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NEW STRAINS OF FUNGUS *SAPROLEGNIA PARASITICA* IN COMMON CARP (*CYPRINUS CARPIO* L.) FROM CYPRINID FISH BREEDING FACILITIES IN MACEDONIA

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ABSTRACT

Saprolegniosis is an infectious fungal disease that is widespread in all stages of the life cycle of fish. The aim of this study was to determine the presence of mycoses in common carp (*Cyprinus carpio*) from eight larger and more significant cyprinid fish breeding facilities in Macedonia, by seasons and localities. For Saprolegnia isolation methodology of Njilloughbdz & Pickering (1977) was used. Identification of fungi was performed by direct microscopic method, according to the classification of Bergey (1994). We determined representatives of the genus *Saprolegnia* in an average 12.65 % in a total of 1134 examined fish. The identified fungus was determined as *Saprolegnia parasitica*, strain 111 and strain 222, which are first published findings in Macedonia.

Key words: common carp (*Cyprinus carpio*), *Saprolegnia parasitica*, cyprinid fish breeding facilities

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DETERMINATION OF PAH AND BTEX LEVELS IN WATER SAMPLES USING GC/FID TECHNIQUE. CASE STUDY PATOKU LAGOON

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ABSTRACT

This study presented data about concentrations of BTEX (benzene, toluene, ethylbenzene and o-, m-, p-xylenes) and PAH (poly aromatic hydrocarbons) in water samples of Patoku Lagoon. Fifteen water samples were taken in different stations of lagoon in October 2013. Headspace solid phase micro extraction (HS-SPME) technique was used to trace BTEX in water samples. For isolation of PAH liquid-liquid extraction assisted with Dichloromethane as extraction solvent were used. 1 L water samples were taken for each stations of Patoku Lagoon for PAH analyze. The analysis of BTEX and PAH in water samples was performed by gas chromatography technique using flame ionization detector (GC/FID). Injections of BTEX were done in injector PTV directly by using Head-Space mode of Polydimethyl Siloxane fiber. 1 ul extract in Dichloromethane (extracting solvent) were injected for PAH analyses. VF-1ms capillary column (30 m x 0.33 mm x 0.25 um) was used for separation of BTEX and PAH compounds. Relatively high concentrations of BTEX and more volatile PAH compounds were detected in water samples of Patoku Lagoon. The presence of volatile organic pollutants could be mostly of automobilist transport near the lagoon, water currents and discharge of industrial wastes in Mati River.

Keywords: BTEX; HS-SPME; PAH; LLE; GC/FID; Water analyze; Patoku Lagoon

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LAND DEGRADATION DUE COAL MINING IN KOSOVO BASIN

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ABSTRACT

Mining activity exerts a long lasting impact on landscape, eco-system and socio-cultural-economic considerations. The coal basin of Kosovo has a huge coal reserves, they are the main power sources for thermal power plant stations of Kosovo. Kosovo coal is lignite type. The lignite is distributed across the Kosovo, Dukagjini and Drenica Basins, although mining has so far been restricted to the Kosovo Basin. The first systematic records of lignite exploitation since 1992, when a small scale, shallow underground room-and-pillar mining commenced in the Kosovo Basin. The considerable reserves of lignite in Kosovo basin, ascertain from geological exploration, present important recourse in one side whereas its exploitation for combustion in Kosovo power plants presents a great environmental problem on the other side. Kosovo lignite presents a type coal with a great quantity of inorganic matter, with presence of some harmful elements and release of polluted gases during its combustion in power plants, hereby causing the degradation and pollution of environment in high degree and relatively great spatial dimensions.

Key words: coal, exploitation, environment, pollution, degradation

TREND OF TROPHIC STATE IN NARTA LAGOON

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ABSTRACT

Narta Lagoon, one of the largest and most important coastal ecosystems of Albania, is situated on the south-eastern coast of the Adriatic Sea, northwestern part of Vlora district. It is characterized by a reduced water exchange with sea, a small depth and an intensive evaporation during the dry season. Evaluation of trophic state is based on chlorophyll a content in water and distribution of photosynthetic pigments. The monitored lagoon on different period can be characterized by different trophic state based on the trophic state classification by Hakanson. During monitoring period 2002-2003, Narta lagoon can be characterized by a high trophic state – eutrophic level, on the first monitoring period during the year 2002. Whereas on the second monitoring during the year 2003, this ecosystem can be characterized by low trophic state evaluated as low mesotrophic level. Trophic state also evaluated in two other periods, 2007 and 2012 was characterized by two different levels evaluated as mesotrophic level and oligotrophic level. The observed differences on the trophic state of selected stations in this lagoon especially its eutrophication can be explain by the communication sea-lagoon, fresh water supply as well as by the pollution near the urban areas.

Key words: chlorophyll, eutrophic, Narta lagoon, trophic state, water quality

INTEGRATED WATER MANAGEMENT IN ARID AND SEMIARID COUNTRIES – EXPERIENCES OF GIZ IS AND DORNIER CONSULTING IN THE MENA REGION

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ABSTRACT

Renewable water resources are limited in arid and semiarid countries. The lack of surface waters and groundwater recharge makes the use of non-renewable groundwater resources inevitable. In many countries in the MENA Region (Middle East/North Africa), non-renewable groundwater is the major resource for both municipal and agricultural water demand. Integrated Management of non-renewable groundwater resources has to cope with the fact, that the resources are dwindling, and sustainability in terms of a balanced water budget cannot be achieved. Hence, focus must be set on the economic and social welfare resulting from the use of these limited resources. Long-term water management plans are needed to overcome economic inefficiencies within the water sector and to ensure a safe water supply for the present and future generations. In the MENA region, the technical development and rapid population growth lead to an overexploitation of the non-renewable groundwater resources, mainly by agricultural users, resulting in water quality deterioration, local water shortage, and establishment of expensive long-distance water supply systems. Here, today's major challenges of Integrated Water Management are: (1) to mitigate the user conflict between municipal and agricultural users, (2) to protect the dwindling resources, and (3) to implement an economic view on the water sector. Facing these challenges ensures the best use of the non-renewable resources, turning them into economic and social welfare for the population.

Keywords: IWRM, non-renewable groundwater, rainwater harvesting.

DETERMINATION OF SOME VOLATILE ORGANIC COMPOUNDS USING BIOINDICATOR SAMPLES

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ABSTRACT

Moss samples (*Hypnum cupressiforme*) and leaves of different trees (*Pinus Nigra*) were collected, in February 2014, in different stations in Albania for determination of airborne for some VOCs levels. This study proves that these bioindicators were suitable in the monitoring of the different classes of organic pollutants such as volatile organic compounds (VOC), organochlorinated pesticides, polychlorinated biphenyls (PCB), dioxins and polycyclic aromatic hydrocarbons (PAH), etc. Five stations were in Tirana city, two in Durres, one in Kavaja, one in Elbasan and two in Fieri city. The analyses of organic pollutants in air samples are limited for many laboratories because of the lack of materials for the sampling of air samples. Another limitation is that data obtained from air samples represent of-the-moment data because of vertical and horizontal air current, temperature, humidity, etc. Mosses, tree leaves and lichens are probably the most widely used plant group in relation to the assessment of airborne organic compounds. The quantitative analysis of VOC was performed by the gas chromatography method by using a flame ionization detector (FID). The column used was a VF-1ms capillary column (30 m x 0.33 mm x 0.25 µm). The total of PCB concentration in mosses ranges between 5 and 26 µg/g fresh weight sample. Benzene, toluene and chlorobenzene were detected at higher levels than other VOC compounds obtained in the study.

Keywords: Mosses; live; Airborne pollution; VOC; Gas Chromatography

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SPONTANEOUS COMBUSTION OF LIGNITE IN BARDH MIRASH MINES IN KOSOVO

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ABSTRACT

Kosovo is rich in coal resources / reserves. There are about 14 billion tones coal resources in Kosova. The coal in Kosova is used mainly in power (electricity) generation and less amount for heating. Kosovo coal is lignite type. Exploitation of coal is being donning in two open pits Bardh and Mirash. There is also a project for building of the new power plant (capacity 2000 MW). For this, supply of coal should be made by the new mine - Sibovci. During mining of coal, is very present self combustion. Oxygen is absorbed on to the surface of the coal causing exothermic reaction, which is the start of oxidation. One direct side-effect of oxidation is that of spontaneous combustion. This occurs when the rate of heat generation by oxidation exceeds the rate of heat dissipation. All coals have the propensity to heat spontaneously, but lower rank coals have a greater tendency to self-heat. The propensity to spontaneous combustion is related to the rank, moisture content and size of the coal. In addition, mining and ventilation practices and geological conditions can also be contributory factors. Self combustion of coal in Kosovo coal mines, especially occurs in: old galleries from the early underground coal mining; slide areas; slopes (especially the central pillar parts of the mine which remain exposed to air for a longer period), faults and joints. Self combustion also occurs in dumped coal masses.

Keywords: coal, oxidation, spontaneous combustion, exothermic reaction, coal fires

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**BETTER AUDITING PERFORMANCE, HIGHER EFFECTIVENESS OF
GOVERNMENT - ALBANIAN CASE****Greta Angjeli, Sulo Haderi***University "Mesdhetar", Tirana, Albania;
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ABSTRACT

The economic, social, and financial developments in face of a very fast globalizing environment and the efficiency required in the appropriate use of public funds has lead to very significant changes and advances in our world, which have to reevaluate the role that the auditor profession entitles. The world today requires more effective public institutions and auditing agencies in order to promote honesty and competent governance, for the benefit of the present and the future of every nation. Keeping this objective at mind, this study concentrates on the efficiency and effectiveness of audits in the public sector in terms of improving governance while focusing specifically on issues related to efficiency indicators and their effectiveness. This study gives an overview of public sector audits and the institutions that carry out these duties, as well as the theoretic basis of conducting an audit in the public sector. Measuring effectiveness and efficiency of an audit is evaluated through several factors and indicators, which we believe are very influential in the process. The study realistically examines the current situation of the auditing process in Albania and gives relevant recommendations which conclude that the effectiveness of audits depends on factors related to the process itself as well as how it is perceived, such as the characteristics of the institution being audited, the characteristics of the environment, independence, integrity, as well as professionalism. The result from an audit process aims to be an added value to governing activities and is often of little economic significance. Nevertheless the effect it has on improving governance is very positive thus helping change the notion that the auditing process should be regarded as merely a necessity or need.

Keywords: auditing, auditor, public sector, effectiveness, efficiency, governance, measures of effectiveness, internal audit, ISA, International Standards of Auditing, corruption, performance auditing, financial auditing, compliance audit, IT auditing

WATER QUALITY AND FISH FAUNA IN LAKEWOOD LAKE ZAMBOANGA DEL SUR, PHILIPPINES

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ABSTRACT

A pioneering study was done on Lake Lakewood, a freshwater lake located in western Mindanao, Philippines to lay down an environmental baseline for the lake ecosystem focusing on limnology and aquatic faunal biodiversity. *In situ* determinations were done on depth-integrated grab samples using portable probe/digital instruments concerning the following water quality parameters: water temperature, TDS, pH, electrical conductivity, chl a, and a, depth profile of DO. Actual fishing and identification of the fish species caught was done to address aquatic faunal biodiversity. Depth profiles of WT and DO within a 10-m deep water column gave ranges of 26.6 (10-m) - 28.8 °C (surface); and 5.96 mg.L⁻¹ - 7.8 mg.L⁻¹, respectively. The results gave no significant spatial variation. Surface determinations of TDS was 57.44 – 65.11mg.L⁻¹, pH, 7.9-8.8; and EC, 0.07 - 0.09 µS/cm. Chl a that ranged from 0.6 to 2.3 mg.L⁻¹; and the BOD, 0.37 – 4.30 ml.L⁻¹ both yielded significant spatial differences. Chl a significantly differentiated among stations. Eleven freshwater fish taxa were identified. Three species belonged to Cyprinidae family, and eight species were of the Clariidae, Osphronemidae, Channidae, Anguillidae, Cichlidae, Hemiramphidae, Anabantidae and Gobiidae. One commercialized cyprinid, locally known as Porang is endemic to the lake. Four shellfishes taxa belonged to the families of Pomacea, Lymnaeidae and Corbiculidae and Viviparidae. Recommendations concerning resource conservation and improved management strategies are discussed.

Key Words: lake faunal biodiversity, Lakewood lake, lake ecosystem, water quality

POTENTIAL SULFUR CONCENTRATION REDUCTION IN CLINKER BURNING PROCESSES

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ABSTRACT

Process operation and productivity of the clinker production kiln is a very complex process and it is very important to emphasize that this depends on many different factors. The impact of these factors in the process is variable and depends mainly on the process conditions, process parameters, raw material, fuel etc. In this article will be introduced the impact of sulphur in the process and possible methods of sulphur concentration reduction in raw material and fuel preparation, as well as during the process. Test result of desulphurization processes of the alternative fuel will be given. In this project it is used a wildfire with high sulphur content which will also be explained below, and which affects directly the efficiency and productivity of the clinker production line. Sulphur has individual impact in the process, and not only. It has negative affects when it is combined with other volatile ingredients. For this reason, we will refer to the other volatile materials as well, such as alkali and chlorine. Recirculation phenomenon is related to volatile ingredients. Recycling of volatile components is related to the fact that, with the increase of temperature, components such as alkalis, sulphur and chlorine, they are released by thermal decomposition of the substances in which they are part of. Together with the hot gases of the kiln, they move backward into areas with lower temperatures in pre-heater sections. When they arrive at sites which have lower temperature than their condensation temperature, they will be condensed and deposited as salts in the relevant section of the system walls. Mentioned ingredients are deposited also in fresh raw materials entering the system and in some cases, entering into reactions with the last one. This way, a certain part of the volatile components go back in the areas with high temperatures in the kiln process. The mentioned process, starts again from the beginning. This phenomenon is known as internal reflows. In such cases, only a limited part of the volatile components can be removed and discharged from the kiln with clinker and the remaining part, is being recycled into the system. Only a small part of them is discharged through stack gases in the closed system. Alkaline ingredients such as chlorine and sulphur enter the clinker production system by raw materials and fuel used in the process. Sulphur-load in the cement kilns production system usually grows by the use of alternative fuels, particularly coke or bituminous sand in our case.

Key words: alternative fuels, processes, clinker, volatile components, sulphur, recirculation, desulphurization, tests, reaction.

RIPARIAN VEGETATION CLASSIFICATION ALONG KORANG RIVER, ISLAMABAD BY USING ORDINATION TECHNIQUE

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ABSTRACT

The present study was conducted at Korang river, Islamabad to identify plants communities grouping and quantification of floristic composition using ordination techniques. Data collection was done for herbaceous flora. Random sampling approach was applied using quadrat of 1×1 square meters. Visual cover estimation was noted down for each plant. A whole of 21 species according to 14 families were identified. TWINSpan (Two Way Indicator Species Analysis) classified 4 sub-communities, named as *Ajuga-Xanthium*, *Plantago-Malvastrum*, *Oxalis-Euphorbia* and *Coronopus-Parthenium*. DCA (Detrended Correspondence Analysis) results demarcated four groups and the frequent species were *Cannabis sativa*, *Cynodon dactylon* and *Coronopus didymus*. Multidimensional scaling or non metric multidimensional scaling was used to extract nonlinear variables in composition of species. The whole dataset was evaluated by Monte Carlo test in order to evaluate stress/pressure as dimensionality function.

Key words: Multivariate techniques, TWINSpan, DCA, NMS, River

INDUSTRIAL SCALE USAGE OF BITUMINOUS SAND IN CLINKER PRODUCTION PROCESS

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ABSTRACT

Cement is very important product of the building materials industry. In the cement manufacturing industry it is important for the product to be produced with high quality according to the standards and also to be competitive in the market. The manufacturing processes of this product involve high consumption of thermal and electrical energy. This is the main reason why the cement manufacturing companies do constantly research on the cost reduction, optimization of equipment, replacement of raw materials and fuel, optimization of processes and efficiency in the management of energy resources. One of the main fields of these researches is the substitution of fuel in clinker production processes. These researches are subject to or directed towards the use of alternative fuels. Special attention is paid to the substitution of clean fuel with lower calorific value alternative fuels, as well as the usage of processed waste from other industrial or urban processes. These studies have been done due to the exhaustion and high cost of clean fuels with high calorific value, used in the production of clinker process. In many countries, there has been paid attention to the usage of fuels with lower calorific value. They would be used as alternative to the process requirements, easily obtainable in quantity, and with a lower cost. In this article there will be introduced researches and evidence of the usage of an alternative fuel, which aims to improve the competitiveness in the market of the product produced by a cement factory, minimizing the direct costs of clinker production. Since the combustible content is becoming increasingly important, this research work will verify the substitution of the imported coal, with a local material called, bituminous sand. The work focuses on the usage of this alternative fuel on an industrial scale, for the production process of Portland cement clinker. In this work will be also shown the main problems encountered during the clinker production process when using alternative fuels which have high sulphur content. Alternative fuel that is selected for replacement is bituminous sand which is well studied so far. Actual results provided from laboratory tests of this alternative fuel, as well as theoretical calculations of the production process, lead to the industrial trial of this material. Results concerning the content of this combustible alternative fuel and the positive theoretically calculations results, will prove the usage of this alternative fuel on an industrial scale in the clinker production.

Key words: production, clinker, bituminous sand, process, volatile, component, circulation, sulphur, industrial scale.

DEPENDENCE OF ALUMINUM IONS UPON PH AND DOSAGE OF COAGULANT-FLOCCULANT IN THE WATER TREATED AT BOVILLE PLANT

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ABSTRACT

In the water treatment plant of Boville, polyaluminium chloride is used as a coagulant-flocculant. Water treatment with polyaluminium chloride causes the increase in the concentration of aluminum anion in water. Aluminum anion concentration in water, according to STASH 3904:1997 and European standard EC 80/778, must be near the value 0.05 mg/ L and with maximum allowed peak of 0.2 mg/ L. Because of the link between aluminum anion exposure and Alzheimer disease development, and other related health risks, it is necessary that the process of coagulation-flocculation is optimized and dosage of polyaluminium chloride ions (Al^{3+}) in treated water is kept according to the above values. For the optimization process of water treatment, in laboratorial conditions, Jar-test method is implemented. Data collected from the Jar-test shows that the minimal values of aluminum anion concentration were achieved at 7.5 pH. To achieve pH correction and water safety, according to STASH 3904:1998, optimal dosage of hydrochloric acid (30-33%) must be in the interval 12-20 mg/L as the optimal dosage of polyaluminium chloride ranges from 8 to 25 ml/g depending on the turbidity and pH of untreated water.

Key words: Drinking water, Jar-test, aluminum anion, pH, coagulation-flocculation.

RETHINKING RURAL TOURISM IN MONTENEGRO: ARCHITECTURAL HERITAGE AND ATTRACTING ENVIRONMENTALLY RESPONSIBLE CONSUMERS

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ABSTRACT

Tourism has entered a new era and under the influence of global market it is developing new forms, which provide great opportunities, but also risks to the economic and social development of states and local communities. Impacts of tourism on sustainable development have been an important theme for government, business and academics. One of the growing forms is rural tourism which meets the needs of people for preserved nature, rural architectural heritage, specific culture and new experiences of life in rural areas. Given that tourism is a priority industry of Montenegro, it is necessary to improve existing and develop new forms of supply, including in sustainable rural tourism as an alternative to mass tourism in coastal area and support to equitable regional development. The aim of this paper is to rethink the current situation and give directions for further study of the problems of rural tourism destinations' development at national and global level, particularly in the context of preserving architectural heritage and attracting new tourist segments. Methodology is based on literature research and case study.

Key words: rural tourism, architectural heritage, consumer behavior, destination marketing

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A STUDY OF POTATO TUBER QUALITY ACCORDING TO DIFFERENT TYPES OF CULTIVARS

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ABSTRACT

Results of research and experience in manufacturing have shown that potato yields can be high just by knowing ecology and biological requirements in accordance with the application of advanced breeding techniques. This is why a study is made during potato vegetation period in 2013. Research has been conducted in two agro-climatic regions of Kosovo; in research farm of Kosovo Institute of Agriculture (Dukagjinit Plain) and in Pestova (Kosovo Plain). Number of cultivars in the experiments was 11, in four repetitions, according to a randomized system (Fisher blocks). Seed class A imported from Netherlands is used for planting. The research involved potato cultivars for fresh consumption and industrial processing which belong to different vegetation periods. From planting to harvest all cultivars are treated in the same way. Research is conducted in two levels: 1. Field research; the vegetative period of cultivars, the number of stalks, plant height and yield is specified in plots and 2. Laboratory research; after harvesting dry matter is determined for 5 kg samples taken for each treatment (measurement is made with analytical scale PR, type METTELER TOLEDO LC-P 43 with European standards. Protein, starch and cellulose are measured through scans method infrared ray based on standard NIR ISO 12009:2010. All parameters were analyzed by using MSTATC statistical program (MSTAT-C 1990). Treatment means were compared by least significant difference (LSD) the level 5% probability (Gomez Gomez, 1984).

Keywords: Potatoes, dry matter, starch, cellulose

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MONITORING PRECIPITATION AND SNOW COVER USING MULTI-SENSOR SATELLITE AND IN-SITU DATA

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ABSTRACT

In-situ measurements of surface precipitation and snow cover although accurate locally, are often inadequate for mapping at large scales. Satellite remote sensing is considered less accurate than in-situ measurements, but complements in-situ data with more frequent views and much improved spatial coverage. The main goal of this study is to demonstrate the utility of multi-sensor satellite imagery in concert with in-situ and other ancillary data for improved winter weather monitoring and assessment. National Oceanic and Atmospheric Administration (NOAA)'s rainfall and snow cover products are presented, followed by a case study of a significant winter rain event over Northern Albania and the surrounding areas.

Key words: Satellite Remote Sensing, Snow Cover, Precipitation, Rain Gauges

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