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BOOK OF ABSTRACT

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BOOK OF ABSTRACT NOVEMBER 2007.

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EMERGING SUBSTANCES IN INDOOR AIR-SAMPLING, ANALYSIS, REACTIVITY

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Abstract

All across Europe, people live and work in indoor environments. On average, people spend between 85 to 90% of their time indoors (homes, workplaces, cars and public transport means etc.). In the past decades several studies have indicated the presence of a vast variety of chemical compounds in indoor environments (buildings, homes); thus people is exposed indoors to a complex mixture of chemicals at concentration levels which are often up to five times higher than outdoors. The presence of these chemicals in indoor air is the result of infiltration of polluted outdoor air and of emissions from various indoor sources, including building materials, consumer products, activities of the occupants, smoking etc.

In order to evaluate the impact of indoor air contaminants on human health adequate monitoring strategies have to be elaborated and applied and analytical methods and techniques to be refined/developed, in order to identify and quantify the main substances present in various indoor environments and to evaluate possible health risks.

In the presentation systematic information on sampling, analysis and reactivity of compounds, which should be monitored with priority in indoor environments will be provided. Moreover, a study dealing with measurement strategies for indoor/outdoor and personal exposure concentrations of pollutants in kindergartens and public buildings in various European cities within the frame of the European Indoor Air Monitoring and Exposure Assessment Project (AIRMEX) will also be

presented. In total 14 chemicals were monitored i.e. hexane, benzene, toluene, m/p-xylenes, o-xylene, 2,4,6-trimethyl-benzene, ethyl-benzene, d-limonene and a-pinene, formaldehyde, acetaldehyde, propanale and hexanale by means of passive samplers exposed over one week and analysed by gas-and or liquid chromatography.

Compared to the classical (short time) air sampling by using pumps over a short period of time, the methodology applied in our study reflects an integrated sampling approach over a longer period, which results to a better evaluation of the overall pollutant situation.
Ca. 600 samples from 32 public buildings and 36 schools/kindergartens have been analysed for VOCs and carbonyl compounds. In most cities measuring campaigns were carried out in different seasons to evaluate possible variations in indoor, outdoor and exposure concentrations.

The sum of the selected VOCs measured inside public buildings (all sites) varies from some a few micrograms/m3 (ca. 8 μg/m3) to ca. 281μg/m3. Outdoor concentrations (all sites) vary from ca. 7 to ca. 153 μg/m3. Personal exposure concentrations were higher than the indoor/outdoor concentrations. In most cases they were twice as high (or even higher) as indoor concentrations and significantly higher than outdoor concentrations.

QMS IN FUTURE - ISO TC 176 PERSPECTIVE

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Abstract

The development of the competitive factors in the markets into a multidimensional structure and the interested parties model have created the need for organizations to adopt a number of Quality Management Systems, and other management systems, part of them based on management standards. Inevitably as organizations are driven by effectiveness and efficiency the need for integrating those systems started to be discussed. In this paper we are trying to analyze this integrated management systems standard future from the perspective of the ongoing debates and work in progress in the ISO/TC 176 , the technical committee responsible for QMS, and we conclude that QMS integration is inevitable, that Risk Management is the common goal of all management systems and that Sustainability may become the future one word to represent business performance.

Key Words
Integrated
Sustainable
Risk Management

ENERGY AND ENVIRONMENT

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Abstract

In Europe, there are countries, which are very interested in the renewable energy resources (rer), like Sweden and others, which do not care at all, like France. During 2003, because of the planet's high temperature in Europe (France, Italy, Greece, etc.) an urgent need for cooling came up, which means need for more energy! EDF, the France Electrical Company had very difficult time for two reasons: 15 out of 58 nuclear reactors were out of order for maintenance and the hydro-electrical production was very low, because of the continuous dryness. France substituted the missing portion of energy from the thermo-power electrical stations and set them to produce electricity on their highest level! In the middle of August, EDF started to discharge into the rivers the water used for cooling the nuclear installations with temperature of 30º C! Note that, the legislation permits much lower temperature of this kind of water, in order to avoid affection of the environment! It is obvious that the French electrical production, which derives from nuclear energy per 78% and from hydro per 12%, was not enough to satisfy the extra needs, because of the climatological changes.

From the decade of 1970 existed the interest for clean energies with the consequence was to have the beginning of a significant technological development of the renewable energy resources, i.e. eolic, solar, biomass and geothermal. The photovoltaic technology was developed very rapidly and according to E.P.I.A. (European Union of Photovoltaic Industry), since for the last twenty years, the price per KWh was

reduced per 5% every year. This reduction could be compared with the computer development! In Japan and in California they have calculated that the price of the photovoltaic KWh will be exactly the same with the price of the conversional KWh in the period of 2005-2010.

Because of the planet's overheating, a global threat is a reality for the humanity! In 1992 the Rio de Janeiro Conversion established, among others, the obligation of the countries to collaborate with each other, in order to reduce the emission of the greenhouse gasses.

Still, there is not an accepted solution, regarding this problem from all the countries, because on one hand the industrial countries are afraid if their model of development can be in danger and subsequently the whole society and on the other hand, the rest of the countries reject the possibility to face obstacles to their plans for development. The same time, these countries are also afraid of becoming victims of the climatological changes, due to the greenhouse effect!! So, they must adopt relating measurements as soon as possible! Under these conditions, the energy problem becomes vital! In Europe, there are countries, which are very interested in the renewable energy resources (rer), like Sweden and others, which do not care at all, like France.

ANTHROPOGENIC RADIO NUCLIDES IN SURFACE SEA WATER AND FALLOUT

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Abstract

A summary of the measurements of the concentrations of man made radionuclides in surface seawater as well as fallout since early ‘60s are here reported as measured in Italy and Japan. Most of the data refers to ^Sr and 137Cs, but occasionally the concentrations of K9Sr and t34Cs in some Italian samples are also given. The fallout produced by the experimental nuclear weapon tests is the main source of radionuclides. The release of the Chernobyl accident contributed also to a worldwide deposition in the Northern Hemisphere with large differences according to the distance from the source, the location and the meteorological condition at the time of the deposition

Keywords:: surface seawater, radionuclides, Italy, Japan, fallout

GLOBAL CLIMATE CHANGE FACT and IMPLEMENTABILITY ISSUES of the KYOTO PROTOCOL

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Significant changes in the climatic patterns and accompanying global warming trends in the last decade are on the top of the United Nations "priority concerns" list. Based on the recent Assessment Report AR4 of WMO-UNEP Intergovernmental Panel on Climate Change (IPCC), evidence for warming of the climate system is unequivocal and with at least 90% scientific consensus, the global climate change is due to anthropogenic greenhouse gases (GHGs) released in the last half-century. The IPPC report clearly points out that the apparent effect of human activities are quantified and are known to cause warming effect on earth's surface.

The UN Framework Convention on Climate Change of 1992 and its implementation document, the Kyoto Protocol, have been ratified. The objective of the Kyoto Protocol is to reduce the GHG emissions by a select group of countries (Annex I Group) by an average 5% of the 1990 levels until year 2012 under a country-based list. The Annex I group of countries currently represent approximately 55% of the total the total GHG emissions of the world.

The Kyoto Protocol is a noble concept towards mitigation of the global warming syndrome via minimizing the GHG releases. However, the ways and means to achieve this goal were hindered mainly by rejection of the United States, about 23% of the world GHG emissions, to sign the Protocol. Currently, USA, Australia and Turkey are the only countries that had not signed the Kyoto Protocol.

The GHG emission reduction targets of the Annex I countries are based on the annual GHG emissions in year 1990 (base year, 1988 or 1989 for some countries). However, the time series until the most recent (2004) national GHG records reveal that there is an increase,

rather than a decrease, in the GHGs in majority of the Kyoto Protocol signatories. Even EU's consolidated (umbrella) release totals have deviated from the targeted levels. All of the signatories of the Kyoto Protocol are currently scrambling to initiate the flexible implementation mechanisms, such as Emissions Trading, Joint Implementation and Clean Development Mechanisms in order to comply with the Kyoto targets until the end of 2012.

It is the opinion of the author that the achievements towards realization of the Kyoto Protocol have not been satisfactory. This personal opinion has been reinforced by the outcome of the latest G8 meeting in Germany in June 2007 that attested a need for a new international agreement includes major other developing countries like China, India, Brazil, Mexico, S. Korea in addition to the Annex I countries. The scheduled UNFCCC Meeting in Indonesia in December 2007 will likely be the arena for negotiations of a post-Kyoto Protocol.

AXIOS RIVER POLLUTION: PESTICIDES, POLYCHLORINATED BIPHENYLS AND HEAVY METALS

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Abstract

Axios (Vardar) river is the second - in length - river of Balkan area, with a total length of 380 km (306 km in FYR of Macedonia and 74 km in Greece). In its estuaries to Thermaikos Gulf (located in the greater area of Thessaloniki - Greece), Axios river formulates an extended delta together with Aliakmonas and Loudias rivers. Agricultural, industrial and urban activities are the main pollution sources of Axios river. Axios river is polluted by industrial chemical waste in Kostivar and Titovo areas, by urban waste from Scopje city and about 12 other smaller cities in FYR of Macedonia.

The present paper is a part of a greater research project aiming to determine the transboundary pollution of Axios river, its water and sediment quality and the direct and indirect impacts to human health and environment. In the framework of this project, it has been determined, the physical-chemical and presence of toxic chemical compounds and elements such as metals, pesticides and other related organic pollutants in various sampling stations during the year 2006. The analyses of Axios river water showed the presence of one or more pesticides in all sampling stations, but in concentrations lower than 0,1 μg/l, which is

the highest permitted limit for each pesticide in drinking water, according to the Directive 778/80 of the European Union. The results showed a significant degradation of the water quality of Axios river, which is mainly due to the presence of toxic organic pollutants like pesticides.

The most commonly encountered pesticides in the surface river water were dichlorvos, EPTC, a-BHC, lindane, molinate, alachlor, metolachlor, methyl parathion, prometryne and endosulfan sulfate. The higher concentrations in river water were measured during the period from June to September, following seasonal application and diminished significantly during the autumn and winter. The polychlorinated biphenyls show relatively high total concentrations in all sampling stations in the Greek part of Axios river sediment during the year 2005. The levels of some heavy metals in river water and sediment are relatively high both in Greek part and the FYR of Macedonia part of Axios river. The results showed a significant degradation of the water quality of Axios river, which is mainly due to the presence of toxic organic pollutants like PCBs and heavy metals and it can be assumed that there is an environmental risk, possibly because of irrigation with water from the river.

ALUMINIUM IN DRINKING WATER TECHNOLOGY AND INTAKE OF THIS METAL IN HUMAN BODY THAT CAUSE DIFFERENT KIND OF INTOXICATION

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Aluminium is a natural constituent of many water supply sources, particularly of upland surface 1waters. Aluminium compounds play an important role in water treatment as coagulants to remove suspended matter and impurities. Many water supplies contain concentrations of aluminium that exceed the standard from time to time. The effect of exposition on human body are divided into local effects and the systematic effects. The local effect is manifested at gastrointestianal tract and lung tissue. 2Systematic effects of aluminium may show effect on the central and periferial nervous system.

The primary aim of this investigation was a control of Al content on the technologically plants that belong to the Public water supply (region of Užice) where aluminum-sulphate has been added as a flocculation agent in the order to estimate daily intake of Al by consumed drinking water, as well as intake of aluminium by different sources.

The waters from three Public water supplies: “Zlatibor”, “Rzav” and “Cerovića Brdo-Užice” have been investigated which as raw water use the rivers, Đetinja, Rzav and Ribnica, respectively. Except plants, the most interesting places for sampling drinking waters were nursery schools, restaurants, and some special places from the network water supply. The latter are very important in the accidental cases-breaking of the tubes when gathering of Al in the pipelines or of bacteria take place.

In the investigated water supllies, the concentrations of aluminium that exceed the standard is noticed during spring period when snow is melting in this area. The raw watter is just surface water and it can be conclude that the climate environmental cycle has influence to the chemical composition of these rivers. It is evident that level of alumi-

num is the highest in March (April). In this areas where the regulatory standards are in used, consumers' intake of aluminium from water is in good agreement with literature data for for areas with similar geochemical characteristics that influence to the content of Al in water. The water after breed treatment with flocolunat stream to the rivers Rzav, Đetinja, Ribnica and cause the change of the natural equilibrium of this ecosystem as well as indirectly the category of these rivers downstreams.

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SESSION 1 :

LEGISLATION- EDUCATION- TOURISM- HEALTH

CHAIRMEN: S. Avdimiotis - S. Savić - M. Kochubovski

HEALTHY FACTS ABOUT NUTRITION IN PREGNANCY

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Abstract

Imagine a pregnant woman and a bulk of information which overwhelm her, confuse her and in some cases are contradictory concerning nutrition, safe and non-contaminated food proper for this period, dietary supplements. It could be the case of seafood whom virtues: omega-3s, healthy and risk-free alternative are nowadays questionable because of mercury and PCBs (polychlorinated biphenyls) early contamination in the food chain. And the risks for infants: foetal neurological, reproductive and immune problems are not very well tackled, even by FDA (US Food and Drug Administration) who just warned women of childbearing age to limit their intake of tuna. The aim of the study is to meta-analyse the scientific reports concerning healthy nutrition and dietary supplementation in expectant or childbearing age women. There is a growing body of knowledge sustaining a positive association between PCBs and neurodevelopment problems in infants mediated by low levels of thyroid hormone (TH) or TH disruptions.

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PUBLIC WATER SUPPLYING OF RURAL AREA OF SOUTH-EASTERN SERBIA: RESULTS AND REAL RESULTS-IMPORTANCE OF ADEQUATE BOOK OF RULES INTERPRETATION

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Abstract

Introducing: official book of rules for drinking waters in Serbia (No 42/98;44/99) with Article 2.determs ”Public water supplying ”. There is no doubt about that. The others points of Article 2. are giving definition for **all** connected with public water supplying. “ Type of water source can be great problem”! Natural water from open water source, or from the close source can make such a mass! It depends of legislation-not of individual opinion!

Aim: in five years long period (2002-2006) has been summed results of exanimation of drinking waters from villages waterworks in Nisavski and Toplicki Region-greater part of Sout-Eastern Serbia. Author wants to determine: kind of water classification, number and percent of uncorrect samples; as well as the most often reasons of uncorrectnes. Of course risk assessment is crucial.

Materials & methods: as materials has been use samples of drinking waters from villages waterworks. All samples have been examined by standard methods on bacteriological, physical and physico-chemical parameters. In period 01.2002 - 05.05.2004. waters has been categorized as “drinking waters”. In the rest of period samples has been categorized as “natural water from covered sources”!

Results & discussion: (A)bacteriological results - in fallowed period from 384 villages waterworks have been examined 529 samples. In 351 samples (66,4%) has been determined different reasons of uncorrectnes. Determed kind of bacterias showed: **great level of water pollution which ehists in long time period.**

(B) physico-chemical results – from the same villages waterworks has been examined 444 samples. In 304 (68,5 %) samples has

been determined reasons of unccorrectnes: **missing of chlorine residuals**, turbidity, more intensive colour, greater level of organic materials (using KMn4 during analyzing). On the same time has been improved chemical parameters of faecal contamination (NH4 N2O3,N2O5).

Conclusion: It is – according to limits of Book of regulations 42/98 ; 44/99 extremily great level of unccorect samples! Question is: if all the time classification was the same – which will be number and precent of unccorect samples? Let not a talk about results – papers! Let have a talk about risk assessment: is it ok that drinking water can be categorized as "covered well" which means that samples is correct?! although consists faecal bacterias or 100 living bacterias!

Are such waters for drinking … or only for warning: let's do our job on the same way – because of people!

ENVIRONMENTAL LEGISLATION AND PUBLIC HEALTH – RELATIONSHIP BETWEEN INSTITUTIONALIZED (LEGAL AND SUB-LEGAL) RULES AND LEGAL GUARANTIES OF THE ENVIRONMENTAL RIGHTS, OBLIGATIONS AND DUTIES

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Reality of expanding environmental problems, necessity of human health protection, as well as the growing needs of economies, national and transnational, produce our utmost demands to observe mutual connections between so opposite needs and problems. Also to produce, as states, adequate answers. Right way for this is to develop, at national levels, legislations, and of course, adequate rules, accepted by states, in their cooperation and coordination at the international level.

In many states, Serbian State as well, we can observe long periods of environmental law developing, but developing of the regulative, not norms that can guaranty effectiveness of any proclaimed environmental: right, obligation, or duty. Or can guaranty such effectiveness only partially and ineffectively. This was the main reason why many states invest great efforts in this direction in last 10 to 15 years (Australia, Canada, France, Germany, Russia, Serbia…). Our text tries to present and explain such mutual connections between needs – their legislative recognizing and establishing, and necessary legal guaranties for their effectiveness. Guaranties formulated with the Criminal law norms and rules.

Key words: environmental rights, obligations and duties, developing of Environmental Law, legal guaranties for the environmental law worth's, Criminal Law guaranties.

ENVIRONMENTAL TOXICITY OF CADMIUM AND HEALTH EFFECT

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Abstract

Environmental toxicology examines the fate and effects of contaminants in the environment. Exposures to heavy metals can affect human health in both way directly or indirectly by disrupting ecological systems that exist in rivers, lake, oceans, streams, wetlands, estuaries and other ecosystems. It is known that Cadmium input to the aquatic environment through discharge of industrial waste, surface run off and deposition of cadmium also strongly absorbed onto sediments and soils. On one hand non-ferrous metal mines represent a major source of cadmium release to the aquatic ecosystems, but on the other hand human activites such as using phosphate fertilizers, burning coal, iron alloys, steel and cement and disposing household waste. Cadmium can be easily entered into the body by eating food, drinking water, smoking a cigarette or even breating the air, resulting health effects from acut and chronic exposure to cadmium in both human and animals. Cadmium was classified as a potential human carcinogen under the EPA 1996 cancer guidelines. The aim of this study is to review the effect of cadmium on human health and ecosystem. In this study, the affects of cadmium on vacating, digestion, and digestive system is reported. It is observed that cadmium causes kidney disease, severely irritates the stomach, vomiting and diarrhea, sometimes sudden death.

Key words: Environmental toxicology, cadmium, environmental health.

MONITORING OF THE AMBIENT AIR QUALITY IN SKOPJE AND VELES AND EVALUATION OF THE HEALTH EFFECTS IN 1990-2006

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Abstract

The aim was to evaluate ambient air quality in Skopje and Veles with parameters sulphur dioxide and black smoke and morbidity rate of respiratory diseases in the period 1990-2006.

According to the monitoring results has been found significantly statistical difference between the average annual concentrations of sulphur dioxide in the ambient air during the period of examination, with higher values in Veles (average = 0,06 mg/m3), compared to Skopje (average = 0,03 mg/m3). Decreasing trend of sulphur dioxide concentrations has been registered in both cities.

The same situation has been noticed concerning black smoke, with significantly lower levels in Veles (average = 0,02 mg/m3), compared to Skopje (average = 0,03 mg/m3). Decreasing trend has been found in both cities, with accent to Skopje.

Incidence rate of respiratory diseases was higher in Skopje, especially in Veles, compared to the Republic of Macedonia.

There has been registered decreasing trend of incidence rate of respiratory diseases (ICD-10 J00-J99) on 1000 population in the period 1990-2006 in Skopje and Veles.

Key words: ambient air pollution, sulfur dioxide, black smoke, respiratory morbidity

TWENTY FIVE YEARS OF ENVIRONMENTAL EDUCATION IN PETNICA SCIENCE CENTER - SERBIA

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Petnica Science Center (PSC) is operating 25 years in Serbia. It is a unique non-governmental, non-profit and independent educational institution working with young people who demonstrate an inclination and interest in science beyond regular school curricula. Most of PSC's educational activities are designed for high school students (age 15-19), but there are also a variety of programs for elementary school children and college undergraduates. Beside various lectures, workshops and courses, student project was the main teaching/learning method in PSC.

Environmental projects were among the first which started in 1982 and their share was usually very high in comparison with other science projects. At the beginning environmental projects were organised with large team of students (20-40). Individual project started later. They were more demanding and useful for students. Projects on water analysis were very popular during the nineties, but later the interest of students was shifted towards food analysis and, to some extent, soil analysis. During the last few years, projects became more complex and their quality was considerably improved.

International activities were always important in Petnica Science center. They included participation of the best students from PSC (and their projects) at various international youth events (science fairs, exhibitions, competitions), short study visits to foreign research institutes (usually on the occasion of some international summer course), hosting of visitors from foreign countries in PSC (students and/or educators/researchers).

The methodology used for the work with students as well as examples of environmental projects will be given.

THE ENVIRONMENT EDUCATION THROUGH GEOGRAPHY

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In the context of the actual development, the essential protection of the environment should be the first priority of the human society. The environmental education is one of the main components of the environment protection which must begin from childhood and continued all your life.

The geographic sciences, through their nature, have a larger kind of approach about the environment, regarding the limits, characteristics and its problems.

The communication of the geographic information about the environment to the involved ones in the educational process, at all study levels, will have a benefic effect, because it will determine the others to be correctly acquainted, to assume responsabilitties, to develop a positive attitude on the environment and its protection, and also to involve in solving the environment problems.

Key words: environmental education, geographic sciences, educational process.

GLOBAL ENVIRONMENTAL CHANGE: NEED FOR HIGHER EDUCATION AND RESEARCH

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Many things are known about global warming and climate change, land degradation, biodiversity losses, water crisis and other issues at global scale. There is a need to bring the knowledge in Global Change to university education system in developing countries. The UN Convention on Climate Change recognizes this reality: under the Article 6 on Education, Training and Public Awareness, it calls on governments to promote the development and implementation of educational programs for building a knowledge base and search for local solution to the global problem.

Developed countries, especially USA, already implemented educational and training courses of Global environmental Change at university level (Columbia, Cornell, Harvard, Indiana, James Cook Australia, Johns Hopkins, Miami, Arizona, California, Princeton, Rutgers, Ohio, Florida, Hawaii, Maryland, Massachusetts, Michigan, Minnesota, Oregon, Utah, Washington, Wisconsin-Madison, Yale).

The first project related to development of courses related to Global environmental Change at West Balkan universities begun in 2006. The project is financed by the Norwegian Government (SIU). Eight West Balkan (WB) universities take part in this project. WB universities jointly develop course curriculums related to Global Environmental Change, based on the experience of NORAGRIC, Norwegian University of Life Science (UMB). WB universities expect to enhance the pool of trained young scientists able to analyze and link current global environmental challenges with problems in local conditions using modern options and means.

THE CONTRIBUTION OF MUSEUM OF NATURAL SCIENCES TO SUSTAINABLE TOURISM OF ROMANIA: CASE STUDY ON CONSTANTA

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Abstract

The Museum of Natural Sciences from Constantza is a public institution well-known in the museums network from Romania, including the following sections: the Aquarium (founded in 1958, the first one from Romania and the largest from the point of view of its collection), the Dolphinarium (founded in 1972, the first one from South-Eastern Europe), the Planetarium and Astronomic Observatory (founded in 1969), the Micro-reservation and the Exhibition of Exotic and Decorative Birds (founded in 1982).

The variety of the patrimony and the multitude of preoccupations of each section make from the Museum of Natural Sciences a significant attraction point for the inhabitants of Constantza city, as well as for the tourists from Romania and aboard who visit the Romanian Black Sea coast.

Furthermore, museum's specialists have been and are permanently involved in research themes specific to the activity of each section and are always involved in cultural-educational activities destined for the public.

Being a museum of natural sciences, an important aspect of the activity is represented by environment preservation and protection, as well as by visitors' education in the spirit of environment protection and of respect for the nature. The Museum of Natural Sciences from

Constantza is an active member of some professional and environment associations such as FGZAR (The Federation of Zoological Gardens and Aquariums from Romania), SOR (Ornithological Society from Romania) and has institutional partnerships of collaboration with schools and universities and with NGOs involved in environment activities. In 2006 the institution became member of B.EN.A. (The Balkan Environmental Association) and furthermore a B.E.N.A. International Bureau for Natural Sciences (inaugurated on 19 May 2007), fact which honors the institution and obliges it to a sustained activity in this field.

All of these could not remain without results, so that the Museum of Natural Sciences from Constantza represents nowadays an important point on the touristic map of Romania, being among the first 3 museum institutions from the country depending on visitors' number.

SESSION 2 :

AIR POLLUTION

CHAIRMEN: D. Ivanova - C. Zanbak - M. Popa

ASPECTS OF GREENHOUSE GAS EMISSIONS IN ALBA COUNTY (ROMANIA)

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In 1992, Romania signed the United Nations Framework Convention on Climate Change, a convention ratified by the Romanian Parliament through Law no. 24/1994. The main objective of this Convention was to stabilize greenhouse gases in the atmosphere at levels that will not dangerously affect the global climate system.
The Kyoto Protocol wishes that by the year 2012, greenhouse gas emissions are 5.2 % lower than in 1990; the most noteworthy gases are: water vapors, carbon dioxide, methane, nitrogen oxides, ozone and chlorofluorocarbons. The main greenhouse gas sources are: electric and heat energy producing activities, industry, extraction and combustion of fossil fuels, using solvents, road transportation, waste treatment and storage.

In 1998, Romania continued to implement the measures set in this Protocol, which aims to abide by the commitments to reduce greenhouse gas emissions during the period 2008-2012 by 8% as compared to the reference year 1989. These measures aim to significantly reduce carbon dioxide emissions to the lowest cost, during a short period of time and with quantifiable benefits for the environment.

Greenhouse gases:

The main greenhouse gas sources in Alba County are:
• Electric energy production - two units produce electric energy for their own consumption, using methane gas as raw matter.
• Heat energy production in district central heating systems (in cities) – up to 95 % of them use methane, except for Campeni and Abrud where they use liquid fuel and wood flour.

• The production of heat energy in central heating systems related to trading, institutional and residential activities. Circa 50% use methane for household heating and cooking (houses). In the area of the Apuseni Mountains, in the Sebes Valley and more recently in rural areas with methane adduction (due to the high cost), wood is use for heating.

The paper intends to present the situation of greenhouse gas generating sources and the situation of emissions in Alba County.

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AMBIENT AIR QUALITY MEASUREMENTS IN TIMISOARA. CURENT SITUATION AND PERSPECTIVES.

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Abstract

The paper is an attempt to describe complex problems concerning air quality in the Romanian city of Timisoara, in a European perspective. The town is one of the most developed ones in Romania, famous for its history and rapid progress into a modern but traditional location of human development.

The papers relates to the experience and results from a range of over 120 days of air quality monitoring campaigns in the Romanian city of Timisoara, achieved in cross roads, industrial areas, and in parks. Air quality measuring is still very new and less experienced in Eastern European countries. The University of Timisoara undertook on line experiments in urban areas, using measuring methods, in accordance to the national and european legislation (point source measurement), but also remote controlled open path techniques. Air quality measurement and traffic structure determination has been done into a major crossroad in Timisoara. The results and conclusions are illustrated with graphical pictures and tables.

Keywords: air quality monitoring, impact, air quality assessment, traffic, stationary and mobile polluting sources

BIOLOGICAL CONTAMINATION OF AIR IN BUCHAREST HOMES

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Indoor air quality is of great importance to the human health. Several population categories, including children, elderly people, sick people and convalescents are staying all most the hole day inside.

This study was made in several apartments from Bucharest city. The purpose of the study was to identify the levels of bacteriological and fungi contamination of air in the studied apartments.

The bacterial contamination in the studied apartments reached a high values especially during the cold season.

In indoor air, Staphylococcus aureus and Streptococcus spp. were identified.

Also, fungi contamination showed a high level in the summer and equal in the winter, in the living rooms. In the bathrooms, a complete fungi layer grew on a Petri dish in all most all studied apartments.

Health evaluation of those living in the investigated apartments showed the presence of respiratory symptoms like coughing, wheezing and respiratory diseases like bronchitis and pneumonia. Also, the presence of irritations localized to the nose, throat and eyes and facial pains were linked to the indoor exposure.

High levels of biological contamination in air can represent the triggers for diseases like asthma and especially for acute asthma attacks and acute respiratory infections.

SUSTAINABLE TRAFFIC DEVELOPMENT IN TIRANA, ALBANIA

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The objective of the project is to improve the traffic situation in Tirana city by developing a legal and planning framework. The project is financed by EU LIFE and co-financed by Federal Ministry for the Environment, Nature, Conservation and Nuclear safety of Germany.

Data on population, car ownership and economic activities were updated and traffic counts at key intersections were taken The first scenario developed under the project is a road traffic oriented strategy giving priority to the needs of the fast growing road traffic. The second scenario proposes a public transport oriented strategy. The key element of this strategy is the creation of a high capacity Bus Rapid Transit system. The economical and ecological consequences of both strategies were analyzed and recommendations for the Tirana transport planning developed.

A protocol for modelling spatial distribution of NO2 in Tirana was developed. Initial recommendations for data procurement and implementation of models in Tirana and recommendations for the deployment of the monitoring network to calibrate and validate the GIS-based models were made. An NO2 passive sampling survey is under preparation

Traffic related legislation was evaluated and areas in the environmental law that would require improvement to align laws, rules, and procedures with the acquis communautaire were identified.

Training was addressed primarily to experts of infrastructure, urban planning and transport department of different institutions relat-

ed to traffic and transport issues and focused on urban traffic planning strategies, methodology of transport survey, public transport operations and planning, services analysis capacity, and sectoral policy integration. Study tours were organized in a number of European countries.
A drawing competition involving primary schools children and car free days were organized.

The project is expected to contribute significantly to the sustainable development of traffic in Tirana city. An integrated urban traffic concept will be developed. Measurement strategies will be introduced, which will result in data comparable to WHO and EU standards. The project will enhance the legislative framework and will build capacities related to traffic and transport management. The project seeks to introduce higher safety standards and increase the efficiency of commercial activities.

INFLUENCE OF DIFFERENT APPLICATION RATES ON B, CR AND ZN CONCENTRATION IN THE COAL ASH

(B.Sc. Mladen Babic, M.Sc. Sretenka Lukajic)

Abstract

The experiment was carried out in the region of Tuzla, B&H, on the ash disposal sites of a thermo electric power plant. The power plant is fed with coal excavated from mines in the vicinity of Tuzla.

In this study the best mixture of locally selected immobilising materials useful for ash improvement was identified. Amendments such as sewage sludge, saw dust, pieces of bark and trope material form the local bear factory, are mixed in different amounts to the coal ash and tested for covering the ash. Therefore, ash/amendments mixtures were made in four different ratios (ash + 2, 5, 10 and 20% of amendment).

After incubation period, chemical properties were measured in order to determine enhancement of ash properties. Heavy metal behaviour in those mixtures was measured. It was shown gradually decreasing of B, Cr and Zn concentration in mixture with higher application rate of brewery trope and pieces of bark.

Depending upon the nature of the coal and the scrubbing processes, the solid wastes will contain high concentrations of potentially hazardous elements such as As, B, Cr, Cu, Ni, Zn, etc. These elements are often volatilized during the combustion process and may condense and participate in a thin film on the surfaces of the ash. The surface deposition and the solubility of the supporting matrix make these elements soluble, potentially mobile, sometimes toxic and an environmental hazardous.

Key words: coal ash, disposal site, amendments, boron, sewage sludge

POLYCYCLIC AROMATIC HYDROCARBON CONCENTRATIONS OF AIRBORNE PARTICULATES FROM MOTOR VEHICLE EMISSIONS IN BELGRADE

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key words: PAHs, urban air, airborne particulates,

Polycyclic aromatic hydrocarbons are the group of aromatic hydrocarbons, consist of two or more benzene rings, classified as a human carcinogen. PAHs are produced by combustion or nusproducts from petrol industry. One of them, benzo(a)pyrene is a five ring PAH, found in combustion generated fine particulate matter.

The PAHs monitoring involves field collection of airborne particulate matter onto sorbent in four main crossroads in Belgrade followed by laboratory chemical analysis of the samples. Airborne particulate samples were collected using high volume gas pumps for 1 hour onto glass-fibre filter papers. PAHs concentrations were determined by HPLC with fluorescence detection and ultrasonic sample preparation. Detection limits and limit of quantification were determined for each PAHs: 5ppb and 0.08 ng/m3, respectly. Concerning the results of the PAH compounds measurement, and our own interest in it, the key substances presented in this paper are: first of all benzo(a)pyrene, benzo(b)fluoranthene, benzo(b)fluoranthene, dibenz(ah)antrancene, benzo(ghi)perylene, indeno(123-cd) pyrene

The implementation of analytical methods for PAH monitoring in air samples and this work has been supported by Bena Carlsberg scholarship.

AIR POLLUTION IN FUNCTION OF TRAFFIC FLOW

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Knowing the fact that through the old city centre (with narrow, canyon-like streets), there is a daily traffic flow of 5700 vehicles/h, solving the problem of vehicular air pollution should be on the priority list.

An action of vehicle counting has been undertaken together with the Faculty of Transport and Traffic Engineering (Belgrade) on the main crossroads, consisting of parallel hourly air sampling of standard vehicular air pollutants.

In this article we have presented 2 characteristic types ("Skupstina" &"Cvijiceva") where the following pollutants have been sampled: CO, VOC, NO2, SO2, Pb.

On the "Skupstina" crossroad during the afternoon rush-hour (from 15-16h / 16-17h), most of the vehicles are individual cars (92%). In a defined period a traffic flow of 6000 vehicles / h is counted.

On the "Cvijiceva" sampling point the same kind of work was done during the morning rush-hour (8-9h / 9-10h),Measured traffic flow was 4000 vehicles/h, of which 86% were individual cars and 14% being lorries and buses.

Pollutant concentration of higher statistical significance is seen on the "Cvijiceva" crossroad.

Bearing in mind the mean vehicle age and low permeability capacity of the main transport routes in Belgrade, solving the problem of air pollution generating from mobile sours should be approached urgently and with at most attention.

Friday, November 16th, 2007

SESSION 1 :

ENVIRONMENTAL INFORMATICS- ENVIRONMENTAL TECHNOLOGY

CHAIRMEN: A. Cigna - Z. Andreopoullou - I. Ionel

ADOPTION OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) IN PUBLIC FOREST SERVICE IN GREECE

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Abstract

The use of Information and Communication Technology (ICT) in public administrations aiming to improve public services and to support public policies is defined as e-Government. However, to put ICT to effective use in a public service requires e-Readiness in terms of the ability of a service organization to benefit from ICT in enhancing their services offered to the public and also concerning issues of security, transparency and improvement on feedback.

This paper studies the adoption of ICT in Forest Service in Greece, which is a Public Service that focus in the protection, preservation and sustainable development of forests and supports the multiple purpose management of complex forest ecosystems in order to meet the multiple needs of the society in goods and services. The research was in the form of a survey conducted between 2002-2003 with the method of questionnaires in Forest District Units in the Region of Peloponnesos in Southern. Greece.

Results suggest the necessity for the rapid introduction and/or expansion in the use of new technologies within daily workflow, in particular those relating to network based services. It is expected that overall networking in Forest Service will upgrade the efficiency of operations, will eliminate bureaucracy and will improve productivity. Employees in their majority believe that ICTs can apply successfully in their sector and accordingly, help to protect the environment, yet they point out the necessity for proper training of the employees using computer and network services and applications.

Key-words: Forest Service, e-Government, networks, public services

DETERMINATION OF TRACE LEVEL OF Cr(VI) IN ENVIRONMENTAL SAMPLES AND THE EVALUATION OF THE IMPACT OF THE CONTAMINATED AREA

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Spectrophotometric determination of Cr+6 (using 1.5–diphenylcarbazide), in aqueous, sediment and soil samples is reported. Different extractants were used for the isolation of Cr+6 from sediment and soil samples;the mixture of 0.5M NaOH-0.28M Na2CO3 used as extractant followed by spectrophotometric determination of Cr6 provided accurate and reproducible results. Total Cr concentration was analyzed by AAS technique.

The polluted site of Porto Romano, Durres, pointed as "Hot Spot Pollution" from UNEP/MAP (1992) was under investigation. The content of Cr+6 in soil and surface water samples inside territory of polluted site is very high (some g/kg in soil samples and up to 180 mg/l in surface water samples). 87-89% of Crtot belongs to its easy soluble form and 2-10% belongs to the form bounded with soils. The content of Cr+6 in seawater (0.04 –0.06 mg/l) and sediment (5-6 mg/kg as Crtot) samples resulted within the normal levels. Only 11 to 13% of Crtot belongs to its easy soluble form and most of it (87-89%) belongs to the form bounded with sediments.

Keywords: chromium, speciation, seawater, sediments, groundwater, soil, AAS, spectrophotometry

AN EVALUATION OF THE DOSE DUE TO SCATTERED RADIATION IN RADIOTHERAPY.

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Abstract

A simple method for the evaluation of the dose, outside the beams, delivered to the body of a patient submitted to external radiotherapy by means of direct measurements is here described. The radiation scattered by the target was monitored by means of pen dosimeters distributed along the body. A virtual model was obtained by dividing the body into about 800 small volumes where the doses could be assumed uniform The power functions obtained by the best fit of the experimental values were used to calculate the effective dose delivered to the body and single organs due to scattering only.

Keywords: radiotherapy, scattered radiation, side doses evaluation

CONSTRUCTIVE SOLUTIONS REGARDING THE PURIFICATION OF USED WATER COMING FROM THE BEER INDUSTRY

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Abstract

This work presents the necessity to implement integrated systems for purifying used water as a result of the evaluation of the surface waters quality in our country, especially of the waste waters from beer breweries. The authors propose a modular system with a central work unit that controls, on the basis of some programmed algorithms, all the electro mechanic equipments connected. In essence, the proposed system for purifying used waters in beer breweries consists in an anaerobe pre-treating combined with an aerobe post-treating.

The work begins with some considerations concerning the quality of the surface waters: the indicators of the used waters, the composition of the wastewater in beer breweries, methods to purify the used waters. Then it's presented the functional-constructive and technological scheme of the installation and, finally, the efficiency of the mechanical-biological method of treating of the used waters from beer breweries.

Key words: used waters, purifying, decantation, neutralization, purification efficiency
Section: Air-water-soil Pollution

ALTERNATIVE FUELS FROM WASTE FATS WITH FREE FATTY ACID CONTENT

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Abstract

This paper presents one method to obtain the ecological fuel "biodiesel" thru animal fats transesterification with high free fatty acid content. All tests where successfully made by the author at T.U. München and University Politehnica of Timişoara with the financial support of Alexander von Humboldt foundation, Romanian Ministry of Education and Research and Balkan Environmental Agency. The author tested two different methods to produce biodiesel: the first is in accordance to the European patent application 0 249 463 A2 and the other is a similar method found on line in the Internet and updated by the research team to the reality of the altered animal fats – high FFA content. As only the last one has being successful, one will concentrate only on this one. The method is presented step by step, including samples pictures and explanatory graphics.

MICROBIAL RESPONSE TO VARIOUS BARRIER TECHNOLOGIES

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Abstract

During the processing of foods, microorganisms are exposed to various barrier technologies that increase the stress within in their environment. These stresses may kill, hold them in a static state, or reduce their ability to grow depending on the bacteria's ability to adapt to its new environment. Since the early 80's the food industry has focused on the interactions and synergistic effects of various barrier technologies to ensure food safety (the control of pathogens), control other spoilage organism, and enhance shelf life without detracting from the foods flavor and texture attributes. These barriers were often referred to as hurdle technologies because of the stress that they placed on the various bacteria growing within the food. As more hurdles or barrier were engineered into a food, more types of bacteria were observed to be killed or inhibited. Significant progress in hurdle technology has been made in the use of Aw, pH, Osmotic pressure, heat treatment, cold storage, and chemical inhibitors to enhance the environmental stress in the control pathogenic and other microbial populations. However, some microorganisms have the ability to adapt or endure these stressful environments better than other. Thus, the adaptation and stress responses initiated by various bacteria to stresses imposed by various barrier technologies, becomes an important consideration. This paper will focus on the interactions or additive affects of barrier technologies and the adaptation by various microbial populations to enhanced stresses.

NOVEL TECHNOLOGY OF COAL-BIOMASS CO-COMBUSTION WITH CO2 CAPTURE

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Abstract

Increase amounts of Carbon Dioxide Emissions (CO2) in the Earth's atmosphere enhance the greenhouse effect and thus contribute to global warming. Since the start of the world industrialization, the atmospheric CO2 concentration has considerably increased.

Carbon dioxide is a major product of the combustion of fossil fuels, which supply over 85% of all energy demands and will likely remain so, into the 21st century. In 2002, 24 billion tones of CO2 were released into the environment, of which, more than one-third were produced by electric power generation sector. Coal has the highest carbon intensity among fossil fuels, resulting in coal-fired plants having the highest output rate of CO2 per kilowatt-hour.

One of the key approaches in reducing the further increase of CO2 emissions from fossil fueled power plants is the co-combustion of biomass with coal. This process represents a near-term, low-risk, low-cost, sustainable, renewable energy option that promises reduction in CO2, and other benefits.

The aim of this study is (i) to analyze the co-combustion process of coal and biomass; (ii) to investigate the effect of the combustion process on the CO2 formation; and (iii) to show the separation and capture possibility of CO2 from the flue gas. It is based on experimental results accomplished on an experimental lab facility, focusing to support re-

search of co-combustion processes of coal with CO2 neutral fuels as well as the CO2 capture from the flue gases, before entering the exhaust stack. Moreover, complementary information about other gaseous pollutants profiles such as CO, NOx and SO2 driven during the combustion will be also indicated. Test results have proved that pollutant emissions are reduced substantially during the co-combustion process; the combustion itself is not effectively affected by the biomass supply; the CO2 in gaseous form might further be removed from the flue gas by a chemical solution of monoethanolamine (MEA), then compressed and stored in pressurized recipients.

The main conclusion of the paper consists in experimental achievements referring to the novel co-combustion technology as well as in the CO2 separation process. One proofs that the proposed combination is worth of research and further development, as it answers global needs of the sustainable development of today's industrialized societies.

NATURAL AND RRETRIEVED SORBENTS FOR WASTEWATER TREATMENT

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Modern industrial society discharges vast quantities of chemicals into the environment. Among the various available technologies for their removal are aerobic and anaerobic biode gradation, chemical oxidation with ozone and hydroperoxide, photocatalytic conversion, adsorption technology, etc.

Natural adsorbents (zeolites) and agricultural ash are very versatile due to their high surface area, well-developed pore structure and surface properties, low cost and accessibility. The potential of use of fly ash in agriculture has been explored by various research agencies, scientists and institutes. Several reports are available on the impact of its use in agriculture. Fly Ash Mission have commissioned 12 Technology Demonstration Projects in association with various R&D agencies, users and fly ash producers. The beneficial effects, and the concerns for possible negative effects of use of Fly ash in agriculture are covered in this paper with special reference to the projects being implemented under Fly Ash Mission.

Particulates (ashes) arising from the burning of crop residues are potentially effective adsorbents for organics including pesticides in agricultural soils. The aged ash and ash-amended soil were used to sorb diuron from water Adsorption of dissolved soil organic matter (DOM) during aging on the ash surfaces reduced the diuron adsorption by 50-60%. Surface competition from the atrazine adsorption also reduced the ash adsorption of diuron by 10-30%. A total of 55-67% reduction in diuron sorption by the ash-amended soil was observed. Due to its high initial adsorptivity, the ash fraction of the aged ash-amended soil contributed >50% to the total As crop residues are frequently burned in the field, pesticides in agricultural soils may be highly immobilized due to the presence of ashes.

THE USE OF NPP CERNAVODA WASTEWATER IN ENVIRONMENTAL STUDY

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Abstract

Black Sea is located in the East part of our country and it receives many surface waters, but Danube is one of the most important rivers from this area. The sea depth is very small in the Romanian coastal part and that's why the quality of received water can have an important impact on marine ecosystem and environment.

The location of NPP Cernavoda near Danube-Black Sea Canal requires the developing of a powerful program of environmental monitoring. Considering national and international regulations, interest area was founded around this important electrical energy provider. The use of tritium routinely released, as low-activity liquid radioactive waste by this CANDU type reactor as a radiotracer, led to an extension of monitoring activity along the Danube - Black Sea Channel.

Danube-Black Sea Canal is ideal for tracers' study, because wastewater evacuations are occasionally due to technical operations of nuclear power plant. In this study we propose to use tritiated liquid effluents from CANDU type nuclear power plant as a tracer, to study hydrodynamics on Danube-Black Sea Channel. Tritiated water can be used to simulate the transport and dispersion of solutes in Danube-Black Sea Channel because they have the same physical characteristics as water. This paper presents the mixing length calculation for particular conditions (lateral branch of the channel, and lateral injection of wastewater from nuclear power plant). A study of experimental published formulas was used to determine proper mixing length. Simultaneous measure-

ments in different location of the Channel confirm the beginning of the experiment. Another result used in the further experiment concerns the tritium level along the Danube-Black Sea Channel. We measured tritium activity concentration in water sampled along the Channel between July-October 2002. We established tritium level and tritium concentrations significant for the edge and the tail of tritiated wastewater evacuations. We obtained unit-peak-attenuation (UPA) curve as related to different mixing times using three locations in which we measured tracer-response curves. The UPA curve, along with the time-of travel curves, provides a ready means of predicting maximum soluble contaminant levels that would be experienced at any location in the investigated area.

DECOMMISSIONING OF THE TRINO VERCELLESE NUCLEAR POWER PLANT: ENVIRONMENTAL IMPACT ASSESSMENT

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As a consequence of the decision to cease operating the Italian Nuclear Power Plant (NPP) of Trino Vercellese, the environmental impact of its decommissioning has been evaluated.

Decommissioning activities of the Trino Vercellese NPP will produce small releases of radionuclides in the atmosphere and to the surface waters around the nuclear facility.

We have also found out that the expected releases will be small compared to the natural radioactivity levels, so that it turns out to be quite difficult to distinguish the radionuclides coming from the nuclear facility and those already present in the surroundings of the plant
Nevertheless, as required by law, a radioecological assessment was carried out to determine the effective doses to critical groups from those releases.

Results, obtained on a conservative basis, showed that doses to critical groups living near the NPP will be negligible. In particular, doses due to atmospheric releases will be below any detection limit, while dose due to liquid releases will be, for the whole 15-years long period, equal to about 0.5% of the annual dose due to natural background radiation.

RECOVERY CLEANING UP OF AQUEOUS SYSTEMS WITH Cr(III) CONTENT

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Abstract

Flotation is a selective and performance separation method, which can be applied for diluted aqueous systems (10-6-10-2M). These systems contain toxically ionic species, which become potential sources on useful compounds. By application of flotation it achieves the separation of ionic species with good separation efficiency (%R≥95) simultaneously with decreasing of these ions in aqueous phase to values less then 1 mgL-1, an important aspect in point of environmental protection. The quantitative recovery of extracted compounds as well as the study of possibility to obtain useful compounds, maintain the applicability of this method in comparison with another cleaning up methods. The research design aims at the systematic study of monocompound aqueous solutions, [M(OH2)x]n+ type (where M=Cr(III)), by flotation. A first condition for separation is preliminary hydrophobisation of ionic species by insolubilization of these as hydroxospecies or another insoluble compounds associates with intervention of a tensioactive substance (STA).

The scope of research design is: reduction of metallic ions concentration from diluted solutions (10-6-10-2M) under or to admissible limits in force of law established; separation of complex species, simple oxide precursors or salts obtains by recovery processing of the foam from flotation result.

The research design covers two major interest areas: environmental protection, clean up of aqueous systems and recovery of metallic ions as useful compounds; obtaining of oxide material precursors or salts by wet way in mild thermal conditions to apply flotation technique.

The objectives of research design have a novelty degree, awarding to these method a special priority in separation method, especially for diluted aqueous systems. For this type of systems clean up classical methods are inefficiency and unprofitable. The precipitate flotation method is another variant for simple oxide precursors obtain than sol-gel classical method.

MINERALS IN SAMPLES FROM TECHNOLOGICAL PROCEDURE OF SUGAR-BEET PRODUCTION

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Determination of food contaminants by trace elements are playing an important role in laste decade because of environment contamination, and could have negative impact on human health.

In this work is investigated the application of different sample preparing methods for determining metals by atomic absorption spectrometry. It is determined the content of macro- and microelements in composite samples of sugar beet, dried sugar beet pulp, molasses and sugar. Sugar beet is the raw material for sugar processing. Sugar is produced by extarcting the sugar beet cossettes, by purification and by crystallization. After extraction retained sugar beet pulp are dryed. After crystallization molasses is byproduct in the process. Final or byproducts in sugar-beet processing, i.e. dryed sugar beet pulp, molasses are recicled in human organism through animal food, meat or trough the main product: sugar.

The division of each metal through the technological procedure of sugar production, from the row material through the intermediate products, to the final and byproducts is also determined.

Experimental data proved that for determining metal content in sugar beet pulps both sample preparing methods – heating to ash and treatment with acids – could be used equally.

In the sugar samples the metal content was determined after preparation the sample by treatment with acids, and without any preceding sample preparation, and it is determined that both procedures can equally be used.

Determining metal content in sugar without preceding sample preparation is easy, does not require special equipment and the time needed for the procedure is led to the minimum.

Table 1. The average values of determined elements, in products of sugar plant

Sample	K (mg/kg)	Na (mg/kg)	Ca (mg/kg)	Mg (mg/kg)	Cu (mg/kg)	Zn (mg/kg)	Fe (mg/kg)	Mn (mg/kg)
Sugar beet	7100.00	2300.00	900.00	2200.00	7.62	6.18	395.60	56,00
Dry sugar beet pulp	2600.00	900.00	5000.00	2350.00	6.35	8.71	152.60	36.00
Molasses	36812.00	8608.00	2971.20	137.88	2.24	11.04	139.20	n.a.
Sugar	18.31	6.29	14.32	0.12	0.08	0.02	n.a.	n.a.

n.a. – not analized

THE INFLUENCE OF SOME ADDITIVES ON THE SPECTROSCOPIC PARAMETERS OF TARTRAZINE

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The quality of food, other than microbiological aspects, is generally based on color, flavor, texture and nutritive value. However, one of the most important sensory quality attributes of a food is color. This is because no matter how nutritious, flavorsome or well-textured a food, it is unlikely to be eaten unless it has right color.

The use of all food additives including food colours is controlled by legislation, which is harmonized across the EU (89/107/EEC, 94/36/EQ 95/45/EC).

The subject of this work is yellow synthetic food colour E102, tartrazine, synonyms Cl Food Yellow 4, code Cl 19140, and chemical names trisodium-5-hydroxy-l-(4-sulfonatophenyl)-4-(4-sulfonatophenylazo)-H-pyrazole-3-carboxylate, It is classified as monoazo colour. The main aspect of research was the influence of some additives (E300 -vitamin C; E330 - citric acid; E951 - aspartame) on the spectroscopic parameters Q^ms and e) of colour El 02. This was necessary to estimate direct usage of UV/V1S method in qualitative and quantitative determination of colour El02 in food. After determination of the spectroscopic parameters, for each previously mentioned additives was conducted analysis of the influence on the intensity variations and the positions of absorption maximum of colour EI02. It was established that those additives had no influence on the spectroscopic parameters. On the basis of those data, direct usage of UV/V1S method is permitted, [n this way, time needed for analysis is shorter and determination of presence and concentration of colour EI02 in food is fast, simply and economical.

ARSENIC REMOVAL FROM AQUEOUS SOLUTION BY SORPTION ON ZIRCONIA AND TITANIUM MODIFIED SORBENTS

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Arsenic is a ubiquitous metalloid that naturally occurs in surface and ground waters. Arsenic usually occurs as arsenate [As(V)] or arsenite [As(III)] in potable water supplies. Arsenic is classified as a human carcinogen (prone to cancer of the bladder, lungs, skin, kidney, liver, and prostate). The WHO, the European Union, and several countries recently lowered the recommended or required arsenic limit to 10 g/L. Options for the drinking water industry can include treatment by adsorption, switching to alternative water sources, or blending with a water that has a lower arsenic concentration. Packed bed sorption systems will be widely employed because they are simple to operate, produce minimal waste, and can be cost-effective.

The aim of our ressearch was to examine zirconia and titanium modified comercial sorbent for arsenic removal. Comercial sorbent MTM, Greensand and BIRM (Clack corporation) were modified with 2 w/w % zirconia and titanium after activation. Modification were performed with titaniumtetrachloride and zirconiumoxychloride. Modified sorbents were dryed on two different temperatures (200 ^{0}C and 400 ^{0}C respectively).

Sorption of arsenate and arsenite dissolved in drinking water (200 μ/L) on sorbents were tested in batch procedure. After removal of sorbent, concentration of arsenic were determined by AAS.

Zirconia modified BIRM showed the best performance for removal both arsenite and arsenate. Modification of greensand did not affect their sorption abillity.

SYNTHESIS AND CHARACTERIZATION OF COMPOSITE MATERIALS BASED ON CARBON CRYOGEL AND ZEOLITE

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In this work, carbon cryogel and carbon cryogel with zeolite were synthesized from resorcinol-formaldehyde (RF) solutions. From the experimental results of the influence of the conditions of the starting RF solutions on structure of carbon cryogel without zeolite, we have chosen optimal starting solution for synthesis carbon cryogels with zeolite. Structure properties of samples were estimated by X-ray diffraction and by determination of specific surface and pore size distribution. Characterization of carbon cryogels and carbon cryogel with zeolite showed that these are materials with very high specific surface and developed mesoporosity. Diffractograms confirm amorphous structure of carbon cryogel and presence of Ba exchanged LTA zeolites. With increasing of the amount of zeolite the height of peaks related to zeolite decrease which shows that crystallite size decrease, too. Results showed that addition of zeolite influence of structural characteristics of composite materials.

NEW TENDENCIES IN THE ACTIVATED CARBON COMPACTED FILTERS PRODUCTION

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Presented scientific research was realized in the cooperation of the Institute of Nuclear Sciences „Vinča“ with The Balkan Environmental Association (B.EN.A.) and with the financial support of the „Carlsberg Srbija d.o.o.“, Čelarevo, company. Aim of this research was to achieve a hot-pressing treatment, with defined process parameters, which will insure production of the activated carbon cylindrical compacts test series using the information gained during the research in laboratory and industrial conditions. General purpose of this work was to obtain clean and uncontaminated water, refined primarily from high chlorine content but also from the substances responsible for the water aroma, color or taste. Main beneficiaries of these results are, first of all, industrial facilities (direct beneficiaries) and households (indirect beneficiaries). The research activities can be devided in several main stages: experimental laboratory research; testing in the realistic, industrial conditions; chemical analysis of the unfiltered and filtered water and production of the test series of the sintered porouse activated carbon cylindrical filters. Conducted research and results obtained during this work should contribute to the better understanding of the activated carbon consolidation procedure in order to expand assortment and application of activated carbon products used for the water refinement.

ANTIOXIDITIVE FREE-RADICAL SCAVENGING ACTIVITY OF COBALT AND COPPER COMPLEXES

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Free radicals induce oxidative damage to biomolecules, which implies oxidative modification of DNA, proteins, lipids and small cellular molecules by these reactive oxygen species. Free radicals not only cause premature aging and wrinkles, but they are also the primary cause of cardiovascular diseases, inflammatory conditions and neurodegenerative diseases, such as Alzheimer`s disease, mutations and cancer.

Antioxidants are the main defense mechanism in the body acting as free radical scavengers.

This study is aimed to determine antioxidative activity of cobalt and copper complexes using DPPH (1,1-diphenyl-2-picrylhydrazyl) spectrophotometric technique, which is found to be a simple and rapid method. Absorbance is measured at 517 nm. Trolox (6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid) is used as a control standard.
Futrhermore, activities of these complexes were compared to those of vitamin C, and α- tocoferol. Also, activities of ligands were established as well.

Method is based on the reduction of DPPH (1,1-diphenyl-2-picrylhydrazyl), a stable free radical. When the radical`s electron becomes paired off in the presence of hydrogen donor (free-radical scavenging antioxidant), the absorption strength is decreased, which can be seen as decreased values of absorbance compared to control standard, trolox (6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid).
The difference in the reduction of DPPH between the blank and the sample was used for determining the percent radical scavenging activity- RSC (Radical Scavenging Capacity).

Complex reacted with 2mM DPPH in the same solvent in which

complex was dissolved, by the same procedure of spectrophotometric analysis.

All cobalt and copper complexes were dissolved in acetonytril, which was used as a solvent for this series.

Results indicate certain antioxidative activity of investigated complexes. Indeed, when analyzing obtained results we can state that cobalt complexes have slightly higher antioxidative activity when comparing to those of copper ones.

Results also indicate that RSC values of cobalt complexes are within the range 0.37-16.03, where [Co2(HCOO)2(tpmc)](ClO4)2• 4 H2O is found to be the one with the gratest radical scavenging capacity.

As addition to this, investigated copper complexes have RSC values within the range 0.38-9.43, where the highest RSC value has been attributed to [Cu4(adip)(tpmc)2](ClO4)6 • 7 H2O.

There were also measured radical scavenging capacities of ligands and as a conclusion we can state that the most active ligator is tpht.

Analyzing all the obtained values it can be stated that cobalt and copper complexes posses certain antioxidative activity and that the radical scavenging activity was increased with increasing concentration of all the antioxidants.

On the other hand, when comparing these values to those of vitamins` (C and E) it has to be pointed out that cobalt and copper complexes have far away lower free-radical scavenging activiti

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TOXICITY OF SOME DANGEROUS CHEMICALS ON SUPEROXIDE DISMUTASE ENZYMATIC ACTIVITY

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The research work presents the evaluation of Superoxide dismutase enzymatic activity modifications as a result of toxic effect of dangerous chemicals. Superoxide dismutase is an efficient enzymatic antioxidant and plays an important role in the protection reaction of organism against negative effects of the free radicals. Therefore it is necessary to study this enzyme for determination of dangerous chemicals toxicity on it.

For this study two pesticides were selected: atrasine and mevinphos, whose toxicity characteristics have been determined after performing of ecotoxicological test to evaluate their risk on aquatic organisms (fish from Cyprinus carpio species), sensitive to the toxic action of compounds taken in study.

In order to obtain relevant results, an enzymatic kit for measure of Superoxide dismutases (MnSOD and CuZnSOD) has been used. Measurements were performed from protein extracts obtained from intoxicated fish organs. The biochemical method is a spectrometrical method and tetrazolium salt is used for superoxide radicals' detection, produced by xantinoxidase.

The obtained results have led to the conclusion that dangerous chemicals taken in study determine catalytic activity modifications of Superoxide dismutase toward blanc. In addition in case of mevinphos the enzyme may be complete inhibited, this being suffocated by the proper metabolites (H2O2 or *OH). These modifications of Superoxid dismutase activity can lead to drastic consequences on aquatic organisms.

Keywords: Superoxide dismutase, toxicity, dangerous chemicals
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SESSION 2 :

AGRICALTURE and FISHERY

CHAIRMEN:S. Nicolaev - A. Kokkinakis - C. Kleps

THE INFLUENCE OF SOME ECOLOGICAL FACTORS ON PEPPER PLANTS DURING THE SEPARATE PHONOLOGICAL PHASES

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Abstract

The main aim of the present study was to establish the relationship between morphological characteristics of pepper plant plants during the different stage and the temperature. Experiments were carried out with six typical Bulgarian cultivars. The morphological behaviors were measured in following stage of development: transplanting, flowering bud, mass flowering, fruit setting, ripening and full maturity. The active temperature sum for pepper development was calculated. The highest relationship between plant development and temperature was established for total vegetative weight. The cultivar responses were observed.

Kay words: ecological factors, agriculture, climatic changes

ROMANIAN MARINE FISHERIS – REQUIREMENTS FOR IMPLEMENTATION OF ECOSYSTEM BASED FISHERIES MANAGEMENT

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Abstract

After 50 years of rapid geographical expansion advancements and dramatic changes in catches and fish structure, the Black Sea fisheries are at crossroad.

Taking into consideration that marine living resources (MLR) are structural and functional entity of marine ecosystem, the impact of users on the ecosystem and especially the fisheries impact is the key task for sustainable development of marine environment
But impact of fisheries on the ecosystem is sometime difficult to separate from impact of other users or processes.

New approach on ecosystem based fisheries management (EBFM) provide a complex process for formulation of common management objectives based on interdisciplinary assessment of MLR state in relation with conservation needs of biodiversity habitat, productivity and environmental quality.

Establishment of these common objectives were based on four identified problems specific for the Black Sea:
• physical changes and deterioration of habitats;
• increasing of sensitivity of the Black Sea ecosystem;
• inadequate fisheries management;
• use of destructive fisheries practices.

Checking of achievements of the objectives provisions needs an evaluation system using specific indicators.

Advisory Group on Fisheries of the Black Sea Commission started recently the process for setting of specific indicator for marine living resources was establish the following groups of indicators:

• indicators for MLR habitats(lagoon, limans, rivers, shelf areas, pelagic);
• indicators for MLR key species;
• indicators for marine fisheries;
• indicators for environmental related issues.

On the other hand, implementation of new EBFM approach, beside of specific indicators, already above mentioned, require to collect new additional well selected data provided by operational oceanography (sea surface temperature (SST) and salinity (SSS), transparency, turbulence, wind, wave and current regime, etc.).

ECOLOGICAL RISKS AFFECTING THE VULNERABLE FISH FAUNA OF RIVERS IN WEST MACEDONIA (GREECE)

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Abstract

The running water ecosystems in Greece including rivers and small torrents, recently face considerable environmental problems. The mountainous river ecosystems of West Macedonia (Northern Greece) recently present an important environmental degradation mostly due because of the extreme use of their natural resources, the pollution they accept and the inappropriate management planning. Therefore, their sensitive fish fauna and their biological resources are disturbed and exhausted, mainly, with a negative impact in the total water ecosystem and the local socio-economic structure.

This paper aims to determine the main environmental problems of the mountainous river ecosystems affecting important risks for the fish fauna and the fish populations in West Macedonia's region as the rivers Agios Germanos, Akritas, Geropotamos, Erigonas, Tetrapotamos, Aliakmon, Veneticos, Greveniotis, Arapitsas, Ladopotamos, Almopeos, Edesseos, Tripotamos, Loudias and Axios.

Data about their fish fauna and the ecological status were collected from scientific references, studies, and research programs as also from sampling and the relative 'Fisheries Public Authorities' of each ecosystem.

An important number of the species of the fish fauna of these river ecosystems is protected from particular national and international laws and conventions. The findings of the study can support the plan-

ning of sustainable and rational environmental friendly management and enhances the relations between biological resources and their habitats. The final results can contribute in the design of a total management plan for the protection of fish fauna in mountainous running waters in our country.

Keywords: river, fish fauna, environmental risks, sustainable development, West Macedonia, fishery management.

STOCK CONDITION, POPULATION DYNAMICS AND PECULIARITIES IN BIOLOGY OF THE TURBOT (PSETTA MAXIMA L.) IN RELATION WITH MEASURES FOR ITS RATIONAL EXPLOITATION OFF BULGARIAN BLACK SEA COAST.

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Turbot (Psetta maxima L.) is demercial species with primary importance in the Black Sea region as regards its high commercial value and specific ecological state in the marine ecosystem.

The level of its stocks is highly dependant on fishing pressure and other far-reaching anthropogenic activities, as pollution, with negative influence on the whole ecosystem. For turbot stock assessment bottom otter trawl and "swept area" method have been used and stock in front the Bulgarian coast has been assessed as 1500 – 1600 tons. The highest average Catch per Unit Area (CPUA kg/km2) for northern part has been detected in stratum 35-50m. - 333 kg/km2 (winter), and in southern part of the coast the highest average CPUA was 292.88 kg/km2 in stratum 50-75m (spring).

According to the research findings, asymptotic length varies from $L\infty = 81.26$ (2006, winter), $k = 0.14$ year -1, $t0 = - 1.09$ to $L\infty = 91.503$ (2007, spring), $k = 0.1368$ year -1, $t0 = -1.61$ to. The growth of turbot has been found isometric (from $n = 3.07$ to 3.2932).

Index of relative importance of different nutrition components in the turbot stomachs was calculated. Highest IRI % belongs to the whiting Merlangius merlangus Nordm. - during winter investigations and to the crustacean Crangon crangon L.- during spring period.

This paper emphasizes the importance and development of different management strategies, provides scientific data for regulation of harvest and scientific advice on sustainable utilization measures.

Keywords: turbot, Black Sea, stock assessment, swept area, management strategies

STUDY ON FISHERIES OF DANUBE DELTA AND INLAND COASTAL WATERS- ROMANIA IN THE AIM OF REHABILITATION

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Abstract:

The average commercial fish catch decreased from about 12,000 tons (1967 year), in Danube Delta and coastal lakes to around 3,000 tons in 2004 year. In this period piscivorous species like pike, wels catfish, european perch declined and the non-piscivorous species like gibel carp, bream, roach and white bream became dominant. According with the last years state of the fish stocks its estimated that in Danube Delta lakes a sustainable yield of about 6,000 tons could be fished. The administration of the stocks on the durable principles and implementation of the correct strategy it decisively depends on the quality data concerning the catch size. The lack or unreliable records led to the underestimation or overestimation of some parameters with negative results about the current state and the exploitation of the stocks. The essential error source in stock estimation of Lake Complexes is represented by the unrecorded catches of the legal family subsistence quota, black markets and poaching. The real data is very important for accurate assessment of the fish stock. Improvement of the quality of the catch statistics and monitoring of fishing effort are required for sustainable management of Danube Delta fisheries.

Keywords: inland fisheries, complex lakes, catch, Danube Delta, fish stock, sustainable yield

POLLUTION WITH HEAVY METALS IN THE WATER-SOIL-PLANT SYSTEM FROM A NORTHERN ROMANIAN AREA

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In Romania, chemical soil's pollution is affecting about 0,9 mil ha (about 0,2 mil ha are excessive polluted). Sulphur dioxide and heavy metals pollution (especially Cu, Pb, Cd and Zn pollution) have aggressive effects on the environment. This pollution was detected in mining areas like Baia Mare, Zlatna and Copsa Mica. The case study was accomplished in Northern Romania on Baia Mare area, were there is a concentration of polluted emissions through extractive industry and non-ferrous metallurgical plants.

The aim of this paper is the estimation of present polluted with heavy metals stadium and its effects on the biotic and non-biotic environment.

Water quality in studied area is affected mainly by the industrials waste waters discharged with insufficient treatment. Many damages regarding heavy metals' concentration and the density of phyto – and zooplankton were recorded in different rivers sections downstream of pollutant sources.

The soils from Baia Mare area have a native acid pH or their acidity is induced by the acid rains. The humus and phosphorus contents are very low, thus complexion capacity of heavy metals is decreasing. The debasification is high and the clay is eluviated in the first 40 cm of soil so, the metals have an increased mobility and its could be highly accumulated in root's plants. In the meadows are occurring a selection of resistant plant species; the consequences are the development of poor grass meadows (Agrostis, Festuca and Juncus).

The plants get high concentration in heavy metals by foliar and root absorption. Its have an increased grows and an accelerated ageing.

The leafs have necrosis spots due to the acid rains. The roots system is develop on the horizontal plane, at the lowest depth through the heavy metals toxicity.

All those environment problems needs continuous monitoring to prevent the damages, to increase the quality of live and to maintain the sustainability.

SUSTAINABLE AGRICULTURE – THE SOLE ALTERNATIVE FOR PRESENT ENVIRONMENTAL AND CLIMATIC CONSTRAINS

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The natural resources, especially climate, water and soil, play an essential part in the development of Romanian agriculture. The climatic modifications produced during the latest period of time emphasized the tendency for intensification of the excessive meteorological phenomena, represented by numerous draughty years with negative implications upon agricultural crops productions and also excessive rainy years, with damage produced upon agriculture and people's dwellings too, as a consequence of floods and landslides due to rainfalls much larger than multiannual average.

Until now, three categories of groups of years were identified: (i) excedentary groups, when rainy, very rainy or excessive rainy months are predominant; (ii) poor groups, when draughty or very draughty months are predominant and finally, (iii) quite normal groups, when the months which turn off from the normal regime in a sense or another do not exceed 20%. After the meteorological research carried out in Romania, it was concluded that the duration of the excessive rainy periods generally, is not longer than 3 years, while the draughty periods may prolong up to 5-6 years. At the same time, the groups mentioned are not accidentally distributed in the evolution of weather; as a rule, the contrary groups (in deficit or excess) alternate, namely rainy and very rainy periods are followed by droughty and very droughty periods. In this regard, there is an application of the law of contraries unit in the succession of rainy and droughty periods. The appearance of 1-3 years period when rainy and very rainy season prevail, logically forecast the appearance of an opposite period. In other words, they say that rains predict drought.

The undeniable evidence on a total warming process settling and its intricate consequences as heat waves, more severe winters, floods, hurricanes, storms, drought – are unavoidable drastic threats against maintaining biodiversity, proper soil resources for agriculture, water resources and their quality and energy supplying sources.

A sustainable and performing agriculture, the main strategic target to ensure environment protection, biodiversity preservation, food security and safety for Romania, becomes more and more dependent on the proficiency of the scientific research, which in collaboration with the higher education and agricultural consultancy will have to offer scientific and technical solutions adapted to the climatic changes dynamics.

Among the solutions offered until now by the Romanian agricultural scientific research, can be mentioned: (i) a new zoning of agricultural crops; (ii) the elaboration of some rational systems of agricultural structures which should consider natural resources capitalization; (iii) prevention and control against environment degradation processes by irrigation, drainage and soil erosion control works; (iv) drawing up vegetal genotypes and animals breeds better adapted to biotic and abiotic stress factors; (v) biodiversity preservation using in situ and ex situ methods; (vi) sustainable administration of forests and extension of afforested areas; (vii) decrease of the sources that produce green house gas emission involved into the climatic changes.

TEACHING AND LEARNING SUSTAINABILITY IN FISHERIES IN LAKE ECOSYSTEMS USING ICT-BASED SYSTEMS

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Abstract

This paper describes the development of an ICT–based learning system that enhances the training in the sustainable fishery of lake ecosystems. The pilot version refers to the environmental sensitive lake ecosystem in the Central Macedonia, Greece, lake Volvi currently are under fishery management and international environmental protection (Ramsar agreement). Fishery constitutes a major economic type of the exploitation of these ecosystems that faces favourable challenges, well adapted with their sensitive environment.

Necessary data to implement the learning system were retrieved from scientific references and research programs. The collected material in type of texts, drawings, pictures and videos digitised to be integrated in the multimedia project. The software used for the creation of the learning system was Macromedia Studio MX 2004, PhotoShop 6.0, and Nero. The system constitutes a virtual learning environment for internet-based training, in a user-friendly interactive environment without extensive computer literacy requirements, while it can also be available in CD-Rom. Wide users-groups can retrieve qualitative and quantitative information on lake ecosystems such as flora, fauna, fish

fauna, fisheries, human interventions and activities for environment protection and rehabilitation, aiming to their sustainable exploitation and development. All the types of the imposed fishery management in lakes are presented and all fishery gear it is presented also in detail the fishery activities of the fishermen cooperatives that are managing the above systems, the existing fishery installations, etc.
This teaching and learning system constitutes a useful tool for life-long learning of fishermen according to EU directives and authorities concerning environmental friendly fishery management, protection, research, environmental education projects and management projects.

Key words: learning system, Internet-based training, fishery management, sustainability, lake management, lake Volvi.

COPPER TOXICITY TOLERANCE IN GERMINATING WHEAT SEEDS

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Key words: wheat, enzymes, copper excess

One of the major environmental problems caused by industrialization is the increment in the concentration of heavy metals in the air, land and water. Heavy metals are required by biological systems as components of protein and enzymes, but in excess, theses micronutrients are toxic. One of the clearest phytotoxic symptoms induced by heavy metals is a diminution in plant growth which is associated with disturbance of several metabolic process. Excess of metal ions induce oxidative stress by increasing the formation of reactive oxygen species (ROS) in plant cells. Plants posses antioxidant enzymes protect them against oxidative damage.

The objective of the study was to investigate the changes in enzyme activities during wheat seed germination in laboratory conditions, in presence of different amounts of copper excess. Two varieties of wheat were studied (Triticum aestivum L.cv. Dropia and cv. Alex) in order to select plants which are tolerant to copper stress. The activity of ascorbate peroxidase, total soluble peroxidase, isoperoxidase and catalase, enzymes involved in the scavenging of reactive oxygen species, were measured.

In excess of copper, plants have develop an ability to synthesize proteins and peptide that can tightly bind and sequester this metal. Measurement of oxidoreductase activity, especially peroxidase and Cu-specific change in the isoperoxidase pattern, might be used as biomarkers to asses the phytotoxicity for wheat grown on copper contaminated media.

EFFECT OF SOME AGROTECHNICAL MEASURES ON THE UPTAKE OF NICKEL BY MAIZE PLANTS

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Nickel is a nonessential element in plant nutrition that can be toxic to plants when its content in soils is high. Several soil properties have effect on the uptake of this heavy metal by plants. The purpose of this investigation was to determine the effect of fertilization, soil acidification and liming on the uptake of nickel by maize plants grown on some alluvial soils. A pot experiment with maize plants grown on soils having various properties and elevated content of nickel was set up. The experiment lasted for 6 weeks. At the end of the experiment the yield of plants was measured. Roots and aerial plant parts were analyzed for the content of nickel. It can be concluded from the results of the experiment that roots have higher concentration of nickel in relation to the aerial part of the plants. The addition of mineral fertilizers (without application of other measures) mainly decreased content and uptake of nickel by roots and above ground plant part. Soil acidification (to pH = 4.5) caused increase in the content and uptake of nickel by maize roots and aerial part. Liming of acid soils had positive effect on the uptake of nickel by young maize plants. In this paper are given multiple regressions that relate the content of nickel in roots and aerial part with some soil chemical properties. The obtained results are important from the standpoint of reducing the pollution of plants with potentially toxic heavy metals.

EDUCATION ON THE INTEGRATION STANDARDS ON AGRICULTURE PRODUCERS

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Republic Serbia Integration into EU together with rights also means taking over obligations related to agricultural and rural policy, food products putting into sale demands advanced production of food products.

Without security certificate food products do not have adequate competitiveness and they can not be imported to EU or to world trade market.

The Goal of these training courses was to approach European and domestic Law regulations by improving knowledge and skills in the field of primary food production.

The concept of the sustainable development in agriculture as a way for sustainable food production was promoted on the good examples and examples from other countries.

Knowledge and skills improvement about EU standards implementation shell have positive impact on changing comprehension of primary agriculture producers and habits of the rural areas inhabitants.

In near future it is expected positive effect of the Project On the organization of the producers, which leads to socioeconomic change in rural areas.

Project shell contribute integrated standard implementation, rise in number of employed on the affairs related to food products export, preserving youth on the villages, new technology implementation, adoption of good agriculture practice.

Key words: food production, standards implementation

SHELF LIFE ESTABLISHMENT OF DAIRY PRODUCTS BASED ON QUALITY AND SAFETY DETERMINANTS

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Abstract

It is presented in this paper, a detailed study about the distribution of the shelf life of dairy products, based on lactic acid bacteria growth and the distribution of the time to cause health risks on Listeria monocitogenes growth .

Growth models, developed and validated on dairy products, were used to predict the growth of microorganisms. Temperature data were obtained from retail (supermarket's refrigerators). Distribution predictions were conducted by two approaches (time-temperature and Monte Carlo simulation). Time-temperature profiles were more appropriate to be used, because Monte Carlo simulation overestimated the growth of L. monocitogenes.

Shelf life was greatly influenced by storage temperature, but initial microbial load had a smaller effect. The expiration date of dairy products might be based on only the growth of the spoilage microorganisms and only when dairy products contamination with L. monocitogenes cell concentrations is high does a product fraction pose health risks for consumers. Sensitivity analysis confirmed that storage temperature and temperature variability were the most important factors for the duration of shelf life. Distributions of shelf life and time to cause health risks give valuable information on the quality and safety of dairy products and may be used as practical tools by dairy processors.

ASSESSMENT AND MANAGEMENT OF MICROBIOLOGICAL POLLUTION OF POULTRY PRODUCTS USING NATURAL AND ARTIFICIAL ANTIMICROBIALS

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An increasing of the production of poultry products in the entire world is actually evident, because of the tendency of the augmentation of the individual and massive consume of them, as healthier for human being. The pollution of fresh and packaging poultry meat and other poultry products derives from the environment and from operating procedures applied in the companies of the production.

The evaluation of their safety and quality involves also microbiological analysis of control, as an important part to evaluate and manage the potential risk of them, originated from microbial strains.

There are realized many scientific studies, to reduce microbial risk, using artificial and natural antimicrobials.

There are presented in this paper the experimental results obtained during a three year experimental work, to reduce the microbial charge of the poultry products more distributed and consumed in different Albanian population groups.

The experimental plan was constructed, based on the experience of other countries, as USA, Greece and others.

First, there were selected the artificial antimicrobials as gentamycin, streptomycin, tetracycline and there were determined optimal conditions for the type, doses and time of treatment. Taking into consideration the effects of small repeated doses of antibiotics in human life, was suggested the substitution of artificial antimicrobials with natural antimicrobials and there were realized the experiments using eugenol, oregano, EDTA and others.

The comparative results for untreated and treated samples are detailed in the full paper. The conclusions include also the specific behavior of antibiotics and natural substances with antimicrobial properties in different parts of products of poultry industry and the selective behavior of them in different genius and species of microorganisms, there presented.

The importance of the study is directly related with the safety of these products and healthy use of them by the consumers.

EXOTIC PHYTOPLANKTON SPECIES IN BULGARIAN BLACK SEA WATERS

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Abstract

The phytoplankton of the Bulgarian Black Sea is composed by 745 species, but their number increasing due to the progress in the microscope technique and the introduction of new species in ballast waters.

The future of the Black Sea as a receiving area of exotic species (Alexandrium monilatum, Gymnodinium uberrimum, Rhizosolenia calcar-avis) depends on the improvement of the marine ecosystems, first of all on deeutrophication process.

In 1995-2005 about 3000 phytoplankton samples were collected by Institute of Fisheries and Aquaculture - Varna, as a part of the Bulgarian National Monitoring Programme and in frames of the DANUBS and EUROGEL projects.

The present article is following out the seasonal dynamics and distribution of this 3 species and also to follow the trends in its development in the Bulgarian waters.

The largest distribution of this species since 1995 up to present days has been observed in coastal waters of the Bulgarian part of the Black Sea in different seasons.

SESSION 3 :

URBAN PLANING AND LAND USE

CHAIRMEN: H.H. Tok - I. Haiduc- V. Zlatanović - Tomašević

SELF-PURIFYING POTENTIAL OF AQUIFERS AS A BASIS FOR THE DEFINITION OF GROUNDWATER SOURCE PROTECTION ZONES

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The underground is a biochemical reactor of sorts, whose self-purifying potential must be utilized both in the design of groundwater sources and in the definition of basic elements of groundwater source protection zones. It is, therefore, extremely important to be familiar with the self-purification processes which take place in aquifers, otherwise it will not be possible to define the basic elements of groundwater source protection zones. In this regard, it is necessary to accurately define the current quality of the water resource and to predict, as accurately as possible, its future quality. Major elements associated with the definition of protection zones of water supply sources are:

- Minimum residence (filtration) time within the protection zone;
- Minimum travel distance within the protection zone; and
- Minimum surface area of the protection zone.

In view of the fact that various substances behave differently during groundwater flow within an aquifer, the analysis needs to address those substances which possess properties relevant to the definition of protection zones, such as: mobility, sorbability, degradability, harmfulness, potential for accidental occurrence, and the like. Groundwater source protection zones must be designed based on the behavior of „critical“ water quality parameters, both for accidental events and continuous input of relevant substances into the aquifer.

A PUBLIC PROJECT OF THE RECOVERY OF THE LANDFILL OF MUNICIPAL STATIONARY WASTAGE OF A SMALL URBAN COMMUNITY AND RURAL AREA IN ORDER TO PRESERVE AND PROTECT THE LIFE ENVIRONMENT

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Abstract

Waste is one of the most important environmental problems in Serbia. Large quantities of the waste are being dumped illegally at roadsides, rivers, abandoned mines, and similar places, posing threats to public health and the environment. The Solid Waste Management Strategy is intended to help mitigate environmental problems caused by inadequate past waste policies, and to improve services and capacities for solid waste management in the country.

This project defines the type of the waste which can be dumped at certain areas, the technology of reducing the waste as well as its destructive effect on the environment, in order to preserve the environment and the protection of the environment projected by law.

The outlay defines the quantity of the dumped waste, as well as the capacity of the observed landfill. The quantity of percolated water and the controlled drain of gasses is determined during a certain period. This defines the existing problems of dumping the municipal waste at the defined landfill. It gives the description of the notional solution for a permanent, minimally ecologically acceptable solution of the recovery ment.

This is supposed to be the basis of the beginning and heightening of the education of the population by a proper treatment of the municipal waste, in order to lessen the volume of the waste which is being dumped. This project would also define the logic of the municipal waste and certainly the projection of the suggested solution for the improvement.

Opšti projekt sanacije deponije komunalnog čvrstog otpada male urbane sredine i ruralna područja u cilju očuvanja i žaštite životne sredine

Rezime

Otpad je jedan od najvećih problema zaštite okoline u Srbiji. Velike količine otpada odlažu se uz put, reke, u napuštene rudnike i slična mesta, pretstavljajući opasnost po ljudsko zdravlje i okolinu. Strategija upravljanja čvrstim otpadom ima nameru da doprinese rešavanju problema okolina koji su uzrokovani ranijim neadekvatnim upravljanjem otpadom, i da poboljša službe i kapacitete za upravljanje čvrstim otpadom u zemlji.

Ovim radom se definiše vrsta otpada koja se može odlagati na deponijami određenog područja, tehnologija zbrinjavanja i smanjivanja otpada kao i njegovog štetnog uticaja na okolinu u cilju očuvanja životne sredine i zakonom predviđene zaštite životne sredine.

Proračunom se definiše količina otpada koji se odlaže kao i kapacitet posmatrane deponije. U određenom periodu određuje se količina procedne vode na deponiji i kontrolisano odvođenje gasova sa deponije. Samim tim se definišu postojeći problemi odlaganja komunalnog otpada definisane deponije. Daje se prikaz idejnog rešenja za trajno, minimalno ekološki prihvatljivo rešenje sanacije. Korišćenja neko vreme, zatvaranje i rekultivacija deponije do kada se planira završetak radova na regionalnoj deponiji.

Ovo bi trebalo da bude osnova za početak i inteziviranje edukacije stanovništva u smislu pravilnog tretiranja komunalnog otpada i razdvajanje otpada na mestu nastanka, sve sa ciljem smanjenja volumena otpada koji se odlaže. U okviru ovog rada bila bi definisana i logistika komunalnog otpada i svakako izrada predloga za poboljšanje.

CURRENT STATUS FOR APPLICATIONS OF MODIFIED ZEOLITES IN DEPOLLUTION OF WASTEWATERS

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Purification of municipal and industrial wastewaters is a necessity of our permanent development modern society. Due to the increasing diversity and resistance of the pollutants, their removal for maintaining water quality became more and more difficult. There are strict rules recommended by "Water Framework Directive 2000/60C/EC" (WFD), and volatile organic compounds monitoring in the water.
Present paper reviews the main methods for modifying of zeolites and their applications in depollution of wastewaters.

A modified zeolite is a zeolite resulted after some modification processes of their physico-chemical and structural processes. These actions can be: irreversible ionic exchange, salt doping, adsorbed compounds decomposition, aluminium extraction as well as proton – zeolite process. Modified zeolites obtaining was made with the purpose of increasing their ion exchange properties, adsorptive properties or catalytic properties.

Studying modified zeolites properties and their actions on wastewater it can be identified the most appropriate zeolites type for a specific type of pollutant.

Based on the modified zeolites remarkable selectivity in adsorption and ionic exchange processes, it was identified Y-TYPE to be applied for wastewater received from different plants of Govora Platform. Volatile organic compounds from these wastewaters are the most important contaminants and the mentioned type of zeolites is the most appropriate type for their removal.

SPATIAL PLANNING IN COASTAL ZONE – AN IMPORTANT ICZM TOOL FOR SUSTAINABLE DEVELOPMENT

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Abstract

Along the Romanian Black Sea Coastal Zone a variety of natural valuable resources are concentrated making the coast an attractive living, working and recreational environment with substantial economic and environmental value. Different uses from the two sectors of the Romanian Coast (the northern sector comprise the Danube Delta Biosphere Reserve recognized by UNESCO being a RAMSAR site sparsely inhabited while the southern sector is more economically developed) compete for utilization of natural resources.

The southern part of the Romanian coastal area is under pressure from increasing population density, urbanisation, marine transport, coastal erosion, pollution. In the last years, as a result of increasing tourism industry and unplanned urbanisation (holiday houses, hotels) in the coastal area, the natural resources of the coast has negatively affected by depreciation of the natural landscape, water quality, damaging the sand dunes and vegetation, and marine ecosystem. Furthermore, pressures for development of coastal resources is often compete with the need to protect and conserve particularly sensitive areas, such those with valuable and diverse habitats. These multiple and interconnected problems needs to be solved through an integrated approach that brings all coastal sectors, level of government and coastal users into rational goal settings and decision making framework..

The PlanCoast Project will enhance the sustainable development of the Romanian coastal zone landside as well seaside by:

a) Developing, introducing and implementing the new filed of spatial planning of maritime area (sea use planning) in the coastal zone in a coherent manner compiling with international standards and facilitating international exchange and comparison of information while at the same time reflecting local and regional needs.

b) Strengthening the implementation of the Integrated Coastal Zone Management (ICZM) in Romanian coastal zone by enhancing the role of spatial planning within ICZM and demonstrating the benefits of spatial planning to ICZM by a selected number of pilot projects.

c) Introduction international comparable GIS databases facilitating the spatial planning process for coastal zones and maritime areas according to ICZM principle.

Keywords: Integrated Coastal Zone Management (ICZM), spatial planning, GIS

ECOLOGY MAP OF BELGRADE

M.A. Vesna Zlatanović-Tomašević B. Sc. Arch.

In April of the Year 1998. Agency for Land and Construction of Belgrade, city public-health institute and Ecotoxicology corps from Belgrade, signed a Contract to make Ecology Map of Belgrade, for the area covered with Master Plan.

The goal of research is development and operations model of environmental managment, which will enable high-quality access to the planning process, building and land use on the territory of Belgrade. Ecological zoning of the city would be done, on which the ecology map of the city would be based. It is planned that this model will enable (through development of informational system) tracking the condition of the living environment, by developing the systems of eco-urban indicators and criterions for their evaluation.

Primary indexes for ecology map formation are: geographical, geomorphological, climatic, geological, hydrogeological, hydrological, pedological indexes, land purpose, infrastructure, natural and cultural values, industrail influence, housing fund characteristics, demographical characteristics, state of public health, state of flora and fauna, etc.

With the new approach to protection of environment and natural resource managment, Belgrade will join the european movement of « ecological and sustainable cities», or world movement of «healthy cities». Ecology map will enable more satisfactory status of Belgrade in international communication and cooperation.

I phase of the project was realized in three stages:

Stage 1: Choosing the character of the subject and working area of the study; records and analysis of existing documentational-informational basis.

Stage 2: The global estaimate of the state, documentation and practice of the environmental managment;

Stage 3: Regional aspects of environmental protection in Belgrade; program task for making the ecology map of Belgrade.
The records and analysis of existing documentational-informational basis have been made, based on which ecology map was done on 56 maps, which treat individual thematic areas.
In the paper, the survey of the work done on the ecology map of Belgrade has been presented.

Keywords: living environment, ecology, geology, model, protection
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THE PERIPHERAL ECOLOGICAL DEGRADATION IN ISTANBUL

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Particularly in last three decades, the population inhabiting in Istanbul was dramatically increased from 3.019.031 in 1970 to 10.041.477 million in 2000. Moreover, the estimated population according to the trend population increase acceptations in 2015 is 23.000.000 and the worst of all is existing population which is about %15 of the national population is settled in only %7 of the national surface area. Nevertheless, the province of Istanbul produces approximately %20 of the national income and %50 of the total national importation and exportation value.

This uncontrolled growth caused a very high destruction of the peripheral natural resources which also directly has huge effects on life quality. The water basins, forest areas, and wetlands are the marked resources.

According to the Istanbul Metropolitan Mater Plan Report published in 2006, during the last three decades, approximately 60.000 ha of the agricultural land of the classes of I, II, III and 110.000 ha of the agricultural land of the classes of IV, VI, VII were lost. Due to the same report, the misused forest area defined by national regulations as 2b area reached to 17.000 ha and that means 1/3 of the total national 2b areas.

However, in the actual case, %47 of the provincial surface area is still forest area. From the objective of the use and protection balance, the threshold analysis concerning the peripheral natural resources during the master plan studies of IMP reflects a major priority.

ECOLOGICAL CONCERNS FROM QUERIES ANALYSIS OF PC-FISHERY TIME SERIES DATA-BASE OF GREECE

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Abstract

New software approaches seems to be a necessity in order to facilitate the end users in fields like ecology and ecosystem to analyze information extracted from databases. In the present paper the results of the queries applied on the Greek PC fishery time series database are generalized and analyzed. The research concerns 71 fish species in the 16 Greek fish regions in order to point out fish species without catches for the periods 1990-1997 and 1998-2005. A comparison between the two periods has been made and useful indications have appeared. The fish regions are divided into three groups: decreasing, sustainable and increasing catch diversity. The analysis of the results shows that the number of fish species without catches in certain regions is growing up and organizations and generally people in charge in Greece have to be concerned for taking measures for ecological, biological, etc. reasons. The developed software can be applied for studying changes in fish catch diversity every following year.

STUDY CONCERNING THE PHONIC POLLUTION GENERATED BY THE URBAN TRAFFIC IN THE TOWN OF TIMIŞOARA – II -

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Abstract :

The environment, at the planetary level, confronts itself more and more with the phenomenon of pollution to which road activity belongs, as well.

Phonic pollution in the urban environment, generated by road activity, although not a violent one is permanent and omnipresent in all the compartments of the social-economic life and occurs within the whole acoustic range.

Noise, as a form of the environment pollution due to road activity represents a serious public health problem, as well as a major problem in elaborating the infrastructure design intended for land transport and in establishing the position of buildings in streets, various technical categories being taken into account.

This paper proposes to evaluate the level of the phonic pollution of the main thoroughfares (traffic networks) in the town of Timisoara, as well as to establish the ways of intensifying the efforts to fight pollution by revaluing the place of the motor vehicle in the urban environment, the quality of man's life and health.

Keywords: noise levels, phonic pollution, urban traffic, vehicle.
Section: Air – Water - Soil Pollution.

Saturday, November 17th , 2007

SESSION 1 :

BIODERVERSITY

CHAIRMEN: C. Varlam - R. Troja - E. Stanescu

EXPLORATION OF MICROBIAL BIODIVERSITY PRESENT IN ALBANIAN MEDICINAL PLANTS

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Specific natural Albanian environments are an important habitat for the growth of medicinal plants. These environments are considered also as an "origin place", responsible for the microbial populations located in these plants.

Albania is a small country but with big differences in relief and climate, sustaining varieties of plants, including medicinal plants also. There are actually, completed botanic , medicinal and biotechnological studies of them, but not yet, detailed studies as important sources for the development of different microorganisms with industrial importance.

The study presented here, is an introduction of a detailed research work for isolation, identification and characterization of microbial strains, obtained from medicinal plants presented in Mediterranean Albanian environments.

The genius and species isolated from medicinal plants are originated from natural micro flora, the pollution of respective environments, microbial content of air and soil in places where the plants are located and changes of climate, or other factors; including also the technical operations to prepare them for use as medicaments in different diagnosis. Microbial study of medicinal plants is realized for these purposes:

- To explore and conserve the microbial world presented in medicinal plants.
- To know well the relationship medicinal plants – microorganisms.
- To isolate and identify new genius and species with a potential use as producers of important compounds: carotenoids, enzymes, killer proteins or others.

- To manage their presence in pharmaceutical preparates of medicinal plants, in order to control the safety use of them as medicaments.
- To find a position for new isolated strains of bacteria, yeasts and molds in Albanian Collection of Industrial Microorganisms.

Autochthon medicinal plants selected for study were Thymus vulgaris; Tilia cordata; Laurus nobilis; Helichrysum arenarium; Matricaria chamomilla; Saturea montana; Rosa canina, Folium sennae and Salvia officinalis.

A detailed information about their microbiological aspects is described in the full paper.

EVALUATION OF CHLOROPHYLL AS THE PRIMARY INDEX FOR TROPHIC STATE CLASSIFICATION

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Abstract

The trophic state index (TSI) of Carlson use algal biomass as the basis for trophic state classification. Three variables, chlorophyll pigments, Secchi depth, and total phosphorus, independently estimate algal biomass. For the purpose of classification, priority is given to chlorophyll, because this variable is the most accurate of the the three at predicting this biomass. Chlorophyll is most likely to respond to nutrients and hydrodynamics, it may also respond to changes in freshwater flow regime, water temperatures and aquatic sediments. Chlorophyll-containing phytoplankton, in a measured volume of sample water are concentrated by filtration at low vacuum through a glass fiber filter. The pigments are extracted from the phytoplankton in 90% acetone. Visible wavelength spectrophotometry is used to measure pigments in sub-parts per million (ppm) concentration. The trichromatic equation of Jeffrey and Humphrey are used to calculate the concentration of chl a, chl b and chl c. Modified monochromatic equation of Lorenzen are used to calculated pheopigments. The aim of this study was the determinations of chlorophyll in different lake and lagoons of Albania and their classification based on trophic state index.

Keywords: Classification, trophic state index, chlorophyll, nutrients, extraction.

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TOXICOLOGICAL ASPECTS IN SHEEP FARMED IN A COPPER POLLUTED AREA

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Abstract

This study had as main goal emphasizing different aspects that appear after ingestion of fodder with a high copper level in sheep.

For this study were used 5 years old ewes farmed all their life near an industrial unit that pollute with copper. There were investigated 3 groups of ewes farmed near the pollution source, at 6 kilometers and at 12 kilometers from the pollution source. The results were compared with those in a control group farmed in a non polluted area.

Investigation that were realized, tried to find clinical and pathological modifications that appear in sheep farmed a long period in a copper polluted area, insisting on toxicological investigations, and both clinically and laboratory analyzes indicated copper chronic poisoning.
It was used spectrophotometer with atomic absorption method, in order to determine serum, wool and organs samples copper level sampled from studied animals.

The studied animals presented the specific clinical signs of chronic copper poisoning. Initially they were discreet (apathy, anorexia), and then digestive, respiratory and nervous signs and even death. The sheep farmed at a longer distance from the pollution source did not expressed characteristic clinical signs.
Biochemical analyzes results showed an increase of the serum transaminases activity proportionally to closeness of the pollution source that demonstrate liver function damage in chronic copper poisoning

It was observed high concentrations that exceed normal level 20 times in liver, and maximum find level was in animals farmed near the pollution source.

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NEW DATA ABOUT ZOO BENTHAL POPOLUTIONS OF ROMANIAN LITORAL LAKES

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Abstract:

On the basis of 58 bottom samples collected in summer 2000the authors present the quantitative state of benthic associations in the lakes belonging to the Romanian littoral (from the south part – Neptun - to the north part: Siutghiol, Tasaul, Nuntasi and Babadag).

In the all investigated lakes, the diversity of bottom fauna is relatively low – about 32 taxa, 17 species and 15 supra-specific taxa were identified (in all lakes 6 taxa and 5 supra-specific taxa are commune); this situation (not very well) in part it was determinate by physicochemical environmental conditions.

Among the benthic invertebrates, the crustacean and insect-larvae populations are the most important, by their numerical density; they are followed by nematoda and oligochaeta from worm's group and mollusca populations.

Generally, the largest part of the bottom fauna occurs on all type of substratum in the all lakes, being eurytop species (nematod and oligochata worms, same species of ostracoda and copepoda crustacean). Some species are peculiar only for certain type of substratum, being less numerous (turbellarian and hirudinea species worms, some species of mysidacean crustacean: Paramysis baerii bispinosa on the sandy bottoms, Pterocuma pectinata – cumacean crustacean and Gammaridae amphipoda on the submerged vegetation).

Between benthic populations from all lakes analyzed, some of the relict Ponte Caspian fauna (species of Theodoxus, Gammaridae species, Paramysis, Pterocuma) is more abundant in the lakes from north part of Romanian littoral.

RECENT DATA CONCERNING EVOLUTION OF THE EUTROPHICATION LEVEL INDICATORS IN ROMANIAN SEAWATER

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Abstract

Eutrophication, the most sever pollution form refer to Romanian marine waters, began in the early 70's and reached the upper limit in the 80's. During this period all environmental factors suffered important changes with disastrous effects towards entire ecosystem. The increasing of the nutrients and organic matter inputs by major rivers and wastewaters resulted in the increase of primary plankton production, of frequency and magnitude of the blooms' phenomenon, released chain disturbances in the ecosystem with impact for biodiversity, resources and balneary qualities.

After 1990, particularly after 1995, because of the decreased nutrients input, marine waters quality was considerably improved as a proof being the diminishing of frequency and magnitude of the blooms' phenomenon and the diminishing of the hypoxic areas found that the ecosystem get better.

During last years, the main physical and chemical parameters of the marine ecosystem from the sampling area, recorded natural fluctuation limits for their concentrations proving a net tendency of stabilization.

The paper presents recent data as for level of the general and state indicators of the eutrophication phenomenon in Constantza area seawater, reference area for the Romanian coast. Were processed data concerning temperature, salinity, nutrients and chlorophyll_a for the

year 2006 and by comparison with the last ten years.

Data analysis demonstrated the improvement of the eutrophication phenomenon and also the improvement of the Romanian seawater quality.

Key-words: eutrophication, level indicators, Black Sea Romanian seawater, nutrients.

THE DEVELOPMENT OF AN INDICATIVE ECOLOGICALLY COHERENT NETWORK OF MARINE PROTECTED AREAS IN ROMANIA

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The paper comprises the preliminary results of the activities carried out by the NIMRD within the BBI Matra project. This project proposes the development of an indicative ecologically coherent network of sub-tidal Marine Protected Areas (MPAs) in Bulgaria and Romania, and is developed in the period 2006-2008, having EUCC – the Netherlands as coordinator and INCDM Romania, IO-Bas Bulgaria, Black Sea Commission as partners.

In creating this network, we started from the main aim of MPAs, which is the preservation of marine resources, for the benefit of the present and future generations. Careful design management implementation can ensure permanent benefits for these marine areas, avoiding, as much as it is possible, possible conflicts with users. In addition, the need of preserving the species and habitats of European importance was taken into account, including mainly the sites proposed to become part of the Natura 2000 European ecological network. The selected sites are the following:

• the 2 Mai – Vama Veche Marine Reserve (present as an MPA in the national protected area network): important for the presence of various habitats of European interest – proper subtypes: 1110 sandbanks which are slightly covered by sea water all the time, 1140 mud flats and sandflats not covered by seawater at low tide, 1170 Reefs – as well as various plant and animal species (some of which are included in the annexes of the Habitats Directive)

• the Mangalia Underwater Sulphurous Springs: discovered in the san-

dy zone or at the base of submarine cliffs, in two distinct zones near Mangalia, the site is unique on the Romanian littoral, being linked with the Dobrogean lime complex;

• the Submerged Beach from Eforie: only here, in the South of the Romanian littoral, there is a beach unmodified through the massif structures for the coastal protection. Only here, the natural hydrodynamics and natural habitats of exposed beach were present and only here, on the Romanian littoral, we can find the bivalve mollusks Donacilla cornea and Donax trunculus;

• Cape Tuzla: in this area, the rocky reef-like bottom presents the greatest expansion into the deep waters, and is the most varied and rocky substrate on the Romanian sector of the Black Sea. Thus, the most varied types of rocky micro habitats are located here, and, consequently, there an extremely varied flora and fauna.

• the Methanogenic Structures from Sfantu Gheorghe: located in the NW sector of the Black Sea, at a depth ranging from 35 metres to 784 meters, these structures are caused by gas emissions, through the oxyc/anoxic interface characteristic for the Black Sea. Shallow waters are situated in the proximity of the Eastern limits of the Danube Delta Biosphere Reserve, details that provides a certainty for a good management. Its importance consists mainly in the presence of underwater structures, composed of sand and carbonates.

• the Danube Delta Biosphere Reserve – the marine zone (present as an MPA in the network of national protected areas): it corresponds to the geographic unit component of DDBR – the coastal zone of the Black Sea, found from the river mouth of the Chilia branch to Cape Midia, down to 20 meters depths.

SPATIAL AND TEMPORAL EVOLUTION OF THE ABIOTIC PARAMETERS AND BIOTIC COMMUNITIES DYNAMICS IN THE COLENTINA RIVER LAKE AQUATIC ECOSYSTEMS

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Abstract

The purpose of the present paper is to evaluate the dynamics of the abiotic parameters and biotic communities – phytoplankton, zooplankton and benthonic macroinvertebrates [1]. From this ecological complex, the productivity and support capacity, mechanisms deciphering through which the productivity in natural aquatic ecosystems is realized, assumes the establishment of the rules which govern in time modeling of energy flux rate, natural cycle of mineral elements and adjustment mechanism of the stages within the established domain. Therefore, the development of a strategy for environment's quality is the complex process, involving various technical analyses, coordinated actions and cooperation between participants [2], [3].

In order to sustain the words above, it was practical diagnosticated by modern ecological methods the trophic evolution of aquatic ecosystems – case study: Colentina river lake aquatic. Water and sediment samples were drawn from ten sampling sites located in the following area: Herastrau, Baneasa, Floreasca, Tei, Pantelimon II – upstream and downstream for each aquatic ecosystems.

The obtained results are presented in a centralized manner for each location in comparison with the limits imposed by the Norm concerning the reference objectives for the surface water quality classification (ORDER no. 161 from 2006).

Keywords: aquatic ecosystem, lakes, abiotic components, biotic communities - phytoplankton, zooplankton, benthonic macroinvertebrates.

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MIGRATION OF HEAVY METALS IN THE ENVIRONMENT

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The aim of this study was to invesigate migration of heavy metals (Zn, Mn, Cu, Fe, Cd, Pb, Ni and Cr) in the environment. During the last decades, forest environment has been strongly exposed to the effect of different harmful pollutants, especially from the atmosphere. Harmful substances from the air, in addition to the direct effect on forest trees, also deposit in the soil, and have an adverse effect on soil chemistry and pedogenetic processes, as well as aqueous chemistry. During the last years of the past century, consciousness on the international level has matured that one of the priority problems of mankind is the need to preserve, improve and protect the environment. Since this is a problem which is not restricted to the territory of one country, it is logical that international community realises the danger of environmental pollution globally and the need for its adequate, quality and efficient protection.

This paper presents the results of the study of heavy metal in the environment of Serbia. The study of the heavy metal (Zn, Mn, Cu, Fe, Cd, Pb, Ni and Cr) content in the environment is very significant, primarily in the aim of monitoring the trend of their migration trought the environment and the effect on the environment in Serbia.

FIRST LIMNOLOGICAL INVESTIGATIONS OF BOTTOM FAUNA OF THE ZAVOJ RESERVOIR, SOUTH-EAST SERBIA

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The Zavoj reservoir formed by damming the River Visočica and the hydro-electric power plant "Zavoj" were built in 1990 in the vicinity of Pirot town (SE Serbia). During the limnological investigations in summer and autumn 2003, and in winter and spring 2004 as well, analyses of bottom fauna composition and structure were performed. Samples of sediments with macroinvertebrate representatives were collected at four localities distributed along the lake. Environmental features (water temperature, pH, conductivity, and dissolved oxygen) varying through seasons as well as water level had great impact on macrozoobenthic assemblages of the Zavoj reservoir. During the whole period of investigation 12 faunistical groups and 51 taxa were recorded. However, only Chironomidae and Oligochaeta were present at each locality and in every season. Apart high frequencies of occurrence registered, representatives of these two groups (Tanytarsus brundini, Procladius Skuse, Tubifex tubifex, Psammoryctides albicola, Limnodrilus claparedanus and L. hoffmeisteri) showed the highest population density. Index of participation of other faunistical groups in total bottom fauna communities varied in regard to investigated season and locality. The saprobic status of the Zavoj reservoir, based on macroinvertebrate bioindicators, was estimated applying the Saprobic Index S after Pantle and Buck (1955). The calculated values of S were in the wide range between 2.22 and 3.14. Water quality classes indicate saprobity level from beta-meso- to alpha-mesosaprobic conditions.

Key words: bottom fauna, communities' composition and structure, water quality, Zavoj reservoir, SE Serbia

CHLORPYRIPHOS INDUCED INHIBITION OF ACETHYLCHOLINESTERASE AND Na,K-ATPase AND REACTIVATION OF ENZYMES ACTIVITY

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Organophosphorus compounds (OPs), commonly used as insecticides for over 50 years, are preferred in agriculture because of their relatively low persistence in the environment. They are indiscriminate pesticides, highly toxic to animals and humans. OPs work by attacking the nervous system and are essentially a nerve poisons. Specifically, these compounds inhibit acetylcholinesterase, the enzyme involved in the hydrolysis of the neurotransmitter acetylcholine at cholinergic synapses in the central and peripheral nervous systems. Organophosphates, due to their lipophilic character, may interact with membranes as structures rich in lipids. Some organophosphates are also reported to inhibit Na,K-ATPase, plasma membrane enzyme essential for functioning and homeostasis of almost all animal cells. Moreover, organophosphtes and their metabolites extrude from the organism by the kidney through the secretory pathway mainly depends on the activity of Na,K-ATPase. These enzymes were the convenient model system for elucidation of toxic effects of OPs.

Chlorpyrifos (O,O-diethyl-o-3,5,6-trichlor-2-pyridinyl-tiophosphate) is a pyridine derivative of the phosphoric acid that belongs, according to the WHO classification, to the group of the moderately hazardous OPs. This work deals with the in vitro investigation of the chlorpyriphos toxicity as measured by its ability and potency to alter the activity of AChE and Na,K-ATPase isolated from human erythrocytes.

The aim of the work was to elucidate the mechanism of the inhibition, and to investigate the recovery of the inhibited enzymes by PAM. In addition, the simple bioanalytical method based on AChE inhibition by organophosphates for fast in situ monitoring of their presence in water was developed.

CYANOBACTERIAL BLOOM IN THE WATER OF RESERVOIR ĆELIJE (SERBIA) IN THE YEAR 2003 - A CASE STUDY

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Reservoir Ćelije (built on Rasina in 1979) consisting of three basins has primary function to supply Kruševac town region with drinking water. In September 2003 hydrobiological investigations of plankton assemblages of the Ćelije reservoir was performed in order to evaluate its actual trophic state and water quality. Investigations of physico-chemical as well as hydrobiological parameters indicate that the Ćelije reservoir manifests all signs of utmost accelerated eutrophication caused by direct and/or by indirect pollution by the River Rasina which is polluted by industrial and communal wastewaters of the nearby settlements. The results of investigations show negative anthropogenic effects on reservoir water quality as a result of presence of high concentrations of trophogenic salts, nutrients originated from Rasina water shed. Qualitative and quantitative plankton analyses reveal existence of very productive plankton assemblages. At the time primary and secondary production of plankton was significant and manifested by appearance and one month maintenance of cyanobacterial water bloom in algal assemblages consisting of dominant/subdominant Microcystis aeruginosa and Aphanizomenon flos-aquae with changeable ratios in different part of reservoir. Alkaline pH reaction of surface lake water was in the range 9.22–9.86. Concentrations of chlorophyll a were high ranging from 52.75 to 72.94 mg m-3. Secchi disc transparency of water was low and in the interval 0.78-1.3m. All investigated parameters of

abiocen and biocen actually indicate high eutrophic status tending to develop in hypereutrophic status of the reservoir Ćelije according to OECD (1982) and National standards.

Key words: cyanobacterial water bloom, trophic status, eutrophication, water quality, reservoir Ćelije, central Serbia

SESSION 2 :

WATER POLLUTION

CHAIRMEN: M. Nicolau - N. Sdrula - I. Mallolari

COMPARATIVE STUDY OF Cr(VI) REMOVAL FROM AQUEOUS SOLUTIONS USING A NEW SORBENTS AND PUROLITE A 400 RESIN

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Chromium is relative abundant in the nature and is considered as a high priority environmental pollutant. Its average concentration in the earth's crust is ca. 100 mg/kg, whereas its concentration in industrial effluents (e.g. leather tanning, metallurgy and plating industry) reaches up to 50000 mg/L (average 50 mg/L).

The toxicity of chromium strongly depends on its oxidation state. Although Cr(Ill) is an essential dietary nutrient, it can be toxic in high doses. Cr(VI) has also been associated with increased incidences of cancers. The different bioavai I ability and bio activity between the trivalent and hexavaient species might account for the differences in toxicity.

This contribution presents the comparative study of the chromium removal using a new polymeric sorbent and a Purolite A 400 anionic resin, as a reference sorption material.

The new sorbent was prepared using epichlorohydrin, NH4OH and polyethylene-imine. Batch experiments were conducted to determine the uptake ability of both materials. For this purpose 50 mg of the each resin were shaken for 24 hours with 10 mL of the Cr(VI)-solutions prepared by dissolution of K2Cr207 in distilled water (Cr(VT) concentration: 150, 300, 600, 900, 1200, 1500, 1800, 2100, 2400, 2700, 3000, 4500, 6000 mg/L. Sorption investigations were also performed using background electrolyte (constant ionic strength I = 0.1, electrolytes used: NaNOi and Na^SOj). The influence of the solution pH was studied by performing three series of experiments using CifVI) solutions of non-adjusted initial pH as well as of pH 3 and 5. The Cr(Vl) determination was performed spectrophotometrically using 1,5 diphenylcarbazide (K =543 nm).

The obtained results indicated that the prepared new epichlorohydrin / polyethylene-imine resins was successfully used for Cr(Vl) removal from aqueous solutions, having a better behavior toward such oxidant species in comparison with the commercial resin (Purolite A 400)

EVALUATION OF METAL SPECIES IN SEDIMENTS, USING THE "BCR"SEQUENTIAL EXTRACTION PROCEDURE

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Abstract

Monitoring of heavy metal levels in sediment samples, as well as metal speciation procedure, is important for the evaluation of environmental situation of an aquatic systems. The state and mobility of heavy metals in sediments samples of Narta Lagoon were studied, using a three steps sequential extraction procedure, known as "BCR" method. The most important species of metals present in sediments were determined after division into fractions, using appropriate chemical reagents such as: a)acetic acid, for exchangeable metals or adsorbed to carbonates, b)hydroxyl amine hydrochloride, for metals bounded to Fe/Mn oxides, c)H2O2, ammonium acetate, for metals bounded to organic matter and sulfides. The metal concentration in each extract was determined by atomic absorption spectrometry. The extractable part of the metals never exceeded 50 % of the total concentration. Consequently, the heavy metals of sediments of this lagoon are characterized by a low mobility and the most part of them are not easily mobilized in the solution. Cd, Cr, Fe are the metals which are extracted in less percentages and Cu, Mn and Ni are the metals extracted in higher percentages.

Keywords: AAS, metal speciation, heavy metals, sediments, BCR method, sequential extraction.

ENVIRONMENTAL POLLUTION FROM DAIRY PROCESSING WASTEWATER.

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Abstract

The average milk production in Albania for the five last years was estimated approximately one million ton/year, but only 20% of it is processed. According to the data of INSTAT, all over our country, there are 430 milk processing units, most of them are seasonal, and in the urban areas are established 15 dairy plants with a processing capacity 10 ton milk/day. So the dairy processing plants are long standing, but they need to operate in harmony with environment to ensure their sustainability and community support. Potential environmental issues associated with dairy processing activities include the significant consumption of water for processing, cleaning, also the discharge of wastewater with high organic loads. Dairy processing wastewater characteristics depending on milk load dilution with wash water, pre-treatment, cleaning compounds, the level of applied technology and age of plant. They contains predominantly milk, its by-products such as whey and butter milk, as well as the cleaning agents. Milk loss to the wastewater stream can amount 2%-3% volume of the incoming milk. Depending on the waste minimization processes employed in the dairy plants, the volume of wastewater generated during dairy processing may be as high as 2 ½ liters for liter of milk processed.

At this point of view, chemical oxygen demand COD, biochemical oxygen demand BOD and pH of them should be recorded. They are

common measurements of wastewater quality, which indicate the level of present pollution by amounts of organic material, dissolved and/or suspended solids, minerals, nitrogen and phosphorus and microbiological charge. Most of them will be presented in this material. Typical dairy process wastewater has a high BOD's value, of about 2,000mg/l. Actually the volume of wastewater that albanian dairy processing plants discharge without treatment is coming bigger and their negative impacts affect the environment and water resources. According above mentioned, it is important the monitoring of environmental pollution by assessment and analysis of dairy processing wastewater output.

Keywords: environmental pollution, dairy processing , wastewater, BOD, COD, analysis.

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NEW APPROACHES FOR INTEGRATED RESEARCH AND RESULTS DISSEMINATION ON TASAUL LAKE-ROMANIA

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For the first time at the Romanian Black Sea Coast, through the bilateral collaboration between scientifical institutions from Romania and Switzerland under ESTROM project, have been approached new kinds of integrated research on coastal lakes, in the aim of rehabilitation, wise use and sustainable development of natural resources.

The objectives have been based on specifical research, involving new highly methods of research, combined with social activities, as followed:

- Investigation of point sources and input of nutrients and toxic substances, selected according to the priority list of the EU-WFD.
- Investigation of the environmental impact on living resources, plankton and fish in particular.
- Identification of needs for action and measures for environmental protection and ecological recovery. Promotion of sustainable fishery.
- Dissemination of results to end-users and proposal of a sustainable Integrated Management Plan, based on sound scientific data.
- Extrapolations of data obtained and gained experience on Romanian other lakes.

The innovative character consists in the the various and new methodological approach. The novelty of results is the integrated analyse of present ecological statement of Tasaul Lake which permits for the first time the data stocking and cause-effects kind of information dissemination, using on short-terms the management processes and on

long-terms the lakes and coastal zone modelling.
The scientifical component has been focused mainly to lakes pollution, flooding, eutrophication.
The proposed issues and planned work have token into account also the strengthening of capacities, national and international networking, and societal problems. In this aim the new approach refers also, to social aspects:
- young scientists and students training,
- meetings with specialists, decision factors, local authorities, stake-holders, owners of water surfaces and exploiting resources,
- meetings, specifical contests, exhibitions and practical application in the aim of lake environment protection and conservation organized for children at different level of education,
- recreational and educational activities at EU level for specifical professional group of fishermen.

SPECIATION OF COPPER IN WATER LAKE MODRAC WITH DPASV

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Protect the water is the basic goal in every country and it's realized through the increased concern about the water and permanent monitoring of water quality. Modrac Lake is the biggest artificial lake in Bosnia and Herzegovina and of particular importance for the Tuzla Canton as one of the drinkable spring. Taking in consideration of the environment of Modrac Lake and great flowing in of waste water we performed monitoring of the copper content in the frame of the bio-geochemical metal circulation. The chemical form was defined and also we did the copper bio-availability based on the calculation of the stability constants (K) and capacity complexing (CL). Monitoring was performed through the seasons on the four characteristic locations.

The results showed that the considerable amounts of active organic materials were present specifically those with whom the copper form pretty stabile complexes

Keywords: lake water, speciation,copper, DPASV, capacity complexing.

COPPER AND CADMIUM CONTENTS IN GROUND AND SURFACE WATER IN ÇORLU-TURKEY

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Abstract

Heavy metal pollution is a quickly growing problem for our oceans, lakes, and rivers, associated with areas of intensive industry. There are several different ways that heavy metal pollution ends up in our oceans, lakes and bays. The four main ways are: burning heavy metal, heavy metal runoff, dumping of heavy metals, and tributary inflow. Roadways and automobiles are also considered to be one of the largest sources of heavy metals. Zinc, copper, and lead are three of the most common heavy metals released from road travel, accounting for at least 90 of the total metals in road runoff.

Meanwhile, they are natural components of the Earth's crust. They cannot be degraded or destroyed. To a small extent they enter our bodies via food, drinking water and air. Heavy metals become dangerous when they tend to bioaccumulate.

Since study area, Çorlu, has been under a heavy industrialization period, alteration of natural water resources has been reported in the area. In order to evaluate the potential of this alteration heavy metal monitoring program was run in the area. In the region, drinking water has been supplied by groundwater abstraction. Surface water has limited usage because of its low quality. Surface water has both organic and inorganic based pollution related to uncontrolled agricultural and industrial activities.

Both groundwater and surface water samples were collected from over 30 sampling points. The heavy metal analyses were carried

out via Atomic Absorption Spectroscopy. Great variations in the results among the samples were recognized during analysis. As expected, maximum concentrations for both cadmium and copper were determined in surface water samples as 202 ppb and 19 ppb, respectively. Although determinations were made for groundwater samples from municipal wells, copper and cadmium levels were under standards to harm people health.

Key words: Heavy metal, Pollution, Water Resource.

ENVIRONMENT AND SUSTAINABLE DEVELOPMENT OF PRESPA PARK

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Abstract

The Transboundary Prespa Park is covering on Albanian site the zone of the Protected Area i.e. Prespa National Park. This ecosystem, as entire body shared in between Albania, FYR of Macedonia and Greece is distinguished by a very diverse nature and culture as well, and the current project is striving to contribute towards enrichment of the following assets:

@ The landscape attractions and the general levels including the geological formations, water resources and at the highest rate including the vegetation richness.

@ The lakes and rivers as wetland that are playing specific functions like: they are serving as reservoirs of water widely used as drinking water and for the irrigation purposes, biomasses, fishery, etc.

@ The rare habitats created at the lakesides (red composition, wet meadows, etc.)

@ The reach fauna generally, and particularly the endemic and sub endemic species that are rare at the national and international level.

@ The high density of some specific water birds (Dalmatian pelican, churley pelican, pigmy cormorant, gray etc).

@ The traditional houses that in many cases are preserved saving specific architectonic values.

@ Traditional local practices that still are present there (like traditional fishing methods and food conserving, culinary, dances, music, agricultural practices, livestock breeding).

@ The local races of animals breaded still there and cultivated plants, traditional plants (Mountain tea).

@ In the Prespa area around the lakes are present famous Byzantine and post Byzantine monuments.

Based on the fact that currently the measures for the protection, administration, rational use and sustainable management of the natural resources is still far from being satisfactory in order to fulfill the criteria including biological, economical and socials - the identification and assessment of the environmental indicators and sustainable development will serve as a tool for the sustainable development. Key words: Environment, sustainable development, indicators, Prespa lake .

Literature

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MODEL OF INTEGRATED MANAGEMENT OF WATER SOURCES AND DISCHARGINGS IN THE URBAN AREAS

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Purpose of the work

Water is essential for life and for developing of the economical activities as well.

The process industries, located in the near areas of cities, which can include oil refineries, chemical and petrochemical plants, metallurgical, food and beverage industry, etc., are big consumers of industrial or potable water and producers of waste waters as well.

The present work establish a model of an integrated management of the sources and discharging of the entire waters handling in a city area in order to reduce the quantity of raw water resources.

Approach

Two ways have to be taken in account: purifying of raw waters to be utilized in various processes and the purification of waste waters before to be discharged into the emissary.

Generally, the method of water purification depends both on the final task and the quality of raw water.

Through the use of recycling techniques and by using recycled water from other sources, the industry could cut its consumption of fresh water by between 40-90 %.

Innovation

The traditional practice of treating waste water no longer meets the demands of modern water management, which has to include all water consumers on the industrial side.

Involving experienced suppliers of water purification systems, right from project development through to commissioning, makes it possible to fulfill legal requirements, while realizing meaningful and complete concepts, both on a technical and economical basis.

Membrane processes can be used on large scale for such purposes. These processes can include reverse osmosis, micro-, ultra- or nanofiltration, electrodialysis or electroosmosis.

Additionally, demineralization equipment, activated carbon equipment, ozonation equipment or ultraviolet equipment can be used.

Results

The results of the work conduct to some easy, practical diagrams and technological schemes, showing for different route of pre- and post-treating of waters and the obtained price of the recycled treated water.

Conclusions

Integrated management of water includes water pretreatment, water utilization and waste water treatment. Depending on local conditions, waste water treatment can be conducted to meet the legal requirements for discharging into the emissaries or to be revert into industrial or potable water as well.

The proposed model to be applied can be a guide for some local authorities having in

mind that in the conditions of the predicted future water scarcity an only wise integrated management of waters can avoid difficult situations.

THE POSSIBILITIES FOR MIGRATIONS OF ZINC FROM INUNDATED LAND TO LAKE WATER

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Geochemistry of heavy metals is of great importance for predicting their behaviour in ecosystems; especially the aspect of their mobility and sorption process. Heavy microelements were often sorbed at the most abundant substrates. They could easily migrate from solid phase to water. Changes in pH could result in dissolution of carbonates and consequently, the elements associated with them would migrate to water. Changes in redox potential could also affect the increase of concentrations of microelements associated with manganese and iron oxides in water phase.

The aim of this work was to define the mechanisms which control geochemical and ecochemical behavior of zinc in future accumulation lake Bogovina on the river Crni Timok (Serbia). The area of accumulation lake is 5.32 km2 (77 millions cubic meters of water). Future accumulation Bogovina is near RTB (Mining and Melting Corporation – Bor) which emits large concentrations of heavy metals. Investigation of the nature of association of zinc and identification of their substrates could contribute to the evaluation of possible its mobilization from future inundated land.

The zinc was determined by correlation analyses. Positive correlations of zinc with Si, Al, Mn, and Fe were found. Negative correlation of zinc with Ca was found. It could be concluded that zinc was bonded or sorbed on manganese and iron oxyhydroxides and also built in the silicate matrix. Negative correlation with Ca implied that small amount of zinc was associated with carbonates.

DETERMINATION OF CHLORIDE, SULPHATE AND PHOSPHATE IN DANUBE WATER: RESULTS OF THE REGIONAL INTERLABORATORY STUDY

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˝The 2 nd South-Eastern European Interlaboratory Study WATER ANALYSIS-2004˝ was organised on the basis of European and international experiences. The International Scientific Committee with professor dr. Anastasios Voulgaropoulos as the Chairperson organised and evaluated the interlaboratory study. The total of 49 laboratories took part in ˝WATER ANALYSIS-2004˝. One laboratories were from Greece, one from the Republic of Srpska - Bosnia and Hercegovina, eight from Romania and all others from Serbia and Montenegro.

The samples were prepared from filtered water of the river Danube near Belgrade. Beside the determination of some or all trace elements (Al, As, Cd, Cu, Mn, Fe, Pb and Zn) participants had to determine chloride, sulphate and phosphate in the samples. Participants could freely select the analytical methods.

All results were analysed using the same methods as in the interlaboratory studies organised by IRMM-JRC (Institute for Reference Materials and Measurements: EU-Joint Research Centre, Geel, Belgium) within IMEP (International Measurements Evaluation Programme). Reproducibility (R) and repeatability (r) were calculated according to the British standard BS 5497: Part I: 1987 (ISO 5725: 1986).

The interlaboratory study was successfull and most of laboratories obtained good results, especially for determination of chloride and sulphate.

INFLUENCE OF CONCENTRACION HEAVY-ARMATURE RELAY METALS IN THE IRRIGATION WATER TO THE HEAVY-ARMATURE RELAY METALS CONTENT IN CONCEIVED HERBS

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Abstract

With regard of living in technological prosperity period and industrialization and in that way water as natural resources recipients a huge quantity of waste water, and also exposed to another origin of pollution, problems with evaluation of water quality for irrigation get bigger in last decades. In the nature are less water of good quality with aggravation trend. Negative impact of mineral water on soil and plants lead to need for determination and evaluation of water irrigation quality.

Therefore in this paperwork the basic goal was estimation and control water for irrigation on territory of community Pancevo and heavy-armature relay metals content in this water. Through this control of water quality which was loading in the soil and through soil into plants and it impacts to quality and appearance of product, market controled and economical worth of vegetables production under modern technology condition in function of healthy food production. Have followed impact of different water quality with three different areas and three different soil type on quantity and quality of produced vegetables and yield.

Results of analysis presented that in this water aint no harmful pesticides and hard metal, in that way and possible content of hard metal in fruit are not result of using irrigation water with bad quality.

Key words: vegetables, soil, water for irrigation, heavy-armature relay metal, ecology

CONTENT OF LEAD AND CADMIUM IN UNWASED AND WASHED SHEEP WOOL IN REGION WITH HIGH TECHNOGENIC CLARC IN BULGARIA

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Abstract

An ICP-ETAAS analyze of unwashed and washed sheep- wool for establishing of Pb and Cd have been conducted. A significant difference in the contents of Pb (15.3- unwashed versus 8.15 mg/kg DM– washed wool) were established. The Cd – content were mean 0.69 (unwashed) versus 0.53 mg/kg DM– washed wool. No statistical differences were established. The authors conclude, that the environment influence significant on the Pb- content of sheep- wool.
Keywords: lead, cadmium, sheep- wool

SESSION 3:

SOIL POLLUTION- RECYCLING

CHAIRMEN: C.Constantin - B. Škrbić- D. Popa

ENVIRONMENT PROTECTION FROM PERSISTENT ORGANIC POLLUTANTS (POPs)

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Abstract : The man, as (un)conscious pollutant of environment has to start to engage in environment preservation and also, in the most safety manner, to eliminate already present pollutants from the environment. Global trend in man's consciousness is returning of natural balance which is perturbated by global pollution. Ecological way of thinking and local acting concerning that theme should prevail, including also economic effects of human activities. The concept of sustainable development is of great significance in quality attaining and sustentation of all conditions necessary for re-attaining of natural balance. Ecological way of consciousnes has to be a priority, while natural balance do not rebalance. Concerning global acting, legislative regulations which by environment protection field is regulated, should be generally adjusted. Serbia intensively works on its legislative regulations adjustment to those adapted in EU.

This work's goal is to explain and point out to significance of European legislative regulations assumption in environment protection field, regarding to Stockholm Convention. This Convention allude to Persistent Organic Pollutants (POPs), which are big threat to live organisms when they come into environment. These kinds of chemicals are heterogenous, could be a combustion product and originate during different industrial production processes. They represent great dangeour while their accumulation affection in organism and are soluble in fats; some of them can induce deseases similar to cancer, if they come into organism. In Serbian public is unsufficient knowledge about this kind of pollution, so such and similar education is necessary. Organization of National Implementing Plan is big step ahead, which takes over the activities on Stockholm Convetion's ratification.

CO2 EXTRACTION OF MERCURY FROM CONTAMINATED SOILS

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Liquid CO2 extraction is a promising new technology to remediate metal contaminated soils. In this work mercury extraction from contaminated soils of an ex-Chlorine alkali and PVC factory-Vlora, Albania is reported. Based on high solubility of organic compound in liquid CO2, organic mercury is firstly extracted from the sample. Inorganic mercury (Hg0 and/or Hg2+) can be extracted with this method if it could be transformed in an organic complex. Diethyl dithiocarbamat, which has high solubility in liquid CO2, is used to react with metallic mercury in the sample forming a well soluble complex compound in liquid CO2 as well. Inorganic mercury extraction is performed after the mercury organic forms have been removed in the presence of diethyl dithiocarbamat, which was added to the sample. "Jennings" autoclave with a sokslet system inside is used to perform all the extraction experiments. Extraction conditions have been 303±1K and 68±1bar, lower than CO2 supercritical parameters. Extraction kinetic was studied performing a fractional extraction process under the liquid-vapor equilibrium. Mercury amount content in each extract obtained during 3-6 cycles is determined with AAS technique. The total amount of mercury extracted from contaminated sample was 19.93μg/g-sample where 0.185μg/g-sample was mercury organic forms.

AREAL DISTRIBUTION OF LEAD IN URBAN AND RURAL SOIL IN REGION OF TUZLA

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Lead as heavy metal, is leading environmental polutant, and daily threaten living world. In the diference of many organic polutants, lead can not be degradating in environment. Lead is usually retain in near soil surface, and it is very hard to remove it from the soil. Acumulation and retain in soil depends of content and type of metals, chemical reactions, content of organic matter, and other edafic factors. Lead has atmospheric distribution ability on areas around source of contamination. The objective of this study was to show areal distribution of lead in urban and rural soil in region of Tuzla. Samples are taken from twenthy locations. Content of lead is determination by atomic absorption spectroscopy. Basic chemical parameters (pH, organic matter content,...) are also given. Analisys of areal distribution map are shown areas with high level of lead nearly by traffic road. Therefore, we can said that heavy metals monitoring is very important because of highly risk on plant, animal and human, especialy children.

POSSIBILITIES OF RECYCLING THE LIME DOLOMITE PLANT DUST

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In the field of the environment protection, alignment according to the standards of the European Union is a complex and continuous process that assures the compatibility of the solutions for the environment problems in Romania with the ones adopted by the European Union. The integration of the environment politics into the politics and the sectorial strategies represents an essential condition of this process.

One of the most important actions, which led to the ecological recovery and to the improvement of the environment conditions, was represented by the harmonization of the environment laws with the EU laws, as an important part of the adhesion process. Currently, a priority is given to strictly accomplish the commitments assumed by Romania in the process of negotiation of the environment chapter, both institutional and especially financial, which can lead to the creation of an environment infrastructure according to the European requests and to assure a clean and healthy environment.

Based on some research regarding the present dedusting process of gases resulted in technological process form lime, dolomite and talc plant, this paper present a few technological solution for dust recycling, resulting in dedusting installations.

CONTRIBUTION TO RECYCLING OF SOME BY-PRODUCTS WITH PHENOL CONTENT

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The paper investigates the leaching control of phenols for protection of soil and fresh water.

The solid by-products from car industry contain high phenols concentrations. The problem was, haw recycling this by-products? For the solution of this problems were studied the leaching of phenols by static and dynamic methods (on columns) in laboratory experiments. The final solution was the use of solid by-products in mixed with bitumen for asphalting routes.

REMEDIATION OF HEAVY METALS CONTAMINATED SOILS

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Keywords: soil pollution, heavy metals, phytoremediation, pilot scale

Abstract

Phytoextraction, an in situ remediation technique that uses hiperaccumulator plants to extract contaminants from soils and accumulate them in the harvestable parts of the plant, which can then be removed from site, is a relatively new environmentally sustainable technology, low-input approach for remediation of contaminated soils.

In this investigation, two field trials were undertaken to evaluate the ability of eleven plant species (Calendula officinalis, Trigonella foenum graecum, Lactuca sativa, Spinacia oleracea, Pisum sativum, Hordeum vulgare, Chelidonium majus, Achillea millefolium, Plantago lanceolata, Zea Mays and Brassica nigra) to extract heavy metals (Cu, Pb, Zn, Cd, Ni, Mn, Cr, Co) from contaminated soils around a major Romanian power plant: Deva power plant.

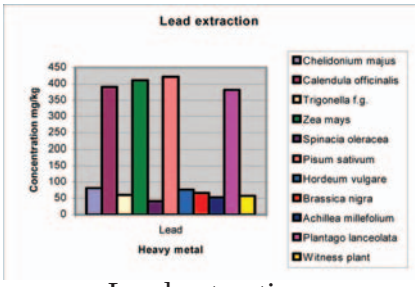
We have collected and analysed (by means of atomic spectrometry) soil and plant samples from each plot before and after the experiment.

In the paper we have presented the encouraging results of heavy metal accumulation in plants and the percent of heavy metal extracted from soil compared to total soil pollutant content.

The feasibility of phytoextraction was reviewed for the two field trials undertaken in this project. The literature would indicate that incineration and pyrolysis appear to be the most promising techniques for

post harvest disposal or possible recovery of metal from biomass grown on contaminated soils. However, both these techniques have to be fully tested on a commercial scale. The estimated costs of disposal of plant material containing "hazardous" concentrations of heavy metals/metalloids to landfill sites are around 200 euros per tonne.

Along with the other costs associated with phytoremediation such as biomass production and pre-treatment of biomass, phytoremediation remains cheaper than many other remediation technologies currently available, but may take more time.



Lead extraction


Calendula officinalis


Achillea millefolium

RESERARCH REGARDING PRACTICAL APPLICATION OF DEFERRIZED STEELSHOP SLAGS IN AGRICULTURE

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The transposition of the communitarian acquis regarding the environment protection in the national legislation and its implementation represents one of the main challenges Romania confronts with within the process of adhering at the European Union. In this context the industrial wastes represent one of the important problems of the environment safety policy, the efforts made being found in the sphere of harmonizing the national stipulations with those of the European Union.

The management of the industrial wastes consists in their exploitation, storage and final disposal or cremation. The weight of these options is about the same in average every year, namely: storage 81%, exploitation 15%, temporary storage 3.3%, respectively cremation 0.7%. In Romania, the waste storing outside represents the most important way of removing the industrial wastes, over 80% of the wastes generated are stored every year.

The use in agriculture of the deferrized slag allows the development of some existing methods regarding the influence of the slag addition in the soil upon the plant growing and development.

The proposed technology does not generate other pollution sources and it is efficient from the economic point of view, it can be implemented in practice either by the producers of such wastes or by other firms using deferrized slag. The use in other sectors of the steel shop slag leads to release the surfaces occupied by these wastes and to render them to the respective natural landscape, there takes place a reduction of the pollution degree in the regions having steel industry.

ANALYTICAL INVESTIGATION OF SOME ORGANIC COMPOUNDS FROM CONTAMINATED AREAS WITH PETROLEUM PRODUCTS

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The role of soil within an ecosystem is to be an interface between air, surface water and underground water and also a zone of transit or accumulation for majority of organic and inorganic pollutants.
Soil oil pollution represents a great environmental threat as it may contaminate the neighborhood soils and surface and underground water. Contamination may occur anywhere during crude oil extraction and treatment, oil product transportation, storing and utilization.

The Romanian environmental legislation, according to Order 756/97 sets the normal values for petroleum products in soil below 100 mg/kg d.m., between 200-1000 mg/kg d.m. for alert levels and between 500-2000 mg/kg d.m for intervention levels.

The objectives of these analytical investigations were to assess the magnitude of pollution with petroleum hydrocarbons within oil field and the vertical and lateral extent of ground contamination. The samples were collected in different location throughout the Romanian oil fields and were analyzed for mineral oil [1], BTEX compounds (benzene, toluene, methylbenzene and xylene) [2,3] and PAHs (11 compounds) [4]. Important differences of the organic level of pollution were observed function of the position and depth of soil samples which were investigated.

The obtained values were situated in the following ranges: from 25 mg/kg to 75 g/kg for mineral oil, from 0.01 mg/kg to 60 mg/kg for BTEX and from 0.1 mg/kg to 35 mg/kg for PAHs.

Keywords: soil, analytical investigation, petroleum products

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[4]***SR ISO 13877:1999 Soil quality-Determination of polynuclear aromatic hydrocarbons. Method using high performance liquid chromatography

THE EFFECT OF THE CHEMICAL FERTILIZERS ON THE AGROCHEMICAL PROPERTIES OF ASH CROPS - FROM ISALNITA POWER PLANT- CULTIVATED WITH POTATOES

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Key words: ash crops, polluting effect, fertilization, potatoes

Coal-fired power plants produce large amounts of fly ash which are only partially used in industry: cement making, concrete mixing, ceramics and other products. (Adnano and al, 1980). Large quantities of ash are stored in waste dumps, and they occupy and submit to degradation vast surfaces of land. In order to find a remedy to the nuisances caused by the ash heaps efficient and easy reachable modalities of restoring to the agricultural circuit the ash-covered surfaces have to be established, as well as ways of restraining the blowing of the powder like stored material, by that, of annihilating pollution (Carlson and Adriano, 1993)

A stretch of land has been re-cultivated with potatoes and underwent different doses of fertilizers with nitrogen, phosphorus and foliar fertilizers for two consecutive years. As control I a lot of ash has been used, and as control 2 an experimental lot with ground from the area.

The obtained results have underlined the favorable effect of all the applied treatments, distinguishing the variants treated with ammonium nitrate.

We have determined the physical and chemical proprieties of the stored ash before and after the experiment and we have determined the quality and quantity of the production obtained. We have noticed that the treatments with chemical fertilizers have improved the agrochemical proprieties of the ash, by increasing the concentration of nitrogen and phosphorus and decreasing the pH. The obtained results recommend the cultivation of potatoes in order to diminish the polluting effects of the ash crops.

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PREPARATION OF FORTIFIED SOIL SAMPLES FOR DETERMINATION OF POLYCYCLIC AROMATIC HYDROCARBONS

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Fortification is a method of controlled increase of compound level in the investigated sample by its adding (spiking) in the exactly known quantity. It is widely used technique for (in-house) quality assurance procedure, especially in the case of the semi-volatile and persistent pollutants like polycyclic aromatic hydrocarbons (PAHs). In this work, two fortification methods of the same soil sample were investigated in order to assess the homogenity of the fortified samples.

In the first case, fortification was carried out in the following manner: PAHs mixture was spiked to the sample and additional solvent was added until it completely covered the sample. The suspension was thoroughly mixed for 1 h with a shaker to allow the even distribution of the added mixture in the sample. Then, the bulk of the solvent was slowly evaporated at room temperature.

In the second case, soil sample was spiked with small (known) volume of PAHs solution and after the intensive shaking, it was stored overnight at room temperature in the closed vessel to allow equilibrium of the PAHs.

Several aliquots of the fortified samples were analyzed and the results revealed that the first fortification method yielded to a better homogenity of the PAHs content throughout the soil matrix for shorter period, even though the losses of low molecular mass PAHs were more pronounced probably as a result of the solvent evaporation step. The second fortification method gave worse distribution (homogenity) of the added PAHs, except in the case of the naphthalene and acenaphtylene.

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EFFICIENCY OF SOXHLET AND ULTRASONIC EXTRACTIONS FOR DETERMINATION OF POLYCYCLIC AROMATIC HYDROCARBONS IN SOIL SAMPLES

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Extraction of polycyclic aromatic hydrocarbons (PAHs) from the complex matrix as the soil is a crucial step in the preparation of sample for the determination of the pollutants level. Solvent extraction of solid sample is one of the oldest ways to pretreat solids, especially in order to extract hydrophobic compounds such as PAHs. Efficiencies of two conventional solvent extraction techniques, Soxhlet (12-h long) and ultrasonic extraction (3 extraction steps, each lasting 10 min), were studied and compared having in view their applicability to the determination of polycyclic aromatic hydrocarbons (PAHs) in fine-ground soil samples. Samples of fortified soils and certified reference material (NWEC-5, river sediment) were used to check the recovery of 16 EPA PAHs by these two extraction techniques, followed by the same cleanup procedure on silica gel column chromatography. Ultrasonic extraction was shown to be more efficient with regard to the lower molecular mass compounds like naphthalene, acenaphtylene and acenaphthene. The average efficiency of the Soxhlet extraction for the remaining 13 PAHs was slightly higher then of the ultrasonic technique (96% versus 92%), but it could be also reached applying three longer ultrasonic extraction steps (each step has to be at least 20-min long). The relative standard deviations of both preparation methods were less than 12%, that is acceptable according to Council Directive of European Commission. Hence, both investigated methods could be regarded as the appropriate for the PAHs extraction, also during the process of intercalibration of new soil reference materials.

Acknowledgement: This work is a part of the project funded by B.E.N.A. in association with CARLSBERG Serbia in 2006/2007.

TIME TREND OF POLYCYCLIC AROMATIC HYDROCARBONS CONTENT IN SURFACE SOIL FROM THE VICINITY OF NOVI SAD

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Occurrence of polycyclic aromatic hydrocarbons (PAHs) in the environment arises mainly from the anthropogenic sources. As PAHs accumulate mostly in the humus layer of soil causing its contamination, determination of their presence in surface soil may provide significant information on the environmental pollution level.

To date, informations about PAHs level in surface soil in Serbia are scares and of limited and local significance. The present investigation was carried out to estimate the presence of 16 EPA PAHs in the surface soil samples in industrialized as well as in remote zones of Novi Sad and Vojvodina Province. The samples were taken in 2007 near the Oil Refinery that was severely damaged during NATO bombarding in 1999, from the same places where the sampling was also performed in 2001, due to investigating the time trend. The agricultural soils sampled in the vicinity of Novi Sad and across Province of Vojvodina without direct influence of anthropogenic source were used to determine the ”background” concentrations. Also, basic chemical-physical properties of samples were determined, while the PAHs-load of the agricultural soils was compared to the existing national regulation in order to evaluate its appropriateness for organic production.

DETERMINATION OF NICKEL AND LEAD CONTENTS IN SOIL AND PLANT SAMPLES IN ÇORLU-TURKEY

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Abstract

The extent of the environmental pollution emanating from industrial activities has intensive effects in Çorlu, Turkey. The study area has a grand power of industrialization for both Thrace region and Turkey. This consequence has not yet been evaluated sufficiently.

As is known due to environmental cycle, trace elements, emanating from atmospheric and industrial pollution accumulate in soil and affect the ecosystem nearby. These elements may accumulate in soil, collected in plant or infiltrated to ground water. If they collect in plant, reaches to food chain and may become harmful effect to people, eating them. Hence, the investigation of trace elements in soil and plant samples is very important in the point of environmental pollution, especially for plants.

In the present study, the concentrations of Pb, Ni and Cu in soil and plant parts collected from Çorlu, Turkey, were determined by Graphite Furnace Atomic Absorption Spectrometry and Flame Atomic Absorption Spectrometry. The maximum concentrations of trace elements were determined as 52.91 mg Pb kg-1 and 40.68 mg Ni kg-1 in soils and 57.06 mg Cu kg-1; 80.90 mg Pb kg-1 in plant parts. The characterization of soil and plant samples was made and results of plant samples were also evaluated due to phototoxic view.

Key words: Trace elements, plant, soil, atomic absorption spectrometry, Çorlu

THE FATE OF PETROLEUM TYPE POLLUTNATS IN SOIL AND QROUND WATERS - MONITORING OF CHANGES IN NATIVE ENVIRONMENT AND TRIALS OF BIOREMEDIATION
(Petroleum Refinery Pančevo, Serbia)

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Fate of a pollutant in the environment is possible to assess by immediate monitoring of changes in its composition in certain native environment, over a longer time. However, the most efficient way is to simulate the natural processes intensifying certain conditions. This saves time, but not at expense of reliability of the results. This group may also include a number of experiments, of attempts of bioremediation.

Recent results will be reviewed in this paper observed by investigating microbial tranformation processes of petroleum-type pollutants in Danube alluvial sediments and underground and surface waters from the locality of Pančevo Oil Refinery, Serbia, as a potential new contribution for better understanding the fate of oil type pollutant in the environment. Also, in this presentations transformations of saturated hydrocarbons of petroleum type pollutants (isoprenoids and polycyclic alkanes of sterane and terpane type) during ex situ bioremediation of soil on the pilot heap (halde) within the grounds of Refinery Pančevo will be presented. Experiments of biostimulation, bioventilation and

reinoculation of autochtonous microbial consorcium were carried out during the period of six months. Finally, for full understanig the the fate of petroleum type pollutant in the environment, in this paper will be described to what extent the hydrocarbons of a petroleum pollutant are degraded by microbial cultures which were isolated as dominant autotrophic/mixotrophic microorganisms from a surface water of a wastewater canal of an oil refinery.

SESSION 4 :

ECONOMY AND ENVIRONMENT

CHAIRMEN:M. Dimkić - A. Ongen - E. Stepanova

ENVIRONMENTAL QUALITY AND ECONOMIC DEVELOPMENT: SUSTAINABILITY STRATEGIES (ODESSA REGION CASE STUDY)

Kateryna Stepanova

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The international experience is proving the dependence of economic development of a country from quality of environment. This dependence has tendency for increasing especially since the second part of 20th century. The main reason is human-induced impact on environment, like peak of industrialization, drastic increase of population, urbanization, unsustainable use of natural resources. As a result of ignorant use of natural resources and poor environmental quality humankind is facing the problems of droughts, desertification, biodiversity reduction, climate change. Negative changes in environment are causing drastic impact on quality of economic and social life of a society. During 1960-1990 years the total level of losses from natural disasters has increased in 40 times. Only during 4 years, from 1990 to 1994 year, the total economic loss has reached $43 billions, in 1995 this figure has increased till $180 billions. In many cases these negative impacts are concerning the developing countries and countries in transition. In this study we will present examples of research about sustainable strategies development of nature resources potential use in Ukraine (Odessa region).

Key words: environmental quality, life quality, sustainable economic development.

SOCIO-ECONOMIC PARAMETERS FOR SUSTAINABLE MANAGEMENT OF GROUNDWATER RESOURCES

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Groundwater is a major source of drinking water supply, but it is also an important component of a society's overall economic prosperity. In Europe, for instance, nearly 75% of the overall drinking water supply originates from groundwater. Unfortunately, increasing rates of groundwater abstraction for municipal water supply, industrial water supply, irrigation, recreation, and other uses, has led to significant pressures on this important resource. In many countries, public policies with respect to groundwater generally lag behind those which address surface water, mostly because of the private appropriation tradition which prevents adequate groundwater administration. For example, in many areas of Europe (e.g., Italy, Spain, and Southern France), rapid development of irrigation in the second half of the 20th century led to dramatic over-exploitation of groundwater, which affected water supply. There are also examples of aquifers exhibiting extreme consequences of excessive abstraction (permanent drawdown, land subsidence, and the like). Over-exploitation of groundwater resources is a phenomenon which is acquiring increasing proportions and beginning to have a transboundary impact. Sustainable management of groundwater resources is often hindered by an insufficiently developed legal background (legal and institutional frameworks), both at the national and international level. This is a result of inadequate knowledge of underground processes (often inappropriate monitoring), as well as unresolved ownership, legal, economic and other issues in the area of groundwater management. This paper presents basic socio-economic factors which are relevant to sustainable management of groundwater resources. It also provides an overview of instruments available at the international level (conventions, multilateral agreements, etc.).

ECOLOGICAL ASPECTS OF VEGETABLE PRODUCTION IN GREENHOUSES – RESULTS OF MINI PROJECTS

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Abstract

This paperwork relate to Community of Pančevo area which were insert on black list of ecological points in Republic of Serbia due to spacious endageration of natural resources.

Objects of this research are water and soil as unregeneration natural resources on which exist all planet life, including state and nation and all economy of any area. With regard of living in technological prosperity period and industrialization and in that way water as natural resources recipients a huge quantity of waste water, and also exposed to another origin of pollution, problems with evaluation of water quality for irrigation get bigger in last decades. In the nature are less water of good quality with aggravation trend. Negative impact of mineral water on soil and plants lead to need for determination and evaluation of water irrigation quality. Criteria for evaluation of water quality are often local character, and dinstinction is understandable, because conditions between individual region are different.

This paperwork includes three Experimental fields on three region Community of Pančevo. Experimental fields are under greenhouses and in period form october 2006 to april 2007 where have produced vegetables lettuce, spinach, onion and radish. First experimental field will be in Glogonj village, second in Banatski Brestivac village and third experimental field belongs secondary agricultural school „Josif Pančić“ in Pančevo.
Research activity which were planed during realization of this activities, have followed impact of different water quality with three different areas and three different soil type on quantity and quality of produced vegetables and yield.
Key words: vegetable production, greenhouses, water, soil, ecology

ECOLOGICAL ANALYSIS OF BUILDING ELEMENTS OF TRADITIONAL BUILDINGS IN THE RURAL AREA OF THRACE REGION (IN TURKEY)

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Abstract

Today, the whole world discusses intensively the solutions and new approaches against the current environmental problems. The architecture finds as its new target the choice of the materials and elements that lead to those buildings that will minimize the environmental problems, create such an ambience that will fit best for human health and protect the ecologic stability. Because, the buildings also play an important role in the growth of these problems with all of their adverse impacts on the environmental values. However, the traditional buildings have so little, if no, impacts on the environment. Since the environmental factors were considered in the process of design of these buildings, they are in harmony with the nature. Therefore, they are considered as ecologic items.

The purpose of this study is to investigate the ecologic characteristics of the buildings elements of traditional buildings. In this respect, the rural buildings in Thrace are selected as a subject matter of this study since they exhibit unique characteristics among the rural buildings that still remain on earth. These buildings are the product of an experience that the local people gained for thousands of years in the natural living conditions. Since they are the product of an accumulated experience, it is considered that they can act as a model for possible solutions to the current environmental problems of buildings. For this purpose, a field survey was conducted in a model rural area within Thrace region to analyze and examine the building elements of local buildings, such as walls, roofs and floors and describe their ecologic features.

ADVANCED TERTIARY TREATMENT OF MUNICIPAL EFFLUENTS IN THE NEW OF THEIR REUSING AS WATER FOR IRRIGATION

Ciprian Dumitrescu, Elisabeta Pena-Leonte, Mihai Stefanescu, Costel Bumbac, Sorin Florescu, Ileana Ghita, Ines Nitoi, Andreea Moise
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Abstract

The costs of a municipal wastewater treatment plant to achieve a quality of the treated effluents in accordance with the legal discharge limits in surface emissaries (HG 352/2005) are very expensive and few plants from Romania can afford such performances.

Our research is an attempt to treat the municipal treatment plants influents in a three steps (anoxic, anaerobic, aerobic) bioreactor so that the advanced treated effluents could be reusedas irrigation water {STAS 9450/88).

The experiments were conducted using a municipal treatment plant influent with the following characteristics:

- total suspended solids under 100 mg/1
- COD over 300 mgO2/l
- BOD over 100 mgO2/l
- NH4' between 10-30 mg/1
- total P between 4-7 mg/1
- total colliforms 7.6x104 - 1.8x105 CFU/mt
- fecal colliforms 2.5xI02 - 2.5x103 CFU/ml

The quality of the treated wastewater was in accordance with HG 352/2005 for organic load, ammonia and total phosphorus contents, and with STAS 9450/88 (M3 category) for total and fecal colliforms.

Keywords: WWTP's, tertiary treatment, water reuse

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ALTERNATIVE BIOTECHNOLOGICAL SOLUTIONS FOR PAPER AND MILL PLANTS SOLID WASTES REUSING

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Abstract

The waste deposition law (1999/3 I/EC Directive 95/2005 MEWM Order) prohibits land filling with pulp and paper industry solid wastes with organic content and imposes their end treatment. This fact leads to the necessity of finding new uses for residual materials that can be re-used.
The paper is a brief review on the possibilities of advanced biotechnological solutions to produce alternative energy sources as methane, hydrogen, ethanol and valuable organic products as acetic acid, lactic acid, a. so., from pulp and paper solid wastes.

The review includes data on paper and mill organic sludge composting in combination with municipal sludge and, the compost fertilizing capacity.

Keywords: paper and mill, solid wastes, landfill, biotechnological solutions, alternative energy sources.

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