia. Using new soil sampling method for soil survey and applied geostatistical tools provides a solution for quantifying spatial variability of soil properties, possibilities for commercial activities and a way to introduce variable rate technology in agricultural input application which can optimize farm profitability through improving yield, reducing input costs and minimizing input losses to the environment. It could be very useful for soil sampling on contaminated sites and for Nitrate Directive purposes. The objective of sampling should be to provide information helpful to management decisions, and to fill knowledge gaps. Sampling should supplement a dynamic spatial information system that stores all relevant data collected within each farm field. Efficient sampling needs to be based on all information sources available to the land manager, and is an iterative process resulting in increasing understanding and improved management over time. The probe prototype was tested in different soil types and in different parts of Croatia. In the paper the results of basic soil chemical parameters are presented for 3 experimental locations.

Key words: Precise soil sampling, circular soil probe apparatus, grid sea

o4-02 – Key speaker

THE FUTURE PERSPECTIVES OF EUROPEAN UNION ENVIRONMENTAL LEGISLATION

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ABSTRACT. The European Union as one of the largest communities in the world with 28 member states is dedicated strongly to the protection and improvement of the environment. The Treaty on the EU and The Treaty on the function of the EU, as fundamental legal acts creates the preconditions for common activities and legislation in field on the environment. The contemporary EU has built a comprehensive system of environmental legislation. This legislation has placed a high level of environmental standards. It is a legal base of the EU common environmental activities. Directives and regulations are the most frequent part of this legislation. The EU environmental legislation faces with a number of challenges. The main goal of this paper is to analyze the existing EU environmental legislation and to highlight the future perspectives of this legislation.

Key words: European Union, environment, legislation, institutions, perspectives

o4-03 – Key speaker

**A SUSTAINABLE POLICY FRAMEWORK
FOR THE IMPLEMENTATION OF THE ICZM PROCESS
IN THE BLACK SEA REGION**

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ABSTRACT. The Black Sea region is experiencing increasing pressures mainly due to population increase, urbanization and growth in agriculture, fisheries, and industry. Changes to its ecosystem during the last 50 years clearly indicate its vulnerability to the anthropogenic effects. The Black Sea Convention provides a regional cooperation framework to protect against pollution (entered into force in 1994). Following the accession of Romania and Bulgaria to the European Union, the Black Sea became the focus of various EU policies both thematic (e.g. Integrated Coastal Zone Management (ICZM), Marine Spatial Planning (MSP), Marine Strategy Framework Directive (MSFD), Water Framework Directive (WFD), Fisheries, Habitat and Birds Directives); and horizontal such Environmental Impact Assessment/Strategic Environmental Assessment (EIA/SEA), access to environmental information, control of major-accident hazards involving dangerous substances, etc. The need to deal in the future with the impacts of climate change in combination with finding adaptive responses is also an essential issue. Current solutions within the individual sector frameworks usually “transfer” problems to other areas, resources, products or services. Industry and power engineering are able to create a situation wherein the environment becomes unsuitable for any other type of utilisation. As problems become more and more critical, the transference of coastal problems from one place to another and from one sector to another can be long-term. There needs to be a mechanism for solving such problems, elaborated within the prevailing economic and social systems. Such solutions must begin to involve all stakeholders including the general public. Constructive working relationships with local authorities, fisheries, tourism operators, scientists, nature conservation interests and other interested parties are encouraging to better-informed adoption of collective goals and more efficient and clear decision-making and may reduce instances for non-cooperation.

Key words: Black Sea Convention, regional cooperation, ICZM, decision-making, stakeholders.

ICTS AND THEIR ROLE IN EU ENVIRONMENTAL POLICY

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ABSTRACT: The definition of Information and Communications Technologies (ICTs) is an umbrella term that include any communication device or system encompassing, inter alia, radio, television, mobile phones, computer and networking hardware and software, satellite systems, as well as the various services and applications associated with them. ICTs have greatly impacted the environment in a positive manner by reducing greenhouse gas emissions. The implementation of most new environmental policies of the European Union (EU) is supported by ICTs. This paper studies the ICT adoption in European Union environmental policy. In particular, the regulations, the directives, the decisions and the communications concerning environmental issues will be assessed according to their ICT adoption. The results show that the EU environmental policies have not reached high rates of ICT adoption. This rate should be augmented within the context of a Green Europe.

Key words: ICTs, ICT adoption, EU policy, environmental policy, Green Europe

**ASYNCHRONIES AND INCOMPATIBILITIES
IN THE REPORTING OF ENVIRONMENTAL COSTS
AT THE LEVEL OF NORTH-EASTERN ECONOMIC ENTITIES
OF ROMANIA**

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ABSTRACT: The objective of this work is focused on identifying and analysing the green costs that an economic entity incursto protect the environment in which it operates, with direct effects on economic development at the regional level, implicitly at the national level. Only through a correct evaluation and presentation of the phenomenon included in environment variables may take place a growing awareness of the importance of informing through additional reporting conducted by an economic entity, on the topic of economic of thee nvironment and the impact on these behaviours.

Taking into account the increasing concern of EU environmental policies and their principles, now all entities regardless of their nature have become more interested in their application management system. In this context, the objective of this paper is being represented policies, objectives and environmental programs, operational control of activities, supervision, and audit in compliance with Communitarian legislation in this field.

Key words: green costs; economic development; Communitarian environmental audit; legislation field; economic entities.

ADDED VALUE OF ENVIRONMENTAL COSTS FOR ENTERPRISES: AN APPLICATION IN THE CEMENT INDUSTRY

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ABSTRACT: Today enterprises have started to pay importance to environmental costs to eliminate qualitative and quantitative damages they have caused. Several factors such as social reasons, customer requirements legal regulations force enterprises to carry out eco-friendly production activities and enable them to reveal environmental costs. While these costs increase cost items in the enterprises, they provide positive contributions to the enterprise as well creating an significant benefit in term of the enterprise.

Environmental costs differ depending on their occurrences. Some environmental costs include activities towards protecting the environment while others occur after the activities are done. There are also environmental costs due to the environmental pollution caused by the enterprises.

The purpose of the study is to explain how particularly the manufacturing enterprises get positive feedback through the measures they have taken in order to minimize the environmental damages caused or to be caused by the enterprises with the annual data of an enterprises in the cement industry, and show how environmental costs of the enterprise occur in this respect and set a model for the other enterprises.

Key words: Environmental Pollution, Environmental Cost, Environmental Awareness, Green Enterprise Image

COMPLEX MEDIA AND GENETIC MANIPULATION FOR IMPROVEMENT AND PRODUCTION OF NEW PRODUCT BY *KLUYVEROMYCESMARXIANUS*

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ABSTRACT: *Kluyveromycesmarxianus* is a well known yeast and it has many known qualities which make it a desirable tool in biotechnology. *Kluyveromycesmarxianus* is found in many dairy and wine products, which talks about its features as a harmless microorganism for human usage. There are more than one unique capability, which makes it a desirable organism for industry like high temperature fermentation and different kind of medium assimilation. The wide range of the medium assimilation is a suitable feature for usage a complex media which have a cheaper source. Many of food waste complex media hydrolysate are used for ethanol production and other food products. The work was based on the growth rate, and the yield. To see the improvements, comparison were done between complex media, *K. marxianus* and *S. cerevisiae*. As a result of continuous work, the improvements are seen in the growth yield and less energy losses for complex media hydrolysis. The research works are in the beginning and it is needed continuous work for better results, even that there are many outcomes which can hopefully improve some industrial yeast products.

Key words: *Kluyveromycesmarxianus*, media, food.

EFFECTS OF QUAIL DROPPINGS AS A FERTILIZERS AND RATES OF APPLICATION ON GARDEN SOIL IN MITROVICA, KOSOVO

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ABSTRACT: Quail manure has a higher total solid content than most other manures. Application of quail manure at appropriate rates could add organic matter to the soil and improve the soil's moisture and nutrient retention. The most common procedure for determining the amount of manure to add to the soil is the nitrogen content and the crops nitrogen needs. Thus, this study aims to present the production of organic fertilizers from quail droppings, the effects and the rates of applications on chemical properties of a garden soil in Mitrovica, Kosovo. The quail droppings from Minifarm "Fllanza", are used to produce the organic fertilizers in close cooperation with Ministry of Agriculture and the Initiative for Agricultural Development Association. To assess the application of the new organic fertilizer product in the garden soil the following parameters were determined: organic carbon (OC), total nitrogen (TN), available phosphorus (AP) and exchangeable bases. The results revealed that, the organic fertilizers from quail droppings significantly influenced chemical properties of the soil, particularly OC, TN and AP contents of the soil. The production of organic fertilizers from quail droppings presents the process of transforming organic waste into environmentally safe fertilizer and the agriculture waste management.

Key words: Organic fertilizers, quail droppings, garden soil.

A MONITORING AND CONTROL SYSTEM FOR IRRIGATION INTEGRATED WITH SMART PHONES FOR THE EFFICIENT USE OF UNDERGROUND WATER RESOURCES IN AGRICULTURAL PRODUCT GROWING

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ABSTRACT: Monitoring and control system for specific data of agriculture zone through crop development process is very important. A structure which is carried out based on the type of the product with the knowledge of temperature and humidity values of the agricultural land can contribute to the efficient use of underground water resources and the establishment of the administration of the land besides the economical contributions to the farmer. In this study, the values obtained by heat and humidity sensors which are placed in different locations of agricultural field are transmitted to a database by using a central operation unit. According to that database, the water requirement based on the product is determined. Those values are transferred to the smart phones by using a Wi-Fi connection. A real time monitoring system is established on the smart phone. The energy supply of the system is obtained by solar cells. The design offers several advantages such as saving of water, time and energy with the efficient use of underground water resources. Thus, the design constitutes an environmental friendly system by using clean energy.

Key words: Underground Water, Agriculture Zone, Smart Phone, Sensor Networks

AAS DETERMINATION OF HEAVY METALS IN HONEY

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ABSTRACT: Investigation of heavy metals in honey was conducted by Atomic absorption spectrometry. In order to get the clear review of heavy metal presence in the environment we collected samples of honey in different places of Kosovo, few in industrial places and some as reference of comparison with the first ones in nonindustrial parts of Kosovo. All results were expressed in mg/kg and in table form, afterwards constructed in charts for each of metals where the sample was collected. Presence of Cu, Pb, and Zn is detected, but no Cd was detected in these samples. Quantity of Zn in all sampling points was greater than other metals, in some cases many times greater. The real quantity can be read from the table as well as from comparison charts where a distinction of Zn quantities in all sampling points was made.

Key words: AAS, determination, environmental pollution, honey, heavy metals

ANTOCYANIN AND UV INFLUENCE UPON CIELAB AND OTHER PHYSICOCHEMICAL PROPERTIES OF SESAME FOOD OIL

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ABSTRACT: One of the most serious problems of the food industry is lipid oxidation, which decreases nutritional quality, increases toxicity, and alters texture and color of the food in question. Research suggests that oxidation of lipids from the diet may play a direct role in the development of chronic diseases in the human body. Natural antioxidants may be added directly to foods as primary antioxidants, which donate hydrogen atoms to quench peroxy radicals before they can further react with unsaturated lipids. Antioxidants significantly extend the shelf life of foods containing lipids susceptible to oxidation such as vegetable oils. Wild berries are a potential source of natural anthocyanin antioxidants. This paper presents experimental results obtained using anthocyanins from *Vaccinium Vitis – Idaea* Fruits, upon color and other physicochemical properties of sesame food oil, which was exposed to UV radiation.

Key words: Anthocyanin and UV influence, physicochemical properties, sesame food oil

THE EVALUATION AND MONITORING OF RESIDUE LEVELS IN RELATED FOOD PRODUCTS AND ECOLOGICAL ENVIRONMENT IN SUNFLOWER AGRICULTURE OF USED IMAZAMOX IN THRACE REGION

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ABSTRACT: Especially, imazamox activated compounds as an alternative to herbicides that applied directly to the soil in the last 15-year period have been used increasingly in IMI tolerant Clearfield sunflower varieties. Influence enzyme of herbicide is acetohydroxyacid synthase (AHAS). Although conventional sunflower varieties more susceptible to imidazolinone herbicides, Clearfield sunflower hybrids have been modified so as to withstand this herbicide to survive. For this purpose, initially imazamox + imazapyr were used as a double-acting and content of herbicide. In recent years, imazapyr was removed from the formulation to prevent the development of product. Imazamox in today have been used in addition to the formulation. Biodegradation rates in different ecological chain toxic effects of pesticides and residues from plant and animal products usually emerges much more clearly after the introduction of these compounds depending on utilization time of compounds. Therefore, in this study has been targeted the residue affect of imazomox. For this purpose, the residue levels of that made with field trials of imazamox and degradation derivatives were determined and examined in soil, different parts of the sunflower plant, which with amount of sunflower oil and sunflower honey produced under the influence of the flora.

Key words; imazomox, sunflower, soil, groundwater

MONITORING OF ANTIBACTERIAL SUBSTANCES (GROUP B1) RESIDUES IN BOVINE MILK IN KOSOVO

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ABSTRACT: Antibacterial substances have a wide use in the treatment of diseases in domestic animals for the therapeutic purposes, mastitis is the most common disease of dairy cows which antibacterial substances are used. Not always usage of antibiotics have the positive effects, where the mismanagement of their correct and professional usage lead in terms of causing serious risk for public health, such as anti-microbial resistance, allergic reactions etc. Regarding this issue the respective institutions for food safety undertook the appropriate measures according to the Law requirements and standards. The Competent Authority are implementing the National Residue Monitoring Program, where the antibacterial substances are part of it. During the first half of the year 2015, 86 milk samples were tested with ELISA, out of 86 samples 60 samples or 69.7 % were not in compliance, and 26 samples or 30.3 % were in compliance. The conclusion is the need for increasing the number of official control and samples to be collected for next year in suspected farms through traceability system.

Key words: Antibacterial Substances; Residue; ELISA; Milk

DETERMINING THE OPTIMAL CONCENTRATION OF FLUORIDE IN DRINKING WATER FROM THE REPUBLIC OF MACEDONIA

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ABSTRACT: Aim: The aim of this study was to determine the optimal concentration of fluoride in drinking water from 11 cities located on different sites through the Republic of Macedonia.

Method: The optimal level of fluoride in drinking water is universally calculated by applying the equation of Galagan and Vermillion, which permits the calculation of water intake as a function of temperature.

Results: The annual mean maximum temperatures (AMMT) recorded during the last 5 years were collected from the meteorological centres of the 11 divisional headquarter stations. The optimal fluoride concentration in drinking water from different cities in Macedonia was calculated to be 0.84 mgF/l in Gevgelija, 0.83 mgF/l in Demir Kapija, 0.88 mgF/l in Strumica, 0.89 mgF/l in Shtip, 0.9 mgF/l in Skopje (Zajcev Rid), 0.92 mgF/l in Bitola, 0.94 mgF/l in Prilep and Ohrid, 0.95 mgF/l in Kriva Palanka, 1.00 mgF/l in Berovo and 1.09 mgF/l in Lazaropole.

Conclusion: Determining the most appropriate concentration of fluoride in drinking water is crucial for communities. The optimal fluoride concentration in drinking water from different cities from the Republic of Macedonia was calculated to be between 0.84–1.09 mg F/l.

Key words: fluoride, drinking water, concentration

SECTION

5

**MANAGEMENT OF URBAN
AND INDUSTRIAL WASTE**



MEDICAL WASTE MANAGEMENT – PRACTICAL APPROACH

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ABSTRACT. The objective of the study was shift from improper to proper management with the medical waste management in the Republic of Macedonia. The aim was to avoid potential health adverse effects from risks to health staff, employees from the Public Enterprises that are transporting and deposit the healthcare risk waste and to the people that are doing secondary recycling, as well to reduce the impact to the environment. In 2000 we have started the process of redesigning the healthcare risk waste management according to the WHO's recommendations. The process of incineration of the medical waste from the Health care Facilities has started in 2000. Since 2000 there have been several training courses on safe management with medical waste. In 2007 has been proscribed a Rulebook for healthcare risk waste management. In 2007–2008 has been prepared a Draft National healthcare risk waste management plan. In 2009 has been published a Manual for safe management of medical waste. In 2015 was published a Manual for safe management of cytotoxic waste and it has been organized a training for responsible staff working at the Healthcare Facilities.

Key words: medical waste, management, training

o5-02 – Key speaker

ION FLOTATION AND VARIANTS – UNCONVENTIONAL SEPARATION AND RECOVERING METHOD IN WASTE WATER TREATMENT PROCESS

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ABSTRACT: Liquid media from different technologies could contain a complex composition (inorganic and organic species) and majority of these have concentrations more than assessed limits by Romanian legislation. Regarding inorganic pollutants, cationic and anionic start from their speciations in different liquid media, an efficient variant for remove and recovery could be ion flotation and its variants (precipitate flotation PF and adsorption colloidal flotation ACF).

In this paper were presented the main principle of ion flotation and its variants which maintain the possibility of its application in systems with inorganic and/or organic pollutants aim at both remove the pollutants and recovering as useful compounds. It was distinguish the possibility of recovering/recycling useful compounds and for this reason the process was economically maintain and has priority given the situation of another treatment variants.

Key words: waste water, treatment process, ion flotation

RELATIONS BETWEEN WASTE INFRASTRUCTURE |AND PACKAGING WASTE RECYCLING: A CASE STUDY OF CITY OF SKOPJE

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ABSTRACT. Contemporary waste management includes waste recycling as one of the most favorable waste treatment. Packaging waste recycling produces a number of environmental and economic benefits. It is related with separate waste collection. Waste infrastructure contributes significantly to the sustainable packaging waste recycling. In the city of Skopje, after establishing collective waste scheme for packaging waste, the waste infrastructure has been improving permanently. This infrastructure besides other factors contributes to the improvement of packaging waste recycling and reducing of disposal on the landfills. It means significantly increasing a number of containers for separate waste selection, underground containers, vehicles for waste collection and transportations and establishing waste recycling yards and plants. But besides of that the situations is still far from satisfactory and in the future all involved stakeholders has to intensive the activities towards further improvement of waste infrastructure and increasing of packaging waste recycling which will contribute to the reduction of waste disposal. The main goal of this paper is to analyze and research the influence of improving waste infrastructure for increasing of packaging waste recycling in city of Skopje.

Key words: packaging waste, infrastructure, recycling, separate collection.

ASSESSING OF SOLID WASTE MANAGEMENT FOR LANDSCAPE RECLAMATION: THE CASE STUDY OF TEKIRDAG-THRACE / TURKEY

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ABSTRACT: Over the past several decades there has been significant controversy concerning the proper solid waste management. Industrial and technological facilities increasing parallel to the growing earth population have social benefits but cause several environmental problems besides. Nowadays one of the most important environmental problems is solid wastes and solid wastes management issue. To decrease the effects of solid waste hazards to possible minimum level, a solid wastes management plan should be developed. Solid wastes management plan; has to be held by a union of related specialized profession disciplines, as a system and protection of natural balance should be strategised in the scope of this plan. In this study, solid wastes and solid wastes management concepts are defined, the properties of solid wastes and solid wastes storage methods are observed and the interaction of landscape reclamation concept. This study is also prepared for designation of the negative influences and to find solution suggestions for this negativitie as possible; that are produced by Tekirdag solid waste storage area on the environment. The unions of solid wastes which are established in Tekirdag Province, the towns and counties attached to these unions and the stages of these unions in transition to systematical storage are studied. The processes of landscape rehabilitation for solid wastes areas are established reclamation techniques and solution offers. One of important the main aim of this research is to find out solid wastes management dynamics of Tekirdag.

Key words: Landscape reclamation, solid wastes, solid wastes management, solid wastes storage

THE INVESTIGATING OF THE USE OF PLASTIC MATERIALS FOR RECYCLING IN LANDSCAPE PLANNING AREA IN KASTAMONU

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ABSTRACT: Plastic, which can be provided using currently connected to both thanks to the use of both primary and recycling, incorporates many features that undoubtedly is a material which has a very important place. Understands the value as many countries have done several studies in progress is recorded in Turkey. In this study, 19th and 20th century that will be compared with the value of steel saw for the world economy as ambitious plastic materials, the environment we were in our own, our city is given to research and thought, explaining that manifest whereabouts. We use at every stage of our lives, as in all disciplines of the plastic materials in the field of landscape architecture is located very wide. The purpose of landscape architecture as well as contribute to the overall peace push recycling provides both aesthetic and economic sense earnings. This study examined the use of plastic materials, landscape design, which has become indispensable in our lives. In this regard, the designs of the plastic frame on the landscape planning in Kastamonu within areas are evaluated. The plastic used in this field, obtaining the data fields for evaluation was done photography, surveys. The resulting data are fitted to the results observed from disturbing the natural environment of the plastic materials used in the field. Consequently, Kastamonu has used in aesthetic plastic materials, was observed benefit in terms of functional, aesthetics and recycling. This work can be done in the future to fund their planning and design work.

Key words: Environmental; Functional; Recycle; Plastic; Landscape use

FLY ASH – WASTE OR ALTERNATIVE RAW MATERIAL

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ABSTRACT: Fly ash presents the waste obtained during the combustion of coal in the thermal power plants. As a naturally occurring radioactive material(NORM) with its physical, chemical and mineralogical characteristics it can be successfully used as an alternative raw material in the production of building materials such as: cements, concrete, tiles, bricks, ruffing tiles, geopolymers etc.

The usage of fly ash as alternative raw material is beneficial from environmental point of view due to the possibilities to protect the natural deposits and the environment, but the final building products have to fulfil the safety criteria for radiation protection.

This study presents the green solutions where fly ash was used as alternative raw material for production of dense and porous ceramics as well as cement.

Kay words: fly ash, ceramics, cements, alternative raw material

INTEGRATED WASTES TREATMENT AS A BASIS FOR PRODUCTION OF NEW MATERIALS

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ABSTRACT: Quantities of generated industrial and agriculture wastes during the last century are much more than all the wastes released during human civilizations developments. Utilization of wastes became a global priority on the way to solve global problem with shortage of raw materials and energy resources.

Mixtures of solid industrial and agriculture wastes are investigated on the way to produce of new materials with different application. Various techniques are applied during mixtures pre-treatment and final thermal process is used for synthesis of new materials suitable for agriculture or building industry. Thermal processes are studied using TG_DTA-DSC equipment. On the base of the investigations it is proved that energy for the main thermal treatment are much lower (from 10 to 30%) in comparison with traditionally used technologies. The same time due to the use of waste biomass as a component the released quantities of carbon dioxide are also much less. The obtained results confirm that the carbon dioxide could be about 50% less and natural fuels could be saved.

On the base of the results obtained a suitable new materials are developed and proposed for practical use in the building industry and agriculture.

Key words: wastes, utilization, new materials, thermal treatment

USE OF SILICA FUME AND GRANULATED GLASS FOR STABILISATION OF CLAY

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ABSTRACT: Past geotechnical field experience revealed that clay soils, when used as a foundation material, may undergo large settlements, whereas their shear strength and bearing capacity are generally lower than a desired degree. In this manner, it is generally a good option to improve the engineering properties of these soils, especially when used as a foundation soil. Silica fume is a amorphous polymorph of silicon dioxide, it is a by-product of silicon and ferrosilicon alloy production. Its binding properties are well-acknowledged and many studies in the literature address the advantages gained by use of this material in concrete production and soil stabilisation. On the other hand, crushed glass is a waste material which is collected from cities, and may not be suitable for recycling. In this scope, it may be an option to use this granular powder material in soil improvement. In order to increase the shear strength of soils, the cementitious behavior of another waste material, silica fume, was used. Therefore, this study presents an investigation into clay-silica fume-crushed glass mixtures. In the experimental study, the crushed glass and silica fume was used at contents of 0-40% and 0-9% by weight of the dry soil, respectively. The specimens were prepared at their optimum moisture contents. The results revealed that, besides environmental benefits of use of these materials in soil improvement, a remarkable increase in strength was observed by stabilization of clay with these waste materials.

Key words: silica fume, granulated glass, clay

APPLICATION OF GEOPHYSICAL METHODS, DETERMINATION OF ORGANIC AND INORGANIC POLLUTANTS RISK IN SOLID WASTE LANDFILL

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ABSTRACT: Urban solid waste landfill, depending on the development, increases the risk of contamination of ground water and the environment. If the dump, uncontrolled organic and inorganic pollutants, is a major problem for the environment. Another problem is that no one geophysical survey has been carried out to determine the storage area. In case of a landfill site to be fractured and fractures of layers in the organic and inorganic origin solution is likely to move into the aquifer due to meteoric water.

In this case, a serious risk to ground water resources was found in the residential area. Another negative effect; biochemical pathways and is formed by decomposing methane gas derivatives of organic origin waste. In this study, Hamamboğazı Aksaray (Turkey) geophysics to determine the environmental risk of forming pollutants in landfills (geoelectrical) methods have been applied. The study has been applied in the field of vertical electrical sounding profiles. According to the data taken; pollutant migration zone vertical and horizontal direction is determined by 2D and 3D sections.

Key words: Solid waste, geoelectric, landfill, dissolved solids, aquifer, polluting zone.

PETROLEUM REFINERY SLUDGE TREATMENT

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ABSTRACT: The process of petroleum refining generates pollutants such as oily sludge with complex composition and broad range of treatment techniques applied, very often with disregard to high treatment costs.

The treatment of oily sludge from wastewater treatment plant, generated after mechanical, physical, chemical and biological treatment of wastewater, will be analyzed and explained in this paper.

Following the Principles of hierarchy and proximity in environmental protection, the process of handling the sludge is divided into three phases: mechanical, physic-chemical treatment of the sludge and recovery/disposal of generated waste. The origin of the analyzed sludge is from refinery units, equipment cleaning and residues from the wastewater treatment unit. The sludge composition will be approximately determined, taking into account the difficulties in this process. Especially, the challenges in obtaining a representative sample due to its huge quantity and different hydrophobic and hydrophilic components. The following methodology will be presented: extraction of oily sludge, physic-chemical stabilization of sludge and treatment of liquid phase, exploitation of hydrocarbon fraction and list of the appropriate operations for recovery/disposal that must be fulfilled will be given.

Key words: petroleum industry, sludge, treatment, dewatering phase, separation

PERFORMANCE OF A MEMBRANE BIOREACTOR (MBR) TREATING MUNICIPAL WASTEWATER

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ABSTRACT: Membrane bioreactor systems (MBRs) represent a modern wastewater treatment technology with various advantages over conventional activated sludge systems. However, one of their main drawbacks is membrane fouling, which is caused by the interaction of membrane material with activated sludge components, such as soluble microbial products (SMP) and extracellular polymeric substances (EPS). In this study, the performance of an MBR treating municipal synthetic wastewater was investigated, aiming to identify the mechanisms of fouling. The system operated at a critical flux of 15 L/m²/h for 5 weeks at room temperature, aerated in order to maintain a dissolved oxygen concentration of 2 mg O₂/L. Synthetic municipal wastewater with a COD value of about 350 mg/L was fed to the reactor, with a flowrate of 2 L/h. System start up took place by the addition of 30 L of sample collected from the sludge recycling stream of a full scale municipal wastewater treatment plant. The system operated using an F/M ratio varying from 0.10 to 0.30 kg COD/kg microorganisms/d.

Treatment of synthetic wastewater with the MBR system resulted in an average COD reduction exceeding 95%. Although complete nitrification was achieved by the system, the denitrification capacity was relatively low, due to the absence of a denitrification anoxic stage. Therefore, total nitrogen reduction was lower than 30%, while phosphorous removal was about 20%. Effluent Transmembrane Pressure (TMP) increased only slowly by the operation time, and it was lower than 200 mbar, corresponding to maximum allowable TMP limit. Various EPS fractions were

extracted from the activated sludge mixed liquor, and it was found that tightly bound EPS dominated, with 20–35 mg/g VSS proteins concentration and 3-8 mg/g VSS carbohydrates concentration. In conclusion, under the examined conditions, low membrane fouling potential was achieved and was attributed to the effect of cell EPS content.

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Key words: Membrane bioreactor; Fouling; Extracellular Polymeric Substances; Chemical Oxygen Demand

ANALYSIS OF WASTE SLUDGE FROM MUNICIPAL WASTEWATER TREATMENT PLANT IN BLAGOEVGRAD TOWN, BULGARIA

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ABSTRACT: The waste sludge is a byproduct that is produced by the processes of purification of waste water by sedimentation and biological treatment. In response to the requirements of the legal framework of the European Union concerning the treatment of wastewater, the number of urban wastewater treatment (MWTP) in Bulgaria is increasing and therefore the generated sludge also increased. Future changes in European and National legislation, such as the introduction of stricter measures related to disposal and the reduction of the maximum permitted concentrations of certain components in the sludge for agriculture, complicating the recovery and disposal of sludge. In Bulgaria this represents a serious current problem. As MWTP in Blagoevgrad town, where generated sludge which treatment processes are temporarily stored and their quantities are increasing due to lack of long-term solution for their recovery or disposal.

This work aims to characterize, sewage sludge in Blagoevgrad town and make analysis (ICP, EA, IR, TG, drying) to demonstrate characteristics of the waste and to suggest thermal environmentally friendly and cost-effective methods for recovery.

Key words: Waste sludge, utilization, ICP, EA, IR, TG

MUNICIPAL WASTEWATER TREATMENT GREEN HOUSE GASSES EMISSIONS – EVALUATION AND REDUCTION SOLUTIONS

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ABSTRACT: Climate changes represent one of the most debated topics in the environmental sector worldwide. Greenhouse gasses (GHGs) emissions have to be lowered in order to meet the legislation requirements and reporting them has become mandatory in most of the industrial sector. At the moment, in Romania, wastewater treatment plants don't have to report GHGs emissions.

The wastewater treatment plant's carbon footprint is used to quantify the GHGs emissions and identify opportunities to reduce climate change impacts. The paper is focused on evaluating the emissions from a BNR wastewater treatment plant that processes mainly municipal effluents. The main contributing factors were identified and both the direct and indirect emissions were considered and the evaluation results were compared to the ones existing in the literature. An analysis of the potential solutions for lowering the GHG emissions was developed and recommendations for a more efficient plant operation were made.

Key words: wastewater, greenhouse gases, carbon footprint

DEVELOPMENT OF MODEL FOR HOUSEHOLD PHARMACEUTICAL WASTE MANAGEMENT

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ABSTRACT: Aim: The aim of this study is to develop a regional model of pharmaceutical waste management based on the principles of life cycle assessment. Its task is to minimize noticeable risks to human health and the environment, which are the consequence of an inadequate pharmaceutical waste management system. Methodology: The research was grounded on basic eco-toxicological characteristics of ATC groups of pharmaceuticals. It is focused towards the development of a model for managing expired household medications, taking into account the fact that 90% of pharmaceutical waste is home-generated. The basis of the model comprises of multi-criteria optimization of pharmaceutical waste management process. The survey covered 2600 households in the area of the city of Nis, which is 5.24% of Serbia's total population and 5.15% of the total number of households in Serbia. The questionnaire provides relevant data and qualitative indicators of the characteristics of households, residents' home pharmacies and the respondents' attitudes on the use of medications. A special part of the questionnaire comprises the list of household medications according to the ATC (Anatomical Therapeutic Chemical) classification system. Results: In the households in the study area, there were 8.21 medication packages per household, of which 12.22% (slightly more than one package per household) were medicines which had expired. More than two thirds (68.03%) of the total number of medication packages found in the households in the research area were classified into five ATC groups of medications. The most common comprise ATC group N – nervous system (16.81%) and ATC group C – cardiovascular system (13.78%). Discussion: Based on results obtained, the projected quantities of expired medications in Serbia will be 74 920 kg / year. The main feature of a developed regional model is to allow the application of methods for treatment of small quantities of pharmaceutical waste, as recommended by the WHO. The model grounded on ATC classification system is compatible with the classifi-

cation based on environmental and health risk assessment of pharmaceuticals. Conclusion: Life cycle assessment of pharmaceutical products is the most efficient tool for managing home-generated pharmaceutical waste and should be used as the basis for integrated sustainable management of pharmaceutical waste flows.

Key words: pharmaceutical waste, ATC classification, regional management model, WHO

ORAL SECTION

6

CLIMATE CHANGE – BIODIVERSITY – ENERGY EFFICIENCY



**ON TREATMENT METHODS OF ORGANIC BIOMASS,
THEIR SELECTION AND APPLICATION POSSIBILITY
FOR ALBANIAN ACTUALITY**

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ABSTRACT. Aim of our study has been examination of different resources of organic biomass in actual reality in Albania and utilization possibility in the energy sector for heat (energy) production. Emphasis has been given to the agricultural and forestry wastes as well as animal organic wastes, aimed to proceed some tendency reaching a suitable status of a mixture prepared from these organic wastes, in order to get as much as possible biogas (Methane). The local potential of each option to reduce carbon emission depends on a number of factors such as the quality of waste chosen as a feedstock, conversion route or treatment method used, processing technology, its maturity and possibility to improve, finally total efficiency of the cycle, its optimization that also depends on management issues. Different alternative methods of degradation or disintegration of waste such as: composting or burning does not resolve permanently the accumulation of waste, since that they themselves leave a certain residue. On the other hand we have performed different pretreatment methods for residues and their combinations, leading to an easier process for anaerobic biodigestion which may be engineering considered as a process in which operating a present number of organisms can produce a mixture of gases (Biogas composed of 65% methane and 35% carbon dioxide) and a mixture of liquid which held a high value of mineral nutrient elements like nitrogen, phosphorus, etc. We have already studied also the possibility of bioethanol obtaining using organic residuals and some preliminary results have been reported in this paper.

Key words: Bio-resources, food residues, biomass, waste water, bio-energy, biogas, bioethanol.

o6-02 – Key speaker

**ECOLOGICAL PROBLEMS CONCERNING THE PROTECTED
FISH FAUNA OF LAKES IN NORTHERN GREECE
(EASTERN MACEDONIA – THRACE, CENTRAL MACEDONIA
AND THESSALY REGIONS)**

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ABSTRACT: Wetland ecosystems, such as lakes, are important features in the landscape that provide numerous beneficial services for people and for wildlife and fisheries. Some of these services, or functions, include protecting and improving water quality, providing fish and wildlife habitats, storing floodwaters and maintaining surface water flow. These valuable functions are the result of the unique natural characteristics of ecological sensitive systems as lakes for the conservation of their flora and fauna that host and their general environmental stability. Due to indiscriminate meddling of man, lakes are on the verge of extinction. Harmful activities of man have resulted in degradation of lakes. Agricultural wastes, sewage and drainage water from urban areas, absence of wetlands and riparian vegetation near the lakes, etc., are some of the causes that lead to degradation of lakes. Due to the degradation that have experienced the lake ecosystems in recent decades, their delicate fish fauna is concerned to a great degree, with further negative effects on their ecosystems. The aim of this paper is to determine the protected fish species found in the twelve lakes in the area of Northern Greece, in the Regions of Eastern Macedonia and Thrace, Central Macedonia and Thessaly (e.g. lakes Vistonida, Ismarida, Kerkini, Doirani, Agra, Nisi, Sfakia, Assomaton, Koronia, Volvi, Carla and Tavropos) and to determine the main environmental problems of the seeco systems, which have important hazards to the sensitive fish fauna and the fish populations. Data were collected from research projects of the authors, published scientific papers and reports from the National Fisheries Authorities of each lake ecosystem. The biodiversity confers resilience through compensatory shifts among species capable of performing key control processes. However, the number of species is not necessarily a good predictor of resilience. The link between biodiversity and resilience depends on the dominant ecosystem control processes, the complement of species capable of contributing to each process, and the susceptibility of these species to a particular ecosystem stress.

Key words: freshwater fish fauna, lakes, wetlands, ecological problems, fish protection status

o6–03 – Key speaker

**ALLOZYME IDENTIFICATION OF THE WRASSES SPECIES
(OSTEICHTHYES: PERCIFORMES: LABRIDAE) ALONG
THE BULGARIAN BLACK SEA COAST**

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ABSTRACT: All wrasses species, described for the Bulgarian Black Sea coast are listed in IUCN Red List of threatened species with last concern (LC) category. A comparison between five wrasses species along Bulgarian Black Sea coast was carried out on the basis of allozyme analyses. One non-enzymatic and five enzyme systems were used as genetical markers for species identification. The mobility of electrophoretical patterns of *LDH*B* locus was applied as marker for distinguishing on genus *Symphodus* (*Crenilabrus*) and *Ctenolabrus*. From wrasses species analyzed only goldsinny wrasse belong to different genus *Ctenolabrus*, which was proved with genetic data. Taxonomic investigations based on genetic analyses will contribute to biodiversity protection, restoration and conservation of wrasses populations.

The preliminary data, based on the number of samples analyzed, showed that *S. tinca* and *C. rupestris* have rare distribution along Bulgarian Black Sea coast and could be proposed as vulnerable species.

Key words: Black Sea, labrids, allozymes, genetical markers, protection

RULES FOR ELECTRICITY EXCHANGE FOR PHOTOVOLTAIC RESIDENTIAL SYSTEMS

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ABSTRACT: Decreased prices of photovoltaic system components in the last years have led to electricity generation cost reduction obtained by photovoltaic systems to the level of electricity price offered to the distribution consumers. Still, compared to the other type of generators, the energy output from photovoltaic systems is generally low in amount and with varying power profile. Hence, they cannot reach adequate price at liberalized markets. One approach for supporting these systems is the introduction of rules for net metering within the distribution systems.

In this paper, technical and economic aspects for installation of photovoltaic systems in households in the R. Macedonia, in cases with possibility for net metering, are analyzed. Several rules for net metering are elaborated, and using realistic examples, their influence to technical acceptability and cost effectiveness for the electricity consumers, the suppliers and the distribution grid, is estimated.

Key words: photovoltaic systems, residential electricity consumption, net metering.

IMPLEMENTATION OF LOW CARBON TECHNOLOGIES IN THE MACEDONIAN AGRO INDUSTRY

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ABSTRACT: Introducing new technology in the agro industry in Macedonia at this stage is of paramount importance for the SMEs in order to be competitive on the domestic and international markets. The importance is even greater when that technology is related to environment since that is an area in which the legislation is becoming stricter. The National Cleaner Production Centre – Macedonia is implementing a project that will help companies from the agro industry in Macedonia to adopt low carbon technologies according the UNIDO approach – dematerializing products, increasing process efficiencies, minimizing process emissions, switching to low carbon inputs and closing the carbon loop. This paper presents the challenges and results achieved in the process of implementation of the Low Carbon Technologies in a company from the agro industry in Macedonia. The selected company is a dairy with traditional production processes interested in lowering the environmental burden and improving its competitiveness.

Key words: Low Carbon Technologies, Cleaner production,
Sustainable development

INFLUENCE OF SOME FACTORS ON THE GLOBAL CLIMATE SYSTEM AND NEEDED MEASURES

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ABSTRACT: During last 20 years, the climate change of our planet became the most often discussed global problem. Many scientists have still different views on the various factors determining the coming climate changes. On the basis of collected data from different reports, the UN Global organization adopted a special convention with proposed measures for mitigation of causes that are responsible for climate changes. For example, greenhouses gases (GHG) are emitted from various sources/sectors, including agriculture, and are responsible for global warming and climate change. Kyoto protocol is one of the most popular international accords for reduction of GHG emissions. After Kyoto protocol, EU is now calling for a new set of measures to be adopted.

This paper presents data available and results from our studies on the above stated problem, proposing the missing successful measures. The methodology used for climate global system evaluation in this work is based on some key factors such as the energy and carbon cycle balances. On the basis of the evidences available, the priority measures needed to minimize climate changes are shown. Moreover, on the basis of performed analysis, review on the achievements and cost and expert assessments effective measures and actions are proposed on the way for better sustainability.

Key words: Climate changes, factors, carbon and energy balances, sustainability, agriculture.

MANAGE EARTH'S CLIMATE

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ABSTRACT: Russian physicist Nikolai Kardashev – according to energy use – founded (1964) scale of three types (planetary) advanced civilization, and physicist Michio Kaku (2003) argued that the Type I civilization to manage the climate on our planet. According to calculations more American physicist (Freeman, Sagan, Lemarchand) Earth is now at the level 0.72 of a Type I civilization. According to estimates, more physicists (Freeman, Morrison, Kaku) the Earth will reach Type I civilization about 2200 years. We think that our civilization can already manage the climate on Earth; for it is necessary to: (1) QUANTUM LEAP IN SCIENCE including – (1a) change of scientific paradigm, (1b) development of new solar technology (1c) development of new climate models and (2) PLANETARY GOVERNMENT, which will set up a research program in civilization in the meaning of Imre Lakatos. The current scientific paradigm (ecological) and proposed climate models do not provide solutions for: (a) development of civilization to Type I and (b) problem of global warming. Because the consequences of previous scientific, technological and economic paradigm upset the natural balance and jeopardize the ecological framework to maintain this civilization – requires interventions that go beyond the existing paradigm. We think that necessary to develop a civilization of pro-active action of a man under the mentorship of nature, i.e. advocating the (Climate) Millennium Intervention (MI), which should be on a new basis to enable maintenance of the existing planetary eco-system. The point of quantum leap is based on a heuristic model of the solar program, based on the MI; setting orbital lampshade to first stage (global warming) decreased solar radiation of 0.7% (our first rough estimate), and in the second stage allows the efficient use of solar radiation. MI lampshade creates a permanent shadow on a particular place on the planet – where warm ocean currents melting glaciers. Of course that was previously required to investigate and make a new climate models – which will be calculated: (a) the optimal allocation MI shadows, (b) the effects of changes in the direction and intensity of (new) air currents (wind) and ocean currents, and (c) a change in temperature (MI shadow) surrounding areas. Our

new scientific paradigm and heuristics solar programs may be the first real steps to Type I civilization. The planetary debate about it should be started.

Key words: Advanced civilization, Global warming; Millennium Intervention, Quantum leap, Scientific paradigm

METHODOLOGY FOR ASSESS THE ALTERNATIVE TRANSPORT POLICIES TO REDUCING TRAFFIC POLLUTION

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ABSTRACT: In the study has been elaborated the methodology using multi-criteria analysis to assess the sustainability of alternative transport policies for cleaner environmental for carriage the cars of passengers. The research includes variants of transportation by automotive transport, motorail and combined technologies. The first step of methodology determine the main criteria and sub-criteria to evaluate the variants. As a main criteria have been chosen environmental, economic, technological and social indicators. The environmental indicators include fuel consumption, emission of pollutants, and traffic noise. The economic indicators include operational costs and infrastructure charges. The technological indicators contain the travel time, stops and travel conditions. The social indicators include comfort, risks, safety, and reliability. The Fuzzy AHP Method is applied to determine the weights of criteria. The second step of methodology include classification of variants of transportation by using PROMETHEE Method. The decision approach elaborated in the study was applied for the assessment of the alternative transport policies for Bulgarian rail and motorway network.

Key words: fuel consumption; emission of pollutants, transportation, AHP method; PROMETHEE method

USE OF NATURAL GAS AS CONTRIBUTION TO THE REDUCTION OF POLLUTION AND INCREASING ENERGY EFFICIENCY

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ABSTRACT: This article analyzes the impact of the increased use of natural gas and increasing energy efficiency through the penetration of energy efficient technologies for the production of electricity in the energy sector in the Republic of Macedonia, in terms of emissions of pollutants and saving energy. It analyzes the advantages and disadvantages of the use of natural gas and compares the use of other fuels and its present and future percentage in the total amount of primary fuels, especially in commercial and household sectors. Emissions of pollutants from the use of electricity in these two sectors are not directly visible but behind them lies a complex process of combustion and energy transformations that are not naive at all, in terms of increasing emissions of these unwanted products. This Article also analyzes the trends seen in terms of fuel consumption in the energy sector and their share in the energy mix of the Republic of Macedonia. It provides assessment and prediction of future trends in production of electricity. The predictions depend on the global trends of development of many technologies to transform energy or energy efficiency of many processes and devices that follow the path from primary energy across final energy to useful energy. These forecasts use a model for calculating the power consumption, to calculate the quantity of emitted pollutants and greenhouse gas emissions as well as for determining the typical emission factors for specific technologies used in the energy sector of the Republic of Macedonia. This method allows the selection of the most appropriate fuel or technologies and contributing in terms of adopting a national strategy for the direction of development of the energy and determination of national emission factors for greenhouse gas emissions due to the use of electricity in the area of commercial and services and household sectors in the Republic of Macedonia.

Key words: natural gas, energy efficiency, energy, emissions, pollutants, greenhouse gases, emission factors

CAN MACEDONIAN HOTELS BE GREEN: THE EVIDENCE OF HOTEL “FLAMINGO” – GEVGELIJA, MACEDONIA

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ABSTRACT: The contemporary tourists are fully aware about the numerous environmental concerns that tourism development is facing with, so they have shifted their accommodation preferences towards eco-friendly hotel establishments. They prefer green products and are willing to pay for “green” services, so they expect that an environmentally responsible hotel will meet their environmental needs and expectations. This provoked profound modification in the hotel industry which has steadily recognized necessity of becoming greener in order to be well positioned in the competitive tourism market. The aim of this study is three-folded: (i) To assess the possibility of having “green” hotels in Macedonia, by elaborating the case of hotel “Flamingo” from Gevgelija; (ii) To analyze the level of fulfillment of ecological and energy standards necessary for becoming an environmentally friendly hotel, i.e. eco-hotel; and (iii) To pose valuable recommendations for boosting development of eco-hotels in Macedonia. The research is based on interviews with hotel managers at all levels responsible for managing various hotel sectors, which are related to producing green products and services. The study revealed that this five-star hotel has positive attitude and perception for becoming an eco-hotel due to its willingness to use energy efficient appliances to reduce energy consumption. In this line, some recommendations are posed in terms of strategies to help reduce negative impacts on high operational costs. These strategies include better isolation of the facility; enhancing and increasing the level of awareness among hotel personnel regarding the benefits that eco-hotels bring; introducing subsidies on local and central level aimed at fulfilling preconditions for running a high energy efficient hotel; and introducing standards and specifications that will lead to application of environmental protection practices and energy efficient concepts in hotels as a strategic priority for further national tourism development.

Key words: Green tourism; Eco-hotels; Environmental protection;

**EFFECTS OF CLIMATE CHANGE ON SEED PRODUCTION
IN SEED STANDS OF ANATOLIAN BLACK PINE
(*PINUS NIGRA* ARNOLD. SUBSP. *PALLASIANA* (LAMB.)
HOLMBOE) IN THE KASTAMONU REGION IN TURKEY**

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ABSTRACT: Anatolian Black Pine, one of the important main forest tree species of Turkey, has a wide geographical distribution, and it takes place in pure and mixed forest stands that are very valuable in terms of ecology and economics. Anatolian Black Pine, which is widely preferred by the forest product industry since its wood is easy-to-process and very durable, has 34 seed stands throughout the country, and the saplings used in artificial regeneration and forestation works for rehabilitating the ruined forests of the species are generally procured from these sources. But the climate change, the most important environmental problem, and the global warming arising due to the climate change have negative effects also on the seed productivity of the beech seed stands, as well as they have on all forest sources. In this case, it is likely that there will be significant difficulties in ensuring the sustainability of pure and mixed black pine forests and in procuring the black pine saplings to be used in rehabilitation of degraded forests. In this study that has been carried out within this context, the differences in black pine seed productivities depending on the change in meteorological observations (precipitation, temperature, and carbon emission) during 15-year period (between 2000 and 2015) in a total of 5 plots (a total of 432.6 ha) in Kastamonu-Araç region that has been registered between 1980 have been revealed. Phenological observations have been carried out for this reason, the seed index and seed life index values have been calculated in accordance with annual productivities, and these values have been compared through Palmer Drought Index, De Martonne Drought Index, Emberger Drought Index, Maximum Moisture Anomaly Index, and UNEP

Drought Index at $P>0.01$ confidence level. In these comparisons, Mann-Kendall Sequential Analysis has been utilized. As a result of performed analyses, it has been determined that, as a result of rapid drought observed in the region in years 2003, 2007, 2009 and 2013, the seed productivity has decreased by 26.5-44.8%. And in period covering 2006-2010, the drought has been both severer and longer than the drought during 2001-2006 periods. And in this period, the seed productivity has decreased by 47.4-54.3%, and it has been determined to be one of the most infertile periods in seed stands. In final period covering the years 2011-2015, the unexpected drought periods have been observed, carbon emission has decreased, and these conditions have created shock effect on beech seed stands, and led the seed productivity to decrease by %58.7. And in year 2012, the longest and most severely drought periods have been observed in the region, and the healthy seed productivity in black pine seed stands in Kastamonu-Araç region has decreased by 61.3-72.6% in proportion to previous periods.

Key words: Drought, seed stand, seed productivity, phenology, Anatolian Black Pine

TEMPORAL TRENDS AND EVOLUTION OF HEAVY METALS CONCENTRATIONS IN SOMOVA-PARCHES AQUATIC COMPLEX – LAST AREA OF THE DANUBE FLOODPLAIN

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ABSTRACT: This study presents the analysis of the temporal trends and evolution of inorganic micropollutants originated from Somova – Parcheș aquatic complex. The main goal of the study is giving a general overview of human impact in this area and evaluating the effectiveness of environmental projects aimed to improve the water quality. Annual mean concentrations of 6 heavy metals (lead, nickel, chromium, mercury, manganese and zinc) seasonally determined from 2 representative points over a period of 15 years of water quality monitoring were taken into account in order to achieve the objectives. It is the first time that these actions and long-term monitoring activities may highlight the effects of hydraulic works carried out in this aquatic complex, with positive environmental impact produced by refurbishment Alumina Plant. The results show a decreasing trend of heavy metals concentrations in surface waters from Somova – Parcheș aquatic complex. Before 2007, it was observed significant exceedings of the maximum permissible concentrations stated in Romanian legislation. After 2008, an improvement on the levels of heavy metals concentration in the study area was found. However, these results may underlie the management decisions of environmental institutions, responsible for defining the strategies for all activities in the region.

Keywords: heavy metals, surface water, Somova-Parches

USING DECISION SUPPORT TOOLS FOR ECOSYSTEM-BASED FISHERIES MANAGEMENT

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ABSTRACT: The Decision Support Framework (DSF) is a pragmatic planning process for moving towards an Ecosystem Approach to Fisheries Management developed within the FP7 project Mare Frame (“Co-creating Ecosystem-based Fisheries Management Solutions”). Mare Frame covers seven case studies, one of which is focused on the Black Sea turbot. Turbot (*Psetta maxima maeotica* Pallas, 1814) is a highly valuable commercial species for the Black Sea fisheries, which has been subjected to severe decline in recent decades. The main reason for the decline appears to be overfishing, in particular due to Illegal, Unreported, and Unregulated (IUU) fishing, but the stock development has also been adversely affected by environmental change (including eutrophication and invasive species). Recent assessments of the turbot stock have been based on different assumptions about stock structure, but reach similar conclusions, namely that the stock is subjected to highly unsustainable fishing pressure and is in need of a recovery plan. The case study is based on the assumption that the western stock of turbot can be regarded separate stock, fished by Ukraine, Bulgaria and Romania (Shlyakhov, 2014). The turbot case study associates itself with the ongoing General Fisheries Commission for The Mediterranean (GFCM) initiative to develop a management plan common for the Black Sea stocks. The operational objectives for the case study are therefore obtained from this initiative, aiming to counteract direct and indirect overfishing in order to ensure the sustainable economic viability of fisheries. Stakeholders are cooperating with Mareframe researchers to propose a management plan. The process includes the following steps: 1) Identify management problem(s); 2) Identify objectives and indicators;

3) Implement models; 4) Develop management alternatives; 5) Evaluate alternatives (decision support); 6) Select best alternative; 7) Draft management proposal. The first three steps have been completed by running the two ecosystem models (GADGET and Ecopath with Ecosim), while the development of a limited set of management alternatives (Step 4) occurred in cooperation with stakeholders. In the end, stakeholders will decide on the best approach with the help of decision support tools. The decision support approach is a Bayesian Belief Net (BBN). The BBN is useful for a case study where information is incomplete and the prevalence of IUU creates uncertainty with regard to outcomes of alternative management approaches.

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Key words: Decision Support Framework (DSF), GADGET, EwE, BBN, stakeholders

POSTER SECTION

1

AIR – WATER – SOIL POLLUTION, RISK ASSESSMENT – SUSTAINABLE DEVELOPMENT



EVALUATION OF DOSE FOR THE POPULATION DUE TO NATURAL RADIOACTIVITY OF UNCULTIVATED SOIL FROM THE SURROUNDING OF THE SKOPJE CITY, MACEDONIA

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ABSTRACT: The recent investigations of the environment radioactivity are particularly important in order to achieve better understanding for the environmental fate of the radionuclide pollutants. Hence, the understanding of natural radionuclides behavior in the environment is also very important, since such information is valuable as relevant parameter for radiological risks estimations. The objective of this research was focused on determination of the activity concentrations of ²²⁶Ra, ²³²Th, and ⁴⁰K in samples of uncultivated soil, taken from 13 locations in the surrounding of the Skopje city. Within the research performed, the obtained data indicated that the value of ²³²Th and ²²⁶Ra activity was within the range from 27.06 Bq kg⁻¹ to 43.66 Bq kg⁻¹, and from 20.38 Bq kg⁻¹ to 39.44 Bq kg⁻¹, respectively. As expected, the ⁴⁰K concentration in soil was significantly higher, ranged between 392.48 Bq kg⁻¹ and 625.80 Bq kg⁻¹. The concentrations obtained were the basis for calculation of other parameters that are fundamental for determination of the environmental radiation safety for the population. The obtained results from this study suggest that in the surrounding of Skopje there is no significant radiation risk for the population, i.e. the safe limits were not exceeded, pointing out the insignificant risk that arises from naturally occurring radionuclides in the environmental soil.

Key words: soil radioactivity, natural radionuclides, gamma spectrometry, radiation risk index, radium equivalent.

p1–02

CURRENT STATE OF MEIOBENTHOS COMMUNITIES FROM THE ROMANIAN BLACK SEA AREA UNDER ENVIRONMENTAL CHANGES

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ABSTRACT: Until the 1960 s, the Black Sea ecosystem was healthy and eutrophication had not had a major impact. The first drastic changes caused by man-made eutrophication occurred in the late 1960s and early 1970 s. Between 1960 and 1980, algal blooms and pollution caused by anthropogenic activities produced important changes in the structure of planktonic and benthic biocoenoses. Among these, the changes affected meiobenthic communities, too.

The aim of the study was to assess the current state of meiobenthos correlated to some environmental parameters, in comparison with historical data.

To analyze the current state of marine meiobenthos from the Romanian Black sea area, 175 samples were taken from 35 stations between Sulina and Vama Veche. Additional parameters, such as particle size and organic matter, were measured for correlations.

The study has shown that the qualitative and quantitative structure of meiobenthos are different from the ones recorded in the 20th century. In contrast to the 1980 s and 1990 s, the current ecological situation on most of the western Black Sea shelf has improved.

Key words: meiobenthos, Black Sea, current state, anthropogenic impact

p1–03

MICROBIOLOGICAL INVESTIGATION FOR ASSESSMENT OF WATER QUALITY IN GJAKOVA WATERSHED

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ABSTRACT: This study aims to determine the water quality of Lake "Radoniqi" which supplies with drinking water all population of Gjakova Municipality, based on the microbiological analysis. This artificial lake has surface of water collection of 120 km² and the main water supplier is river Lumbardh of Deqani with an average flow 5m³/s. The samples were taken every month in three locations: River Lumbardh, Derivative channel and in the Lake over a period of one year from January 2015 to December 2015. Enumeration of bacteria is made by membrane filtration method and by counting colonies on plates with RBA, M-Endo Agar less, PCA and BEA agar. In these paper will be presented data about microbiological parameters: total coliform bacteria, fecal coliform bacteria, aerobic mesophilic bacteria and streptococcus faecalis as indicator of water pollution. The main objective of this study was the assessment of the quality of water in Lake "Radoniqi" according the microbiological parameters and the comparison of the results with the European Standard EN/ISO 9308-1: 2014.

According to preliminary results, higher values of coliform bacteria were in river Lumbardh and low values in Lake "Radoniqi" due to increased rainfall and summer season.

Key words: Coliform bacteria, aerobic mesophyl bacteria, streptococcus faecalis

p1–04

MIGRATION OF ARSENIC AND OTHER MICRO ELEMENTS IN ANTHROPOGENIC CONTAMINATED SOILS

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ABSTRACT: The soils are continually contaminated with increasing contents of heavy toxic metals of anthropogenic origin that have negative influence on the eco system. In the focus of this research is arsenic as one of the most characteristic anthropogenic pollutants in soils. Research area is selected as part of Skopsko Pole i.e. agricultural micro locality near to the urban centre, where anthropogenic contamination of the soil with arsenic was evident. The ICP-AES analyzis have been applied for determination of the content of arsenic in various horizons of soil, up to 1 meter depth. The content of arsenic in various minerals in the soil as well as quantity of water soluble arsenic have also been determined.

The basic aim was to define mechanisms and intensity of migration of arsenic in the soil. The type of soil from the micro locality which is dominantly consisted of coarse grained quartz and fine grained clay along the whole profile, and its physical and chemical properties, enable intensive and free migration of micro elements in soluble and fixed form.

Key words: soil, contamination, arsenic, migration, ICP-AES.

INVESTIGATION OF SOME ENVIRONMENTAL CONTAMINANTS IN WATER FROM SHELL FISH PRODUCTION AREAS

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ABSTRACT: Aqueous measurements of the organochlorine pesticides and other chlorinated contaminants, although their low solubility, provide good information of their transport in the environment as well as their flux and distribution.

Presence of those chemical contaminants in mollusks growing water area should not exceed a certain level which can be harmful to shellfish and larvae as well. In this study the presence of organochlorine pesticides and nd-like PCBs in water samples from mollusk production areas of Butrinti Lagoon in South Albania, was investigated. The organochlorine (OCL) and nd-like PCBs were quantitatively extracted from water samples by a simple extraction procedure with hexane in a separation funnel, then concentrated and injected in GC/MS/MS system. The presence of chlorinated contaminants was investigated during 3 years at a sampling frequency by every 6 months. The frequency plan and the sampling points were chosen in accordance with Albanian Legislation on the quality requirements of shellfish growing waters. The presence of some OCL was identified though at low quantity but at any case above the detection limit of the method at 0.01 µg/l. Their consistent presence during the monitoring period is maybe due to the former agricultural activity in the surrounding area of Butrinti Lagoon.

Key words: Organochlorine pesticides, nd-like PCB, water, Butrinti mollusk production areas.

p1–06

THE PRESENCE OF TOXIC ELEMENTS IN THE RIVERS OF KOSOVO AND THE IMPACT ON AGRICULTURAL LANDS

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ABSTRACT: The main goal of the study is analyzing some samples of water in pool as in Lepenci which lies in the region of Ferizaj and Llap River that lies in the Prishtina region and the industrial pouring along these rivers. It gives suggestions to diminish the environmental impact of effluent discharges and further improvements of actual situation. In many cases the impact on water, air and soil compartments has resulted irreversible. Effluents produced by these economical sectors are discharged, with no previous treatment processes, by dumping the pollutants to the surface waters.

As a result of uncontrolled exploitation of natural resources because of the development has caused the pollution of the ecosystem with toxic elements as: Mercury, Arsen, Cadmium, Cuprum, Zinc, Nickel, Mercury, Mangan, Cadmium.

The aim of this project is researching the degree of pollution with heavy metals in vegetables products such as a "potatoes and onions" along the flow of water in the rivers

Multi elementary analyses with CP-techniques is realized in Agrovet Laboratory in Fushe Kosova – KOSOVA.

Key words: water pollution, heavy metal, vironment, potato, onion.

HEAVY METALS IN PETROLEUM COKE AND ENVIRONMENTAL RISKS

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ABSTRACT: Coke or oil coke is a very important by-product of secondary processing of heavy oil residues. Albanian crude oils belong to the group of relatively asphaltous-resinous heavy oils, and its end-point by-product, the petroleum coke, in the overall material balance of the crude oil processing, takes an important stake, about 19%.

Due to its energetic high potential (over 8,000 kcal/kg), compared to all solid combustible fossil fuels, the petroleum coke has found widespread use as an energetic source in various fields of economy. Despite its beneficial outcomes due to the final by-product of the technological processing of the crude oils, this product serves as deposition well of heavy metals and other solid wastes.

The main purpose of this paper is to evaluate the environmental risk from the heavy metals content in the petroleum coke produced in the country, by comparing these qualitative indicators with the coke of the international market of fuel oil consumed actually in Albania.

The main heavy metals analyzed in the samples were: Vanadium (V), Nickel (Ni), Lead (Pb), Iron (Fe) and Calcium (Ca). Determining of the content of these metals in petroleum coke were conducted by the method of the X-ray fluorescence analyzer.

Key word: petroleum coke, crude oils, heavy metals, X-ray fluorescence, environmental pollution

THE POLLUTION OF AGRICULTURAL SOILS FROM THE OILFIELD EXPLOITATION – INCIDENCE OF THE MARINEZ' OIL EFFUSION

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ABSTRACT: The Oil Industry in Albania, with an almost centennial exploitation, beyond its economical benefits, social and new urban centers development, has been and continues to generate negative environmental impact on soil, water and air of the regions where this industry operates.

Patos-Marinza is one of the biggest on-shore oilfields, not only in Albania but also in Europe. This oilfield currently carries around 60% of geological oil reserves in the country or over 251.907 million tons of crude oil.

Its intensive exploitation has been documented for many decades since now. Recently, due its maximal exploitation beyond the technological limitations in early 2015, an incidence happened in the Marinza oil field, where oil effusions were present for a long period which brought to the interruption of the oil extraction in the area.

Through this work we had intended to present a portion of the current environmental situation of the residences situated inside the perimeter of Marinza oilfield. A correlation among the environment situation and effusion oilwell incidence is evidenced in the qualitative indicators over agricultural lands, contaminated.

Key words: oil effusion, environmental pollution, Marinza oilfield, agricultural soil

p1–09

A PRELIMINARY STUDY OF THE PRESENCE OF SOME ORGANIC POLLUTANTS IN TOPSOIL SAMPLES IN INDUSTRIAL AREA OF ELBASAN, ALBANIA

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ABSTRACT: This research was carried out in the city of Elbasan, which represents an important urban and industrial area of Albania. This industrial complex, builded in 1962, has been all these years, the major source of organic and inorganic pollution of the surrounding area. The analyses of pollutants were performed in topsoil samples taken in eleven stations. The target organic pollutants were BTEX (benzene, toluene, ethylbenzene and xylenes), MTBE, polyaromatic and aliphatic hydrocarbons, HCHs, DDT-related chemicals and some PCB markers. After extraction and clean-up, the samples were injected in a gas chromatograph Varian 450, with μ ECD detector, with capillary column Rtx – 5.30 m \times 0.32 mm, 0.25 μ m film thickness. The concentrations of PAHs in soil samples were much lower than those of aliphatic hydrocarbons. MTBE was detected in all samples, but BTEX were found only in some of them. The rapid urbanization and industrial activity are the most important sources of organic pollution in sediment samples of this industrial area.

Key words: topsoil, PCBs, PAH, BTEX, MTBE

PERSISTENT ORGANIC POLLUTANTS (POP_s) IN SYNGNATHIDS AT THE ROMANIAN BLACK SEA COAST

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ABSTRACT: Organochlorine pesticides (OCPs) are persistent organic pollutants (POPs) widely used since the 1940s to fight pests in agriculture and to exterminate mosquitos. The representative compounds in this group include dichlorodiphenyltrichloroethane (p,p'DDT) and its metabolites (p,p'DDE, p,p'DDD), aldrin, dieldrin, endrin, lindane, heptachlor and hexachlorobenzene (HCB). Polychlorinated biphenyls (PCBs) are synthetic organic chemical compounds of chlorine attached to biphenyl (molecule composed of two benzene rings). Because of PCBs' environmental toxicity and classification as a persistent organic pollutant, PCB production was banned by the United States Congress in 1979 and by the Stockholm Convention on Persistent Organic Pollutants in 2001. Despite the fact that both POP groups were banned worldwide, due to their harmful effects on the environment and human health, they are constantly found in the marine environment of the Black Sea, along the Romanian coast. Most probably, the contamination sources are the Danube River and air-borne residues resulting from evaporation from inland soils/waters where these substances were applied in the past. POPs accumulate in fatty tissues of aquatic animals, which makes them highly persistent in biota and prone to bioconcentration / biomagnification along the food web. Filter feeders, such as mollusks, tend to accumulate more POPs, being excellent bioindicators, but fish can also be used to monitor the contamination of the marine environment. Syngnathids are more exposed to heavy metals than pelagic fish species due to the fact that they live close to the seabed, where these pollutants tend to accumulate. In this context, the paper aims to analyze the bioaccumulation of POPs in two species of Syngnathids from the Romanian

shallow waters: the long-snouted seahorse (*Hippocampus guttulatus*, Cuvier 1829) and the greater pipefish (*Syngnathus acus*, Linnaeus, 1758). The seahorse and pipefish samples were collected from two sampling locations along the southern Romanian coast (Constanta and Costinesti). The highest values of OCPs were recorded by heptachlor in pipefish tissue in both sampling stations (1615.68 ng/gDW and 484.45 ng/g DW, respectively), while lindane and dieldrin also recorded high values. Even if they recorded rather low values, DDT and its metabolites were detected in all samples analyzed from both stations. Among PCBs, PCB138 recorded the peak value in pipefish tissue in the Costinesti station (141.16 ng/g DW), closely followed by PCB52 in seahorse tissue (130.26 ng/g WW), again in the Costinesti station. The results obtained confirm the resilience of POPs in the marine environment, so many years after their use was banned, which is of great concern for human health ultimately.

Key-words: persistent organic pollutants (POPs), organochlorine pesticides (OCPs), polychlorinated byphenils (PCBs), Syngnathids, bioaccumulation

p1–11

RELATIONSHIP BETWEEN SOIL ORGANIC MATTER AND POPs PESTICIDES RESIDUES IN AGRICULTURAL SOILS IN ALBANIA

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ABSTRACT: The aim of this paper is to see the relationship of soil organic matter (SOM) and POPs pesticide residues in agricultural soil samples. The samples were collected from organic/conventional greenhouses and farms in Tirana, Durrës and Lushnjë areas. We have determined POPs pesticides residues and content of organic matter in these soil samples. The study showed that in general the soil samples that have much higher amount of organic matter have also higher concentration of POPs pesticides residues (such as metabolites of DDT and isomers of HCH).

Soils with higher amount of organic matter are rich in microorganisms which play an important role in POPs residues degradation. In order to assess the degree of degradation of the POPs pesticides residues, in the future would be of interest to repeat the POPs pesticides residues analysis in these soils after a period of time.

Key words: POPs pesticides, Soil Organic Matter (SOM), residues, degradation.

p1–12

ESTIMATION OF HEAVY METALS CONCENTRATION IN GROUND WATER IN REGION OF TAPIZA, TIRANA, ALBANIA

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ABSTRACT: Natural water is not clean in the environment. Among other pollution are metals. Heavy metals pollution presents a serious problem for human health and ecosystems. The current study reports the analysis of toxic metals, arsenic, cadmium cobalt and copper and lead of the groundwater (drinking water) in the region of Tapiza, with respective coordinates: 41°18'34"N and 19°49'5"E. Capacity of ground water through wells installed in depth 90 – 300 m is used for supply and distribution of drinking water to community of Tapiza. We have selected a total of 8 sampling points for to collection groundwater samples. The analyses of heavy metals, arsenic, cadmium cobalt and copper and lead of the groundwater were performed at the Institute of Applied Nuclear Physics, University of Tirana, using Graphite Furnace Atomic Absorption Spectrometry. From results obtained showed that concentration of heavy metals in groundwater samples are in ranges: As 2.6 – 9.2 µg/L; Cd 0 – 0.61 µg/L; Co 4.3 – 17.8) µg/L; Cu 7.5 – 28.4 µg/L and Pb 0.96 – 5.84) µg/L. Also, the concentrations of analyzed metals are found in groundwater samples is compared with the Maximum Concentration Level specified by the USEPA for drinking water standard.

Key words: heavy metals, groundwater, atomic absorption spectrometry.

p1–13

THE IMPACT OF INDUSTRIAL WASTE OF THE FORMER BATTERY PRODUCTION FACTORY ON SURFACE SOIL AROUND IT

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ABSTRACT: The current study reports the distribution of lead concentration on the surface soils samples at a distance 80-2000 m around the former Factory Production of Batteries to Berat, Albania. We have selected 33 surface sampling points of soil where 20 of them represent the uncultivated soils and 13 cultivated surface soil samples. All the representative soil samples were analyzing using Atomic Absorption Spectrometry for their lead content, in Institute of Applied Nuclear Physics, University of Tirana, Albania. From results obtained the fraction of lead in surface soil samples ranged from 78 mg/kg to 24207 mg/kg and average concentration of lead was 1821mg/kg. Concentration of lead in uncultivated soil samples was found higher than the concentration of lead in cultivated surface soil samples, soils which have been worked for cultivated crops. The fraction of lead in soil samples that are collected at different points are compared with the MCL specified by the Directive 86/278/EEC. Also, we have calculated factor of Hazardous Quoted for each sampling point. It was observed that oftentimes HQ values were higher; they were ranged from 0.4 to 80.7.

Key words: lead, surface soil samples, Atomic Absorption Spectrometry

MONITORING OF AIR QUALITY IN PRISTINA IN 2015

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ABSTRACT: Although Kosovo is a very small country with an area of approximately 10,887 km², the pollution in a country level is very low, but the main pollution problems are in urban areas which are highly contaminated. The main source of this pollution is: industries, Kosovo Energy Corporation (KEK) power stations – road transport, central heating companies (in Pristina, Gjakova and Mitrovica), urban and industrial waste dumps (with various local impacts), wood and lignite for household heating (World Bank, 2011). Since air pollutants are limitless, the greatest pollutants are; volatile organic compounds (VOC), CO₂, NO_x, CO, sulfur compounds SO₂, PM₁₀, PM_{2.5} etc. In the case of this research we have presented the monitoring of air quality in the region of Pristina where the analysis of air quality are taken from KHMI, throughout the year 2015 by measuring these parameters, SO₂, CO, NO₂, and O₃, PM₁₀ and PM 2.5 all these being measured (µg/m³), and always by referring to the directive (2008/50 / EC) and the Law on Air Protection from pollution (no. 03 / L-160).

Key words: air pollution, contamination, industries, organic compounds, observation, analysis, measuring, law, CO, NO_x, SO₂, O₃, PM₁₀, PM_{2.5}

ENVIRONMENTAL IMPACT ASSESSMENT OF QUARRIES IN FOUR MUNICIPALITIES IN WESTERN PART OF KOSOVO

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ABSTRACT: Industry of quarry and its allied activities in Kosovo have significantly contributed infrastructural development (road construction, highway, bridges, etc.) and improving living standards during the last decade. In other side, its negative impact in environment such land degradation, air and water pollution, loss of biodiversity, health related issues, noise vibration etc. are present and often visible.

This research was focused to analyse the impact of operators on land degradation, air and water quality and biodiversity (flora and fauna including natural and cultural heritage). Research is implemented to assess environmental impacts of quarries in four municipalities located in the western part of the Republic of Kosovo: Istog, Pejë, Deçan and Gjakova. Research area covers a territory of 1,822 km², or 16.71% of the territory of the Republic of Kosovo. In total, 16 quarries are identified, of which 13 are still active and 3 passive. The largest number of quarries operates in the municipality of Istog (6), followed by Deçani with 4, Peja with 3 and Gjakova with 3. Altogether, a quarry operation in the research area occupies an area of 41.56 ha.

The research findings show that the quarry operations have high negative impacts in the environment. Even the most of operators have environmental permits issued by the Kosovo Ministry of Environment and Spatial Planning they mostly aren't respecting the provisions stipulated in the law. Most of them don't use any environmental friendly technologies, while existing technology has no filters for air and water purification. Deforestation, dust generation, water, air and noise pollution followed by resource depletion and biodiversity loss are common threats associated with open quarry operations in the investigated area.

Key words: Degradation, Environmental Impact Assessment, quarry, permit, pollution

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MONITORING OF POLYCHLORINATED BIPHENYLS DISTRIBUTION IN ENVIRONMENTAL OBJECTS OF RUSSIAN INDUSTRIAL CITIES

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ABSTRACT: The two Russian cities were chosen for the polychlorinated biphenyls (PCBs) fate investigation. The environmental contamination level in Serpukhov city (Moscow region) represents the situation in the highly polluted region where a big source of PCBs release in the environment was operated. Moscow city is the industrial city with no huge PCBs contamination sources that represents the PCBs fate in any industrial city in the world. The purposes of our research were to determine the PCBs contamination levels in environmental objects of Moscow and Serpukhov cities and to describe the partitioning mechanisms in real environment. The results of our research show the occurrence of a few points with extremely high level of soil contamination in Serpukhov city near the condenser plant. It was also determined that the number of tetrachlorinated biphenyls prevails in the surface soil samples. The increase of the concentration with the soil depth of Serpukhov city was found out, except one sampling site where the high concentration remains in the deeper samples. The presence of PCBs in soils of different administrative districts of Moscow city was determined and the possible impact factors were predicted. The temporal trends of the contamination levels change were analyzed.

Key words: polychlorinated biphenyls, environmental distribution, environmental objects contamination, Moscow, Serpukhov

REMOVAL OF CYPRODINIL FROM WATER BY *LAGENARIA VULGARIS* SHELL- Al_2O_3 BIOSORBENT

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ABSTRACT: The removal of cyprodinil from aqueous solution using biosorbent based on *Lagenaria vulgaris* shell was studied. Biosorbent was prepared by drying, grinding, chemical purification and chemical modification of the shell with Al_2O_3 . The effect of contact time, initial cyprodinil concentration and initial biosorbent dosage on the sorption process was studied in a batch process mode. Significant decrease of cyprodinil concentration during the treatment indicated high efficacy of investigated material. Biosorption of cyprodinil occurs in two phases in time, a rapid initial uptake, followed by a slower process. Maximum sorption efficiency was observed in the first 40 min of sorbent-sorbate contact. The effect of initial cyprodinil concentration on the removal efficiency was investigated at initial cyprodinil concentrations ranging from 5 to 100 mg dm^{-3} . With the increase of initial cyprodinil concentration, removal efficacy decreases. The effect of sorbent dose on cyprodinil removal efficiency was investigated at biosorbent dosage ranging from 0.5 to 8.0 g dm^{-3} . The optimal biosorbent dosage for cyprodinil removal is 4.0 g dm^{-3} . The obtained results showed that biosorbent based on chemically modified *Lagenaria vulgaris* shell with Al_2O_3 could be used effectively for removal of cyprodinil from water.

Key words: Biomaterial, Chemical modification, Al_2O_3 , Sorption, Cyprodinil

EVALUATION OF SOME BACTERIOLOGICAL AND PHYSICO-CHEMICAL PARAMETERS OF WATER SUPPLY AND GROUNDWATER OF SHKODRA CITY (ALBANIA)

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ABSTRACT: Samples from drinking waters may have large concentrations of coliform bacteria, especially if are the cleaned infrequently. Private well and drilling waters unlike public water supply are not controlled regularly. Water quality problems of wells and drilling waters can often be linked to: drilling and wells depth, construction deficiencies, selecting the wrong place, or the presence of cracks, channels and caves formations. Monitoring for the presence of pathogenic bacteria is essential assessment of water quality, which directly or indirectly use leads to serious health problems of man. Problems that come from drinking waters are numerous, because the consumption of contaminated water can be: abdominal typhoid, gastroenteritis, dysantries by pathogenic bacteria, parasites etc. This study present the samples collected from tape water and water from private wells and drillings of Shkodra city. Water samples were collected according to European recommendations and WHO legislation. The physico-chemical and bacteriological measured parameters were: *pH*, *conductivity*, *turbidity* and *Escherichia coli*. The presence of *E. coli* in some of our samples is an indicator of faecal pollution of underground waters of Shkodra region. The physico-chemical and bacteriological parameters were carried out at the Centre for Microbiological Diagnostication, University of Shkodra "Luigj Gurakuqi", Albania.

Key words: pH, conductivity, turbidity, *Escherichia coli*.

DIVERSITY, DISTRIBUTION AND ECOLOGY OF THE BUSHES PLANT COMMUNITIES IN THE PARANG MOUNTAINS (SOUTHERN CARPATHIANS) ROMANIA

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ABSTRACT: The surveys have been carried out in the Parâng Mountains which are part of the Southern Carpathians, in Romania. In the hilly zone and in the lower mountain sub-zone, some woody plant communities occur, such as: *Pruno spinosae-Ligustretum vulgarae* Tx. 1952; *Rubo plicatae-Prunetum spinosae* Web. 1974 em. Oberd. 1992, *Pruno spinosae-Crategetum* (Soó 1927) Hueck 1931 and *Spiraeo-Coryletum* Ujv. 1944. *Pinus mugo* develops here scrubs between 1,700 and 2,100 m. We found such types of scrubs in the following locations: Mt. Papusa, Mt. Tidvele, Mt. Micaia, Mt. Muntinu, Mt. Mohoru, Mt. Setea Mare, Mt. Setea Mica, Mt. Carbunele, Mt. Dengheru and Mt. Musetoaia. The scrubs with *Juniperus communis* ssp. *alpina* are frequent in the upper limit of the spruce forests, on the Mt. Papusa, Mt. Tidvele, Mt. Micaia, Mt. Muntinu, Mt. Mohoru, Mt. Setea Mare, Mt. Setea Mica, Mt. Carunele, Mt. Dengheru. In the sub-alpine zone, the plant community *Junipero-Bruckenthalietum spiculifoliae* Horv 1936 is also frequent. On the mild crests of the versants, the meadows are interrupted by small clusters of *Loiseleuria procumbens*. The following habitat types have been noticed in the studied area: 4060 Alpine and Boreal heaths; 4070* Bushes with *Pinus mugo* and *Rhododendron hirsutum* (*Mugo-Rhododendretum hirsuti*) and 4080 Sub-Arctic *Salix* spp. scrub. They are habitats of conservative interest according to the Interpretation manual of the European Union habitats – Eur 28 and the Romanian Manual for Interpretation of Natura 2000 habitats in Romania (2008).

Key words: Diversity, Ecology, Bushes Plant, Carpathians, Romania

SELECTIVE EXTRACTION AND PASSIVATION OF ARSENIC AND OTHER MICRO ELEMENTS OF ANTHROPOGENIC CONTAMINATED SOILS

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ABSTRACT: In the soil from the micro locality E-NE-SE around the OHIS factory, an increased degree of contamination with arsenic of anthropogenic origin has been detected. The objective of this research is an integral perception of the soil state with this pollutant, aiming to determine options for remediation of the contaminated soil. The basic parameters are being monitored for the extracted quantities of arsenic from various plant species that exist at the micro locality, in correlation with soil composition in the medium of the root system and the external factors. Intention is to define the affinity of the existing plants for available forms of arsenic. Two natural inorganic raw materials have been appointed as potential materials for remediation of contaminated soil with arsenic from the micro locality: diatomaceous earth from the locality of Slavishko Pole and trepel from the locality of Suvodol. Applying the extractors, their appropriate selective affinity and capacity for arsenic and other micro elements is evident.

Key words: arsenic, soil, remediation, affinity

INTENSE RAINFALL AND DEGREE OF REMOVAL OF HARMFUL PARTICLES FROM THE AIR ABOVE THE CITY OF SKOPJE

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ABSTRACT: The intensity of rainfall is the main parameter to calculate the size of the implementation of rain and sludge water in time and space. The intensity of rainfall may determine the duration of the rain fell and the probability of occurrence due to the decline defined as the probability of occurrence for several years.

The emergence of the atmospheric pollution which unfortunately are increasingly present in the Republic of Macedonia as a consequence, a sediment water pollution falls to the ground and so drops absorb impurities in the air. Impurities then transported through storm drains recipients, who are exposed to additional pollution.

Analyzing the most pojavuvanite intensity rain, he came to appreciate the size of the rain that falls in the Skopje region, depending on the size and duration of the precipitation fell rains received mathematical curve (hyperbolic functions) that define the size of rain, depending on the appearance of rain in time (once every two years, once a year, twice a year or once every five years).

The treatment table pollute Mateo or their concentrations in air and precipitation intensity values obtained the necessary critical (minimum) of rain that provides the natural purification of the atmosphere.

This way you will get optimal intensities of rain that cleans the atmosphere, not without causing flooding or increasing the level of groundwater.

Key words: Hydrological fields of rain, mathematical modeling of hydrological fields, hyperbolic functions, curved regression coefficient, the concentration of pollutants. The critical value of fallen rain

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POLLUTION OF THE VARDAR RIVER FROM SKOPJE'S FECAL AND ATMOSPHERIC SEWERAGE

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ABSTRACT: Vardar River as the largest river in the country is the skeleton of a hydrographic system that is exposed to various types of pollution that in a long time can have unforeseeable negative consequences for the entire ecosystem in Republic of Macedonia. One of the major concentrated pollutants of Vardar River is the sewage system of the City of Skopje. The sewer of the City of Skopje is separated and is divided into fecal and atmospheric sewer. In the past we observed periods of dry years where the water level of the Vardar river is in decline and it's with small flow capacity has more problems in effective self-purifying of river water. Water of the river is continuously exposed to pollution because the flow of fecal sewerage of Skopje is almost constant throughout the year, while flow through the river is changing depending on the season and changing of dry and wet periods. Also, as a problem of pollution that can occur are atmospheric water deposits (rainfall) that collect whole dirt from the air over the City of Skopje and together with atmospheric waste water is transported into Vardar River. To solve this burning problem, until now three feasibility studies were made in different time periods that only confirms and justify the need for construction of central wastewater treatment plant for fecal wastewater. All previous measurements of the quality of wastewater unequivocally indicate on completely degraded quality of fecal waste water. This professional study indicates on alarming situation with the amount of waste water discharged into the Vardar river and the need to undertake urgently measures to overcome this problem by building a central wastewater treatment plant for the City of Skopje.

Key words: Hydrological arrays of flows and rainfall; Dry periods; Level of self-purifying of river water; Quality of measurements of fecal waste water; European standards for quality of waste water.

PRESENCE OF PCBS AND DDTs IN FISH HARVESTED IN FIERZA LAKE, ALBANIA

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ABSTRACT: This study provides preliminary data regarding the presence of some Persistent Organic Pollutants in fish and fishery products. The POPs taken in consideration were the organochlorine pesticides and the PCBs in edible tissues of fish *Alburnus albidus* harvested in Fierza Lake, in northern part of Albania. The study was conducted in one year period and the samples of fish *Alburnus albidus* were taken every month. From the organochlorine pesticides taken under investigation during this study the presence of DDT (dichlorodiphenyltrichloroethane) was confirmed, in its persistent form the DDEpp` isomer. Results indicate evident contamination of the fish *Alburnus albidus* with PCBs in all samples and the value vary from 1 to 21 ng/g wet weigh, represented form congeners PCB 153 and PCB 138. Although the concentrations of PCBs were lower than maximum limit established in European legislation, comparing the results obtained to the other similar studies conducted in Albania related to fish and fishery products during last year, the contamination of fish *Alburnus albidus* harvested in Feirza basin, present a higher level of polychlorinated biphenyls (PCBs). This can be due to geographical position of Fierza Lake where the two biggest rivers of Western Balkan White and Black Drin run through, carrying all the contamination of the surrounding areas into the lake.

Key words: POPs, *Alburnus albidus*, Fierza Lake.

A CROSS SCALE APPROACH TO AIR POLLUTION FROM THERMAL POWER PLANTS: EVIDENCE FROM ROMANIA, BULGARIA AND GREECE

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ABSTRACT: Thermal power plants using fossil fuel are the most important industrial sources of air pollution in European Union. Especially coal has a higher impact as it also contributes with 20% of total emissions of greenhouse gases. The present study takes into consideration three Balkan European Union countries (Romania, Bulgaria and Greece) highlighting the dynamics of energy sector in order to evaluate its contribution to diminishing air quality mainly by SO₂, NO_x and dust emissions. It is a cross-scale analysis that takes into account the main trends that can be acknowledged by the studying multiple sources official data at available at different geographical scales. The statistical and cartographic analysis from local to county level and from regional to national scale is an opportunity to study some important hotspots of industrial air pollution and their impact in the last 10 years. The results are put in relation to other social and economic indicators such as exposed population or sustainable alternatives (renewable energy investments) also analysed at different scales. The final outcomes are intended to support an evaluation of the effectiveness of national policies in restructuring the national power generation sector for each of the three Balkan countries.

Key words: thermal power plants, air pollution, cross-scale analysis, EU Balkan countries, energy policies

THE EMISSION OF PARTICULATE MATTER (PM₁₀) IN THREE MACEDONIAN CITIES AND ITS ENVIRONMENTAL AND HEALTH IMPACTS

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ABSTRACT: It is assumed that no other pollutant is as complex as particle pollution. Also called particulate matter or PM, particle pollution is a mixture of solid particles and liquid droplets found in the air. Aerosols are one of the most dangerous air pollutants, by its inhalation they attack the respiratory system, can deposit in the deepest parts of the lungs, and they reduce visibility creating visibility effects that are typical for "fog" and classifiable as smoke. Air pollution is a significant problem in certain urban environment in Macedonia. Aerosol samples were collected at an urban background site in Skopje, Tetovo and Kicevo and the samples were analyzed for the aerosol mass concentrations and their chemical content. The aim of this paper was to evaluate the results from the measurements of emission of particulate matter (PM₁₀) and to determine its environmental and health impacts. Results from the measurements of the concentrations of PM₁₀ exceeded MK/EU standards in certain areas.

Key words: Environmental impacts, Health impacts, PM₁₀

MONITORING OF GROUD WATER AFTER THE ACCIDENT SITUATIONS

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ABSTRACT: After the accident situations, tests of the quality of underground water on piezometers have been performed in complex process systems industry. Measuring apparatuses were placed in the vicinity of complex process systems area at the depth of 50m. Results have shown that the water is of low quality. We came to a conclusion that the underground water in the vicinity of main piezometers is polluted. At the complex process systems (example 1) area results of these tests indicate a higher amount of organic substance in the water. The amount of reduction produce such as ammonium ion has also been increased. The amount of halogen hydrocarbon is very high as well. In a sample taken at the depth of 45 m there is a high amount of hydrocarbon, originating from oil. There is aromatic hydrocarbon at all depths (benzene, toluene, xilen). The amount of phenol is high, whereas the amount of mercury is low. Tests have proven that substances of pyralen type are also present. Samples at all depths have high specific conductivity. Results of the tests performed in the vicinity of complex process systems (example 2) area shown enormous electrolytic conductivity of samples at all depths. At 25 m and 45 m we found a high amount of reduction produce of the ammonium ion type, as well as organic and pyralen substance load. On the basis of the provided information, it is obvious that we are dealing with a long-term pollution of the environment. The paper presents soil remediation technologies that can be successfully used for problems.

Key words: monitoring, piezometers, chemical analyses,
underground water

THE IMPORTANCE OF INFORMATION SHARING AND INFORMATION QUALITY IN SUPPLY CHAINS MANAGEMENT: A STATISTICAL ANALYSIS

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ABSTRACT: The development of information technologies has made possible that all the parts of a supply chain can communicate with each other. Information sharing and information quality are two important factors that directly affects in supply chains performance. Experience has shown that deficiencies in the quality of information have led to major harms in the performance of supply chains. The aim of this paper is to study the main factors of the level of information quality in supply chain. The population of this study is comprised by small and medium – enterprises operating in Vlora, Albania. A questionnaire was conducted to study the level of information sharing and the level of information quality by the targeted companies. This study reveals that the significant factors in determining the level of information quality are: environmental uncertainty, inter-organizational relationships, top management support and IT enablers. The logistic regression and discriminant analysis are used to analyse the data. This study concludes on identifying the factors that influence positively in information quality and factors which adversely affect.

Keywords: supply chain, information quality, information sharing, multivariate statistics

SUSTAINABLE DEVELOPMENT FOR IRRIGATION SYSTEMS

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ABSTRACT: In many countries the irrigated agriculture is playing a key role in meeting the demands of food security and development of the nation's economy. The improvement and development of the systems, considering irrigational and potable water, are the reasons for further development of irrigational systems for agricultural causes on the territory of R. Macedonia. Developing irrigation infrastructures requires integration of various supporting activities that must be socially acceptable, economically reasonable and environmentally friendly.

The main focus of this paper is to determine a set of indicators to measure various ramifications deriving from the reconstruction of an existing system for irrigation and supply of potable water in a certain region, including its influence on the environment, its social impact, as well as the impact on the economic development of the region.

Contribution towards sustainable development of the foreseen reconstruction is analysed while taking into account available relevant agricultural, geological, geodetic, hydrogeological, and pedological data.

Key words: irrigation systems, sustainable development

**IMPROVEMENT OF MINING AND ENERGY COMPLEXES
MANAGEMENT BASED ON RISK ASSESSMENT,
ENVIRONMENTAL LAW AND SUSTAINABLE
DEVELOPMENT PRINCIPLES**

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ABSTRACT: Applying the basic principles of sustainable development in the energy sector is the possibility of solving environmental problems and reducing emissions of harmful products. Improving the system of environmental management of mining and energy complex is based on the application of the theory of risk assessment and consideration of legislation in the field of environmental protection. The analysis of the process of transformation of coal energy and the consequences of working activities, in terms of impact on the quality of the environment and the possible emergencies, was analyzed according to ranks of environmental indicators and the application of modern methods of risk assessment. Existing regulations in the field of environmental protection and energetic sector are the basis for the preservation of the quality of air, water and land.

Key words: risk assessment, management, energy, environmental law, sustainable development

PRELIMINARY RESULTS AND IMPACT OF MARINE LITTER IN ALBANIAN ADRIATIC AREA

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ABSTRACT: Actually about 60% of the Albanian population is living in the coastal areas. So, from one side the closure of the industries helped for the diminishing of the environmental pollution including the coastal water, on the other hand there is an increase of urban pollution in the coastal area caused by the tourism development mainly in the Adriatic coast and by the increasing number of inhabitants in the main Albanian cities like Tirana, Durrës and Vlora. During the last decade tourist construction along the coastal zone are not preceded or accompanied by necessary infrastructure as water supply and sewerage, collection, transport and sanitary disposal of solid wastes. Such situation has increased the amount of solid waste, especially marine litter.

Marine litter or debris consists of a range of materials including plastic, metal, wood, rubber, glass and paper. Items washed ashore are the most prominent signs of marine litter, but most of the litter entering the water is found on the sea floor, both in shallow and deep water, while the remainder floats on the surface. It is estimated that 15% of marine debris floats on the sea surface, 15% remains in the water column and 70% rests on the seabed. Most plastics are extremely durable materials and are likely to persist in the marine environment for a considerable period, possibly as much as hundreds of years. However, plastics also deteriorate and fragment in the environment as a consequence of exposure to sunlight (photo-degradation) in addition to physical and chemical deterioration, which is likely to result in numerous tiny plastic fragments called micro-plastics. Fragments of plastic have been shown to concentrate pollutants that have arisen in the environment from other sources.

The first aim of this study was to assess for the first time the impact of marine litter in Albanian Adriatic area. This survey was along the Albanian marine coasts, respectively between Drin and Vlora bays

during period July 2015. The survey (27 hauls) was taken with staff of Marine Laboratory of Bari (Italia) and the staff from the Laboratory of Fisheries and Aquaculture of Agriculture University of Tirana. The survey conducted using the fishing vessel "Pasquale e Cristina" and used the trawl net MEDITS GOC73, which has a stretched mesh size in the cod-end of 20 mm. Hauls performed within 3 nautical miles from the coasts to 50 – 800 m depth. The marine litters were weight for each hauls. In total from our trawl survey was 18.82 kg macro-plastic. The percentage of macro-plastic was dominant comparing metal, wood, rubber, glass and paper. So this study gives a panorama to increase knowledge on occurrence, amounts and sources of marine litter in the Adriatic. Also it increases knowledge on marine litter hotspots in the Adriatic and on socio-economic impacts of marine litter in the Albanian Adriatic area.

Key words: macro-plastic, Albanian coastal, hauls, fishing gear, hotspot.

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CHEMICAL LEASING AS A NEW BUSINESS MODEL CONTRIBUTING TO SUSTAINABLE INDUSTRIAL DEVELOPMENT

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ABSTRACT: The intensive use of natural resources and the increased amount of waste that influence negatively on the water and air pollution, gives us the concern to think more globally about new approaches and methods of work that will lead us to constant development of the concepts ensuring sustainable development. For this purpose, UNIDO developed a new business model for chemical management that is focused on providing services instead of selling substances. The aim of the Chemical Leasing concept as a business model is not only to change the traditional trade of chemicals and give value to the service that the chemicals do, but also to develop partnership between producers and consumers of different chemicals globally. Chemical Leasing reduces the consumption of chemicals and optimizes their usage. It provides environmental, safety and economy improvements for all parties included in the concept. It is a challenge for small and medium sized enterprises to improve their image by participating in this innovative venture in developing countries and economy in transition. This paper presents the fundamentals of the Chemical Leasing concept and analysis its contribution to the sustainable industrial development.

Key words: Chemical leasing, Cleaner production,
Sustainable development

**TEACHING ENGINEERS TO THINK SUSTAINABLY:
A SOFTWARE TOOL TO TRAIN LIFE CYCLE APPROACH**

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ABSTRACT: Environmental and sustainability themes are steadily gaining duly importance in engineering curricula taught at engineering schools of Western Balkans. However, life cycle thinking is yet to be acquired by many working professionals and young engineers in the region, and many engineering curricula should be enriched by environmental science related courses. Learning how to recognize and assess environmental impact of a product is closely related to the availability of software tools that allow for initial screening in a manner that is consistent with the users' capabilities, intentions and needs. There are several software packages and databases designed for Life Cycle Assessment (LCA), a widely accepted method that covers a range of uses. Nevertheless, there is a niche for some simple, user friendly software, convenient for educational purposes at various levels, including refreshment courses and trainings of working professionals. Spreading the life cycle approach among students, young engineers and working professionals would require simple, yet effective software tools suitable for new way of thinking. Environment is only one of the many issues facing engineers of various backgrounds and therefore, any tool must be relatively simple and rapid. A simple, yet descriptive tool has been developed to assist LCA related educational process. This paper brings about description of a software tool designed to develop life cycle thinking among engineering students and to trace the route for further software development in this field of growing interest.

Key words: Sustainability, Environmental Education, LCA software,
Design for environment

THE ECOTOURISM IN THE FRAME OF GREEN ECONOMY AND GREEN BUSINESS

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ABSTRACT: With the term “Green” we use to express something that is ecological and especially something which is friendly to the environment, so it can be directly connected to these economic, social or even constructions infrastructures. Each country and every citizen who is an active member of society should encourage the **“Green Infrastructures”, “Green Economy”** and **“Green Business”** in order to promote growth, reduce social inequality, to reduce the impact of climate change and environmental degradation, for better manage the problems the inflated raw material failure to provide resources that will yield long-term gains and finally address the continuous speech pressures of population growth has mirrored the rise of consumerism.

Infrastructures could be green if they take serious apart the sustainability, not only to satisfy the needs with any way (and often against the environment). It is clearly that these green infrastructures appear expensive but actually if we consider seriously in depth of time and the consequences to the environment are cheaper than the ordinary infrastructures and their reconstructions.

During the last decade, globally and especially in our country research and technology around the protection of the environment and their proper use of exponential, moving very fast, apart from private company aimed at creating products-services and the educational institutions working on new methods and techniques on the economic and ecological “Green” environmental management. As in Alexander Technological Institute of Thessaloniki where have established the Environment Committee which deals with the use of proper technique and

knowledge for the useful and specialist environmental study to the students are for well informed and generally throughout the state.

In the frame of green business the case of ecotourism is a pragmatic application in the direction of actual sustainability. In fact the tools of conventional tourism into ecotourism with the use of the principles of environmental management and protection are the most significant approach to the model of sustainable economics in this domain.

Except the economic crisis that yields lack of money for the promotion and utilization of suitable technology for growth, important role plays also and the important lack of legislation where it might regulate environmental problems and situation. While Greece have a lot of innovative ideas and direct applications, when we go from the theory into practice, the bureaucracy but also the phobia managing for change it cuts the ambling to another direction than the one that we chronic (constantly) experience. Thus it happens also with the green economy and business capability.

Key words: Green Economy, Business, Sustainability, Infrastructures, tourism, ecotourism

ENVIRONMENTAL RISK MANAGEMENT INTEGRATED WITH RISK ASSESSMENT

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ABSTRACT: Risk management, as focus of this paper, has been defined as the identification, assessment, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and impact of unfortunate events or to maximize the realization of opportunities with not deflect the business goals. Risk assessment is the formal process of evaluating the consequences of a hazard and their probabilities. The output of this structured process provides a judgement as to the presence likelihood of the risk and its significance, along with details on how the risk was assessed and where assumptions and uncertainties exist. The evidence required to provide judgements and subsequently characterise a risk in this way can be qualitative, quantitative, or semi-quantitative. Uncertainty is always present when conducting each stage of an environmental risk assessment. The techniques available to analyse, understand and manage these uncertainties include the collection of more data, the use of trusted sources, probability density functions, Bayes linear methods, and/or sensitivity analysis. This paper has analyzed application of the environmental risk management and risk assessment tools through case study for influence of flood events to future climate change. The integrated analysis of hazard, exposure and vulnerability values in environment can provide a valuable approach to achieve a fast evaluation of potential damage to help high-level decision making. They can be easily integrated in an automated chain model connected to the early warning system to gain an appraisal of potential risk. The model for risk assessment tool is applied to data for Italian river Po, based on cooperation at master studies between universities in Florence and Skopje. However, a calibration and validation of the model would be needed to assess and reduce uncertainty, to apply more comprehensive statistical indicators about socio-economic trends in the impact area and to evaluate the changes in the exposure value for future scenarios.

Key words: environmental risk management, risk assessment,
decision making

INFLUENCE OF REVERSE LOGISTICS AND GREEN LOGISTICS AS PART OF SUPPLY CHAIN TO ENVIRONMENTAL SUSTAINABILITY

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ABSTRACT: To survive in competitive and changeable market-place, companies need innovation in their products, services and business processes, and also need focus of the management to the whole supply chain. Effectively managing and balancing the profitability and interconnection of each player and function in the supply chain with including the new trends will improve the overall supply chain management (SCM) as well as company's profit.

Logistics are a significant function of modern business systems where logistic systems and supply chains have rapid grown in recent years with focus on the economic performance to optimize the costs and to increase return on investments (ROI). Contemporary logistic systems have to incorporate sustainability through development of the supply chain operations because of increased environmental awareness, regulatory social initiatives and economic pressures. Consideration of environmental and economic aspects in supply chain design is required to reduce negative impacts on the environment caused by the increasing levels of industrialization. Also, reason why companies choose to “go green” is that it gives the company a competitive advantage as the customers are demanding nowadays that the businesses go green.

This paper has presented new trends such reverse logistics and green logistics, as part of green supply chain. Analysis of the impact factors has done with developed approach for modeling of sustainable supply chain network based of the influence indicators to achieving sustainability from socio-economic-environmental perspectives.

Key words: Reverse Logistics, Green Logistics, Supply Chain, Sustainability

POSTER SECTION

2.

**AGRICULTURE, AGROECOLOGY,
FOOD QUALITY SAFETY,
PUBLIC HEALTH – ENVIRONMENTAL
MEDICINE**



INTRODUCED SPECIES – POTENTIAL THREAT TO AGRICULTURE AND URBAN PLANTS

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ABSTRACT: Modern technologies, computerization, fast transport and many other facilities speed up the transfer of living beings and faster the way of its movements as well. Many insect species move from place to place following their instincts and ecological conditions but their spreading are often caused without their will. In new surroundings they might collapse or find suitable conditions for their development and establishment. In that case some of them become silent residents, but some become serious pests which cause significantly economic damages to different kind of agricultural crops, ornamentals and forests. In such case they become enemies of the natives who have to focus on possible ways to live with them in peace. In this paper the most important insect species introduced to Serbia in last decade will be discussed (*Nezara viridula*, *Leptoglossus occidentalis*, *Halyomorpha halys*, *Cydalima perspectalis*, *Tuta absoluta*) together with their impact on agriculture and urban areas.

Key words: introduced species, *Nezara viridula*, *Leptoglossus occidentalis*, *Halyomorpha halys*, *Cydalima perspectalis*, *Tuta absoluta*

**VALIDATION METHOD FOR DETERMINATION
OF NEONICOTINOID INSECTICIDES AND THEIR METABOLITE
IN HONEY BEES BY MODIFIED QUECHERS
AND LC-MS/MS ANALYSIS**

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ABSTRACT: Growing concern about the impact of pesticides on pollinators is reflected in the enormous literature on the topic in the past few years. Neonicotinoids are a relatively new class of insecticides, which possess a nitromethylene, nitroimine or cyanoimine group, that share a common mode of action which affects the central nervous system of insects, resulting in paralysis and death. This group of pesticides can be present in the environment and when used as seed treatments, translocate to residues in pollen and nectar of treated plants. Since their introduction to agriculture, neonicotinoids have been accused for being highly toxic to honeybees, possibly at the nanogram per bee level or lower. To determine such low concentrations in waxy matrix, the determination of neonicotinoid insecticides is a challenge as an analytical procedure. The validation of multi-residue method for the determination of imidacloprid, clotianidin, acetamiprid, thiametoxam, thiacloprid and 6-chloronicotinic acid as their main metabolite, in honey bees was done. The method involves QuEChES method for the extraction of neonicotinoid insecticides. The extracts were analysed by liquid chromatography-electrospray ionization-tandem mass spectrometry (LC-ESI-MS/MS). The LOD was calculated by MassHunter Qualitative Software and it was below 0.0001 mg/kg. The linearity was checked using matrix matched calibration from 1 to 50 ng/ml with the $R_2 > 0.99$ for all investigated pesticides. The recovery data obtained by spiking honeybees samples at two concentration levels (0.01 and 0.001 mg/kg) was in the range from 98–125±5-12.6% with the addition of the internal standard carbofuran-D3.

The relative standard deviation was below 20% for all investigated pesticides. It should be noted that the average recovery for the 0.0001 mg/kg was very high, $252 \pm 13.7\%$ which is above the SANCO/12571/ 2013 allowed value.

Key words: neonicotinoid insecticides, metabolite, honey bees

THE URBAN AREAS WITH THE HIGHEST IXODID TICKS (ACARI: IXODIDAE) ABUNDANCE IN SERBIA

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ABSTRACT: All ixodid ticks in all developmental stages are obligatory parasites and habitat generalist as they most often depend on the environmental microclimatic features and the presence of suitable hosts. Ticks are vectors of numerous and severe diseases of humans and animals and therefore intensively studied because of their permanent presence in the urban areas. The species diversity, seasonal dynamics and abundance of ixodid ticks were studied during 2015 at four cities in Serbia, from April to September, at three types of the urban ecosystems: parks, cemeteries and river promenade banks. The obtained results were analyzed using Simpson-Yule index and statistically proved by ANOVA. Four tick species were identified: *Ixodes ricinus*, *Dermacentor marginatus*, *D. reticulatus* and *Rhipicephalus sanguineus*. *I. ricinus* was the dominant species in parks and cemeteries and *D. marginatus* at river banks. The highest abundances for all detected species were obtained in May. In order to suppress and control tick-borne diseases in the urban ecosystems it is necessary to conduct continuous monitoring of tick species and their abundance in all urban areas, especially those with the adequate vegetation cover and high and constant presence of the proper hosts.

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Key words: ticks, urban areas, abundance, *Ixodes ricinus*, *Dermacentor marginatus*

**EFFECTS OF ESSENTIAL OIL *ANETHUM GRAVEOLENS* L.
ON THE ADULT INSECTS *TRIBOLIUM CONFUSUM*
AND *TENEBRIO MOLITOR* (COLEOPTERA: TENEBRIONIDAE)**

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ABSTRACT: Stored products insect pest control is important in managing post harvest grains, food products, and processed goods. *Tribolium confusum* Herbst. and yellow mealworm *Tenebrio molitor* L. (Coleoptera: Tenebrionidae) are cosmopolitan stored product insects. Adult and larvae of both are serious pests which cause quantitative and qualitative losses in infested products. Adult insects were obtained from laboratory colonies maintained in incubators at $25\pm 1^{\circ}\text{C}$ and 70-80% r.h., reared on mixture of wheat flour and bran. Insects were fed with flour disks containing a known concentration of essential oil of *Anethum graveolens* L. The chemical components of essential oil were identified using GC-MS analysis. The results of insecticidal effect of ten different concentrations of E.O. and LD₅₀ after 48 h and 72 h of exposure were discussed. The essential oil of *A. graveolens* which was rich in monoterpenes carvone (48.3%) and limonene (43.5%) showed strong insecticidal activity against these pests. The most effective concentration for *T. confusum* was 450 $\mu\text{l/ml}$ and mortality rate was the same 85% after 48 h and 72 h. The mortality rate for *T. molitor* for 450 $\mu\text{l/ml}$ after 48 h was 75% and 97.5% after 72 h. The LD₅₀ value after 48 h against *T. confusum* was 239.17 $\mu\text{l/ml}$ and against *T. molitor* was 298.165 $\mu\text{l/ml}$. LD₅₀ after 72 h against *T. Confusum* was 229.327 $\mu\text{l/ml}$ and against *T. molitor* was 250.584 $\mu\text{l/ml}$. According to these results and other references it could be concluded that carvone as a component of essential oil of *A. Graveolens* has strong insecticidal activity.

Key words: *Tribolium confusum*, *Tenebrio molitor*, LD₅₀, *Anethum graveolens*, essential oils

ANALYSIS OF THE EVOLUTION OF OPERATIONAL STRUCTURES IN ROMANIA – COMPARISON OF PRE AND POST-ACCESSION

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ABSTRACT: The issue of Romanian agriculture development analysis at national and regional levels especially in the context of Romania's integration into EU structures is very important because we are facing a certain dilemma of compatibility between the new common agricultural policy adapted to the current state of agriculture in EU and Romanian agriculture state that has other objectives (deep restructuring and consolidation of holdings, massive financial support for technical and economic efficiencies growth). Farms in Romania were represented in 2010, according to the General Agricultural Census (GAC), the proportion of 99.2% of individual farms. Structurally, most farms have less than 2 ha utilized agricultural area (70.8% in 2010), followed by 2 to 4.9 ha holdings accounting for 18.8%. The number of those under 2 ha increased in the post-accession period by 9.9%. Highest dynamic however, 57.8% have had those 50 to 99.9 ha, followed by those with more than 100 ha (an increase of 42.1%). These structural changes identified on the same trend since 2007, at least holdings over 30 ha, show a clear impact of direct payments on the surface, which led, albeit at a fairly low rate, the formation of holdings higher dimensions, more than 30 ha.

Key words: agriculture, operational structures, farms, utilized agricultural area, pre and post-accession.

REFLECTION OF ENVIRONMENTAL CONDITIONS ON THE MORPHOLOGICAL CHARACTERISTICS OF WILD CHERRY PRUNUSAVIUM IN BOSNIA AND HERZEGOVINA

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ABSTRACT: The benefit of wild cherry is reflected in the nutritional, therapeutic, pharmacological, and in the food chain, rich bee pasture and was in energy balance. Knowing that wild cherry founder of the largest number of fine varieties of cherries and sour cherries grown in the world and in our country, made the morphometric and meristic tests vegetative and generative phyto parts of wild cherry. These tests were conducted vegetation in 2012 and 2013 in the northeastern, central and southern part of Bosnia and Herzegovina, the selected natural superior genotypes of wild cherry in different climatic zones. Followed by a reflection of abiotic and biotic conditions on the morphological characteristics of wild cherry. All morphological characteristics are determined by international descriptor for wild cherry (UPOV TG 1/2). There was a variation in terms of flowering, leafing and fruit maturation, which represents a quality starting material for further breeding work (Nocajevic, S. 2009). The morphological differentiation within the studied taxon *Prunusavium* is directly related to the reflection of the environmental conditions in the study area of Bosnia and Herzegovina. Detailed insight into the morphological and phenological differentiation of populations within a taxon-*Prunusavium* is an important condition for a total consideration of genetic resources and the evolving state of the mentioned taxa for future scientific research. In addition to genetic conditions that are responsible for the phenotypic expression there are numerous environmental conditions which significantly affect the morphological characteristics of wild cherry.

Key words: reflection, wild cherry, morphological characteristics, environmental conditions, Bosnia and Herzegovina

EFFECTS OF PESTICIDES COMBINED WITH NANO-PARTICLES (NPS) ON GERMINATION ENERGY AND GERMINATION OF SEEDS OF CULTIVATED PLANTS

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ABSTRACT: Nano-particles (NP's) are due to their unique properties used in various fields, in medicine, technology, food production, environmental protection etc. One of the possible applications is by combining with pesticides, in order to lower their quantities and produce a better spatial distribution on leaf surfaces and enhance efficacy. Also, NP's have potential in remediation of contaminated soils with metals and metalloids. However, their impact on plants is not yet well studied. **The aim of the study was to assess biological effect of NP's alone and combined with imidacloprid on germination energy – GE and germination – G of seeds of ten agriculture plants** (maize, barley, sorghum, white mustard, cabbage, radish, cucumber, beans, sunflower and buckwheat). Bioassay was carried out according to a standard filter paper method (ISTA, 2011). **Insecticide Confidor 200-SL** (200 g/l of imidacloprid) and NP (4.05×10^{-2} mg/ml) were used in treatments: imidacloprid (0.3% – application rate) + NP; imidacloprid (0.15%) + NP; imidacloprid (0.075 %) + NP; control I – distilled water; control II – NP solution; control III – imidacloprid (0.3%). The significant inhibition of GE and G of sorghum, white mustard, cucumber and bean seeds was registered in treatment with the highest imidacloprid concentration+NP, while GE and G of white mustard seeds were significantly lower in the control III. However, in all treatments the minimum germination, according to the Regulation on the quality of agricultural seeds (Official Gazette 58/2002), was achieved.

Key words: nano-particles, imidacloprid, phytotoxicity, cultivated plants

SUBSTITUTION LOGISTIC MODEL AND DYNAMICS OF DIFFERENT GREEN HOUSE TECHNOLOGIES IN ALBANIA

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ABSTRACT: The principal application of logistical analysis in economics, mainly in the estimation of technology diffusion is the logistic substitution model. The purpose of the paper is the dynamic analysis of plastic, glass, heat and solar greenhouse technology using substitution logistic model. Agriculture is a crucial factor of Albania's economy. With suitable policies, assistance, and an appropriate rules and lawful infrastructure, it has the prospective to develop into a motor for the country's economic development and become competitive in foreign trade. Green house-grown vegetables can generate a favorable business, but it is a difficult and problematical investment. The substitution logistic model describes and gives an accurate forecasting of the vegetables-grown production in green house helping farmers in better managing of their business.

Key words: Logistic Model, Green house Technologies, Albania

PESTICIDE RESIDUE TESTING OF ORGANIC VEGETABLES

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ABSTRACT: In the Republic of Serbia there is a constant boom of organic farming. At the end of 2013 the organic farming covered 7455 ha out of 238 ha were involved in vegetable growing. The demand for organic products has significantly increased in recent years due to the rising awareness of health food and the protection of consumers and the environment. That is why the analyses of 61 organically produced vegetables were done in 2015. The validated method, based on the QuEChERS, sample preparation for more than 100 compounds with determination by LC-MS/MS were used for the analyses. As a maximum residue level of pesticides we used the orientation value for each pesticide which is 0.01 mg/kg and is applies to the original unprocessed product (EC 178/2002). Also it is very important to know that in organic products no more than total of two pesticides may be present. No pesticides were found in 63.29% of analysed sampled, while 17.27% were with the pesticide detections below the orientation value. Apart from analytical issues, the relationship between the detected and actual usage of pesticides is not that straightforward. The use of pesticides in organic production is forbidden and the detected residues, in all probability, come from soil, irrigation or drift.

Key words: Pesticide residue, organic vegetables

A POSSIBILITY FOR USING A MODIFIED NATURAL CLINOPTILOLITE AS FOOD ADDITIVE AGAINST LEAD INTOXICATION IN SMALL MAMMALS

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ABSTRACT: The industrially polluted regions are health hazard regions regarding the development of chronic heavy metal intoxication. Good substances for toxicant adsorption are those that can prevent the metals entering in the blood of animal organism. The hypothesis is that when heavy metals enter through the digestive tract, zeolites are one of the most suitable means for “trapping” of metal ions. The substantial role of the clinoptilolite as a factor essentially reducing Pb bioaccumulation is considered in an experiment with small mammals chronically exposed to lead. As a feed additive, clinoptilolites have been used so far in poultry and livestock to positively influence feces consistency, reduce diarrhea, bound mycotoxins and aflatoxins, and allow better performance of intestinal microflora.

The work presents a study of the effect of clinoptilolite, used as a food supplement, in conditions of Pb intoxication. Modified clinoptilolite KLS-10-MA was prepared and applied as food-additive in laboratory inbred ICR line mice, chosen as experimental animals. In the experiment the degree of the positive effect of this sorbent in the reduction of Pb bioaccumulation was explored. Evidences that clinoptilolite is practically non-toxic substance were presented. An application of such additives could be of great importance for human and animals suffer under heavy metals intoxication, and particularly with Pb, in order to protect the organisms.

Key words: clinoptilolite, food additive, lead intoxication

**MORPHOLOGICAL VARIABILITY IN TOMATO
(*SOLANUM LYCOPERSICUM*) FRUITS
FROM HEIR LOOM VARIETIES FROM MACEDONIA**

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ABSTRACT: The significance of the fruit morphology is important because it is a basis for further analysis of the true origin of the particular varieties. In this article, 20 genotypes of heirloom tomatoes originating from different parts of Macedonia are observed, especially the morphometrical characteristics of the fruits of the genotypes. Five fruit samples of every genotype were picked in their ripe stage in order the measurements to be performed. In this article, the results from weight of the fruit, stalk, exocarp and seeds will be presented. The evaluated data units are displayed in grams and millimeters. The results of the evaluation show a great level of variation between the genotypes, as well as a high variation among the population in a particular genotype. The evaluation results represent a good basis for further detailed evaluation and can be addition to the material needed for cross-breeding and development of new tomato varieties, as well as a basis for further development, protection and commercialization of the heirloom varieties that are subjected to this research.

Key words: tomato, morphology, variability

SCREENING OF DROUGHT AND HEAT TOLERANT HYBRIDS IN MAIZE (*ZEA MAYS* L.), USING SELECTION INDEX AND RANKING METHOD

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ABSTRACT: The present study aims at selecting maize hybrids with tolerance to drought and scorching heat. To this end, it has set up a studied experience at ARDS Simnic (Romania), in terms of two years with rainfall (2008/2009 and 2009/2010). On the basis of yields obtained in conditions without drought (Y_p) and in conditions of drought and scorching heat (Y_s), were calculated twelve selection indexes. The analysis of the correlation between studied indexes and yields showed that the yield under no stress (Y_p) and under stress (Y_s) was correlated significantly positive with the indexes MP, GMP and STI and consequently, the use of these indexes can lead to increased tolerance in both conditions. Screening for tolerance to drought of the studied hybrids using the ranking method, allowed the identification of hybrids with the highest tolerance, respectively: Cobalt, Thermo and Symba. Therefore, these hybrids are recommended to be used as sources of genes for improving the tolerance to drought and scorching heat of maize and cultivated in terms of the area of study.

Key words: correlation, rank sum, standard deviation of ranks, stress, yields

**THE COROLOGY, ECOLOGY AND PHYTOSOCIOLOGY
OF THE *AMBRÓSIA ARTEMISIIFÓLIA* L., INVASIVE ALIEN
PLANT IN THE SOUTH-WESTERN PART OF ROMANIA**

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ABSTRACT: The heavy anthropic activity has as a result the invasion of allochtones in the natural damaged ecosystems from Romania and the whole Europe. This fact has a negative impact over the genuine evolution and development of natural biocenosis. Invasive species are the real main threats for the agro- bio- diversity. They determine a huge loss in the agricultural production. Thus, the invasive plants have a negative impact over the agriculture and forestry. It may affect the entire natural inheritance of a country.

Ambrósia artemisiifolia L. produces great damages in the crops and not only. It is also a highly aggressive allergic species. The present work contains chorological, ecological and phytosociological surveys regarding *Ambrósia artemisiifolia* L. in the South-West of Romania. It is very widespread, both in urban and rural zones, in this part of the country. It can be recorded in crops, bushes, on the edge of the roads, on paths, close to yards, in parks and gardens, being a special problem for the native biodiversity.

Key words: *ambrósia artemisiifolia* L., alien plant, Romania

MINERAL COMPOSITION OF HAZELNUT (CORYLUS AVELLANA) VARIETIES CULTIVATED IN ALBANIA; DAILY MINERAL ELEMENT REQUIREMENTS TO CONSUMERS

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ABSTRACT: Albania, as a Mediterranean country, is suitable to the pedo-climatic conditions for hazelnut cultivation. In this study are analyzed two hazelnut cultivars *Visoka* & *Tonda Romana* cultivated. Main interest to the agronomic cultivation of the hazelnut tree is related to marginal condition this tree supports. Analysis by ICP-MS of mineral composition in the hazelnut fruits was conducted for samples from harvesting years 2013 and 2014. Mineral composition varied from 2.23 - 3.35% dried weight. Among to cultivars analyzed through the consecutive years was concluded that *Tonda romana* ($3.09 \pm 0.21\%$), has higher content compared to *Visoka* ($2.43 \pm 0.21\%$). *Visoka* & *Tonda Romana* mineral were analyzed: K, P, Ca, Mg, Na, Mn, Cu, Fe and Zn. Their values K, 680.2 mg/100 g; P, 290.1 mg/100 g; Ca, 114.44 mg/100 g; Mg 63.92 mg/100 g; Na, 6.81 mg/100 g; Mn, 11.04 mg/100 g; Cu, 1.82 mg/100 g; Fe, 3.71 mg/100 g; Zn, 2.05 mg/100 g. Hazelnut is considered an important mineral source of the consumers diet. Study present information for the daily mineral element requirements referred to 100 g hazelnut.

Key words: *Corylus avellana* L.; hazelnut; minerals; daily diet. Albania

**RESEARCHES CONCERNING YIELD AND MORPHOLOGICAL
AND BIOCHEMICAL CHARACTERISTICS OF SOME KALE
VARIETIES (*BRASSICA OLERACEA* L. VAR. *ACEPHALA*)
AND CHINESE CABBAGE (*BRASSICA RAPA* VAR.
CHINENSIS)**

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ABSTRACT: Cabbage leaves (Kale) is a sporadic species cultivated in Romania, although there are excellent climate and soil conditions for growing this species. In this view and considering the nutraceutical qualities of the species, was studied the behavior of three cultivars of Kale for a period of 3 years (2013–2015) in South-Western Romania. The experience was set up in randomized blocks, with 3 repetitions. The biological material was represented by two cultivars of Kale: Dwarf Green Curled and Nero Di Toscana and a variety of Chinese cabbage, cultivars 'Pak Choy White'.

The aim of the study was to know the agro-biological and biochemical properties of these cultivars of cabbage leaves to promote and introduce the cultivation of this species in Romania. After the study, it was found that the best production was recorded in Nero Di Toscana cultivar of cabbage leaves, 3.3 kg/m² and in terms of chemical composition, total sugar content was higher in Dwarf Green Curled of 3.11% and in vitamin C in cabbage Pak Choi of 120.23 mg/100 g f.m. Also, Cabbage leaves can contribute to the vegetable diversification variety, improving productivity and vegetable growers' incomes from Romania.

Key words: cabbage leaves, vitamin C, nutraceutical qualities

THE RISK OF ANTIBIOTIC RESIDUES IN CHICKEN EGGS IN KOSOVO

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ABSTRACT: Despite of beneficial effects of antibiotics in treatments of infectious diseases, antibiotic residues in meat, milk, eggs and another products can cause serious side effects for human health. It is clear that, antibiotic residues in food stuff, cause bacterial resistance, allergic reactions, toxicity, carcinogenic effects and change of natural micro flora of intestine in consumers. So, the aim of present study is detection of antibiotic residues contamination rate in chicken eggs. Improving the standard of food and consumption of eggs increased in recent years in Kosovo have brought the development of the poultry farms. The latter aim to increase their products not only through the quantity and quality of feed for poultry but treating them with veterinary pharmaceutical preparations with antimicrobial character in order to combat bacterial diseases in poultry, so the aim of present study is detection of antibiotic residues contamination rate in chicken eggs.

The study presented is focused on five regions of Kosovo: Prishtina, Prizren, Ferizaj and Gjilan. Performance characteristics for Qualitative tests, screening methods described in Decision 2002/657 / CE, were used for the evaluation and testing of samples of eggs. 65 samples of eggs are tested, using Premi® Test, a microbiological test screening based on inhibiting the growth of *Bacillus stearothermophilus*, a thermophile bacterium sensitive to many antibiotics and sulphonamides. Laboratory testing showed that 18.4% of egg samples analyzed resulted to be positive for the presence of residues. Concluding, the antibiotic residue in chicken eggs has to be monitored as routine test due to their side effects on human health.

Key words: Antibiotic residue, Chicken eggs, screening test

SALICYLIC ACID PRIMING EFFECT ON THE GERMINATION CHARACTERISTICS FOR BEAN (*PHASEOLUS VULGARIS* L.), UNDER INDUCED DROUGHT CONDITIONS

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ABSTRACT: Seed germination and seedling growth are critical steps during the growing season of plants. These steps can be affected by various a-biotic or biotic stress factors, finally resulting in a plant density reduction and thus of the production. Drought is one of the a-biotic factors that manifests strongly in many areas of the world, especially in arid and semi-arid areas. The priming of the seeds with salicylic acid (SA) can improve or not plant resistance to water stress according to the concentrations used. The objective of this study was to evaluate the effect of seeds priming on the germination percentage (PG) and growth parameters of bean seedlings after the 4 levels treatment with salicylic acid (SA) (0, 0.25, 0.75 and 1 mM) and 4 levels of sodium chloride NaCl (0; 89.9; 179.7; 269.5 mM). The results showed that the induced stress by different levels of NaCl has significantly reduced the proportion of germinated (PG) seeds and growth parameters of bean seedlings, except the fresh weight of the seedlings. Seeds priming with low levels i.e. 0.25 and 0.75 mM SA has significantly improved beans seedling growth parameters except the weight of the bean shoots.

Key words: beans seedling, plant resistance, growth parameters

FOOD EXPORTS AND EXCHANGE RATE IN ALBANIA: A GRANGER-CAUSALITY ANALYSIS

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ABSTRACT: Exports play an important role in the Albanian economy, influencing the level of economic growth, employment and the balance of payment. The exchange rate is an important economic variable influencing the export, import, and prices of products. This study is an attempt to evaluate the causal relationships among value of food, beverages and tobacco exports (in million Albanian lek, ALL) and exchange rate (ALL/Euro) in Albania by using time series data for the period January 2005 – December 2015. The long run relationships between exchange rate and food exports were explored by using co-integration analysis. Then a Granger-causality analysis has been carried out to assess whether there is a one- or both-sided causal relationship between the variables under consideration. The two macroeconomic series used are non-stationary, integrated at order one, and co-integrated. The results showed that there is a long run relationship between exports and exchange rates in Albania. The findings also showed that there is a significant relationship between the value of food exports and exchange rate; a one-sided causal relationship and exactly, exchange rate influences the food exports. These findings are useful for customers, farmers and policymakers.

Key words: stationarity, vector autoregressive model, Johansen test, vector error correction

QUALITATIVE AND QUANTITATIVE ANALYSIS OF AFLATOXINES IN RAW PEANUTS (*ARACHIS HYPOGAEA* L.)

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ABSTRACT: Aflatoxines are toxic cancerogenic secondary metabolites, predominantly produced by two fungal species: *Aspergillus flavus* and *Aspergillus parasiticus*. The toxicity of aflatoxines make them primary health hazard because of their occurrence in agricultural food crops. In order to detect presence of contaminants, usually occurring in very low concentrations of several $\mu\text{g/kg}$, precise analytical methods for detection and quantification are necessary, that have to be simple to carry out and specific, but mainly very sensitive.

The subject of this paper is qualitative and quantitative analysis of total aflatoxines ($\text{AFB}_1 + \text{AFB}_2 + \text{AFG}_1 + \text{AFG}_2$) in raw peanuts. The analysis has covered 78 samples of raw peanuts.

Preliminary qualitative assessment indicating the presence of contaminants was done using the method of thin layer chromatography, characterized by its simplicity, rapidness, but still sufficient accuracy to separate the contaminated samples. For quantification of aflatoxines, we developed a method of fluorometric spectroscopy. It is an effective procedure for quantification with analytical yield in the range 89.79-104.78%, correlation factor $R^2 = 0.9993$ and sufficiently low value of the limit of quantification LoQ of 2,1 $\mu\text{g/kg}$.

The analysis detected 23% of samples with concentrations of total aflatoxines above the permitted MRL, with average value of 2.6 $\mu\text{g/kg}$ and the maximum of 12.8 $\mu\text{g/kg}$.

Key words: aflatoxines, raw peanuts, TLC, fluorometry

ECOLOGICAL ENTREPRENEURSHIP – OLIVE PRODUCTION POTENTIALS IN MONTENEGRO

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ABSTRACT: In this paper the influence of environment on the quality of olive oil was examined. Land from olive groves located in the five locations in three towns at the coastline in Montenegro and olive oil produced from these olive trees was investigated.

Land testing included the following parameters: pH, contents of selected metals, polycyclic aromatic hydrocarbons (PAH), PCB, phenolic herbicides, triazines, carbamates, dithiocarbamates, chlorophenoxy compounds. Analysis of land on the one location (Bar) was shown increased presence of As, Cr, Ni in regard to maximum allowable concentration. Similar results were got on the second location (Bar) where was found increased presence of Cr, Ni and F.

The tested oil samples obtained from these locations do not satisfy the quality standard prescribed norms. Namely, oil testing included the following parameters: the content of free fatty acids calculated as oleic acid; water and other volatile matter content; peroxide, saponification and iodine number; reaction to rancidity; refractive index (nD 40 ° C), as well as contents of metals and pesticides. These results present need for modernization of traditional olive production in Montenegro, what needs intensive national and EU funding and expertize.

Key words: Ecological entrepreneurship, olive production

DISTRIBUTION OF FIRE BLIGHT *ERWINIA AMYLOVORA* AND ITS CONTROL AT THE DISTRICT OF TIRANA, ALBANIA

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ABSTRACT: Fire blight is a bacterial disease caused by the bacterium *Erwinia amylovora* (Burrill) Winslow et al and is considered as one of the most dangerous diseases of pome fruit worldwide. It is listed as a quarantined disease Plant Protection Directive of the European Union and is one of the main pests in the list A2 European Organization Plant Protection (EPPO).. It destroys apple, pear, quince crops and other species of Rosaceae family. Seeing its devastating effects, huge economic damages and higher control costs, it was attained a monitoring of this disease in the district of Tirana for 2015 year. During vegetative period of pome fruits, apple, pear and quince observations have been conducted in orchard production, the orchard in production and the production of planting nurseries. From these observations have resulted to suspicious symptoms of the disease considering it as the first step of the pathogen diagnosis. During this period, plant samples were collected with suspicious signs of the disease, which were brought to the laboratory and underwent laboratory tests to determining the final identification of the pathogen *Erwinia amylovora* on Laknas and Zhurje vilage. Then were conducted control measures with Cu fungicides reducing bacterial infection till 30 %.

Key words: Fire blight, observation, *Erwinia amylovora*

MYCOTOXIGENIC FUNGI PRESENCE IN WHEAT AND MAIZE IN DIFFERENT REAGIONS OF ALBANIA

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ABSTRACTS: Mycotoxins are secondary metabolites produced by mycotoxigenic fungi. Their presence in food and feed, may have hazardous implication in the humans and animals health. The aim of this study was to analyze the presence of mycotoxigenic fungi in cereals harvested in Albania. Microbiological evaluation was accomplished in different media for yeasts and moulds contamination was conducted. This method is conventional, because it gives approximate results, but it helps to a judgement on the density of mycotoxigenic fungi and other microorganisms. Mold isolation, identification and enumeration of the colony forming units (CFU), as well as identification according to species was conducted.

For each sample was prepared four dilutions with 3 parallels and after incubation at 26°C, the colonies were counted. In this study we will present the results of third and fourth dilution, in which all colonies were clearly obvious. The concentration of microorganisms vary $0.5\text{--}34 \times 10^3$ cfu/g in wheat samples and vary $80\text{--}500 \times 10^4$ cfu/g in the maize samples. Moulds, identification and classification revealed that species there was noticed mainly Ascomycete classes especially *Aspergillus*, *Penicillium* and *Fusarium* species. In conclusion, wheat samples which have been analyzed were within standards, while maize samples were not within standards.

Key words: Mycotoxigenic fungi, Yeast, Wheat, Maize, Albania

MONITORING OF GROWTH-PROMOTING HORMONE RESIDUES IN BOVINE MEAT IN KOSOVO (GROUP A₄ ZERANOL)

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ABSTRACT: The use of substances with anabolic and hormonal activity in stock farming poses a serious food safety risk. The lack of a unique policy framework and standards among different countries represents an enormous drawback regarding the prevention of human exposure to growth-promoting substances. Kosovo Competent Authority adopted the National Plan for Official Control and Residue Monitoring Plan, in compliance with European Community, which strictly prohibits the use of Group A substances in animals used for food production, as well as consumption of meat containing Group A residues, according to the Directive 96/22/EC. The purpose of this Publication is to present only Group A₄ substances, so as to detect the Zeranol parameter. In order to assess the occurrence of residue levels in the above-mentioned parameter of fresh bovine meat, samples from 30 animals were collected in five regions in Kosovo, in various slaughter houses. The samples were handled in accordance with the sampling Standard Operating Procedures, and previously treated according to the standard protocol. Thirty samples were tested so far by means of competitive ELISA, as a screening method. The tests were performed at the Institute for Food and Veterinary in Skopje, Macedonia. One sample resulted as suspected threshold 0.52 µg/kg, so will be confirmed by another confirmatory method in another reference laboratory. The conclusion is that an increased frequency of residue monitoring through traceability mechanism on farm level is planned and intended.

Key words: Meat; Residue; Zeranol; Elisa.

EVALUATION OF INCIDENCE OF DDT [1,1,1- TRICHLORO- 2,P2-DI (4-CHLOROPHENYL) ETHANE] IN ANIMAL FAT

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ABSTRACT: This paper shows the results obtained from the monitoring of chemical contaminants such as organochlorine pesticides in animal fat in Albania. The samples tested were collected from veterinary inspectors from slaughter houses in some of the main districts of Albania. These results have shown once again the persistent contamination of all surroundings with these persistent organic pollutants, even if there is a long time since their use in the past. Because of their strong lipophilic nature DDT and its isomers as well as their tendency of passing up onto the food chain, they are still encountered in animal fat tissues, though at a low level but at any case detected and identified as such. The analysis was based on a modified QuEChERS method which consists in ethyl acetate extraction followed by freezing out as a first cleaning up step and followed by a second cleaning up using PSA/C-18. The extract then transferred in glass vial and further injected in GC system coupled with a MS/MS detector. The results confirmed that major part of samples tested (74.5 %) showed a detectable contamination by p-p' DDE (< 20 ng/kg), although none of the results exceeded the maximum permitted level established from EU Regulations.

Key words: organochlorine, persistence, pesticides, DDT, animal fat

THE IMPORTANCE OF THE IMPLEMENTATION OF HYGIENE PRACTICES IN FOOD BUSINESS OPERATORS

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ABSTRACT: In the food sector, to ensure the safety and health of citizens, essentially means ensuring the hygiene of foodstuffs. But apparently this is not always possible to standardize all products and behaviors of people who manipulate the product, the practices necessary to ensure the hygiene of the final product. This occurs due to the presence of different situations, as well as the rapid evolution of products and processes processing. Assessing environmental hygiene in the food business, it is essential for the quality of the final product. Microbiological contamination can be transferred to food during preparation and treatment phase (secondary contamination). This strongly affects two important values: health and accelerate the emergence of negative phenomena in food.

Therefore it is necessary that any establishment within the sector, food industry, with the support of organizations operating in the same field (Control Authority, Research institutes, universities as centers of education, associations of consumers, etc.), to develop a specific analysis of operating conditions to identify the manner in which ensure hygienic control their process. This paper describes ways of applying analytical verification, conducted with the aim of a correct practice of HACCP (Hazard Analysis Critical Point) in the food business (products of animal origin). The determinations made were based on the necessity of the application of this methodology opposite the current situation in plant transformation products of animal origin in Albania.

Key words: HACCP, microbiological control, swabs, air, surfaces, hands

ANALYSIS OF VITAMIN A& E IN HUMAN MILK AND INFANT FORMULAE FOR DIFFERENT STORAGE CONDITIONS

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ABSTRACT: Storage of human milk for further use in infant feeding, now is more frequently, as a result of the social- economic activities of breastfeeding mothers. Expressed breast milk is usually stored frozen for consumption at a later time. Currently, human milk is stored in containers with headspace, where the removal of oxygen should minimize the oxidative effects in compounds of stored breast milk during shelf life, and improve nutritional quality.

The purpose of this study was to analyze the quantity of some vitamins and compare any variation in vitamin A & E in milk frozen in two different containers; one with air in the headspace versus vacuum sealed storage containers. Vitamin A and E content were analyzed using high-performance liquid chromatography (HPLC). Fresh, mature, human milk donated by 4 women with healthy infants was used for analysis. Infant formula as powder and rehydrates liquid was also analyzed. According the results of analyses, the values of infant formula nutrient are generally higher than the human milk values.

Key words: Vitamins A&E, high-performance liquid chromatography, human milk, infant formula

DETERMINATION OF CHLORPYRIFOS RESIDUES IN LETTUCE BY GC MS/MS

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ABSTRACT: Chlorpyrifos is one of the extensively used insecticides in different crops. The experiment was conducted in a greenhouse, near Durrës, where the lettuce (*Lactuca sativa* spp) was subjected to a treatment with two different concentrations of chlorpyrifos, based on the maximum and minimum recommended concentration, respectively 0.1% and 0.075%. Samples were collected every 5 days for a period of 21 days after treatment. Pesticide residues were extracted with ethyl-acetate and then they were analyzed using GC MS/MS. The method was validated, resulting in parameters conform to the regulation, and the LOQ was 0.01mg/kg and the recoveries for the tested pesticide ranged from 70% to 120%, with a relative standard deviation (RSD) lower than 20%. After pre-harvesting day, the analyzed samples showed that the concentration of chlorpyrifos in lettuce is higher than the tolerable value of MRL. This method is suitable for the analysis of Chlorpyrifos residues in lettuce with high sensitivity and accuracy. The monitoring of pesticides in food should be considered and performed always to ensure the product safety and the quality of consumer's health.

Key words: Pesticide residues, chlorpyrifos, validation, lettuce

COMPARATIVE STUDY ON DIFFERENT NATIVE OLIVE CULTIVARS FROM ALBANIA

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ABSTRACT: The present study was designed to determine the fatty acid composition and total phenolic contents of Albania native olive cultivars (*Kalinjot*, *Ulliibardhe Tirana (Bianco di Tirana)*, *Karre*, *Nisiot*, *Kotruvs*, and *Kokerrmadh Berati*). The characterisation of fatty acid profiles from different olive cultivars is usually proposed as a methodology to differentiate these products according to their cultivar and geographical origin. These cultivars have been selected based on their economic interest since they together contribute by approx. 85% of olive trees planted in Albania.

Results on fatty acid (FA) profiles exhibit an oleic acid content variation, from $73.94 \pm 0.02\%$ (*Karre*) to $80.07 \pm 0.04\%$ (*Nisiot*), values which are within the normal range for such FA. The content of linoleic acid varies from $4.10 \pm 0.01\%$ (*Nisiot*) to $9.31 \pm 0.01\%$ (*Kotruvs*), whereas the content of linolenic acid varies from $0.45 \pm 0.01\%$ (*Karre*) to $0.72 \pm 0.02\%$ (*Kalinjot*). All 6 olive varieties revealed moderate levels of palmitic acid, which varied between $9.94 \pm 0.02\%$ (*Nisiot*) and $12.21 \pm 0.02\%$ (*Kotruvs*).

The Total Phenolic content for the studied olive cultivars varied from 63.02 ± 5.63 (Ulliikuq) to 445.03 ± 16.83 mg/kg olive oil (Ulliibardhe Tirana); such variation may reflect different antioxidant capacity among olive cultivars.

Key words: Albanian Native Olive Cultivars; *Kalinjot*; Fatty acid; Polyphenol content

MOISTURE DIFFUSIVITY: LITERATURE DATA COMPILATION FOR POTATO AND APPLE

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ABSTRACT: The moisture diffusivity of food materials is a thermophysical properties which is include in mathematical models for modeling of drying processes. The literature data of moisture diffusivity of food materials are inconsistent and unreliable because effect of the applied methods for the experimental determination, the use of different methods of analysis and variation in composition and structure of the material. In this paper a literature data of for moisture diffusivity of potato and apple were selected and presented. For this purpose literature search in international food engineering and food science journals was made.

Key words: moisture diffusivity, potato, apple

EFFECT OF WATER DEFICIENCY ON PHYSIOLOGICAL AND CHEMICAL PROPERTIES OF PEPPER GROWN IN GREENHOUSE

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ABSTRACT: The cultivar Jalapeno pepper (*Capsicum annuum* var. annuum) was used in this research. The experimental design was split plot with five replications and four water restriction levels (control, 0%, 25%, 50%) were used. The research was made in a cold plastic greenhouse at Namık Kemal University, Agricultural Faculty, Department of Horticulture. After planting, plants were grown in normal growing conditions (hoeing, watering and fertilization) for a month and water restriction treatments were applied from the second month onwards. The plants development and other parameters were recorded. During the experiment leaf water potential (MPa), leaf relative water content (%), membrane damage index (%), total chlorophyll content (SPAD) and leaf temperature (°C) were measured. Artificial draught stresses made by water restrictions affected the growth and development of plants badly. The normal growth was observed in control (100% water). The plants watered with 50% were affected less than 25% and 0% water treatments. The treatment (25% water) gave noticeable stress symptoms, leaf wilting, reduced growth and development and yield reduction. The treatment (0% water) caused reduced growth, small leaf, wilting, drying, reduced yield and gradually the death of plants. As a result, leaf water potential, leaf relative water content and total chlorophyll content were the highest in 100% water treatment. The lowest leaf damage, membrane damage and leaf temperature were determined in 100% water treatment as well.

Key words: Water stress, leaf water potential, relative water content, total chlorophyll content, membrane damage index

**THE EFFECTS OF DIFFERENT WATER DEFICIENCY
ON PHYSIOLOGICAL AND CHEMICAL CHANGES
IN CAPE GOOSEBERRY (*PHYSALIS PERUVIANA* L.)
WHICH WERE GROWN IN GREENHOUSE CONDITIONS**

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ABSTRACT: *Physalis peruviana* L. was used in this research. The experimental design was randomized block with 4 replications and 5 water application (control, 0%, 25%, 50% and 75%) the experiment was made in a cold greenhouse to avoid the risk of rain in open. During the experiment, leaf water potential (MPa), membrane damage on the leaves (%), leaf temperature (°C), total phenolic matters (mg/100 g) and total chlorophylls (mg/l) in the leaf were measured. According to the results, the control application gave less total chlorophylls (41.23 mg/l) and total phenolic matters (285.77 mg/100 g). As the water level decreased, membrane damage on the leaves (% 76.36) and leaf temperature increased and the levels were the highest in the 0% water deficit. The stress of water affected badly the growth and development of the Golden Berry. It was found that the plants were given 100% water (control) and 75% water level were not affected by water stress but 0%, 25% and 50% water level applied plants could not overcome the stress and could not sustain the growth and development.

Key words: Cape gooseberry, leaf water potential, membrane damage on the leaves, total phenolic compounds, total chlorophyll content

CELIAC DISEASE DIAGNOSIS IN CHILDREN – A CASE STUDY

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ABSTRACT: Celiac disease (CD) is a common autoimmune disorder, induced by the ingestion of gluten proteins present in wheat, barley and rye. In our practice the Celiac disease is little known or accurate under diagnosis. Disease prevalence of Celiac is growing according to different studies. In our country there is no comprehensive study but we studied the prevalence groups played less than 2%. Celiac Disease is growing and we are in front of the fact called "Celiac iceberg". It happens quite often that repeated and prolonged diarrhea associated with edema and malnutrition is underestimated but it may be celiac disease. Our Case: E. L patient aged 2 years was admitted to hospital in March 2013 with a diagnosis of Ascitis and Edema. History of the disease: She has a history of about 6 months of being pale and tired. In the last 3 weeks she manifested diarrhea and edema in both her feet, She is the only child in the family. Physical examination: The general condition of the child is relatively ill, tired, reacts slowly, dry mouth. Abdomen is Voluminous, Distended, Hepa under the costal border 3–4 cm, the inferior extremities, edema. The child's weight is 11 kg. Immunologic examination (Anti tissue) was positive for CD. In the recent weeks the child alongside diarrhea and edema had heart complications with perikarditeksudativ which is a rare and serious complication of CD that made the patient pass a serious condition. The conclusion is that it should not be underestimated the repeated and prolonged diarrhea in children under 3 years old which are also accompanied with mild edema. Failing to react and take measures quickly can result in serious complications.

Key words: Celiac Disease, gluten, edema, tired, pale

ENVIRONMENTAL HEALTH AND ECONOMIC VALUE

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ABSTRACT: Research offers a broad body of evidence about human health, welfare and benefits of improved functions related to nature experiences nearby cities.

We demonstrate the numerous possibilities for future research efforts that connect the subway nature, human health and welfare outcomes, and economic values. In the review the literature on urban health and welfare based on the nature of the benefits and provide a schematic classification, then propose economic potential values associated with nature metro services.

Economic assessment of the benefits derived from urban green systems has been mainly undertaken in the fields of environment and natural resources economy, but have not usually addressed to health outcomes. Urban trees, parks, gardens, open spaces and other elements of nature nearby, called collectively the subway nature; generate more positive externalities that have been largely negligence economy and urban policy. Here, a range of health benefits have been identified and presented, including the acquisition and beneficiaries. Although the meaning of these benefits has not yet been expressed repeatedly, and although it is likely that attempts to link ecosystem services urban and economic values will not include all expressions of the cultural or social development of new approaches to interdisciplinary integrate environmental and economic health disciplines are needed.

Key words: Metro populations health nature.

PHYSICO-CHEMICAL ANALYSIS OF DRINKING WATER ITS IMPACT ON HEALTH IN SEVERAL VILLAGES IN THE MUNICIPALITY OF MITROVICA NORTH

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ABSTRACT: Mitrovica North lies in the northern part of Kosovo. It is known as the center of the largest mining and industrial and polluted not only in Kosovo, but also for the European dimension.

Environmental pollution in Mitrovica North surroundings is due to the exploitation of mineral resources (It is estimated that nearly half of Kosovo's mineral reserves 49.7% is concentrated in the vicinity of Mitrovica), intensive development of ferrous metallurgy, chemical industry and above all as wrong location due to industrial facilities and outdated technology which is used in industry. Large number of polluting facilities in a relatively small space, high rate of exploitation configuration of the terrain with wind rose, inadequate urban choice, etc., accompanied by a high degree of environmental pollution, thus making the population lives in Mitrovica North and in its surrounding settlements.

This paper is the work for the purpose of sensitization of the public and wider state at this moment in the municipality, and the actions required to be taken for more effective monitoring of pollution tracking. To review data refer to the National Institute of Public Health in Mitrovica: evaluation results in the period 2015 through the measuring points indicate an excess of the allowed maximal concentrations of water pollutants not only residential areas, but also areas industrial. To review data were taken at the National Institute of Public Health in Mitrovica.

The main purpose of this study was to identify some physical and chemical characteristics of drinking water in some villages in the municipality of Mitrovica North. On the basis of these analyzes is tested access to drinking water resources is taking this water.

Key words: natural mineral water, recreational and therapeutic purposes

**LONG-TERM EXPOSURE IN BALLSH OIL REFINERY:
AN INVESTIGATION ON OCCUPATIONALLY EXPOSED
WORKERS WITH SPECIAL REFERENCE
TO CARDIOVASCULAR DISEASES**

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ABSTRACT: The oil refinery in Ballsh city is the biggest refinery in Albania and it produces up to one million ton of oil per year. It is located along Gjanica River in southwestern part of Albania. Petrochemical industries have been identified as an important source of emissions for wide-range chemical substances, including POPs. Not only workers, but also non-occupationally exposed population living in the neighborhood of these plants, may be potentially exposed to chemicals released during the production and refining of crude oil and derivatives. The aim of our study was to investigate the health effects of long-term exposure of the workers through blood test analyses, like: total cholesterol, low-density lipoprotein cholesterol (LDL), high density lipoprotein cholesterol (HDL), triglycerides and phospholipid. Total serum lipids value was calculated, as well, as a risk parameter for cardiovascular diseases. 934 male workers from this refinery, aged 19-69 years, were the target control group of this study. Preliminary results showed increased values for measured parameters, which play a large role in determining the risk of heart diseases in these workers. The data were interpreted according to age. A statistical analysis of the obtained data has also been done.

Key words: oil refinery, POPs, total lipids, cholesterol, cardiovascular disease

THE EPIDEMIOLOGY OF HEPATITIS C VIRUS GENOTYPES IN ALBANIA

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ABSTRACT: In South-eastern Europe, similar to other post-socialist regions on the continent, the prevalence of hepatitis C is increasing. The epidemic of Hepatitis C virus infection is continuously evolving in Albania such as in Europe. Until now the intravenous drug use has become the main risk factor for the HCV transmission, prevalent infections have increased and genotype distribution has changed and diversified. Meanwhile in Eastern European countries epidemiological data are limited such as in Albania. Through this study, we furnish more information about the prevalence of HCV virus genotypes in Albania. In this study we enrolled 120 subjects HCV RNA positive during the period 2007-2015 with an median age of 50 years old from the Public Health Institute and National Blood Transfusion Centre, Albania. They belong to different groups of population such as general population, IDU (intravenous drug users), thalassemics, patients under hemodialysis treatment and pediatric age. The HCV virus genotype 1 is the most frequent with 33% (40/120), while genotype 1b is found in 28% (34/120); both of them are presented more over in the general population group. Other genotypes noticed are 2c with 8% (15/120) and genotypes 3 and 4 with 5% (6/120) each of them. Among subgenotypes we observed 3a in 4% (5/120) and 4c in 0.8% (1/120) of the subjects enrolled in the study. It's important to mention that genotype 3 is more frequent among IDU and thalassemic patients, while genotype 1 and 4 are more present in hemodialysed patients. In the pediatrics group we find only genotype 1. Even though limited data, we noticed that HCV virus genotype 1 is the most frequent in Albania such as in other countries of Central-South Europe. Parenteral route of transmission of different subtypes of this virus in Albania is very evident, but further epidemiological studies are required.

Key words: HCV, Genotypes, Albania

ANALYSIS OF ON-BOARD IMAGING SYSTEM VERIFICATION IN RADIOTHERAPY

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ABSTRACT: The accurate dose distribution delivery in three dimensions is one of the most important issues in radiotherapy. To improve the effectiveness of the treatment and reduce the side effects, tumor targeting should be precise as much as possible, because patients, tumors and normal tissues all move. When radiotherapy treatment uncertainty is quantified, movement due to changes in patient setup, internal organ movement and movement associated with breathing should be taken into account. Operating with three axes of motion, On-Board Imaging system (OBI) detects these movements using high resolution, low-dose digital imaging.

The paper presents OBI-verification in radiotherapy, by data analysis for average translational shifts performed for treatments in different regions (abdomen, thoraces, head & neck). OBI device is used just before treatment, when the patient is in the treatment position. Patient is on-line repositioned by visualizing bone-soft tissue anatomy in kV-kV — cone-beam CT images respectively. The average shifts and uncertainties are presented in three directions (vertical, longitudinal and lateral) for each patient during the whole radiotherapy treatment, and for all patients into the same treatment region. In conclusion, analysis of provided results is performed, in aim to improve the effectiveness of treatments and to reduce side effects by reducing treatment margins.

Key words: radiotherapy, on-board imaging, verification

SMALL FIELD DOSIMETRY IN RADIOTHERAPY

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ABSTRACT: Technological improvements in radiotherapy machines using small fields (SF) have improved mechanical accuracy & stability as well as dosimetric control. Small fields are nonstandard radiation fields, for which reference dosimetry cannot be reliably performed using the existing protocols. Field size definition, difficulties in accurate measurements, modeling of SF dose calculations in TPSs, calibration protocol reference conditions achievement are some of the challenges in SFdosimetry. Small and IMRT field dosimetry can be complex –large perturbation effects that can have significant impact on reference dosimetry procedures and output factors. Comparison between different detectors provides valuable information.

The aim of this paper is to show the differences into dose profiles and depth dose measured in the same conditions for standard and non-standard radiation fields. Measurements are performed using detectors with different sensitive volumes. Beam quality and symmetry&flatness are analyzed. Results show: the differences for SF are obvious, on the edge and in the penumbra region into profiles and in the build-up region into depth dose curves. To avoid these uncertainties, for static SF where reference conditions cannot be met and for IMRT fields where delivery conditions are far removed from calibration conditions, the new formalism should be implemented.

Key words: small field, calibration, symmetry, flatness, beam quality

**ADDING FLORES PATHOGENS, ASSESS, IDENTIFY
MICROBIAL CONTAMINATION AND IDENTIFYING
NEW STRAINS SURGERY CLINICS DURING
MARCH 2014 – DECEMBER 2015.**

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ABSTRACT: Hospital environment plays an important role in being a reservoir for pathogens microbes, resistant microorganisms and a suitable environment for the transmission and spread of Infection Nosocomial pursuit of health personnel and the community for visitors. The combination of the survival of flora pathogens with hospital environments, as well as the transmission of microorganisms from surfaces, other elements or bodily fluids from one person to another constitutes one of the most frequent incidences of nosocomial infections.

Purpose: To evaluate and highlight microbial contamination and new strains in surgical environments, identify areas "reservoirs" of microbes that may play a role in the emergence of a nosocomial infectious episode in development and promote control of disinfection and sterilization procedures, through medical staff awareness to reduce hospital infections.

Methodology: The study was conducted during the period March 2014 – December 2015 and included several surgical clinic of the University Hospital Center (new clinic I Surgical, Pediatrics, Onkologjic, Ophthalmology, Faciali, Otorino-Laringologjia, Cremation-Plastics, Urology, Clinic II surgical, Emergency surgical), Maternity No. 1, Maternity No. 2 the serviceman surgical Kukes, Gjirokastra, Vlora, etc.

Results: For the tabulation and evaluation of the samples we analyzed was relied International Standards New CDC guidelines, the World Health Organization National Nosocomial we Surveillance NNIS infections, HPA Health Protections Agency, the WHO Global Strategy for Containment of Antimicrobial. Of the total 650 samples /92 microbial strains isolated, *E. coli* 20.6 %, *Staphylococcus aureus* 16.3 %, *Pseudomonas Auregnosa* 15.2 %, *Klebsjela Pneumonia* 18.4%, *Penicilium* Mushrooms 15.2%, *Proteus* 8.6%, *Acinetobacter Bawmani* 3.26%, 2,17%

strain Pantoea a class Enterobacteria which is broadcast Hospital Infection.

Recommendations. Implementation and rigorous implementation of all elements of the Clinical Protocol for the Control of Hospital Infections Prevention.

Key words: microbes, pathogens, strains, nosocomial contamination.

PREVALENCE OF ANEMIA IN SHKODRA DISTRICT

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ABSTRACT: Anemia defined as a low blood haemoglobin concentration. This disease is more prevalent in developing countries and considered of public health significance. Anemia prevalence is highest in preschool children, pregnant women and also elders. While the etiology of anemia is multifactorial, iron deficiency is the most commonly recognized nutritional cause. The aim of this study was to estimate the prevalence, number of persons affected and factors associated with this disease in Shkodër district. We have analyzed data from the longitudinal medical record reviews of 180 persons who received medical care from January 2013 through April 2015 in clinics and hospitals in Shkodër district. We have used a standardized questionnaire to collect our data. Software SPSS version 16 was used to calculate the data. Each hemoglobin level of <10 g/dL were evaluate as an anemia case. The prevalence of anemia was 18.3% in all age groups. The min age was 1 years old and max 88 years old with average 32.7. Prevalence to men resulted 5.5% and to women 12.8% with significance level between them for $p < 0.05$. We found a significance associate between demographic factors and other risk factor related with anemia such as malnutrition, family history and complication of other disease.

Conclusion: Prevalence of anemia in our study resulted to be very high. This prevalence is concentrated more in preschool-aged children, pregnant women and elder persons. It is a major problem with impacts on social and economic development of our life. Early detection and effective management of anemia in pregnancy can lead to substantial reduction in under nutrition in childhood, adolescence and improvement in adult height.

Key words: Anemia, prevalence, Shkodër

PREVALENCE OF HYPERTENSION AND RELATION TO CLASSICAL RISK FACTORS AMONG HUMAN POPULATION OF SHKODËR, ALBANIA

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ABSTRACT: Hypertension is one of the four classical risk factors for cardiovascular disease. The prevalence of hypertension is increasing rapidly in developing countries more in urban areas due to changing life style and increasing longevity of hypertension. The aim of this study was to evaluate the prevalence of hypertension and associated risk factors among urban population (average age was 65.22 with min and max age from 21 years to 88 years) of Shkodër district of Albania. Systematic random sampling was used in our study. Each participant was interviewed by using a standardized questionnaire. Data was analyzed using SPSS version 16. Proportions and chi square test were used. Out of the 152 individuals the hypertension prevalence resulted to be 46.1% in both sex men and women, but the prevalence of hypertension were more highest to men compared to female 28.3% and 17.8% respectively with no significant association between them ($P=0.95$, for 95% CI: 0.70 to 1.43). This prevalence is increased with age and peaking at 45–55 years in females and >55 years in males. No significant association has been seen between age groups. About the lifestyle and other important factor risk for hypertension can be mention that a significant associate were been seen for smoking, obesity, physical activity and family history.

Conclusion: The prevalence of high blood pressure among adults of Shkodër district is high. We think this is result living in difficult financial conditions and constant stress due to the difficulty at life. More life style factors are significantly associated with hypertension. So there is an urgent need for calls attention especially in the elderly.

Key words: Prevalence, Hypertension, risk factors, urban, Shkodër

DETERMINATION AND EVALUATION OF MYCOTOXINS IN FOOD, NEEDS OR NECESSARY?

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ABSTRACT: Mycotoxins are secondary metabolites of molds that have adverse effects on humans, animals, and crops that result in illnesses and economic losses. Aflatoxins, ochratoxins, trichothecenes, zearalenone, fumonisins, tremorgenic toxins, and ergot alkaloids are the mycotoxins of great agro-economic importance. Mycotoxins can be classified as hepatotoxins, nephrotoxins, neurotoxins, immunotoxins, and so forth. Cell biologists put the mycotoxins into groups such as teratogens, mutagens, carcinogens, and allergens. Exposure to mycotoxins is mostly by ingestion, but also occurs by the dermal and inhalation routes. The diseases caused by exposure to mycotoxins are known as mycotoxicoses. All mycotoxins are low-molecular-weight natural products (i.e., small molecules) produced as secondary metabolites by filamentous fungi. Mycotoxins usually enter the body via ingestion of contaminated foods, but in the case of toxigenic spores and direct dermal contact are also important routes. **Aims of the study** was to elaborate the importance of determination and examination of mycotoxins in food in R. Macedonia. **Material and methods:** Therapeutic methods for detection and measurement of mycotoxins are ELISA, LFD, FPIA and others. They are basic methods for evaluations of mycotoxins in food. **Conclusion:** Quality assurance of data generated is highly important to reference laboratories monitoring cereals in food or feed, as inaccurate results could have dire consequences for public health or the economy.

Key words: mycotoxins, food

POSTER SECTION

3

**RENEWABLE ENERGY RESOURCES
AND MANAGEMENT OF NATURAL
RESOURCES, GREEN SMART CITIES /
SOCIETIES – GREEN ARCHITECTURE
AND LANDSCAPE DESIGN,
LEGAL FRAMEWORK**



ALKALINE CATALYTIC APPLICATION IN THE PRODUCTION OF BIODIESEL FROM VEGETABLE OILS

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ABSTRACT: The predicted shortages of fossil fuels and related environmental concerns have recently attracted significant attention to scientific and technological issues concerning the conversion of biomass into bio-fuel. First-generation biodiesel, obtained from vegetable oils and animal fats through the trans-esterification process, relies on commercial technology and rich scientific background, though continuous progress in this field offers opportunities for improvement.

This paper focuses on new catalytic systems for the trans esterification of oils to the corresponding Methyl/Ethyl Esters Fatty Acids (FAME/FAEE). Trans-esterification of edible oils, produce fatty acid alkyl esters (biodiesel) and glycerol. The objective is to convert vegetable oils into biodiesel using an alkali catalyzed transesterification process. Sunflower is one of the leading oilseed crops, cultivated for the production of oil in the temperate region of the world. The special role of the catalyst as a key to efficient technology is outlined, together with the other important factors that affect the yield and quality of the product.

From the results it was clear that the produced biodiesel fuel was within the recommended standards of biodiesel fuel. It has also been considered as an important crop for biodiesel production.

Key words: biodiesel, transesterification, alkali catalyzed, vegetable oil.

TREATMENT POSSIBILITY TO USE SOLAR PHOTOVOLTAIC SYSTEMS IN PUBLIC LIGHTING IN THE MUNICIPALITY OF MITROVICA

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ABSTRACT: Public streets lighting have a great importance and is necessary as it affects the increase of security and quality of life of citizens, but as an institution is also a standard that must be met to EU Directives.

From the current situation it appears that the public lighting in the streets of Mitrovica are not in good working condition because the system is outdated and bulbs have large consumption of electricity capacity. Consequently there are very large expenditures of energy and investments in maintenance through which are affected the municipal budget. With a proposed technology to replace the current bulbs by the source of renewable solar energy with photovoltaic system, the supply will be independent of network system of public supply with electricity through which there will be neither electricity expenses nor investment in maintenance thus affecting a significant reduction the amount of carbon dioxide that is released into the environment.

Key words: public lighting, solar-photovoltaic, environment, electric bulbs, cost.

PHOTOVOLTAIC MAXIMUM POWER POINT TRACKING METHOD IMPLEMENTATION IN LABVIEW

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ABSTRACT: In recent years, due to the rapid depletion of conventional energy resources and the ever-increasing energy demand, alternative energy sources and their optimal utilization have become a focal point in the field of energetics. Photovoltaic (PV) power generation technology specifically, has seen major advances in the past two decades, enabling its widespread use in both industrial and domestic applications.

Maximum power point tracking (MPPT) is a technique used with charge controllers to maximize the power output of a photovoltaic system. This paper will present a maximum power point tracking (MPPT) algorithm for a photovoltaic system and an implementation of the algorithm as a virtual instrument in the graphical programming language LabVIEW. The algorithm used is based on the incremental conductance method of maximum power point tracking. A theoretical outline of the method will also be presented. The virtual instrument will be used to control the output power of a simulated model of a photovoltaic panel and the simulation results will be presented will also be presented, considering its advantages and disadvantages.

Key words: MPPT, Incremental conductance, PV system, LabVIEW

FEASIBILITY STUDY OF LIGHT REPLACEMENT AT FEEIT

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ABSTRACT: Light Emitting Diodes (LEDs) have several advantages over other lighting techniques, such as low heat output, long lamp life, small size, energy savings and durability. They also occupy extraordinary design flexibility in color changing and dimming. These features have made LEDs popular for commercial usage in recent years.

In this paper the current lighting in Faculty of Electrical Engineering and Information Technologies (FEEIT) in Skopje, is analyzed in detail. Some of the key parameters measured and calculated are the average luminance and power consumed by the fluorescent lights in some Faculty lecture rooms which are mostly used during the day. For each type of fluorescent light a proper LED replacement is suggested, placed on the same spot as previous, which reduces replacement costs. The technical analyses are made in theDIALux 4.12 software package. The suggested solution introduces a significant energy and money savings per year, improving the working conditions at the same time.

Key words: fluorescent lighting, LED lighting, payback period

BINARY CO-GENERATION POWER PLANT WITH SOFC – ENVIRONMENTAL ASPECTS

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ABSTRACT: In this paper are analysed the ecological aspects in regard of the application of binary cogenerative power plants with solid oxide fuel cells (BCFC). The BCFC are combined cogenerative power plants with fuel cells, gas and steam cogenerative power plants, which are considered as high efficiency power plants. It is proposed optimization methodology according to which is developed and verified an optimization software. As a leading optimization criteria is choosen the maximal efficiency of the analysed power plant. In the paper are presented many calculation results from the software which are relating to energy, ecological and economical characteristics for this kind of power plants. The obtained results are analysed in regard of ecological aspects such as pollutant emissions dependig from the fuel type. Comparison is performed between the results (ecological parameters) of BCFC with and without fuel cells. According the analyses of the results, conclusions are drawn which justifies the advantages in implementation on this kind of power plants

Key words: co-generation power plants, fuel cells, environmental benefits.

SOLAR DRYING OF RASPBERRY

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ABSTRACT. Drying conditions for solar drying of fruits were estimated by field conducted experiments. Solar driers without auxiliary heat source were under investigation. Water-filled vessels and a bed of rocks were used as heat accumulators. Air state or psychrometric zones in the drying room of the dryer, flow rates of air, product thickness and the time of drying are proposed for red raspberry solar drying.

Key words: solar drying, raspberry, drying conditions.

OPTIMAL MANAGEMENT OF CLEAN ELECTRICAL POWER PLANTS

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ABSTRACT: This paper proposes a strategy for optimal management of electric power plants that use renewable energy sources (green energy). The purpose is to maximize the use of these resources, due to their clean properties and low impact on environment. It is taken into consideration the impact and interaction with the power system and the energy market. The proposed management strategy uses the virtual power plant concept. The case study led to encouraging results and opened new research directions. Also, practical implementation possibilities are identified.

Key words: electric power plants, optimal management, green energy

DEVELOPMENT OF INTEGRATED ENVIRONMENTAL INFORMATION SYSTEM

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ABSTRACT: Some of the biggest environmental problems in our country have been caused by air pollution, loss of water resources and inadequate management of waste and chemicals. On the national level more institutions are included in the establishment of the regulated environmental programmes, such as: pollution control and quality of air, water and soil, noise control, solid and liquid waste control etc. The institutions manage with a large amount of small, mutually unconnected and unsynchronized databases, inadequate for fulfilling wider needs and requests. Coordination and cooperation between the relevant institutions is not on the satisfying level. The development of integrated environmental information system will help in supporting the process of identifying and undertaking effective measures for protection and promotion of the environment and increasing the environment data quality and optimizing the data flows between the relevant institutions in the country and fulfillment of the reporting obligations towards relevant international bodies within the area of Environmental Data Quality. This paper describes a concept for development of an integrated environmental information system to the improvement of the environmental protection, which will impact the support to the decision making process and reporting to the international community in the environmental area. The system will provide automation, save on the use of resources, reduce the possibility of human error and increase transparency due to public access, faster collaboration between relevant institutions and the EU. The system is going to improve understanding of environmental issues while increasing capacity in institutions involved in environmental monitoring, and improving of reporting obligations. It is clear that improvement of reporting will have a direct impact on regional and international cross-border issues like: trans-boundary pollution, climate change analysis, natural disaster prevention, etc. Motivated and well trained staff on national and local level in involved

institutions will help establish a public information system with on-line access. This will have a positive impact on the wider population due to better access to information.

Key words: pollution control, air quality, environmental information system

CHEMICAL COMPOSITION OF BIO-OIL PRODUCED BY FAST PYROLYSIS OF WOOD CHIPS

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ABSTRACT: Biomass (cellulose, hemicelluloses and lignin) waste is a renewable energy source that can partially substitute the fossil fuel in future. Pyrolysis of biomass is a thermo-chemical process conducted at high temperature and in absence of oxygen for conversion of biomass to liquid (bio-oil), solid (bio-char) and gas fuel. Liquid bio-oil can be stabilized with hydrogenation or esterification. Also, it can be directly used as a renewable liquid fuel.

In the present paper, wood chips bio-oil was produced by fast pyrolysis in a semi-batch reactor using Al_2O_3 , SiO_2 and opalized silicate tuff as catalysts. The effect of process parameters and catalyst influence on the yield and bio-oil composition were analyzed. The presence of catalysts significantly increased the amount of bio-oil. Fourier Transform Infrared Spectroscopy (FTIR) has been applied for qualitative and quantitative analysis of main bio-oil compounds.

Key words: pyrolysis, wood chips, bio-oil, catalysts, FTIR analysis

THE EVALUATION OF DENSITY AND VISCOSITY OF BLENDS OTHE EVALUATION OF DENSITY AND VISCOSITY OF BLENDS OF WASTE PLASTIC PYROLYSIS OIL AND COMMERCIALY DIESEL FUEL

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ABSTRACT: The aim of this study is evaluation of density and viscosity of blends obtained with mixing commercially diesel fuel and condensed liquid fraction produced by pyrolysis of waste polyolefin mixture. The blends of pyrolysis oil with diesel fuel were at ratios of 1, 3, 6, 10, 20, 40, 50 and 75 % on a volume basis. The pyrolysis oil was obtained with catalytic cracking of waste plastic mixture of high density polyethylene (HDPE) and polypropylene (PP) in presence of Al_2O_3 as catalyst in a semi-batch reactor. It was characterized using Fourier Transform Infrared Spectroscopy (FTIR). The properties of blends were compared with the properties of commercially diesel fuel. There is excellent agreement between the measured values of density and viscosity with estimated values proposed by empirical equations.

Key words: pyrolysis, blends, density, viscosity, empirical equations

SMART SOLES, SHOE SOLES THAT PRODUCE ELECTRICITY

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ABSTRACT: Climate change threatens the future of our way of life and economy, as well as our health and the natural environment that humans treasure. There is little doubt amongst informed scientists that greenhouse emissions from human activity are already contributing to an increase in extreme weather events and loss of life around the world, and that dangerously high levels of CO₂ concentrations are already being reached.

Concerned by the data we've seen, we are introducing improvement, which will stimulate increased use of the benefits of day-to-day items simultaneously generating electricity and reducing the air pollution.

Our team focused on harvesting the energy potential of daily used items and thus provide a second function to already existing products and forms of transport.

Shoe soles that generate energy (electrical) due to sheer pressure which then is transferred and stored in a battery charging USB outlets was made and its usage is quite broad.

Thinking outside of the box, we came up with the goal of transforming daily item into energy creator. We believe that our prototype can be used globally, especially in the rural areas where there is lack of electricity deployment.

According to our research, consistent lab work and various tests the prototype is highly functional, innovative and promising, fulfilling all points from sustainable development, renewable natural 'green' energy resources and affecting the climate changes positively.

Key words: smart soles, shoe soles, electricity

GUANIDINIUM LEAD IODIDE PEROVSKITE AS PROSPECTIVE MATERIAL FOR SOLAR CELL

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ABSTRACT: Perovskites are materials with interesting properties that may be used in different fields of science and engineering. Lately, there is a growing interest towards application of perovskites in solar cells. This is a result of discovery of semiconductor-to-metal transition properties combined with narrow band gap in some halide organic-inorganic perovskites. The application of $\text{CH}_3\text{NH}_3\text{PbI}_3$ for construction of high effective solar cell devices due to its high absorption coefficient, good electrical transport properties, and favorable band gap, is well known. However, there is a growing interest in searching for new organic-inorganic perovskites with even better properties than $\text{CH}_3\text{NH}_3\text{PbI}_3$. One of the most promising organic cations, that could be incorporated in perovskite structure is guanidinium $[\text{C}(\text{NH}_2)_3]^+$ (abbreviated Gu). Therefore, here we present the synthesis, identification, morphology and some properties of GuPbI_3 . GuPbI_3 was obtained starting from guanidinium iodide and lead iodide and dissolved in acetonitrile. The mixture was heated and stirred and then cooled with formation of yellow powder. The elemental analysis (C, H, N) of the obtained compound was in agreement with the proposed formula $[\text{C}(\text{NH}_2)_3]\text{PbI}_3$. The SEM photographs and the EDX analysis showed that the compound is pure, consisted of needle-like crystals in which the molar ratio of Pb: I = 1: 3. The IR spectra, recorded in KBr pellets, showed the characteristic peaks for guanidinium cation given in the literature. The cell parameters of GuPbI_3 were determined by the recorded powder XRD pattern.

Key words: organic-inorganic perovskites, powder X-ray diffraction, IR spectroscopy, SEM

FLOODING OF THE CITY OF NIS 2015 – THE RESULTS OF THE FIRST SERIES OF SAMPLING, THE CONSEQUENCES

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ABSTRACT: In early March 2015 suburban parts o the City of Nis have been flooded again. Consequences of previous floods (May, July 2014, obviusely, have deepened.

Objective: in certain part of flooded areas author wonted to improve the contamination by: locations, types of samples and cause (bacteriological, physical, chemical); as well as to identify possible sources of contamination. Industrial Zone, South and tranch which drains off waste water of the Central rubbish-heap of City of Nish were “wachhed on”.

Crucially as medical doctor, author wonted to determ possible consequences – health risks assesments for the population.

Material: As materials have been used samples of: water, soil and drinking water. Water have been sampled from: the tranch which drains off waste water of the Central rubbish-heap of City of Nish, from arable land – fields ; and from the houses yards.

Samples are classified as a surface water and, on the same tame, as waste water too. Soil has been, purposly, sampled on the way that samples, locationaly, make a whole with water samples.

Drinking water where sampled in households which use “their own sources of water supply”.

Methods: have been used the methods which belongs to the group of standard, purposly spreaded, and prospective.

All activities were appropriate to standards and limits determed in legislation for certain types of samples.

The results showed the expected and unexpected contaminations.

.Soil from from 2 arable land – fields consisted copper over limit. Results has not been understood as “alarm”. Contaminant is, probably, consequence of excessive and improper use of artificial compost.

As alarm has to be considered evidence over the limit of arsenic.
Location – house yard near the Industrial Zone “South”.

Water classified as surface water were in the third rang but, classified as waste, have been improved as direct contaminants. Expected microbiological contamination has not been improved in all samples.

Drinking water samples mostly have been contaminated with nitrates. This is chemical evidence of old faecal contamination.

All drinking water have been categorized as “natural water from closed sources”. Because of that has been imposible to correctly interpret results of microbiological analysis. Has been usolated bacterias which are evidence of old faecal contamination.

The consequences can be multiple- short-term and especially long-term.

Key words: Flooding, public health, Nish, Serbia

UTILIZING OF LANDFILL GAS AS ENERGY SOURCE

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ABSTRACT: Under developed system of waste management based on the practice of dumping waste in inappropriate and unregulated landfills. They have grand detrimental effects on the environment, particularly the creation of landfill gas and sewage that often represent a very serious source of pollution of the atmosphere, land, groundwater and surface water.

Communal waste can be treated as energy resource due to the fact that contains organic matters. That allows its burning with addition of small quantities of other fuels or even without that. Quality of urban waste, from energetic point of view, depends mainly on its composition.

Landfill gas is the biggest polluter of landfills, grateful to the methane and carbon dioxide as its main components. Outdated and inadequate methods of waste disposal are long ago excelled in developed countries. This abstract briefly presents the old landfill Vardariste located in Skopje, and its potential for use of flue gas as alternative energy source.

Key words: Communal waste, landfill, gas energy, Vardariste

CHARACTERIZATION OF CRUDE OIL FROM VARIOUS NATURAL RESOURCES IN ALBANIA USING INSTRUMENTAL ANALYSIS

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ABSTRACT: The characterization of crude oils depends on the characterization and properties of pure hydrocarbons. Calculation of the properties of a mixture depends on the properties of its constituents. Characteristics of crude oil are very important in design and operation of the almost every equipment in the petroleum industry.

A petroleum fluid is defined by its thermodynamic and volumetric properties and by its physicochemical properties. Their behaviors are modeled from experimental data in order to properly simulate the processing of these fluids during the production. To achieve optimal crude selection and processing decisions is very important to have information refer to crude oil quality. This includes: the characteristics of crude oil fraction, density, octane number, sulfur content, viscosity, etc.

The aim of the work for this paper has been gathering as full as possible information for the quality identification of some specific crude oils extracted in our county, and determining the classification range of previewed fractions during the crude oil sequential distillation. It was indicated from our experiments that the most physical properties of crude oils has not been varied wide range of their values, except the water content which has been fluctuated in wide range for different resources.

Key words: crude oil, characterization, refinery processes, physical properties

ELECTROCHEMICAL SYNTHESIS OF BASIC BISMUTH NITRATE HIGHLY EFFICIENT SORBENT FOR TEXTILE DYE REMOVAL

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ABSTRACT: Electrochemical synthesis through the electrodeposition is a very convenient method for material synthesis, due to its simplicity, rigid control of film thickness, uniformity, and deposition rate and is especially attractive due to low cost of equipment and starting materials. Sorbent (basic bismuth nitrate) was synthesized by galvanostatic electrodeposition from an acidic Bi (III) solution on a Ti substrate, followed by calcination in air at 150 °C. The potential use of prepared adsorbent for organic compounds removal was evaluated by decolorization of Reactive Blue 19 as model pollutant in aqueous solutions. Comparing with the basic bismuth nitrates synthesized with different methods, electrochemically synthesized shows much higher sorption capacity. Total decolorization of 200 mg dm⁻³ of RB19 was achieved in 2 min by 500 mg dm⁻³ of sorbent. In order to obtain optimal parameters for sorption process influence of initial dose of sorbent and initial concentration of dye was evaluated. An increase of the initial dye concentration caused the decrease of the decolorization rate constants. With increase of initial dose of sorbent, decolorization rate increases.

Key words: basic bismuth nitrate, electrochemical synthesis, sorption, textile dye, RB19

REMOVAL OF OIL AND FATTY ACIDS BY DISSOLVED AIR FLOTATION (DAF)

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ABSTRACT: In recent years, it tends at alternatives to petroleum because of global warming, world oil supply and demand, and energy security. One of the alternatives is biodiesel for replace petroleum fuel use in automobiles. Biodiesel has many environmental benefits from this point of view but exist wastewater coming from biodiesel manufacturing consists mainly of unreacted oil and fatty acids in emulsion form generated during the transesterification process washing step.

In this study was applied dissolved air flotation (DAF) to solid product obtained during wastewater treatment. The effect of process factors (pH, molar ratio, concentration of oil/fatty acids, pressure, and gas flow) were investigated using one by one variable factor at a time experiment. The proposed technique has advantages: removal efficiency is more than 95%, rapid startup, high rate operation, produces less sludge, possibility to recycle the water in washing step of biodiesel manufacturing and reuse the obtained solid product in flotation process after calcinations and dissolving in acid medium.

Key words: removal of oil, fatty acids, dissolved air flotation

ENERGY TRANSITIONS IN SMALL SCALE REGIONS

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ABSTRACT: Energy resources should be put to good use and used in a way that protects the environment both locally and globally. A valuable alternative energy generation from renewable sources is the development of decentralized energy production technologies. These solutions have a renewable energy source. They are hybrid systems which are the combination of two or more renewable energy solar, wind, biomass etc., that satisfy the energy needs for micro-regions or isolated communities. To develop such projects, regional planning is important both for managing financial resources and how land use.

The novelty of this approach can be linked to the concept of small generating equipment installed locally known as *Distributed Generation* (DG), which helps to meet part of its energy needs locally by using renewable energies or energy transitions. Distributed generation would lead to a reduction in transmission and distribution infrastructure, and reduce network losses. These systems are modular and can be installed quickly, small distributed generating system may expand to keep pace with increasing energy needs. Distributed systems provide local control and ownership of energy resources, encouraging economic development at community level.

Key words: energy generation, renewable sources, decentralized energy production

ACOUSTIC POLUTION IN THE I-ST URBAN ZONE IN KAÇANIK MUNICIPALITY

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ABSTRACT: Acoustic pollution in Kaçanik municipality is mostly concentrated in the first (I-st) urban zone. Although there are many factors that cause the noise, the main causes of the noise pollution in the municipality of Kaçanik are: regional roads, rail roads, air and social activities (nightclubs, discotheques, cafeterias, bars, restaurants), equipment and machinery (metal processing, metal cutting, electricpower generators, electric motors, compressor, pneumatic hammer, etc.). After the war in Kosovo, for a period of 6 – 7 years due to reductions of the electricity supply, main noise polluters used to be electric power generators. With the stabilization of electricity supply most of the time the noise polluters have been laud and uncontrolled music from bars, pubs, cafeterias and other business of this type. According to our latest survey, citizens of the first zone (I-st) specifically the visitors and employs of these locations are exposed to the intensity of the noise which is over 90 dB(A), which is very harmful. Management of these business do not apply any measures that are required by the legal norms to prevent pollution of the environment, even though there is a municipal Regulation for Noise Protection / Law on Environmental Protection, which are harmonized according to the European Union directives, these regulations are not implemented. It is very unfortunate that most of the noise polluters are not aware of existing of this kind of regulations in the area of Kaçanik municipality.

Key words: acoustic polution, Kaçanik municipality

TRADITION AND MODERNITY IN DANUBE DELTA'S ARCHITECTURE CONTEMPORARY INTERVENTION TOWARDS SUSTAINABLE SETTINGS

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ABSTRACT: The present paper brings into comparison the inherited vernacular architecture of the Danube Delta and the recent real estate development, stressing the importance of addressing both the local communities' necessity for a modern lifestyle and preserving the integrity of the built and natural environment. The subject revolves around a key question: "How to reconcile the old and the new, the local and the global, in the attempt to preserve and enhance the value of the existing patrimony, whilst ensuring communities benefit from a sustainable development process? " The comparison reveals that the aggressiveness of mostly tourism-related facilities affects both the built heritage and the natural landscapes and ecosystems of the Danube Delta.

Contemporary intervention in a protected area, when speaking of architecture and urban planning, has to take into account the visual and ecological impact in evaluating aspects like the scale of the building, the building materials and techniques, energy sources, the cultural and social context.

It concludes that acknowledging local traditional architecture as an important reference, yet a model to be upgraded in terms of complying to contemporary living standards, is an essential step when considering altering the built environment in the specific landscape of this world heritage site.

Key words: Danube Delta, traditional architecture, contemporary context, cultural specificity.

ARCHITECTURAL SOLUTION FOR URBAN AND HORTICULTURAL DECORATING OF SIDEWALKS TO BE BUILT ALONG THE LENGTH OF BLVD. TURISTICKA

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ABSTRACT: The architectural solution for urban and horticultural decorating of the sidewalks on Boulevard Turisticka consists of 5 options with modern design that includes forms and colors designed for creating a boulevard that with its glow will provide better and more quality offer for the city and for tourists. Moreover, it will offer citizens and tourists increased safety while they are recreating. Also, this solution includes self-sustainability of the boulevard that would function entirely independent of the city's electricity grid.

The main street of Municipality Ohrid, a combination of several smaller streets and greenery is predicted to be varied with changeable design consisting of:

Straight line sidewalk-solution consisting of two shades of ocher, every shade would mark the direction of movement for pedestrians along the sidewalk. The sidewalk is to be built from printed concrete in two colors.

Sidewalk with round form-solution consisting of round forms with radius of 1 m suitable for movement in two directions. The circular forms are a combination of brown, yellow and gray color built from printed colored concrete.

Sidewalk with two semicircular forms – solution consisting of semicircular forms suitable for movement in two directions for pedestrians with semicircular forms for high and low greenery. The trails for the pedestrians are predicted to be built from colored concrete in three colors, brown, yellow and gray.

Sidewalk with rectangular forms-solution consisting of rectangular forms with dimensions 2*0.5m combination of multiple colors such as brown, yellow, green, gray and white made from printed colored concrete.

Sidewalk from triangular forms-solution consisting of triangular forms with dimensions 1,5*1,5*1,5m combined from two shades of gray and white made from printed colored concrete.

Basic principles on which the architectural solution is made are creating better living conditions, sustainability, development, rational use and protection of the space and protection of the joint values of the space and environment promotion.

The architectural solution for Blvd. Turisticka is predicted to be made as energy independent facility i.e. the required electricity will be generated from the elements of the facility. In the dividing strip of the boulevard it is predicted for vertical spiral wind power plants with generators to be installed that would produce electricity for the candelabras of the dividing strip. The vertical spiral wind power plants would generate electricity from the wind and the movement of the vehicles. Also, the candelabras that lit the footpaths have solar panels and spiral wind power plant which the kinetic and solar energy turn and accumulate into electricity to be used for lighting at night of the footpath.

Goals to be accomplished with the implementation of this architectural solution are: safer traffic, development of tourism and creating modern boulevards attractive for both citizens and tourists.

Key words: horticultural decorating, boulevard

SUSTAINABLE URBAN MOBILITY – PROBLEMS OF SUSTAINABLE BICYCLE TRAFFIC IN CITY OF NIŠ

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ABSTRACT: With everyday population growth, city territory is spreading and pollution is increasing rapidly. In order to finish all their obligations faster, people more often use car than bicycles and most of the cities have enormous problem with air pollution, traffic congestions and life in urban areas became unbearable. In order to make cities more “livable places” and to create green smart cities, it is important to improve sustainable urban mobility. That way CO₂ and other negative emissions and also energy consumption will be reduced, and at the same time the attractiveness of the urban area will be increased. This paper discusses problems of urban mobility in the city of Niš, third largest city in Serbia. Niš has more than 1320 km of motor roads, approximately 75,000 of registered vehicles different categorized and only 20 km of bicycle paths. Every year number of new registered vehicles is increasing and in last 10 years this number increased for 30%. The aim of this paper is to point out on main problems of urban mobility and to show strategies for improving mobility by increasing bicycle traffic in order to improve quality of life in city and to reduce pollution. Current emission is about 88,000 t_{CO2} per year. By improving urban mobility plans and promotion of bicycle traffic, building better infrastructure for bicycle traffic in the city it is possible to reduce this emissions for 10% in next few years.

Key words: Urban mobility, Air pollution, Green – smart cities, bicycle traffic, energy consumption

DETERMINATION OF THE VITAL ECOLOGICAL CORRIDORS: THE CASE OF THRACE REGION

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ABSTRACT: Land cover includes natural and planted vegetation and human construction, which covers the surface of the Earth. Growing urbanization and industrialization have caused increase of the construction and disappearance of natural area. As a result of this intensive lands use change causes many environmental and ecological degeneration. This degeneration increasingly continues and creates negative effects at Trakya Region which doesn't have ecologic planned for land use. Ecological corridors are landscape elements that make up for the negative effects of habitat fragmentation in agricultural or natural landscapes. Ecological corridors concept is increasingly popular. For this is reason, it is important development of plans for ecological corridors and greenways have been rapid for the last decade. Trakya Region is located in the westernmost corner of Turkey along the borders with Bulgaria and Greece, which are EU members along with hosting the highway passages between Turkey and Europe. Therefore planning of ecological corridors is even more important because it exceeds the cross-border in the region. Thrace region is under environmental pressure due to the intensive use land. In this study, the identification of existing ecological value and ecological corridor planning possibilities were explored.

Key words: Ecological corridors, Thrace region, Landscape planning

THE EFFECT ON URBAN IDENTITY IN BLUE-GREEN- HISTORICAL CONTINUITY

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ABSTRACT: Open and green spaces in urban areas meet human needs in terms of creating liveable and sustainable cities is of great importance. These areas presenting have many functions such as providing physical comfort, adding aesthetic value, recreation opportunities, reducing noise and air pollution to the city. It must be within a system to fulfill these functions.

Population growth, rapid and irregular movement of urbanization, industrialization, of green space system leads to destruction to the image of the city and urban identity. To new urbanization concept of cultural, historical and sustainable natural areas and that is important to ensure continuity for more legibility of urban green space.

In this study, natural-cultural and historic values that have London, Boston, St. Petersburg, Prague, Paris and Istanbul city will be examined in the case of blue-green-historical continuity. In this context, identity cards were created for each city. In this cards, the effects on urban identity in the city of blue-green-historical continuity were evaluated. Scoring was made within the scope of blue-green-historical continuity to the experts. Accordingly, the results are evaluated.

Key words: Open and green areas, urban identity, green smart cities, blue-green-historical continuity.

EFFECTS OF MINERAL ADDITIVES ON THE PHASE FORMATION IN SELF-COMPACTING TYPE DECORATIVE CEMENT COMPOSITES

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ABSTRACT: The decorative cement mortars and concretes are composites representing an artificial imitation of the natural rocks. Their main advantage is better workability, while their key objectives are their durability and stability. During decorative composites preparation is very important to achieve a good aesthetic surface that allows their multilateral application (decorative stamp concrete, pots, balustrade, ornamental stones, restoration of architectural monuments, decoration of facades, fences, terraces, etc.). For the purpose is necessary to use white Portland cement and mineral additives of white or color fine and coarse aggregates. These preparation peculiarities effect on the surface properties of the cement composites and considering the necessity of greater quantity of water the obtained composites show large differences in their structure in comparison to conventional cement. We investigated the different types of cementitious composites based on White Portland cement and marble as additive (filler). The prepared composites were investigated after 28 and 90 days of water curing, measuring some physical-mechanical properties such as density, compressive strength and porosity. The X-Ray powder diffraction analysis, Fourier Transformed Infrared measurements and Scanning Electron Microscopy were used to identify the crystal structures and morphology. The experimental data show that the cement composites with higher water content exhibit more variety of new-formed phases, like hydration products of C-S-H type. The structure of self-compacting type decorative mortars is so dense that there is no possibility of crystal hydrates development at late curing ages. The use of marble as filler leads to a partial inclusion of carbonate ions in the new-formed hydrated phases (carbo-aluminates).

Key words: White Portland cement, decorative mortar, cement hydration

DETERMINATION OF OPEN AND GREEN AREAS: THE CASE STUDY OF MALTEPE IN ISTANBUL CITY

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ABSTRACT: In urban environmental especially green areas play an important part in forming good quality environments with their esthetic, ecological, economical and social functions. Some of part Istanbul Anatolian has developed rapidly under the influence of urban expansion to become a major settlement. However, the open and green area systems have not developed sufficiently in paralel with this development. In this research open and gren areas have been searched in the frame of urban planning. Within the scope of this study, the landscape architecture principals of the existing green area system of Maltepe in Istanbul city were examined. In undertaking this study, the observation, examination and evaluation methods, generally accepted as the foundation for landscaping evaluation methods, were used. In other words open and green spaces should be designed according to the principles of landscape architecture. Following the determination of quantity and quality characteristics of open and green spaces in Maltepe district a study of open and green spaces of Maltepe in Istanbul city was the subject of this research and from the results precautions to be taken are presented.

Keywords: Istanbul, Open and green areas, Open and green area systems, Urban areas.

ANALYSIS OF ENVIRONMENTAL AWARENESS AND SENSITIVITY LEVELS: A CASE STUDY IN EDIRNE CITY

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ABSTRACT: Environmental problems are becoming serious in Edirne City and Turkey because of the interacting effects of increasing population, insufficient environmental management, excessive industrialisation and urbanisation. This study aimed to determine environmental awareness and sensitivity levels of Edirne City public. The surveys was distributed to 400 people between, with face-to-face interviewing method. To assess the surveys applied in the research, SPSS and Microsoft Excel were used. In the survey were determined with social characteristics of individuals like gender, age, martial and profession, education, environmental education, income. Also, the potential effect of these characteristics to the individual awareness and sensitivity levels and their approach to the subject of environment were explored. In addition, this study investigated the influence of economic and socio-cultural factors on environmental awareness and sensitivity levels. As the results of this study, the environmental awareness and sensitivity score were calculated.

Key words: Environmental awareness, environmental sensitivity,
Environmental problems

RECREATIONAL QUALITY OF VLORA BAY BEACHES (ALBANIA) EVALUATED USING AS BIOINDICATOR FAECAL STREPTOCOCCI, YEASTS AND MOULDS.

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ABSTRACT: Microbial quality of four recreational beaches of Vlora Bay (Plazhi i Ri, Akademia e Marinës, Plazhi i Vjetër, Plazhi i Nartës) was estimated during the period of July – October 2014 and March – August 2015. Sand and seawater samples were evaluated for faecal streptococci (FS), yeasts and moulds. Referring to the results it was observed that faecal streptococci were detected in all sampling sites and environments (in dry sand, wet sand and seawater). Wet sand samples had higher concentrations of faecal streptococci than dry sand or seawater samples. Yeast and mould densities were higher in dry sand samples. The most frequent genera of fungi isolated from the samples were *Candida sp.*, *Aspergillus sp* (especially *A. niger*, *A. fumigatus*) and *Penicillium sp.* Akademia e Marinës beach had the highest percentage of isolated fungi (73.3%), followed by Plazhi Ri (53.3%), Plazhi Nartës (43.3) and Plazhi Vjetër (36.6%).

Key words: Vlora Bay, sand, seawater, faecal streptococci, yeasts, moulds.

THE PUBLIC OPINION ANALYSIS OF SOME URBAN PARKS IN THE CITY OF ISTANBUL

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ABSTRACT: Because of the increasing population and urbanisation, public are affected by a pollution of the air, water and soil in city. For this reason, urban green area especially urban parks are have strategic importance for the quality of life because of increasingly urban life pressure. Istanbul is one of largest city in Turkey with a population of around 15 million (2016) and an area of around 5750 km². In this study the importance of public preferences in some urban parks are examined in the case of Istanbul City. This paper summarizes the findings of a survey conducted to determine the public attitudes towards some urban parks in Istanbul. The main concern of this paper is to consider the importance of urban park for publics and for the sustainability of the city they inhabit.

Key words: Urban Parks, public opinion, preferences recreation,
Istanbul city

THE ALBANIAN CRIMINAL LAW PROTECTION OF THE ENVIRONMENT AND THE CHALLENGES FACING THE CURRENT LEGISLATION IN THE FRAMEWORK OF EUROPEAN UNION INTEGRATION

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ABSTRACT: In this paper will be addressed law enforcement challenges in the field of environmental protection as the main issues that is repeatedly emphasized in the annual progress reports of the European Commission for Albania. Emphasize that the issue of law enforcement in the field of environment is problematic not only in Albania. As will be mentioned in this paper in the context of the main directives of the European environmental crime (2008 / 99KE) and some of the basic EU instruments covering environmental policy areas, have faced significant problems in their implementation in EU in general. In this context, all the states applicant for EU membership have to accept the *acquis communautaire* before being a membership, even in Albania along the approximation of legislation in the field of environmental protection and Albanian criminal legislation, will be necessary to adapt in time with environmental crime directives.

Key words: environmental law, challenges, protection, EU.

PROPERTY VALUATION CHALLENGES FOR PROPERTIES CONDEMNED FOR ENVIRONMENTAL PUBLIC UPGRADES

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ABSTRACT: No property may be taken for public use without just compensation. The issue is what is “just compensation” and how it is determined in a particular circumstance. Regardless of the type of valuation, the Greek Constitution (article 17, paragraphs 3–5) clearly forbids estimation based on possible future projections. In this way, future externalities, positive or negative, deriving from the change of use are not incorporated. This contravenes the Pareto optimal resource distribution and even challenges the Caldor-Hicks compensation criterion, especially in cases of partial takings.

We suggest valuation to include a best-case and a worst-case scenario for possible future values. A combination of them, e.g. the average, will be used to determine benefits and costs and the final level of compensation. The most important externality under consideration, especially in cases of land properties condemned for public large-scale constructions such as environmental public utilities, should be the environmental effect. The internalisation of possible negative externalities should be internalised by the construction benefactor.

Key words: valuation, property taking, Pareto optimum, environmental externalities

ENVIRONMENTAL REPORTING – A COMMUNICATION INSTRUMENT IN THE GLOBALIZATION PROCESS OF ECONOMIC ENTITIES

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ABSTRACT: The modern business manager is "placed", in the current period, to face some situations where his decider side has major and even critical implications for the future and performance of the business he manage. Thus, regarding the transparency and sharing of certain categories of information outside the organization borders and its evaluation, reporting and storage in a synthesis document, specific to the entity reporting, he must take into account the relevance of that information. Depending on its significance, environmental costs incurred must be made public, along with other economic and financial information. Awareness of reporting these types of information through the environmental balance sheet or eco balance sheet could visibly support to increased contribution of economic entities in terms of protecting the environment and community in which it operates, the formation and foundation of a culture of efficient and effective environmental management. Beyond these primordial aspects, even one single company could be a good example for other companies. So, overall, business entities can contribute to increased economic and social wellbeing at micro and macro level. In this context, the aim of the present paper is to identify and display those types of information that should be reflected in environmental reporting, to report economic-financial information additional to the mandatory one, information related mainly to the costs that the entity should hire when its operating activities affects the environment; effects visible on sustainable development.

Key words: environmental reporting, environmental protection,
environment-economic entity report

POSTER SECTION

4

MANAGEMENT OF URBAN AND INDUSTRIAL WASTE, CLIMATE CHANGE – BIODIVERSITY – EFFICIENCY



DEVELOPMENT OF THE REVERSE LOGISTICS MODEL FOR MANAGING INDUSTRIAL WASTE FLOW

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ABSTRACT: Establishing a unique system of waste management in industrial plants requires the knowledge of the process of generation, the procedure of handling, storage, transport, treatment and disposal of waste.

There are many European directives which regulate the area of industrial waste management. In Serbia, this area is covered by many legal regulations which are currently being redefined in order to be in full compliance with the European Union standards. One of the biggest problems of environmental protection in Serbia is inappropriate waste treatment, as well as non-utilization of industrial waste (limited capacities for waste recycling, non-utilization of industrial waste for reuse, and low utilization in energetics). The consequences of such behavior are negative environmental impact and exploitation of natural resources. According to the national document – Report on the State of the Environment in the Republic of Serbia for 2014 from Serbian Environmental Protection Agency, following results show: from the total quantity of generated industrial wastes, 76.81 % of non-hazardous waste are left on locations where the waste is generated without any treatment options. Also, the same non-treatment refers to the 80.43 % of hazardous waste. The society deals with the problem of finding the way for waste reuse or by-product treatment which are dismissed by users or waste generators with the aim of waste reduction and natural resources conservation. So, reverse logistics processes all the operations related to the reuse of products and by-products. The main goal of the paper is creation of a model for solving the location problem of waste (secondary raw materials) treatment facilities, taking in consideration the territorial distribution of raw materials, the type and the quantities of raw materials and the distance between the industries. In this manner, the resource usage is optimized by interaction between companies through the exchange of by-products and through integrated systems management of industrial waste. The specific goal of the research is to design an

appropriate model capable of analyzing all relevant industrial plants within an observed region according to the type of required secondary material and the amount of waste they generate. Methods of global optimization, i.e. heuristic and metaheuristic algorithms, will be applied to determine the location of by-product treatment facility.

Key words: reverse logistics, industrial waste, facility location

MATERIAL FLOW ANALYSIS METHOD APPLIED TO WASTE RESULTED FROM THE RAILWAY INFRASTRUCTURE

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ABSTRACT: The metabolism of the railway transports generates quantities of waste which could have a negative impact on the biophysical structure of ecological systems. Therefore, specific analysis methods and instruments need to be applied in order to develop scenarios for waste management. The materials flow analysis is such kind of an instrument. The concepts of material flow analysis are used in many countries and regions in EU and Japan. In Romania studies focused on this subject are scarce.

This paper aimed to characterize and quantify waste flows in a sector of the Romanian railway transport system infrastructure and also to develop suggestions which can lead to waste management improvement in the transport system. The material flow analysis method was applied using data from 2008–2012, containing information about the concrete railway sleepers at the level of Craiova branch of the national railway infrastructure. A scenario concerning the concrete sleepers' recovery consists in building access roads. Therefore, if from the total of waste generated in this sector during the study period, 50.56% would be reused in road infrastructure, a total of 14837 m length consolidated road would be built. As a consequence, the acquisition of the sleepers would drop with 32% and, in turn, the diminished stocks would reduce the pressure on soil.

The material flow analysis in the railway transports in Europe brought to the elaboration of the "Guide for the environment performance", through which there have been identified specifications for the management of the environment in railway transports.

Key words: material flow analysis, railway, waste management

UTILIZATION OF GARMENT INDUSTRY TEXTILE WASTE

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ABSTRACT: Because of increasing environmental demands, especially on dealing with products end of life phase, product manufacturers and designers must consider the future disposal of their products. In recent years, an increased emphasis on developing recycling techniques for industrial waste products has been placed, with the goals of protecting the environment.

The aim of this work was investigation of the possibilities of reusing of cotton textile waste, generated during the manufacture in garment industry, as reinforcement in production of composite materials. The main focus has been put on the preparation and characterization of composites based on cut waste from garment industry. The materials have been cotton fabric and cotton textile waste as reinforcements and phenol phormaldehyde resin as matrix. The composites containing 60 % wt. reinforcement were manufactured by compression molding. For the composites, the mechanical and thermal properties were analyzed and compared to those of commonly used continuous fiber reinforced composites based on cotton fabric and phenolic resin. It was found that the composites based on cotton textile waste are more sensitive to processing cycles with respect to continuous fiber reinforced composites. The mechanical properties for composites based on cotton textile waste are lower for about 25%, but the thermal stability investigated by Martens method for both composites reinforced with cotton fabric and with cotton textile waste is very similar. The obtained results have shown that cotton textile waste could be reused for production of composite with acceptable mechanical properties and they can be successfully used in various industries as construction material.

Key words: textile waste, cotton fabric, reinforcement, composite material, garment industry

MUNICIPAL WASTE MANAGEMENT IN SKOPJE: OPPORTUNITIES AND PERSPECTIVES

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ABSTRACT: Municipal waste management in Republic Macedonia was recently recognized as an issue of serious concern, especially in Skopje the capital of Republic of Macedonia. Many actions were undertaken for solving the situation but it is a fact that Skopje still faces numerous challenges and problems to be solved in the field of municipal waste management. Most of the waste is collected and transported on the landfill “Drisla” which is operating with old technology and is in need for improvement and further development to provide better conditions. There are companies that perform processing of waste, including recycling of paper, cardboard, plastics and metal. But there is still not an established regional network of waste treatment or any kind of disposal facilities. Skopje is also fighting with the public vs. commercial waste in sense of recycling. In the near future there is a necessity for more in-depth actions and activities in legislative development, infrastructure financing, foreign investments, developing a more contemporary waste management system. The main aim of this paper is to analyze and to research the municipal waste management in Skopje. Also this paper makes efforts to give some recommendations for the further improvement and impact on the environment and society.

Key words: waste, management, environment, opportunities, perspectives, Skopje

EFFECT OF USE OF RECYCLED AGGREGATE ON ROLLER COMPACTED CONCRETE PROPERTIES

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ABSTRACT: In this study, the effect of recycled aggregate on roller compacted concrete properties were investigated. For this purpose 0%, 25%, 50%, 75% and 100% of crushed limestone coarse aggregate was replaced with recycled coarse aggregate. 5 different concrete mixture having cement dosage of 200 kg/m³ were prepared. Trial mixtures were designed for determination of optimum water content of roller compacted concrete mixtures according to ASTM D 1557 standard. As a result, maximum dry density-optimum water content of roller compacted concrete mixtures were determined. Thereafter, 150/300 mm cylinder specimens were prepared and cured under standard conditions. 7, 28 and 90 days compressive and split tensile strength of specimens were evaluated.

Key words: concrete properties, recycled aggregate

IMPLEMENTATION OF EU STANDARDS AND NATIONAL STRATEGIES TOWARDS SUSTAINABLE WASTE MANAGEMENT IN SERBIA

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ABSTRACT: Inadequate waste management is one of the most significant problems in terms of environmental protection. The previous practice of waste management in the Republic of Serbia mainly included unsanitary landfilling without prior treatment and necessary environmental protection measures. Waste collection was organized in urban areas while rural areas were poorly covered or totally excluded from organized waste collection, which resulted in appearance of a large number of wild dumpsites. The European Union has high standards in waste management and environmental protection. Serbia, as a state with the EU candidate status, is making efforts to harmonize national waste management regulations with EU regulations and to improve the current state of waste management. The paper consists of two parts, the first one dealing with the strategic and legislative framework of waste management; and the other containing data on waste amount and current state of waste treatment. Waste is generally disposed of in landfills, of which only few meet the sanitary requirements, while others are unsanitary, overcharged or situated at inappropriate locations. There is significant progress in the area of legislative and strategic documents, but there are still numerous problems with implementation in practice, and further development is needed.

Key words: waste management, sanitary landfill, legislation, strategy

CHARACTERISTICS OF CATALYTIC PYROLYSIS OF WASTE POLYOLEFIN MIXTURE

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ABSTRACT: Recycling of waste plastics is very important issue in order to relieve environmental pollution. Worldwide, the conversion of plastic waste to fuel has been researched. The pyrolysis is very important recycling method because it results in hydrocarbon products like fuels.

In this study catalytic pyrolysis of waste polyolefin mixture of high density polyethylene (HDPE) and polypropylene (PP) was investigated in order to obtained liquid fuel. The waste mixture was heated to 550°C at a heating rate of 10°C min⁻¹, in semi – batch reactor. Different types of catalysts, natural (opalized silicate tuff and SiO₂) and synthetic (Al₂O₃), were used for catalytic decomposition of waste mixture. The condensed products of all samples were greater than 85%. The condensed liquid products were formed in condenser when all samples were heated up between 415°C – 420°C. The highest quantity of fuel oil was produced between 420°C – 470°C. The greatest amount of condensed liquid products around 92%, were formed during the catalytic degradation of waste polyolefin mixture and mix of Al₂O₃ and SiO₂ as catalysts, when metal particles were added in reactor.

Key words: pyrolysis, polyolefin, catalysts, liquid products, yield

EFFECT OF UTILIZATION OF RECYCLED COARSE AGGREGATE ON CONCRETE PROPERTIES

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ABSTRACT: In this study the effect of recycled coarse aggregate on concrete properties were investigated. For this purpose 0%, 25%, 50%, 75% and 100% of crushed limestone coarse aggregate was replaced with recycled coarse aggregate. 5 different concrete mixture having water/cement ratio of 0.45 were prepared. The fresh properties of concrete (slump and unit volume weight) were determined. The concrete specimens were cured in standard conditions for 28 days. Thereafter, the compressive strength, splitting tensile strength, flexural strength, ultrasound pulse velocity, density and water absorption tests were performed. The results obtained were evaluated comparatively.

Key words: recycled coarse, concrete properties

PYROLYSIS OF WASTE ENGINE OIL TO GASOLINE AND DIESEL FUEL

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ABSTRACT: Waste engine oil is a hazard waste usually combusted without controlling of air pollution. Reinforcing waste engine oil using acid treatment is impracticable because the sludge generated by this process. Process of pyrolysis is an environmental friendly process to conversion of waste engine oil to liquid fuel.

In this work dried and filtered waste engine oil was catalytic (Al_2O_3 and SiO_2) subjected to pyrolysis and converted to gasoline and diesel fuel. The process of pyrolysis was conducted in a semi-batch reactor at $10^\circ\text{C min}^{-1}$ and $15^\circ\text{C min}^{-1}$ heating rate and $400\text{--}600^\circ\text{C}$ temperatures. Process conditions were controlled using PID controller. Optimal process conditions were $10^\circ\text{C min}^{-1}$ heating rate and $530\text{--}600^\circ\text{C}$ temperatures.

Using Fourier Transform Infrared Spectroscopy (FTIR) was confirmed the presence of gasoline and diesel fraction into the pyrolysis oil.

Key words: pyrolysis, waste engine oil, process parameters, catalysts, FTIR analysis

END OF LIFE TRETMENT OF POLYMER COMPOSITE MATERIALS

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ABSTRACT: Because of increasing environmental demands, especially on dealing with products end of life phase, product manufacturers and designers must consider the future disposal of their products. For conventional materials like steel and aluminium well-functioning recycling methods exists. This is not the case for structures of polymer composites, which are used more extensively, especially for structures like vehicles and vessels. Several techniques do exist but they are not yet commercially available. The current disposal methods of polymer composites are landfill and incineration. Polymer composites are materials, which consist of several materials like fibre, matrix, and additives. This circumstance complicates the waste treatment of composite materials. Therefore, it is necessary to develop adequate waste treatment techniques for polymer composites including sandwich structures. Recommendations for waste treatment have been formed for a number of polymer composites. These recommendations are based on the analysis of costs and environmental effects and they compare different scenarios for mechanical material recycling and energy recovery by waste incineration. Recycling of the polymer materials largely depends from the type of used polymer matrix. Incineration is one of the methods for waste treatment of polymer composite materials, because it can be used for energy recovery. However, waste incineration will always result in a additional cost for the waste producer. Many investigations have pointed out recycling of polymer composite materials as the best alternative considering environmental effects. Since recycling polymer composites is a complicated process, especially recycling thermoset composite it is important to acquire comprehensive information about the constituents of these materials.

Key words: polymer composites, material recycling, energy recovery, environmental effects, waste treatment model.

RANKING OF THE CRITERIA FOR MULTICRITERIAL MODELING OF THE SYSTEMS FOR MUNICIPAL SOLID WASTE MANAGEMENT IN URBAN AREAS

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ABSTRACT: Managing with hard structure communal waste is important not just for the countries but as well as for the companies, from the aspect of possibility for additional profit and by its efficient work process through reducing their cost. Besides the protection of the environment, also as one of the motives for implementing this adequate system for the hard structure communal waste is the realization of the aspirations of the Republic of Macedonia for joining the European Union according to the standards of the European Union referring to managing of different types of waste. The future of successful organizations and countries that have aspirations to join the European Union depends on the proper and correct approach in managing the hard structure communal waste. Third criteria are environment (ecology). To achieve optimal results for environmental criteria, FOR the standards of the European Union referring to managing of different types of waste and for environmental issues, the best is to use the method of ranking criteria and then to make a multifactor modeling for systems of management the solid communal waste that shall obtain optimal and correct decision for maximum benefits.

Key words: solid waste management, ranking criteria, multicriteria modeling, thermal treatment, incineration, pyrolysis, composting, recycling, zero waste, clean production

THE IMPACT ON SURROUNDING ENVIRONMENT OF THE PLANT TO TREAT SEWAGE FROM DAIRY FACTORY

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ABSTRACT: The dairy industries handle large volumes of milk, and produce a lot of wastewater material. The wastewater removed from the milk contains soluble organics, suspended solids, trace organics, and minerals. All these components contribute largely towards their high biological oxygen demand (BODS) and chemical oxygen demand (COD). This wastewater usually is discharged into the river. Lately the dairy industry like other industries in Kosovo has come under pressure to improve its environmental performance. With the use of plant to treat wastewater from dairy, it is attempted to reduce the organic compounds on surrounded environment and reuse of water for further processing. The purpose of article is to increase the awareness of society regarding the treatment of wastewater. What kind of impact has wastewater to environment if it is discharged not treated? And to see, the benefit of plant for treatment of waste water not only from dairy industry but from all kinds of industry.

Key words; Waste water, dairy, environment

ELECTROCOAGULATION OF TEXTILE DYEING WASTEWATER CONTAINING A MIXTURE OF ORGANIC DYES BY IRON ELECTRODE

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ABSTRACT: This study focused on testing the efficacy of iron (Fe) electrode in an electrochemical treatment (electrocoagulation) of wastewater containing a mixture of organic dyes. The mixture consists of the following azo dyes: Acid Black 194, Acid Black 107 and Acid Yellow 116. The present organic dyes are toxic, cause skin irritation, eye irritation, and are extremely dangerous to aquatic organisms. The study was conducted on a prepared synthetic wastewater in a laboratory electrochemical reactor. During the research, tracking the impact of the current density, various concentrations of dye and supporting electrolyte, electrolysis duration, pulsed current regime. The results are shown through color removal efficiency, COD removal efficiency, current efficiency and specific energy consumption. At the initial concentration of the dye ($\gamma = 200$ mg/L) and concentration of supporting electrolyte ($\gamma_{\text{NaCl}} = 1$ g/L) achieved the color removal efficiency of 80.64% for 420 seconds of treatment ($j = 10$ mA/cm²), and the initial concentration of dye ($\gamma = 50$ mg/L), $\gamma_{\text{NaCl}} = 8$ g/L, attained by the color removal efficiency 96.01% for 300 seconds of treatment ($j = 10$ mA/cm²).

Key words: electrocoagulation, waste water, azo dyes.

ECOLOGICAL AND ECONOMIC MANAGEMENT LESS RISKY WASTE IN ACCORDANCE WITH THE SUSTAINABLE DEVELOPMENT OF THE NORTHERN PART OF THE REPUBLIC OF SERBIA

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ABSTRACT: This paper highlights the importance of managing less risky waste in accordance with sustainable development, assuming the opening of several new sites of processing locally arranged on the territory of the northern part of the Republic of Serbia, respectively in Vojvodina. The introduction of such a planned approach would have many benefits on the ecological system of the largest cities in Vojvodina, and the products of processing less dangerous plant and animal origin waste would have result in economic products that have a measurable market value. The authors point out that the introduction of multiple processing centers of plant and animal waste has shown practical readiness of Serbia to implement socially responsible behavior on the territory bordering the EU. The result of such practical applications may result in product or compost, which can serve as a basis for re-cultivation of important areas. Restoring compost larger surface area is virtually socially responsible behavior of present generations towards future, which would have shown selflessness and responsibility of the Republic of Serbia, which goes to the EU and adopt solutions that are ecological and economically acceptable and socially responsible.

Key words: disposal of plant and animal waste, compost, socially-responsible behavior.

CALCULATION OF CARBON FOOTPRINTING FOR PERSONS, HOUSEHOLDS AND ORGANISATIONS

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ABSTRACT: Climate change or the increase in earth's temperature is recognized as a serious global environmental problem and it is linked greenhouse gas production. The global warming can cause catastrophic weather events, flooding, water shortages and disturbed ecosystems and it is important for each individual. The greenhouse gas (GHG) emissions that cause climate change are emitted mainly from burning fossil fuels. In order to affect climate change, GHG emissions must be measured and reduced. The amount of carbon dioxide (CO₂) emissions associated with all the activities of a person or other entity (e.g., building, corporation, country, etc.). It includes direct emissions, such as those that result from fossil-fuel combustion in manufacturing, heating, and transportation, as well as emissions required to produce the electricity associated with goods and services consumed. In addition, the carbon footprint concept also often includes the emissions of other greenhouse gases, such as methane, nitrous oxide, or chlorofluorocarbons (CFCs). A new term "carbon footprint" has been coined, to describe the quantity of CO₂ and other greenhouse gas (GHG) emissions emitted directly and indirectly by any individuals, companies, events, products or services. In developed countries, transportation and household energy use make up the largest component of an individual's carbon footprint. There is a number of standard methodologies for calculating carbon footprint. The basic calculation of carbon footprinting is a quick exercise, but in some other cases, when the organization calculates some indirect emissions or the emissions from particular product a software for that purpose is available. Calculating a carbon footprint is a useful exercise only as a part of a complete environmental management system.

Key words: carbon footprinting, greenhouse gas, climate change, sustainable development

ENVIRONMENTAL ISSUES IN ENGINEERING

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ABSTRACT: The industrial engineering consumes of materials and is dependent on a continuous supply of them. Increasing population and living standards cause the consumption rate to grow – something it cannot do forever. Finding ways to use materials more efficiently is a prerequisite for a sustainable future. Recent global attention to the issues and challenges of sustainable development is forcing industries to conduct self-assessments to identify where they stand within the framework for sustainability, and more importantly, to identify opportunities, strategies and technologies that support achieving this goal. Design for environmental sustainability is the long-term view: that of adaptation to a lifestyle that meets present needs without compromising the needs of future generations.

A key point in progressing a sustainable society is finding means to reduce the environmental load of industrial activities. For this we need the reorganization of industries. The zero emission concepts is a shift from the traditional industrial model to integrated system in which everything has its use. The concept envisions all industrial inputs being used in final products or converted into value-added inputs for other industries or processes. In this way, industries are reorganized into eco-industrial networks such that industry's wastes or by-products are fully matched with the input requirements of another industry and the integrated whole system produces no waste. This linking of industry is called industrial symbiosis. Industrial symbiosis as part of the emerging field of industrial ecology demands resolute attention to the flow of material and energy through local and regional economies.

Key words: sustainable development, environmental effects, zero emissions, industrial symbiosis, eco-industrial networks

EFFICIENT USAGE OF ENERGY IN MODERN BUILDINGS

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ABSTRACT: Efficient energy usage today represents one of the most important issues affecting the global environment which directly reflects on quality of life and doing business by reducing the financial costs of energy consume. High energy requirements in modern homes and commercial buildings by using various appliances, systems for heating, cooling and lighting have a significant participation in electricity consumption. In electricity distribution networks, the smart buildings represent a modern approach to applying information and communication technologies in buildings. The goal is basically to increase energy efficiency and comfort by using various modern technologies through the high degree of devices and appliances automation. Energy savings in smart buildings is enabled primarily by appearance of efficient control and consumption management systems in the buildings automation. Efficient use of energy is achieved by using various types of sensors, intelligent control and executive devices with programmed scenarios, smart metering devices, remote management of appliances and devices, even and integration of renewable energy sources themselves into the smart buildings.

Key words: Efficient energy, smart buildings

ADVANTAGES OF A HYBRID FUEL CELL/MICRO GAS TURBINE SYSTEM FOR ELECTRICITY PRODUCTION

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ABSTRACT: A fundamental element of the social and economic development of any country is the electricity supply. World's electricity demand is in continues rise, and the fossil fuel reserves are consumed faster than new ones are generated. As environmental issues, air pollution, climate change and greenhouse gasses are becoming world's foremost concern, the search for more advanced energy efficient technologies became the driving force in developing new systems or enhancement of already proven technologies in order to enable sustainable future.

The main focus of this paper is exploring these new innovatory energy efficient technologies for electricity production using natural gas as a source: fuel cells, the micro gas turbine and their synthesis in one hybrid fuel cell/gas turbine system. A short overview of the two separate technologies will be made, as well as the concept of their integration into one hybrid system, with an emphasis on its main advantages. Additionally, few examples of already build and tested systems will be presented.

These hybrid systems could be the perfect “green box” for combating the energy crises and a leading technology for insuring sustainable future and reducing the environmental impact of the electricity production.

Key words: fuel cell, gas turbine, hybrid system, energy efficient technologies

SURVEY ABOUT IMPLEMENTATION OF ENERGY EFFICIENCY MEASURES IN CONSTRUCTION SECTOR IN MACEDONIA

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ABSTRACT: Around 40% of the energy used in the EU is related to the energy use in buildings. Because considerable share of this energy could be saved by implementing simple and efficient EE measures in construction sector, it is expected that this sector should give a significant contribution in achieving national and EU 2020 energy targets.

In this paper we present a brief scope of the characteristics of construction sector in Republic of Macedonia, especially in terms of implementation of energy efficiency measures and contribution of renewables. We also discuss the existing national legislation, policies and RES obligations as well as strategies related to energy efficiency in buildings. Furthermore, we made projections for reconstruction needs in order to meet national energy targets for 2020 and we have estimate energy savings and reductions of CO₂ due to implementation of energy efficiency measures in construction sector.

In order to map current situation a comprehensive survey about current status and implementation of energy efficiency in construction sector in Macedonia is conducted, through detailed assessment of questionnaires involving around 80 companies from this sector. The results are discussed in order to identify the targets and to define the priority measures.

Key words: building sector, energy efficiency measures, RES, EU 2020 strategy

INFLUENCE OF COAL QUALITY ON THE BOILER EFFICIENCY AND OPPORTUNITY FOR IMPROVEMENT

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ABSTRACT: Boiler is very important device for developing industry and production, and because of that it is necessary to optimized his work and in the same time efficiency. Efficiency of the boiler can be determined by two methods, direct and indirect method. Indirect method for determination boiler efficiency includes all heat losses in a system, while direct method didn't include any losses. In this paper are represent changing of the boiler efficiency determined with indirect method, according EN12951,part 15 and combustion coals with different quality, different heat value and ash content. According results from the calculations and test, combustion coal with higher heat value, increase boiler efficiency. In the paper also is analyzed influence of the other characteristics of the coal on the boiler efficiency. Comparison of the results from the calculation with different coal quality, make possibility to find out the proper fuel selection. In order to improve boiler efficiency are analyzed and different opportunities.

Kay words: boiler efficiency, low calorie value, ash, increase efficiency, comparison.

CLIMATE CHANGE IMPACT ASSESSMENT OF CULTURAL AND NATURAL HERITAGE IN OHRID REGION

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ABSTRACT: Cultural and natural heritage in Ohrid aren't only the most important category of heritage in Macedonia but probably groups that will be most susceptible to impacts of climate change in the next few decades. Frequent flooding and extreme weather events (storms, winds) can cause considerable damage to biological species and of historic buildings too. Therefore, a Climate change Impact Assessment on natural and cultural heritage of Ohrid region was prepared through detail identifying and describing of the vulnerable biodiversity and monuments. The methodology was established through analyzing of the risk vulnerability, to detect the consequences of climate change. It was done by archeologist from IECE and ecologist from CEIM after few field and desk research. The results from the given Assessment were more damage and increased loss of natural and cultural heritage in Ohrid region. Mitigation plan and recommendations were part of the Assessment. This paper presents an approach to contribute to understanding of the current impacts of climate change on natural and cultural heritage in Ohrid region as an important precondition for tackling this challenge in the future.

Key words: Climate Change, Ohrid, Cultural and Natural heritage

CONTEMPORARY ASPECTS OF CLIMATE CHANGE AS SECURITY ISSUES

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ABSTRACT: The main aim of paper is determinate contemporary aspects of climate changes as security issues. Researching the problems correlate with climate changes have been started with defining the reference object of climate protection. Main question is putting on which grade of climate change could affecteds ecosystems and social activities before situation become awareness. The second part of the paper problematizing and identifying contemporary climate change and security issues produced by climate change in several international regions.

Key words: Climate change, security, international security,
environmental security

ENERGY EFFICIENT SCHOOL BUILDING REFURBISHMENT USING DOUBLE-SKIN FACADE IMPLEMENTATION OF LOW CARBON TECHNOLOGIES

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ABSTRACT: The use of different kinds of Double Skin Façade (DSF) are developed and used in new architectural projects in order to improve indoor environment, increase the human comfort and save energy. The double-skin facade behavior depends on many parameters such as orientation, the geometry, the ventilation strategy, solar protections, etc. This study mainly focused on improving building façade design in education building considering thermal performance and reducing energy consumption in cold climate of Turkey. The effect of DSF system, applied on the south and north façades of a typical 24 classroom-high school building, on heating/cooling loads and natural ventilation was investigated. Two different models were developed by using DesignBuilder software; comparing conventional façade and double-skin-façade with insulated glass. Façades improvements were discussed in terms of CO₂ emission, energy consumption and the payback time. The results show that energy efficient refurbishment of an existing façade with DSFs have possible energy saving between the range of %25 and %35. In conclusion, this study aims to provide the optimum thermal comfort for an effective teaching-learning cycle in school buildings thus, reduce energy consumption and CO₂ emission for healthier and less energy dependent Turkey.

Key words: Energy Efficiency, Low Carbon Technologies, Double-Skin Façade

ESTIMATION OF INDOOR RELATIVE HUMIDITY USING ANFIS AND BPNN: A CASE STUDY FROM ESKISEHIR, TURKEY

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ABSTRACT: Evaluation of building energy efficiency of necessitate systematically designed experimental studies since the design parameters should be validated with real life data. In this scope, it is a well known fact that indoor thermal comfort conditions are thoroughly important for design, however, collection of data may be time-consuming and expensive. Moreover, because these parameters are collected after construction of the building, determination or prediction of these parameters can be useful in design stage. These parameters can also be used for back-calculation of energy efficiency parameters. In this study, adaptive neuro-fuzzy inference systems (ANFIS) and back-propagation neural networks (BPNN) were employed to predict the indoor thermal comfort conditions. Data used in this study is collected from a residential building in Eskisehir, Turkey. Three hobo dataloggers were placed in three rooms of different locations in the building. The data concerning indoor temperature, relative humidity and dew point was systematically collected. A novel approach was adopted in evaluation of data: data collected from two rooms were used for prediction of relative humidity in the third room. It was concluded that ANFIS and BPNN are useful tools for estimating indoor thermal comfort conditions using data collected from same environment.

Key words: relative humidity, experimental studies

CHALLENGES OF INTRODUCING ELECTRIC VEHICLES IN REPUBLIC OF MACEDONIA

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ABSTRACT: One of the most complex and important areas in contemporary economy and life is road transport. Number of characteristic is related to this sector: one of the biggest employers globally, one of the largest people and goods movers, safety issues, energy aspects, and well known problems with pollution.

Due to mobile nature of road vehicles, there is a reach history of efforts of international harmonization of regulations tackling technical issues. Education, trainings, specific business models and policy building are areas very close related to this area.

Witnessing the latest development in terms of design, sale and use of electric vehicles it is not difficult to recognize the need for smaller countries like Republic of Macedonia to be proactive and, first of all to recognize opportunities and challenges this process brings.

This paper starts with deep and carefully analysis of actual trends of production and introducing electric vehicles in road transport, globally, and more specific in EU countries. Based on that and on analysis of actual road transport characteristics in Republic of Macedonia, a number of challenges have been recognized: need for new business models, an issue of network of charging stations, needs in education adopting, policy making etc. Some of the result of this research and analysis are expected to be of help to professionals and researchers in the area of road transport now, and in the near future.

Key words: electric vehicles, challenges, charging stations, education, training, business models..

VOLTAMMETRIC SENSOR FOR CHLOROPHENOLS BASED ON MODIFIED SCREEN PRINTED ELECTRODES WITH REDUCED GRAPHENE OXIDE

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ABSTRACT: Electrochemically reduced graphene oxide at screen-printed carbon electrode (SPCE-ERGO) effectively enhances electrochemical responses of chlorophenols. The influence of the modifier on the electrochemical behavior of catechol, hydroquinone, 2-chlorophenol, 2,4-dichlorophenol, 4-chloro-3-methylphenol, and pentachlorophenol at the screen printed carbon electrodes (SPCE) was investigated in phosphate buffer solution at pH 7. The electrode material was printed on transparency film for inkjet devices. Modification of the SPCE with reduced graphene oxide has been significantly increased the sensitivity compared to unmodified electrode. In cyclic voltammetry (CV) and differential pulse voltammetry (DPV) signals increased for investigated phenols except for pentachlorophenol. Amperometric measurements show the most significant increased sensitivity to phenols with modified electrode, where more significant increase of sensitivity is observed to hydroquinone about 38 times at applied potential of 0.1 V, 2-chlorophenol for 16 times at -0.3 V, and 2,4-dichlorophenol about 13 times at -0.4 V. Simple way of preparing such a sensor, its easy modification, and improvement of signal to chlorophenols make this sensor suitable for application.

Key words: SPCE, chlorophenols, reduced graphene oxide, sensor

THE EVALUATION OF SOME CHARACTERISTICS OF SPECIES IN THE PHYTOCENOSIS OF SHKODRA LAKE

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ABSTRACT: The quality of the environment is changing day to day and mostly the anthropocentric factor is the cause. Humans are affecting a lot the potential of the nature and its biodiversity, but also they are affecting their live and its conditions. On the other hand the industrial technology linked with agriculture, forestry and the nature in general have the duty to protect the environment and the biodiversity. Changes on the quality of the environment influenced also the vegetation around Shkodra Lake. The flora of the Lake and its vegetation areas are famous, with a lot of species and are creating various habitats. The study is presenting the evaluation of some characteristics of phytocenosis in the shores of Shkodra lake. Is presented their situation and are presented dominant species and fidelity, abundance etc;, in order to have a clear picture of the situation of flora and also in order to protect the precious vegetation of these habitats.

Key words: vegetation, flora, characteristics of phytocenosis, dominant species, abundance, fidelity

THE BIODIVERSITY OF FLORA OF MORAVICA RIVER (BANAT, SERBIA)

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ABSTRACT: Moravica is a river in southwest part of Banat (Vojvodina Province, Serbia) length of 17.4 km. This relatively small river is characterized by a great floristic richness. A total of 87 taxa include 47 hydrophytes (8 floating, 10 submerged and 29 of emergent plant species) were found in Moravica river. Some of rare and endangered plant species have found a shelter for its development here, such as: *Marsilea quadrifolia* L., *Acorus calamus* L. and *Alisma gramineum* Gmel.

By long term of phytocenological research the stands of 14 aquatic and semiaquatic associations were identified in Moravica river. Some of them, such as *Lemnetum (minors)-trisulcae* Den Hartog 1963, *Acoreto-Glycerietum aquaticae* Slavnić 1956, *Rorippa-Oenanthetum* (Soó 1927) Lohm. 1950, Pop 1968 and *Bolboschoenetum maritimi continentale* Soó (1945) 1947 are very rare in Banat region, and Serbia at all. Nevertheless, a new subassociation *Bolboschoenetum maritimi continentale* subass. *marsiletosum quadrifoliae* Ljevnaić-Mašić (2010) were found here.

Because of the great diversity of flora and vegetation, Moravica could be seen as one of the potential centers of floristic diversity. Unfortunately, a strong anthropogenic influence threatens to undermine this unique flora and vegetation and the weather would be implemented appropriate measures to protect the aquatic ecosystem.

Key words: flora, vegetation, biodiversity, Moravica river

ONE OF THE MOST AGGRESSIVE INVASIVE ALIEN PLANT ON THE ROMANIAN BLACK SEA COAST

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ABSTRACT: The spread of invasive alien species poses a serious threat to the conservation of natural and semi-natural habitats. The invasive plants change the character, form or nature of ecosystems and they have a tremendous impact on the native floral communities. In the competition between the invasive plants and the native plants, the invaders have a superior competitive ability. According to Richardson et al. (2000) the alien invasive plants are naturalized plants which produce descendants, sometimes in large amounts, at considerable distance from the parental plants and over large stretches. IUCN defines alien invasive species as “an alien species which becomes established in natural or semi-natural ecosystems or habitats, is an agent of change and threatens native biological diversity”. Early detection and rapid assessment of invasive plants can limit the damages and allow an efficient control of the most dangerous species.

The coastline has a higher proportion of alien plants compared with the inland areas. On the Romanian Black Sea coast, a lot of habitats with different degrees of human impact occur and this fact facilitated the quick spreading of the invasive plants in the littoral zone. One of the bigger sources of invasive plants are the harbours but not only. Tourists, on their clothes and shoes and also their pets on the fur, have introduced seeds or fragments of the alien species in the coastal area.

One of the most aggressive alien plant which has become invasive on the Romanian Black Sea coast is *Cenchrus longispinus* (longspine sandbur).

During field surveys carried out in the coastal area of the Black Sea, large colonies with *Cenchrus longispinus* have been observed in Mamaia resort (near Constanta town). Longspine sandbur grows sporadically and only in small local populations between Mamaia and

Năvodari and in other locations on the southern coast of Romania. In Mamaia resort, *Cenchrus longispinus* is abundant especially in ruderal areas from the edge of the beaches, close to the terraces of restaurants and bars built on the beach, along the access pathways towards beaches, in the green spaces, near the campings and in disturbed habitats.

Longspine sandbur may cause inconvenience to tourists due to its spiny burs which can injure the hands and feet of the people and the mouth of the pets in infested areas on the beaches and in the green spaces.

Information concerning the chorology, syntaxonomical affinities, about how it entered in Mamaia resort and about the risk of spread along the coastal area, will be given in the article.

Key words: alien species, Black Sea coast

CLASSIFICATION AND EVALUATION OF FRESHWATER FISH SPECIES OF GREECE, ACCORDING INTERNATIONAL PROTECTION DIRECTIVES AND LEGISLATION

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ABSTRACT: Greece hosts a large proportion of fresh water fish species that are threatened at the European level, and has important responsibility for the protecting these species within its territory. Freshwater fish are immediately linked to their surrounding environment, which is a unique combination of abiotic and biotic factors that are a part of the environment's history. The threats for freshwater fish of Greece are rather heightened, either because of the reduced quantity of water in the bodies of water due to natural causes (drought), or excessive use (irrigation, water supplying). Making an inventory of fauna and freshwater fish is mandatory if one wants to be aware of it. Unfortunately, this process is rather ephemeral and is driven by personal estimation, and there is, consequently, always the risk of mistake, omissions or underestimations/overestimations.

This paper aims to make known the number of threatened and endangered freshwater fishes of Greece. To serve this purpose, a table where freshwater fishes were classified was created. In the table there are included mainly data from FishBase, Greek Red List of fresh water fishes, Berne Convention and Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora of 21st May 1992 (the Habitats Directive). In particular, the International Classification System (IUCN), the names of families, the names of species, common Greek names, and the number of freshwater fishes used are exclusively based on FishBase (fishbase.org).

In total, in Greece, there are 22 families with over 150 species of freshwater fish, out of which, 82 are endangered. Based on the International Classification System (IUCN), out of the 150 species only 2 have not been labeled as endangered, whereas 66 species are under low risk, and 82 are endangered. According to the Greek Red List, 34 of

the species have not been labeled as endangered, 52 are under low risk, and the rest 64 are endangered. On the contrary, according to Berne Convention only 14 species have been labeled with any of risk levels, and 17 according to Council Directive 92/43/EEC. Finally, only 6 species are protected at the same time by the International Classification System (IUCN), the Greek Red Data Book, Berne Convention, and Council Directive 92/43/EEC.

Fresh water fish species of Greece require greater action to improve their status. While many species already receive some conservation attention, others do not. Fish species can be saved from extinction but this requires a combination of sound research and carefully coordinated efforts.

Key words: fresh water fish fauna, fish protection status, fish protection legislation

ASSESSMENT OF WATER DRINI RIVER FOR MICROBIOLOGICAL PARAMETERS

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ABSTRACT: Drini river is the main source of water that fulfill the industrial and the agriculture needs in Albania. The objective of this study was to evaluate the quality of water based on microbiological parameter such as heterotrophic bacteria and faecal coliform. Sampling was collected at 9 stations during the river stream with two times per year frequency. The data were comparison between fecal coliform and heterotrophy in all the stations. Sampling, storage, transport and analysis are made according to international standards. The method of calculation is to determine the MPN (Most probable Number). Calculations and reports for Cfu / 100 ml. Based on the results obtained were in generally within the limits permitted by international standards, for surface waters used by people and agriculture.

Key words: faecal coliform, Drini water, heterotrophic bacteria,
cfu/100 ml

EVALUATION OF QUALITY OF COASTAL WATER FOR FAECAL INDICATOR BACTERIA

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ABSTRACT: Evaluation of the microbiological quality of coastal water taken from 3 sites along the Plepa, Currila and Jala beach in Albania. The bacteriological analysis results were in accordance with the European Union standards. Sweater samples (96) were collected once a month from June to September 2013 from 2015. Samples were collected in three point, first 5 meter from coastal, seconds 50 meter from coastal and third 200 meter from coastal. These samples were analysed for the presence of faecal indicator of bacteria like this *Escherichia coli* and *Enterococci faecalis*. The results showed that the total number of bacteria, expressed as CFU/ml. It was founded that the water taken from Plepa are poorly quality all the period of study. In Curila the water has sufficient, and in Jala the water has good quality.

Key words: bacteria indicator, sweater, Albania coastal, pollution.

THE COMPOSITION OF THE DAILY BUTTERFLIES IN THE VILLAGE SHKOZA IN MALISHEVO

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ABSTRACT: This paper presents the research on butterflies (Lepidoptera) in the village Shkoza in Kosovo. The data on the structure of butterflies in Kosovo is quite limited and incomplete because a large part of its territory is not explored in this respect. The village Shkoza belongs to the municipality of Malisheva, located in the central part of Kosovo, and it is characterized by mountainous hilly terrain configuration with 640 m. – 893 m. altitude. The fauna of butterflies has not been explored so far in this region, so this paper presents a small contribution to a better acquaintance of the biodiversity of Kosovo in general. Butterflies are collected with an entomological net, mainly at noon, in the period May – September 2011. During this research a total number of 400 butterflies were collected. The collected butterflies in taxonomic terms belong to 44 species and 5 families, among which the Nymphalidae family has dominated with 24 species. Among these species there are species which according to the IUCN Red List are categorized as endangered species in Europe. Since after this research the forest in this area has been burnt, it is assumed that the structure of butterflies in this village may have changed, thus we are challenged to make a research over again in order to find out how the destruction of the habitat by fire has affected the structure presented in this paper.

Key words: butterflies, fauna, biodiversity, Kosovo

THE IMPLEMENTATION OF AARHUS CONVENTION IN SHKODRA AS A TOOL TO FULFILL AN OBJECTIVE FOR THE SUSTAINABLE DEVELOPMENT IN THE REGION

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ABSTRACT: Aarhus Convention is the convention for the access to information, public participation and for the right to bring to the court environmental cases. Its implementation's goal is local but its importance is regional and global. The goal of the study is to present the level of the implementation of Aarhus convention for the period 2011 – 2015 in Shkodra region, the scale of the involvement of several key actors in its implementation. Also are given some recommendations for the public, civic society and local authorities for the rights of the Convention, and their duty to work for sustainable environmental and social politics at local and regional level.

Key words: Aarhus convention, public participation, sustainable development, implementation of the Convention, environmental cases

EVALUATION OF THE VALUE OF BIOCOMFORT FOR KASTAMONU-INEBOLU

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ABSTRACT: Biocomfort are considered in landscape planning and design of the study. The range of biocomfort that people feel healthy and dynamic people in the range, otherwise, if the range is not in biocomfort they do not want to stand in that area. Coastal areas are located within this area of their value in the biocomfort landscape has been no study until now appropriate for the range. In this study, using thermal perception maps, thermal comfort is very important for landscape planning offers a model for the physical planning process. Forward-looking landscape in the areas of planning and design process by enabling the creation of biocomfort suitability values of the people of that area allows you to make a smooth landscape activities. For this purpose, according to the Kastamonu-Inebolu index of physiological equivalent temperature climate data biocomfort maps were produced. Inebolu coastal areas to determine the biyokonf structure, climatic data are collected from meteorological stations. Monthly temperature of Rayman 1.2 program with the help of the station, wind, precipitation, humidity values used to obtain and geographic information system (GIS) software inverse distance weighted interpolation technique-month psychological equivalent temperature and the province was used to produce a thermal perception maps. Thus; most comfortable months and regions for activities in coastal areas Inebolu was detected by thermal maps based on psychological perceptions of equal temperature. Things to further the specified thermal perception in landscape planning maps to map the most suitable areas for contribution to plan for the long term are provided.

Key words: Inebolu; Biyokonfor; landscape planning.

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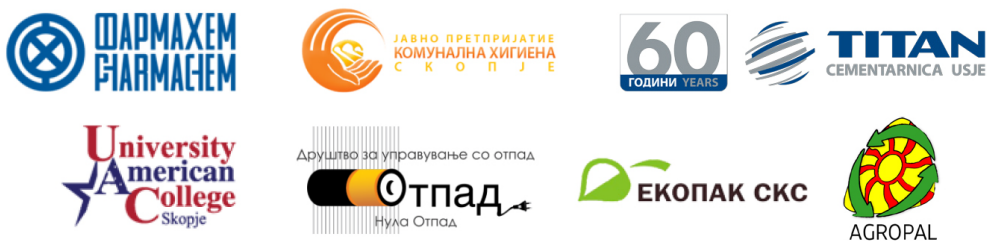
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