

PUBLISHED BY THE ACADEMY OF SCIENCES OF ALBANIA

JNTS

JOURNAL OF NATURAL
AND TECHNICAL SCIENCES



SPECIAL EDITION

2016 (3)
XXI

LETTER FROM THE EDITOR

The 20th anniversary of scientific publishing: a prolific scientist

Dear colleagues,

Welcome to the 20th anniversary of the *Journal of Natural and Technical Sciences* of the Albanian Academy of Sciences.

The origins of the Journal lie in 1996 when some of the most eminent personalities involved in the area of natural and technical sciences, working for the institutions that were part of the Academy until 2007, met together and decided to publish a multidisciplinary journal.

This innovative way of recording the Academy of Sciences' business in the area of natural, technical and medical sciences proved to be a model for scientific publishing, as we now know it. It provided a means of reviewing scientific discovery, recording it, and the most importantly provided a means for disseminating these findings.

The celebration of this anniversary falls at a time when scientific publishing is in the midst of the revolution of electronic publishing. The journal is available on line. Our objectives are, even more than ever before, to make scientific findings, freely available to the widest audience possible, in particular to young researchers.

In the third issue of the journal, we will commemorate all the publications from the archives of the Editorial Office in the fields represented in the journal: mathematics, physics, chemistry, biology, medicine, informatics, mechanics etc. and their respective subdisciplines.

Many difficulties have been encountered. The writing machine was used to write the first issues of the journal.

The authors of the first issue are Llukan Puka, Fatmir Hoxha, Kostandin Dollani, Robert Kushe, Alqi Çullaj, Mjalinda Pere, Efigjeni Kongjika, Loreta Shameti, Spartak Bozo, Fatbardha Babani, Marenglen Spiro, Miriam Bogdani, Betim, Muço, Shyqyri Aliaj, Sulejman Xhelepi, Donard Strazimiri, Lefter Cane.

In addition to the regular chronological volumes of the journal, three special issues in seismics, biology and algebra have been published.

580 papers have been written by 1330 authors, since 1996. 799 (60%) authors out of 1330 are men and 531 (40%) are women. 1160 authors (87.2%) are from Albania and 170 authors (12.8%) are from abroad: Europe, North and South America, Near East, Middle East, Far East etc., being the perfect example of mutual understanding and comprehension among nations. The

average number of authors per paper is 2.5. In 2014 the title of the Journal changed from *Albanian Journal of Natural and Technical Sciences (AJNTS)* into *Journal of Natural and Technical Sciences (JNTS)*, in line with the recommendations of IFLA, Elsevier's representatives.

The Editor-in-Chief expresses his gratitude to all the Editors-in-Chiefs, members of the Editorial Board and editors and to the authors and reviewers for the efforts made while writing and reviewing the papers of outstanding scientific achievements. We are very much looking forward to working with all those who are interested in the area of scientific research, building on the outstanding achievements of the forthcoming years. Our principal aim is to make *JNTS* a prominent international journal, specializing in the rapid publication of innovative, high-quality research articles. It is our mission now to take the journal forward and encourage the submission of presently under-represented disciplines.

As the scope of the journal is broad, we also seek to attract submissions that relate to the issues of societal interest and development of the country such as quality of life, climate change, pollution, environment and conservation of biodiversity, water resources, health, food security etc., in support of global agendas that are seminal to natural and technical sciences comprising earth sciences, biology, molecular biotechnology, nanotechnology, chemistry, mathematics, physics engineering, medicine etc.

We, as scientists work beyond frontiers of any kind to promote peace and friendship. Consequently, support cross border collaboration in the aforementioned science areas and subsequent publications.

To the old and new readers alike, thank you for your support.

We welcome your papers and we aim to accommodate any wish you might have to help us further the interests of the journal and make it the premier journal concerned with all aspects of natural and technical sciences that illustrate the unifying concepts of science with evidence, either observational or theoretical from any relevant field.

The history of editorial boards is in the forthcoming section reported.

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2010 XV (1); 2010 XV (2), special edition: “Proceedings of the 4th International Conference on Algebra and Functional Analysis”; 2011 XVI (1); 2011 XVI(2); 2012 XVII(1); 2012 XVII(2); 2013 XVIII (1); 2013 XVIII (2)

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AJNTS No. 1, 1996**A FEW WORDS OF INTRODUCTION**

The Journal of Natural and Technical Sciences is the first issue being offered to the readers. It represents the attempts made by the Institutes of the Academy of Sciences in publishing a Journal in the English language. It is also an outcome of the scientific, research and intellectual work these institutes have been so far involved in.

There are seven Institutes of Natural and Technical Sciences active within the Albanian Academy of Sciences. They have been publishing, up to present day, articles and studies in their independent non-periodical publications, in the Journals of Tirana University and partially abroad.

In the first two entities, the articles were written in Albanian. While during the recent 3-4 years, in the process of reorganization and restructuring, difficulties have been encountered, being reflected then in the irregular publishing of the Journals.

The intellectual potential of Albania in the fields of natural and technical sciences stands higher than the economic level of the country. This is quite significant during these recent 3-4 years of Albania, opening towards the western democracies and to world science community, in particular. It is obvious, too, that communication in the Albanian language had created some difficulties in coping with the worldwide accepted scientific language of inter-communication, that is the English language. Now, this problem is overcome.

Therefore, communication of intellectuals through their publications in scientific and up-to-date Journals necessitates also their presentation in the common worldwide language of English.

The subjects of papers in the first issue of the Journal of Natural and Technical Sciences, at least now at the very start, will be rather wide in scope of knowledge, in accordance with the activity of the Institutes: Physics, Mathematics, Informatics, Biology, Seismology, Geography, Hydrometeorology, Hydraulics, Chemistry, and it will always be open to scientific papers from Universities.

As the financial aspect has assembled in the first issue all these pure scientific studies, we hope that very soon the Journal will be published in separate subjects of science, in narrower fields of activities.

I am confident that the Editorial Board of the JNTS will increase, in its coming issues, the quality of accepted papers and will contribute in pushing ahead the work started with the spirit of responsibility and devotion towards science and integration of Albanian Science amidst scientific world community, which it has been so long deprived of.

Prof. PETRIT SKENDE

*V/Chairman of the Directors Board
of the Academy of Sciences of Albania*

ON THE CUT-OFF PHENOMENON IN A QUEUE ON RANDOM ENVIRONMENT

Llukan PUKA

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ABSTRACT

This paper presents another queuing system in which we can study the cut-off phenomenon and also some results concerning this phenomenon. The queue is a G/G/1 queue in a random environment.

A PARALLEL METHOD FOR FINDING POLYNOMIAL ROOTS

Fatmir HOXHA

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ABSTRACT

A new parallel method for finding polynomial zeros, based on a global optimization of root approximations, is presented. This method compute simultaneously, all zeros of a real or complex polynomial. Tests performed in a sequential environment give satisfactory results. Some tests carried out on a multiprocessor show the efficiency of the algorithm in a parallel environment.

THE ESTIMATION OF PUBLIC EXPOSURE BY THE CHERNOBYL ACCIDENT IN ALBANIA

Kostandin DOLLANI, Robert KUSHE

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ABSTRACT

This paper presents the estimation of public exposure by the Chernobyl accident in Albania, based on the measurements of radioactivity concentration in the air, food, fall-out and gamma dose rate, carried out in the country during the accident period. This estimation has been performed taking into consideration the possible pathways of public exposure, such as external exposure by radioactive cloud and by radioactive materials deposited on the ground, and internal exposure by inhalation and ingestion of contaminated food. For the estimation of public exposure six age-groups of population have been considered, from infants to adults.

The collective effective dose by this accident has been approximately 2500 man.Sv and average committed effective dose to members of the public has been 815 μ Sv.

Health impact of this exposure could be expected as 150 supplementary cases of malignant diseases and about 30 hereditary effects for all the population during the human life.

CHEMICAL COMPOSITION OF RAIN IN TIRANA (ALBANIA) DURING A ONE-YEAR PERIOD (1995-1996)

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ABSTRACT

Systematic monitoring of chemical composition of rain in Tirana (Albania) has been investigated. Rainwater samples were collected during the period March 1995 - April 1996, using a bulk sampler. Samples were analyzed for pH, alkalinity, conductance, major cations (Ca^{2+} , Mg^{2+} , Na^+ , K^+ , NH_4^+), anions (Cl^- , NO_3^- , SO_4^{2-}) and some traces of metals (Pb, Cd, Zn, Cu).

A log-normal distribution was best fitted to the majority of measured characteristics, prevailing the lower results. Relatively high pH values characterize rain occurrence in Tirana. Only 8% of all pH values were acidic (pH lower than 5.6), and around 75% were between 6.4 and 7.2. On an equivalent basis, Ca^{2+} and SO_4^{2-} clearly dominate the rainfall chemistry. Neutralization due to calcareous dust was the major reason for low acidity. Rain composition was considerably influenced by marine sprays. Two different patterns were shown for the variation of chemical composition by season: all positive ionic species averaged higher in summer and lower in winter, whereas anions demonstrated an opposite tendency. Most of measured parameters present higher variance in summer and spring.

CHANGES OF PEROXIDASES ACTIVITY OF WHEAT SEEDLINGS UNDER HEAT SHOCK AND HYDROGEN PEROXIDE STRESS

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¹ Department of Physiology and Microbiology,

² Department of Ecology and Flora, Institute of Biological Research,
Academy of Sciences, Tirana, Albania

ABSTRACT

Peroxidases, as stress enzymes, seem to be involved in the protective antioxidant systems which reduce oxidative injury of cell membranes through the scavenging of the free radicals, induced by high temperature stress, and responsible for lipid peroxidation.

In this study work the responses of 10 varieties and 7 mutants of wheat (*Triticum aestivum* L.), against heat shock and the responses of 2 varieties (one thermotolerant and one theri-nosensitive), under oxidative (hydrogen peroxide) stress are estimated.

The significant differences between stressed and control plants were found for the peroxidases activity. The experimental data show that the change of the peroxidases activity to heat shock and oxidative stress is a specific feature of the genotypes. Thus, the thermotolerant variety "Dajti" presents an increase of the peroxidases activity, while the theri-nosensitive variety "L8-76" shows a decreased peroxidases activity under the stress. It seems to exist a low specificity of the responses of plants under different stresses.

The appreciation of the peroxidases activity parameter is possible as a practical criterion in the screening of the tolerant varieties.

SALINITY RESISTANCE OF THREE WHEAT CULTIVARS

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ABSTRACT

We study here the effects of three salinity levels (50 mM, 100 mM and 150 mM NaCl) on the early seedling growth of three wheat (*Triticum aestivum* L.) cultivars of Albanian origin characterized by different sensitivities to salt. Sodium accumulation is similar in seedlings of different cultivars and, in general, Na⁺ is confined to the root. Chloride accumulated at high levels in both the root and the shoot, but least so in "Dajti". No appreciable differences are observed in K⁺ content. The most salt-tolerant cultivar show a higher capacity for osmo-regulation than the other two cultivars.

SPECTROSCOPIC STUDIES OF CHRYSENE-DNA ADDUCT VIA FLUORESCENCE

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¹ Department of Biochemistry and Biophysics, Institute of Biological
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² Biophysics Section, Department of Physics, University of Tirana, Albania

ABSTRACT

Hydrocarbon-DNA adducts are formed when polycyclic aromatic hydrocarbons are metabolized in cell. Photon-counting spectrofluorimetry has been used in studies of the chrysene-DNA adducts, formed after the metabolization of weak carcinogen chrysene by hamster embryo cells. Fluorescence spectral data have provided supportive evidence that metabolic activation of the hydrocarbons occurs via the formation of vicinal diol-epoxides. In this paper, we discuss the results of fluorescence spectra of the chrysene-DNA adducts. These studies provided that the fluorescence properties of the formed adduct are phenanthrenelike. The metabolic activation occurred in this system through a vicinal diol-epoxide of the bay-region type.

THE FLOW OF THE DRY PERIOD AS AN INDICATOR OF THE GROUNDWATER RESOURCES

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Tirana, Albania

ABSTRACT

Taking into consideration the typical Mediterranean regime of rivers in Albania, the main parameters of the dry period flow, it is evaluated the mean flow of the dry period and the flow of the driest month. Using the multiannual data, there are analysed and calculated groundwater recession curves and their parameters.

Based on these data, the groundwater storage of Vjosa and Semani catchment areas are computed, being considered as two rivers with completely different hydrological characteristics. Higher values of the modul and of the correlation coefficients in River Vjosa, in comparison with that of River Semani, are explained with the presence in Vjosa of a relatively powerful karst aquifer.

POSSIBLE SEASONALITY OF SEISMIC ACTIVITY AND RAINFALL-INDUCED EARTHQUAKES IN BALKAN AREA

Betim MUÇO

Seismological Institute, Tirana, Albania

ABSTRACT

Although the exact way the underground water variations are connected with earthquake mechanism is not fully understood and it is generally accepted that changes in the tectonic stresses are the main cause of the seismic activity of one area, the evidence for the role groundwater is playing in triggering of earthquakes is increasing more and more. For many scholars the influence of underground water in tectonic processes is one of the traces to be followed for explaining the puzzle of intracontinental seismicity.

Considering the rainfall as the main source feeding the surface stream flows and, in turn, the underground water, in this approach a preliminary statistical investigation is performed and some results are obtained regarding the seasonality of seismic activity and the intercorrelation between rainfall and earthquakes in the Balkan area. Employing a lot of pluviometric as well as seismological data, our study points out that there are zones in this peninsula where unusual rainfall could influence on the natural trend of seismic activity.

NEOTECTONICS AND SEISMOTECTONICS OF DRINI FAULT ZONE (EASTERN ALBANIA)

Shyqyri ALIAJ

Seismological Institute, Academy of Sciences, Tirana, Albania

ABSTRACT

The Pliocene-Quaternary Drini graben fault zone shows the highest recent geodynamic activity, as well as the highest seismic one in East Albania. It follows the valley of River Drini i Zi from Lake Ohri to the north and to the south, towards Korça and Erseka. It is more than 200 km long and up to 10-15 km broad, very well expressed in the relief.

The Drini graben fault structures, trending N-S, are developed obliquely to the main pre-Pliocene structures. They are represented by Kukësi, Skavica, Peshkopia and Lake Ohri grabens, as well as Korça and Erseka half-grabens.

The Drini graben fault zone is created during Pliocene-Quaternary, due to the extensional tectonics in eastern Albania and eastwards. Since Pliocene time, from Erseka up to Kukësi graben and half-graben lake basins are formed, while horst structures are generally developed on their both sides. The greatest vertical movements took place during the Pliocene. The data are also in favour of the beginning of the

neotectonic period since Pliocene, when the last very strong structural reconstruction has occurred, of which the present day structure and relief are formed. The recent activity of Drini faults is also shown by thermal springs near Peshkopia, Dibra and Ohri. The horst structure, in the east of Peshkopia graben. is associated with active diapir domes from Mali i Bardhë up to Dibra. Fault kinematics of Drini fault zone and focal mechanism solutions of the earthquakes having occurred there, show that during Pliocene time dominant was an extensional regime, trending W-E, while during Middle Pleistocene to the present day period, an extensional regime dominates, trending NW-SE. The Drini fault zone is still active, and seismogene is nowadays the most active one in eastern Albania. The earthquakes, with $M_{\max} = 6.0 - 6.9$, are generated there and can be generated in the future, especially in Korça, Ohri and Peshkopia segments.

PRELIMINARY QUASI THREE - DIMENSIONAL SIMULATION OF FUSHE KUQE - RINAS AQUIFER BY FINITE - DIFFERENCE METHOD

Sulejman XHELEPI, Donard STRAZIMIRI

Center of Hydraulic Research, Academy of Sciences, Tirana, Albania

ABSTRACT

In this paper we present a "quasi three - dimensional" model for steady state flow in the Fuslid Kuqe - Rinas confined aquifer system.

Groundwater flow within the aquifer is simulated using a block - centered finite - difference approach, and the finite difference equations are solved using the Strongly Implicit Procedure.

The program is written in FORTRAN 77 and will run without modification on most computers that have a FORTRAN compiler.

The results of the first stage in this study show a general state of flow, groundwater balance and sonic indirect particular phenomena, connected with the saltwater intrusion and the movement of mineralized waters, induced by the heavy groundwater pumping in the Fushë Kuqe area. Two last problems and another predicted will be an object of study for the second stage.

DISTINCTIVE FEATURES OF THE DAM FAILURE WAVE Lefter CANE

Center of Hydraulic Research, Academy of Sciences, Tirana, Albania

ABSTRACT

Problems of theoretical aspect of the wave caused from the complete and immediate failure of a dam are treated in the beginning of this article. Two types of waves (the wave in a dry bed and in bed with pre-existing water level), and the distinctions in their calculated mathematical models, are underlined. Onward are given the results of the study for some distinctive features of the two types of waves, performed in the Center of Hydraulic Research. The conclusions of this study help to make these features more evident and determine the calculating model for each case.

AJNTS No.2, 1997**SOME RESULTS ON STOCHASTIC PROBLEMS OF THE
SCHRÖDINGER TYPE****Fejzi KOLANECI**

Academy of Sciences Tirana, Albania

ABSTRACT

Under certain assumptions we consider two stochastic problems of the Schrodinger type in some Banach or Hilbert spaces. The main purpose of this paper is to prove the local solvability of these problems. Several mathematical examples and physical applications are given.

**EXTRACTION OF CARBON DIOXIDE FROM METHANE GAS AND
DETERMINATION OF $\delta^{13}\text{C}$ BY MEANS OF THE SIRA 10 MASS
SPECTROMETER****Jovan ZOTO**

Institute of Nuclear Physics, Tirana

Bilal SHKURTAJ

Institute of Petroleum and Gas Research, Fier

Betim ÇIÇO

Institute of Nuclear Physics, Tirana - Albania

ABSTRACT

This material deals with the analysis of the carbon isotopes and also with the determination of the $\delta^{13}\text{C}$ in methane gas. The isotopic analysis was carried out through carbon dioxide, extracted by the oxidation of methane with copper oxide in vacuum conditions; respective schemes were constructed and experimented to realise this.

We have also described two methods of the purification of the natural methane from the other gases, prior to oxidation procedure. The comparison of our data of $\delta^{13}\text{C}$ with the data found in other laboratories, for the same samples, is presented in this paper.

A NEW ALGORITHM FOR RAMAN SPECTRA UNFOLDING**Agim MINXHOZI, Kreshnik ANGONI**

Institute of Nuclear Physics, Tirana, Albania

ABSTRACT

Accepting Meissel approximation for the Voigt function it is necessary to solve a nonlinear system of equations. It resulted that applying the direct procedures (all unknowns iterate simultaneously) for some spectra with highly overlapped bands in Raman spectroscopy, the convergence was not reached. It induced us to introduce a

new algorithm, which iterates the parameters to be determined not in the same time. The so-called shape parameter, is iterated step-by-step, for all the peaks, after the normal iteration of the other parameters, searching for the minimum of the residuals. The result was very positive, because it was possible to unfold spectra which could not be unfolded with the direct method.

POTENTIAL NATURAL VEGETATION MAP OF ALBANIA

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Institute of Biological Research, Tirana - Albania

ABSTRACT

The aim of this work is to construct a map of the potential natural vegetation of Albania on the basis of a unified concept and existing knowledge. The map illustrates the distribution of dominant natural plant communities and their complexes which are adapted to existing climatic and edaphic conditions.

The map will be used principally for the following purposes:

- systematic protection of natural ecosystems, natural resources and biodiversity;
- the comparative observation of processes and changes in ecosystems (monitoring);
- recommendation for sustainable use based on natural bioproductivity;
- research and education in the field of ecology, environmental and nature protection.

GENETIC POLYMORPHISM OF GENETIC LOCUS α_{S1} ON GOAT POPULATIONS IN ALBANIA AND COMPARISON WITH THE EUROPEAN BREEDS

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Academy of Sciences

**Sector of Genetics, Faculty of Natural Sciences, Tirana, Albania

ABSTRACT

Using SDS-polyacrylamide gel electrophoresis and isoelectric focusing, 5 alleles of α_{S1} -casein locus were identified on the goat populations in Albania, among 7 alleles identified in the European breeds.

Alleles of strong effect, A and B, had high frequencies in the goat populations of Albania (A = 0,44; B = 0,47).

Using multivariate methods of analysis and supported on allelic frequencies of the α_{S1} -casein locus, attempts were made to better-off the genetic relationship of the European breeds with the Albanian goat populations. Concerning this analysis two groups were: the first one contains European breeds with high frequency of the weak and the intermediate alleles (F and E); the other one were European breeds and Albanian goat populations with high frequency of the strong alleles. The Albanian population of goats had strong genetic relationship with the Garganica and Maltese breeds of Italy.

PHOTOSYNTHETIC RESPONSE TO HIGH TEMPERATURE OF SOME WHEAT VARIETIES VIA CHLOROPHYLL FLUORESCENCE

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ABSTRACT

High temperature affects the functional integrity of the photosynthetic apparatus, particularly thylakoid membranes and reactions associated with it. The chlorophyll fluorescence provides essential information on the state and function of photosynthetic process in plants. The aim of the presented paper is to characterize the effect of heat stress on photo-synthesis of some varieties of wheat via some chlorophyll fluorescence parameters. The values of F_{690}/F_{735} , at maximum, and steady-state fluorescence determined by fluorescence induction kinetics using LITWaF, the parameters of chlorophyll fluorescence emission spectra measured by CCD-OMA spectrofluorometer, the chlorophyll fluorescence ratios F_o/F_m , F_v/F_o and $\Delta F/F_m'$, as well as photochemical and non-photochemical quenching coefficients (qP and qN), determined by PAM fluorometer, were used to estimate the thermotolerance of analyzed varieties of wheat.

ABOUT GENETIC RELATIONSHIPS OF SARAKATSANS WITH ALBANIANS AND OTHER BALKAN POPULATIONS

BAJRAMI Zyhri, MIKEREZI Ilia, KUME Kristaq

Department of Biology, Section on Genetics, Faculty of Natural Sciences, University of Tirana - Albania

ABSTRACT

Allelic frequencies at ABO, MN and Rhesus (D, d) loci from some Balkan populations including Sarakatsans, were analyzed in order to study their genetic relationships. After multivariate analysis of the data, the populations were generally grouped according to their geographic position. Albanian and Sarakatsans populations formed a separate group indicating good genetic relationships. Since Sarakatsans are always considered as one of the most ancient human populations in Europe, our finding puts forward for discussion complicated problems about their common origin and their ethnogenetic relationships.

ASSESSING NITROGEN TRANSFORMATION IN A SOIL-CROP SYSTEM IN THREE CULTIVATED SOILS USING ^{15}N AS TRACER

Sulejman SULÇE

Soil Science Institute, Tirana

Spiro GRAZHDANI

Agricultural University of Tirana

Skender MALJA

Nuclear Physics Institute, Tirana

ABSTRACT

Within all processes of nitrogen cycling, the quantification of the mineralized nitrogen, derived from fertiliser or organic amendments applied to soil, is very important, in both economical and ecological viewpoint. The study of these mechanisms, using ^{15}N as tracer, has given place to numerous works. Thus, a laboratory study was performed by us in three more representative soils of Myzeqe district. The kinetics of biological immobilization of two applies nitrogen fertilizer forms was measured. The results show that the intensities and kinetics of immobilization of two nitrogen fertiliser forms, under controlled conditions, vary in function of bio-physico-chemical characteristics of soils.

ON THE FUNCTIONAL RELATIONSHIP BETWEEN SOLAR RADIATION AND SUNSHINE DURATION IN THE WESTERN LOWLAND OF ALBANIA

Pranvera BEKTESHI

Hydrometeorological Institute, Tirana, Albania

ABSTRACT

In absence of necessary space information of solar radiation, it is of particular interest the evaluation of functional relationship of Solar Radiation-Sunshine duration.

Based on high quality of this relationship, it is possible to pass from heliographic information into actionometric one. The global solar radiation and sunshine duration measured at different stations were used to test five models for calculation of solar radiation. The models were compared on the basis of statistical error tests using root mean square error (RMSE) and the mean basis error (MBE). This study indicates that for the Western Lowland of Albanian the Prescott's model is accurate.

THE SEISMIC FAULTS IN ALBANIA

Eduard SULSTAROVA

Institute of Seismology, Academy of Sciences, Tirana, Albania

ABSTRACT

From the distribution in space of the historical and present seismic activity, the analysis of the macroseismic field of strong earthquakes, the focal mechanism of earthquakes occurred during 1948-1988, neotectonic data, the zones of seismic faults in Albania and nearby area, and the field of recent tectonic stresses have been

distinguished. Generally, the seismic faults are of strike-slip type in the transversal fault zones, while in the longitudinal ones, situated in the western part of Albania, the faults are reverse up to thrust type, but generally of normal type in the inner and eastern part of Albania.

Compressional stresses of NE-SW (N 45°) direction predominate in the Western part of the Albanides, while tensional stresses of nearly N-S (N 20°) predominate in the inner zone.

JACKSONVILLE BEACH WELLFIELD-SCALE TRANSPORT MODEL, FLORIDA

Louis H. MOTZ

University of Florida, Gainesville, Florida, U.S.A

Donard STRAZIMIRI

Center of Hydraulic Research, Tirana, Albania

ABSTRACT

Substantial declines in ground water levels have occurred in northeast Florida due to heavy pumping in the Jacksonville area. As a result, increases in chlorides have occurred in a number of wells in the Jacksonville Beach area. Ground water flow and chloride concentrations are being modeled by the St. Johns River Water Management District (SJRWMD) on a regional basis in northeast Florida, but subregional-scale flow and chloride models are required in specific areas to address problems that deal with present-day and future impacts due to pumping from individual wellfields. In addition, smaller scale, site-specific models are needed in sonic wellfield locations to address concerns about localised saltwater upconing due to well location, casing and open-hole depths, and pumping rates of individual wells.

TIDAL COMMUNICATION OF ALBANIAN COAST LAGOONS

Stavri LAMI

Center of Hydraulic Research, Tirana - Albania

ABSTRACT

The method of calculation of tidal water exchange in the sea - channel -lagoon hydraulic system is described based on the geometric and hydraulic characteristics of the channel, on the tidal amplitude in the sea and on the lagoon surface area.

The bibliographic studies have resulted that the current circulation in lagoon delta are indicated on the stability degree of the lagoon tidal inlet.

The hydraulic works, which are connected with the formation of the optimal channel cross section and with the construction of the deviation breakwaters of the littoral transport, are determined as important measurements for the improvement of the sea - lagoon communication capability.

The application of the calculation method is carried out for two typical hydraulic systems of the Albanian coastline; Ionian Sea - Butrinti Lake system and the Adriatic Sea - Narta Lagoon system.

RADIOACTIVE GAUGING OF GROUND WATER FLOW DIRECTION IN A SINGLE WELL BY MEANS OF A DOUBLE - COLLIMATED SCINTILLATION DETECTOR

Sokrat AMATAJ

Institute of Nuclear Physics, Tirana, Albania

ABSTRACT

The measuring component of this gauge is the same as in other well-known gauges [1], except for the fact the detector is fixed and collimated at all sides.

A lateral window, in this spinning collimator, makes possible the capture and the record of the water tracer radiation, whereas another bottom window "sees" periodically a small orientation radioactive source which is incorporated in the axis of a free gyroscope. Radioisotopes of different energies of gamma radiation are used to label water movement direction. The reference direction and respective signals are separated by spectrometric means. This gauge was tested in laboratory conditions fully justifying our expectations and, in many points, it is more convenient than other gauges used until now to this purpose.

IDENTIFICATION OF "CARBON IMPURITIES" IN DEFECTIVE SECTIONS OF COPPER WIRES BY RAMAN MICROSPECTROMETRY

Kreshnik ANGONI

Institute of Nuclear Physics, Tirana, Albania

ABSTRACT

The microscopic examination of defective sections on copper wires shows the presence of impurities. Raman spectra provide the possibility to identify them as carbonic materials, with low structural order.

VALIDATION OF CLAMBO MODEL SIMULATION OVER ALBANIA

Vangjel MUSTAQI, Bojko THEMELKO

Hydrometeorological Institute, Tirana, Albania

ABSTRACT

The Limited Area Models (LAM) are used to represent local climate structure. In this study the validation of a climatic version of LAM (CLAMBO), used by Regional Meteorological Service of Bologna over Albania, for the period October 1989 - April 1991, is done. Total monthly simulated precipitation follows rather well the time series of observed precipitation. But, an underestimation of simulated precipitation is observed, particularly in months with abundant precipitation. The simulated time series represent well the climatology of the maximum as well as of the minimum temperature.

But an underestimation of model (except of summer months for maximum temperature) can be seen.

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AJNTS No. 3, 1997**CONTRIBUTION ON GENETIC IMPROVEMENT OF WHEAT IN
ALBANIA****Mentor PERMETI**Institute of Biological Research,
Academy of Sciences, Tirana, Albania**ABSTRACT**

In Albania many varieties of wheat have been grown in the past, coming from different European countries, mainly from neighbour countries and from northern, central and southern America, as well. Experiments have been done with them in some ecological zones and their growth in wide areas showed that they were unadaptable in our climatic and agricultural conditions. Consequently, their yields were not satisfactory. This situation put forward the need to begin with the genetic improvement of wheat, in order to develop, in our conditions, high yielding and technological value to wheat varieties.

**NECROTIC STRAIN OF TOBACCO MOSAIC VIRUS (TMV)
ISOLATED FROM PEPPER CVS. IN KOSOVA****Nysret TARAKU and Ismail CACAJ**Agricultural Faculty, Institute for Plant Production, University of Prishtina,
Peje, KOSOVA**ABSTRACT**

In recent years, tobacco mosaic virus (TMV) has caused severe losses of yield peppers crops *Capsicum annuum* L. Typical pepper strains of the virus, capable of overcoming the resistance of commercial varieties, have been described.

In this paper the authors investigate strain of TMV that induce necrotic symptoms with mosaic and various deformities of infected leaves.

The causal virus was mechanically transmissible, and the host range was similar to host range of strain of TMV. The virus had TIP of around 90-95°C, DEP 10^{-6} - 10^{-7} live for more than 30 days at room temperature, rod-shaped particles (280 nm - 300 nm x 18 nm), and serologically related to common strain of TMV. This isolation was identified as atypical strain of TMV and the disease was called "pepper necrotic disease".

Keywords: Phytopathology, Viruses, Pepper.

EFFECTS OF LOW DOSES IRRADIATION ON THE TISSUES STRUCTURE TO THE LEAF OF TOBACCO

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Academy of Sciences, Tirana, Albania

ABSTRACT

This report describes the radio stimulation effect on the structural tissues of the leaf. It was performed on two tobacco hybrids, Arberia and Argjiro, planted in different climatic zones of the Albanian different sowing terms, after radiation (5, 10, 15 and 20 days), and on various doses. The study of cytological parameters was performed simultaneously with the yield experiment carried out by Tobacco Institute in Cërrik, in 1988 - 1990.

The effect of radiostimulation was observed to the chloroplasts number, to the epidermal and mesophyll cells and on the yield of both hybrids. In order that positive correlation coefficients exist from a cytological, biometrics parameters and production yield, important is to make possible the prediction of the effective optimal doses of gamma rays for this culture.

FAST NEUTRON ACTIVATION ANALYSIS FOR CU DETERMINATION IN COPPER ORES

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Institute of Nuclear Physics, Tirana, Albania

ABSTRACT

Fast Neutron Activation Analysis (FNAA) with 14.5 MeV neutrons is a powerful tool for quick and accurate elemental determinations in several cases. In the presence of other major elements such as *Al*, *Fe* and *Si*, the determination of *Cu* is described in different copper ore samples by 14.5 MeV neutrons. The content of *Cu* varies from several tens of ppm up to several percents. The relative errors, being not larger than 15% for the lowest determined concentration, depend on the content. For quantitative determinations, calibration curve and standard-sample methods are used.

A REFERENCE MEASUREMENT SYSTEM FOR RADON-222 CALIBRATION

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*Institute of Nuclear Physics, Tirana, Albania

**Istituto Nazionale di Metrologia delle Radiazioni Ionizzanti, ENEA,
Casaccia, Roma, Italy

ABSTRACT

A Reference Measurement System (RMS) for ^{222}Rn calibration was recently developed at INMRI of ENEA and is setting-up at INP. Main performances of this system, based on radon transfer and counting system calibrated by ^{226}Ra traceable standard liquid solution are published in the Symposium on Radionuclide Metrology and its Applications (ICRM '95), held in Paris.

The reference counting instrument is a cylindrical electrostatic cell with a PIPS detector, which is used for the detection of the electrostatically collected ^{218}Po ions. The activity of ^{222}Rn gas in a spherical glass bulb can be measured in a RMS by a particular procedure that does not require volume determinations or any assumption of total radon removal from the liquid solution of ^{226}Ra . The combined uncertainty estimated for the calibration of ^{222}Rn sources as in a typical gas transfer system is about 1%. The RMS and the operational procedure adopted are briefly described together with a short outline of the transfer instrument based on a NaI(Tl) well-type detector used for calibration purposes.

The excellent results, obtained from this system on International Comparison on Radon Measurements in 15 European laboratories organized in 1995, in the frame of EUROMET project, are reported.

DETERMINATION OF URANIUM IN WATER USING ENERGY- DISPERSIVE X-RAY FLUORESCENCE ANALYSIS

Nikolla CIVICI

Institute of Nuclear Physics, Tirana, Albania

ABSTRACT

In this paper the application of EDXRF, in combination with a relatively simple preconcentration technique for quantitative determination of uranium in water, is described. The preconcentration step implies the precipitation of uranium ions with a non-specific chelating reagent, ammonium- I -pyrrolidine dithiocarbamate (APDC), in presence of a coprecipitant. The precipitate is collected on a Millipore filter, which is measured in the XRF system. Calibration curve, obtained by plotting the measured intensity of U-L α line versus the concentration of uranium in standard solutions, results in a straight line over the whole range 1-95 $\mu\text{g/l}$. Minimum detection limit results at 0.15 Pg uranium corresponding to 0.3 $\mu\text{g/l}$ for 500 ml sample. The precision at 5 $\mu\text{g/l}$ level, expressed as relative standard deviation of ten repeated measurements, is 7%.

Finally, values of uranium concentration in sea water samples of the Albanian Adriatic and Ionian coast, obtained via this method, are presented.

HUMAN IMPACT AND EROSION IN ALBANIA

Farudin KRUTAJ* and Lefter VESHI**

*Center of Geographical Research, Tirana

** Institute of Soil Studies, Tirana, Albania

ABSTRACT

As a phenomenon, erosion in Albania is expressed in great values and aftereffects, to that extent that it gets forms of a national misfortune because it leaves bare, washes, erodes and transports in continuity the best portion of earth, incites sliding, damages other lands, fills in improper time aquifers, it damages streets, channels, inhabiting centers and the infrastructure network. It destroys in an accelerated way the ecological rapports that nature has created with so great mastery and that humanity had preserved.

Albania is typical for the consequences of erosion, of similar dimensions in these 50 years. Through erosion, each year around 60-65 million tons of sedimentary material and salts leave the soil, which do make up the best fertile soil. The anthropogenesis factor has influenced in the degree of erosion phenomenon. Uncontrolled interference, mostly as a consequence of autarkic direction of the isolated economy (to produce bread within the country) brought about damages of incorrigible dimensions in flora cover, of the ecological equilibrium.

Man-nature rapport and the environmental stresses are the object of study in this paper.

GEOMORPHOLOGIC PECULIARITIES OF THE ALBANIAN ADRIATIC COASTLINE

Perikli QIRIAZI*, Skënder SALA**

Department of Geography, University of Tirana*

Geographic Studies Centre**

ABSTRACT

This paper aims at analyzing the geomorphologic forms and processes of coastline relief. The attention is mostly concentrated on the actual dynamics of coastline and on its tendency. The data and conclusions are based on direct observations performed in the framework of the compilation of geological and engineering mapping of Albania. In order to define the laws of development of geomorphologic processes, we have consulted different maps and analyzed the whole activity on the coast-line, especially during the last 50 years.

ALPINE GEOLOGICAL EVOLUTION OF ALBANIA

Shyqyri ALIAJ

Institute of Seismology, Tirana, Albania

ABSTRACT

The Alpine geological evolution of Albania has passed through three periods of time, during which three completely different types of structures were created and developed. These are divided as follows: I. the Mesozoic large basins and platforms; II. the Tertiary molassic basins and III. the Pliocene-Quaternary strong uplifting and mountain formation.

The establishment, development and deformation of Mesozoic large structures as well as the Tertiary molassic basins are treated in their basic aspects and illustrated through geotectonic profiles. The Pliocene-Quaternary period of strong uplifting, that led to the formation of neotectonic recent structure and the present-day relief in Albania, as well, are dealt with in particular.

THE USES OF ANS METHODS IN QUALITATIVE STUDYING OF SOLUTIONS OF DIFFERENTIAL EQUATIONS AND SYSTEMS

Gjergji CULLI

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University of Gjirokastra, Albania

ABSTRACT

Recent years, an increasing interest in the qualitative study of solutions of differential equations and systems has been observed. This paper presents the qualitative study of solutions, using the ANS methods (ANS-Nonstandard analysis). This theory is presented by Robinson in his book entitled: "Nonstandard analysis", [7]. More about ANS, one can find in the books: [3], [7], [81], [91], [101], [11].

With ANS methods the continuity of solution, the unity of solution, the dependence of solution from the initial conditions, etc., are studied. These problems are treated in another paper, giving more information about them.

PRECIPITATION AND TEMPERATURE VARIABILITY OVER ALBANIA

L. MUÇAJ, V. MUSTAQI, Eglantine DEMIRAJ

Hydrometeorological Institute, Academy of Sciences, Tirana, Albania

ABSTRACT

The reveal of long-term changes in temperature, precipitation in Albania and the determination of their tendency and rate is performed in this paper.

Over the coastal zone the mean annual temperature indicates intervals with different trends, but a negative trend (about 0.5 - 0.8°C) predominates in the period under study. A decreasing trend of annual precipitation is observed, as well.

The actual trend concerning only to the winter temperature, spring and annual precipitation, fit relatively good to the results for the expected trends, gained by using GCMs from the Climatic Research Unit from the University of East Anglia.

THE PROBABILITY WEIGHTED MOMENTS METHOD COMPARED WITH THE METHOD OF MOMENT FOR THE GUMBEL DISTRIBUTION FOR THE SEMANI RIVER

Mirela BICJA

Hydrometeorological Institute, Academy of Sciences, Tirana, Albania

ABSTRACT

This paper has been carried out with the aim of applying a new method of parameters and quantiles estimate for Gumbel distribution, which is called Probability Weighted Moments (PWM), and it is compared with the traditional Method of Moments (MOM), for the Semani river.

In an attempt to achieve this goal, flow data (the annual maximum peak flood) were assembled for 11 catchments within the Semani basin containing 326 station-years of records.

The two methods (PWM and MOM) were compared based on three types of goodness-of-fit indices: a) Kolmogorov -Smirnov; b) Mean Absolute Deviation; c) Standard Error of a Quantile Estimate as a Fraction of the Quantile.

The results have shown that regardless of the type of the goodness-of fit index, the PWM method estimators of parameters and quantiles for the Gumbel distribution were found to be superior, with respect to the Conventional Method of Moments.

A FRACTAL APPROACH OF RECENT SEISMICITY OF ALBANIA

Betim MUÇO*, Ilir KANE*, Llukan PUKA**

*Seismological Institute, Tirana, Albania

**Faculty of Natural Sciences, University of Tirana, Albania

ABSTRACT

The fractal analysis is applied to study the distribution in time and space of earthquakes in Albania. The investigated period is 1976 - 1995 and the respective catalogue represents a satisfactory completion for the earthquakes having a local magnitude of higher than 3.0 and with epicenters inside the rectangle in extreme coordinates of 39.0 - 43.0°N and 18.5 - 21.5°E.

Apart from the calculation of time and space fractal dimensions for all the country, for an investigated period, a time variation of the spatial fractal dimension is also provided for different zones of Albania. For this reason, a special program on PC, in Turbo Pascal, was compiled.

An attempt is also made to correlate the changes of time variation of fractal dimension with the seismic activity and the different seismotectonic features of each zone, including the b value. The results are compared with similar studies carried out in neighbour countries.

This approach could serve as a new insight for the new map of the seismic assessment which is under compilation in Albania.

THE AUTOMATION OF INFORMATION TRANSFER IN THE LIBRARY DATA BASE "ISIS"

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University of Tirana, Albania

ABSTRACT

The Library Data Base CDS/ISIS represents relevant advantages in fast inserting, retrieving, displaying and interchanging information. The Information treated by this Data Base must be in the standard format ISO 2709. To make possible the importing of information from different formatted Data Bases, a computer algorithm is presented. The program has a Data bank as input file and outputs a new file in the ISO 2709 format. This new file may be easily imported in the ISIS Data Base, being available for all users.

AJNTS No. 4, 1998**COMPARATIVE ESTIMATION OF SOME PHOTOSYNTHETIC CHARACTERISTICS OF DIFFERENT WHEAT VARIETIES AND MUTANTS****Efigjeni KONGJIK**

Institute of Biological Research, Academy of Sciences, Tirana, ALBANIA

Davida PERTENA

Institute of Vegetable - Potatoes, Tirana, ALBANIA

ABSTRACT

The main way to increase the plant productivity is the creation of optimal conditions of the photosynthesis. The estimation of a new genetic material of wheat to the physiological characteristics is based on the genetic variability. The aim of this study is the comparison of the physiological parameters of seven varieties and four mutants of wheat. The assimilation rate, stomatal conductance, internal CO₂ concentration and transpiration rate are measured by infrared gasanalyser; the quantity of photosynthetic pigments, the surface and specific density of the leaves are measured. The coefficients of correlation between the photosynthetic parameters themselves and between these and productivity parameters are calculated. The possibility of using these parameters as a selection criterion is discussed.

Keywords: Wheat, varieties, mutants, photosynthetic pigments, net CO₂ assimilation, leaf surface, specific density of leaves, productivity.

EFFECT OF HIGH IRRADIANCE ON CHLOROPHYLL INDUCTION FLUORESCENCE IN WHEAT LEAVES**Fatbardha BABANI**Biochemistry and Biophysics Department, Institute of Biological Research,
Academy of Sciences, Tirana, Albania**ABSTRACT**

Photoinhibition of photosynthesis were studied in some wheat varieties (*Triticum aestivum* L.) exposed to 1500 $\mu\text{mol photons m}^{-2} \text{ s}^{-1}$ up to 3 hours. High irradiance induced considerable changes in the functional state of the photosynthetic apparatus. Loss of photosynthetic activity with exposure photon was assayed by changes of the chlorophyll fluorescence induction kinetics, Chl fluorescence spectra, during the induction kinetics and the variable Chl fluorescence parameters. The decline of Rfd-values as a measure of the potential photosynthetic activity, as well as the decline of the optimal quantum yield of PSII -Fv/Fm and Fv/Fo ratios, within irradiation time, indicate that the plants experienced photo inhibition. The PSII inactivation was expressed by the increase of nonphotochemical quenching coefficients qN as well as by the decrease of PSII quantum yield, and of the capacity for PSII driven electron flow. The possibility of using Chl fluorescence, as a criteria to identify high light resistance of wheat varieties, is discussed.

Keywords: chlorophyll fluorescence, induction kinetics, high irradiance, photosynthetic activity, wheat, photoinhibition

EFFECTS OF IRRIGATION WATER AND NUTRIENT MANAGEMENT ON SOIL WATER QUALITY

Spiro GRAZHDANI, Sokrat DHIMA, Sulejman SULÇE

Agricultural University of Tirana

ABSTRACT

An irrigation system can only be efficient when it is both scheduled properly and operated to apply the desired amount of water efficiently. Testing for nitrate-N in irrigation water and soil can provide for substantial reductions in fertilizer N applications, if residual levels in the soil are high, or if considerable nitrate-N will be applied with irrigation water. Several research works have been conducted to illustrate how the movement of nitrate -N below the root zone of the intensely irrigated crop-production areas can be reduced by changing water and nitrogen management practices.

The objectives of this research work were to evaluate: a) the impact of irrigation scheduling and nitrogen accounting procedures on nitrate-N, leaching below the crop root zone and crop yield; b) the effects of irrigation scheduling according to available soil water depletion on water application for optimal crop production. Our research work has shown that $\text{NO}_3\text{-N}$ leaching is influenced by both irrigation and fertilizer nitrogen management in sugar beet production. Sugar beet yields were not appreciably affected by the application of these management practices, while input costs for fertilizer nitrogen and irrigation water were reduced.

REHABILITATION OF AGRICULTURAL LANDS WITH LIMITED PEDOCLIMATIC CONDITIONS INTO RANGELANDS

Andrea SHUNDI - Academy of Sciences, Tirana, Albania

Qani LIPE - "AlbaGreen", Tirana, Albania

ABSTRACT

We present the results of trials, regarding the advantage of rehabilitation of agricultural lands with limited pedoclimatic conditions into rangelands, through sowing of forage species in association or alone, the results of their production and of spontaneous herbage, the benefits of coordination of intensive cultivation with extensive cultivation of rangelands, and quantitative and qualitative parameters, that are obtained from the increase of biomass in the soil and from the reduction of erosion. A solution for tens of thousands of hectares, representing around 10 percent of agricultural land, as a main source of living for the population in the mountainous regions of Albania, is proposed. The experiments with 15 forage species were carried out in four typical zones with rangelands, which had been transformed into crops and fruit-tree lands, but resulted no economical and damaged the ecological environment.

Keywords: Rehabilitation, trials, rangelands, limited, association, forage species, intensive/extensive, qualitative/quantitative, biomass, erosion, Albania

STUDY OF THE CONDITIONS FOR THE PREPARATION OF EHIDA KIT LABELED WITH ^{99m}Tc

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Garufalia KUSHE - Institute of Public Health, Tirana, Albania

ABSTRACT

Considering raw material EHIDA, N-(2,6-Dietilacetanilido-) iminodiacetic acid, synthesized in our laboratory, some variants are studied for the preparation of EHIDA instant kit labeled with ^{99m}Tc . The prepared kits are of high radiochemical purity (over 98%) and their biological distribution is in full accordance with Pharmacopoeias' requirements. pH and the temperature of environment of labeling have influenced in the yield of labeling.

CEMS STUDY OF THIN FILM INTERMETALLIC COMPOUNDS

FE - AL
Fatos Ylli

Department of Radiometry, Institute of Nuclear Physics, Academy of
Sciences, Tirana, Albania

ABSTRACT

Fe-Al thin films were produced by a simultaneous deposition of iron and aluminium using the reactive magnetron sputtering. The phase analysis and their transformation during annihilating were studied by means of X-ray Diffraction, Rutherford Backscattering Spectroscopy and Conversion Electron Mössbauer Spectroscopy. CEMS spectra are shown the presence of FeAl, Fe_2Al_5 and FeAl_3 in majority of samples. In the annealing samples with pure Si wafer we noted the increase of Fe_2Al_5 when Fe content decreased.

FINITE ELEMENT MODELING OF IP ANOMALOUS EFFECT FROM BODIES OF ANY GEOMETRICAL SHAPE LOCATED IN RUG-ED RELIEF AREA

Application of finite element method in modeling of geological sections
Neki FRASHËRI

Institute of Informatics and Applied Mathematics, Academy of Sciences
Alfred FRASHËRI

Faculty of Geology and Mining, Polytechnic University of Tirana, Albania
ABSTRACT

Modeling of geo-electrical sections is carried out by using finite elements in two cases:

1. Ore bodies with massive texture having contrast of resistivity with surrounding rocks, where modeling is done in 2.5-D;
2. Ore bodies with disseminated texture having no contrast of resistivity with surrounding rocks, and modeling is done in 3-D.

There are taken into account two parameters, the apparent resistivity and induced polarization. The effect of the relief as well as of the global geological structure is

taken into account. Case stories are presented to demonstrate different effects and the usability of modeling by finite elements.

A CONVENTIONAL PROCEDURE OF VIEWSHED EXTRACTION FROM DIGITAL ELEVATION MODELS

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Center of Geographical Studies, Academy of Sciences, Tirana, Albania

ABSTRACT

The viewshed extraction from a DEM is taking an important place on most Geographical Information Systems (GIS), today. But the actual procedures of doing this requires much space and time, and the results are not really convenient. A heuristic method and viewshed uncertainty are reviewed, as well. Some modifications in order to improve and some conventional results are proposed, and a procedure of viewshed extraction is described.

NEOTECTONIC STRUCTURE OF ALBANIA

Shyqyri ALIAJ

Institute of Seismology, Academy of Sciences, Tirana, Albania

ABSTRACT

The Albanian orogene in collision with the Adria microplate (= Adriatic plate) is composed of a pile of nappe (allochthonous) sheets and is generally divided into two domains of different present-day tectonic regime: the external domain, affected by compressional regime and the internal one, affected by extensional regime.

The Pliocene-Quaternary period, characterized by strong and progressive uplifting, is accepted as neotectonic period, the period of recent structuring and relief formation. The mountains began to rise quickly since Late Pliocene. Neotectonic (Pliocene-Quaternary) Zonation of Albania (land and offshore) is analyzed based on the tectonic regime and types of deformations. Four big neotectonic units are recognized as follows: 1 - Internal area of Alpine folding, affected by extensional tectonics since Pliocene; 2 - External area of the Alpine folding, strongly affected by compressional pre-Pliocene movements; 3 - Periadriatic Foredeep, strongly affected by post-Pliocene compressional movements, and 4 - Pliocene-Quaternary, generally non-deformed Foreland. The neotectonic present-day structure of the afore-mentioned units have been described. The convergence boundary between the Albanian orogene and the Adria microplate is determined.

Keywords: Neotectonic (Pliocene-Quaternary) Zonation, Neotectonic Structure, Internal area, External area, Periadriatic Foredeep, Foreland (the Albanian Basin and the Apulian platform), Adria microplate, Albania.

BIOSTRATIGRAPHY AND PALED-ENVIRONMENT OF THE CONIACIAN PHOSPHATIC HORIZON IN THE IONIAN ZONE

Afat SERJANI & Agim PIRDENI

Institute of Geological Studies and Designing Tirana, Albania

ABSTRACT

The carbonate-radiolarite-phosphate-globotruncanic horizon is a marked one all over the Ionian Zone both in Albania and Greece. The Coniacian age (belonging to D. Concovata Zone of this horizon is precised, based on microfaunistic assemblage, mainly globotruncanids, by the investigations carried out in several stratigraphic sections.

This horizon has an evident phosphatic character at the central part of the Ionian Zone, where the overwhelming majority of phosphorus has been deposited. The sedimentation of limestones, phosphate and radiolaritic beds of this Coniacian sequence occurred under deep water conditions, in the Ionian Basin. The calcite and francolite grains, of very small dimensions, 3-5 up to 15-30 microns, were formed in this deep-water environment. Sedimentation of phosphatic layers has taken place under a relatively calm tectonic regime. But the activity of submarine currents is observed, mainly in the Gusmari deposit, characterized by massive ore. We are of the opinion that the phosphatic horizon formation has occurred in depth, where elastic terrigenous matter was totally missing in a pelagic, reduced environment, at levels of minimum oxygen.

The microorganisms have played an important role on the location and accumulation of phosphorus.

Keywords: Phosphatic horizon, Coniacian age, the Ionian Zone, Albania, Greece, Stratigraphy, Mineralogy, Petrography, Petrography, Sedimentation conditions. Palen-environment

DISCUSSION ON FREE VIBRATIONS OF BRIDGES

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ABSTRACT

Presented are aspects, comparisons and comments related to some experimental tests and analytical investigations on free vibrations characteristics of a reinforced concrete bridge. The experimental work and data processing are carried out using appropriate equipment possessed in Seismological Institute of Albania. Regarding the longitudinal vibrations of the bridge, a discrepancy between analytical and experimental values of free vibrations periods is revealed. The taking into account of such discrepancies, in order to make a more realistic evaluation of design seismic forces, is suggested.

Keywords: bridge, Vibration Survey System, frequency, period, Fourier spectrum, design seismic forces, aseismic measures

**28th INTERNATIONAL CONGRESS OF GEOGRAPHY HAGUE, THE
NETHERLANDS, AUGUST 5-10, 1996**

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ABSTRACT

The 28th International Congress of Geography was hold in Hague, the Netherlands at August 5-10, 1996. There were about 1500 geographer from 79 countries. The proceedings was organised in 24 commissions, 8 groups and 11 sessions. The Congress was honoured with the participation of authorities from the Netherlands and other countries. This year was the 125th jubilee of the first International Congress of Geography in Antwerp (Brussels 1871). For the first time there were participants from the Republic of Albania in such very important activities.

AJNTS no. 5, 1998**ANALYSIS OF QUANTITATIVE CHARACTERS IN THE
ALBANIAN GOAT POPULATIONS****Mynyr KONI**Department of Genetics, Institute of Biological Research, Academy of
Sciences**ABSTRACT**

Studies of quantitative characters in seven populations of the Albanian goat revealed a high degree of genetic variation. Single-classification analysis of variance showed that the populations differ significantly among themselves. Discriminate analysis of morphological characters indicated that Vrina and Ducat populations were significantly different from the rest. Dendogram showed that Dukat is the most distinctive provenance, while Dragobi-MatShkodër are relatively close.

Keywords: Quantitative characters, Population, Discriminate, analysis, Dendogram

PETTIS INTEGRABILITY ON CERTAIN BANACH SPACES**Vasil SKËNDERI**Departement of Mathematics, Faculty of Natural Sciences
University of Tirana, Albania**ABSTRACT**

We have studied Pettis integrability of functions with range in Banach space of type WCG, WCD or WLD. Also we have shown that if X is WCD and $f: \Omega \rightarrow X$ is weakly measurable and bounded, then there exists a measurable function g which is weakly equivalent to f .

ON THE NATURAL WIND REGIME IN ALBANIA**Eglantine DEMIRAJ**

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ABSTRACT

The aim of the paper is the evaluation of natural wind potential, the definition of high promising areas and preparing of wind map. There are considered all the meteorological stations within the territory, measuring wind velocity and direction. It is taken a special care in the study of the sites, equipment and the data processing.

The study will make an analysis of the observed data, of the wind speed and direction roses, of the distribution of the average monthly wind speed after the direction and the analysis of the daily and inter annual march of wind speed. *Keywords:* wind roses, wind regime, energy

THE COVERAGE OF LAND WITH MORE VEGETATION IN ALBANIA

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ABSTRACT

The coverage of land with vegetation presents a main strategic objective for any country. The climatic conditions and soil in Albania, influence on vegetation with abundant rainfall and temperatures, but restraint mainly during the period of June-September with dry and high temperatures as well as with soil with limited fertility especially in rocky and stony soils.

The main approach for a best coverage of land with vegetation are the improvement of ration between forests-pastures-vegetation cultivated particularly the most complete and dense coverage in each of three above groups.

In the warm area and irrigated, the cultivation of land two-three times in a year increase with benefits the production. Same is with the cultivation of graminacea associated with leguminous plants increasing the quantity and the quality of production.

Keywords: coverage with vegetation, erosion, desertification, rainfall, forest, fruit trees, crop lands

REMOVAL OF COMBUSTIBLE SULFUR IN COAL BY ALKALINE TREATMENT

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ABSTRACT

A brown coal was treated by a 1M KOH solution at room temperature for a maximum of 2 h. The desulfurization mechanism was well described by the model of unreacted-shrinking core in a homogeneous coal particle of unchanging size during process development. The external diffusion stage might be omitted when modeling this process. The diffusive flow of KOH through particle pores imposes a chemical reaction component too. It was possible to remove 60 % of combustible sulfur after 2 h of treatment.

Keywords: combustible sulfur, alkaline solution, kinetics

THERMO-HYDRAULIC MODELING IN MOUNTAINOUS AND HILLY AREAS: APPLICATIONS TO ALBANIA

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ABSTRACT

A heat transfer model incorporating the underground fluid flow pattern was proposed to illustrate a characteristic arrangement of flow system in a mountainous area and tested on three such locations of Southern Albania. Modeling included surface topography, simple geological structure, climate conditions, and regional heat flow. The results showed that heat distribution by topographically induced groundwater flow even at a relatively low-relief area may amount up to 1.3-1.5 of the undisturbed heat flow. Higher relief amplifies the fluid circulation. The penetration depth of fluids increases and significant heating can occur, which gives rise to thermally driven upflows. Disturbances due to convective heat flow in this case may exceed 200%.

Keywords: heat flow, mountainous area, topographically induced convection

THE ROTATION OF EARTH'S INNER CORE AS THE CAUSE OF DIPOLAR MAGNETIC FIELD GENERATION

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ABSTRACT

We studied two processes that could generate a dipolar magnetic field: the electron inertia in metal and the Barnett effect, and calculated the field generated by such processes. Then, we solved analytically the hydrodynamic problem of the fluid motion in the spherical shell when the inner and outer sphere rotate with different angular velocities and considered an analogue model for the liquid outer Core of the Earth. Putting this solution into the kinematics equation of the dynamo theory we discussed about its solution and about the possibility of modifying and amplifying of the dipolar field by the fluid motion.

Keywords: Geomagnetic field, dynamo theory, Barnett effect, magnetization, hydrodynamics

A COMPARATIVE STUDY OF DIFFERENT SYSTEMATICS OF NEUTRON INDUCED REACTION CROSS-SECTIONS AROUND 14.5 MEV NEUTRON ENERGY

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ABSTRACT

The systematic behavior of (n, p) , (n, α) and $(n, 2n)$ cross-sections for 14.5 MeV energy neutrons has been investigated within the Weiskophf formulation of statistical model for nuclear reactions, and introducing a term that takes care of the excess incident neutron energy over the threshold reaction energy as well. An inter comparison of the predictions of various systematics and the measured values is provided. It is seen that for the evaluated reaction cross-section, our formulae gives better agreement with the experimental values.

Keywords: nonlinear least square fitting, statistical test, cross-section, systematics

A NEW TECHNIQUE FOR THE CORRECTION OF SELF-ABSORPTION DURING GAMMA-RAY SOURCE MEASUREMENTS

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ABSTRACT

The direct measurement of induced gamma activity for large samples in Fast Neutron Activation Analysis (FNAA) gives lower results than the real ones, due to the self absorption in the sample itself. Using Monte Carlo modeling with known samples, a study on the influence of sample content and density on measured activity is done. For the correction of direct determinations an iterative technique is introduced. The efficiency of the proposed method depends on the information the user has or obtains on the sample content. In any case, there is always an improvement of the results. In principle, this technique can be used for any gamma ray source, because the way the source is prepared does not play any role. The only assumption is the isotropy and homogeneity of the source.

LABELLING MDP WITH ^{90}Y

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ABSTRACT

It has been studied and demonstrated the potentiality of the preparation of methylene diphosphonate (MDP) labelled with ^{90}Y . The complex $\text{MDP-}^{90}\text{Y}$ is prepared with satisfying yield and radiochemical purity of more than 95%. The complex $\text{MDP-}^{90}\text{Y}$ is

stable in vitro in water solution and in human serum. Yield of labelling, slightly depended from the condition of the performance of labelling, such as pH, concentration of MDP and its quantity. A chromatographic method (ITLC.SG), with mobile phase 0,1M Tris in pH 7 was used to evaluate the labelling yield of quality control. This is a quick and commode method for the visualisation of the yield and radiochemical purity.

TREAD IN TRACKS ON THE ANCIENT MOUTH OF RIVERS

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I. INTRODUCTION

The dynamic of Albania Adriatic coastline has been studied by different specialists, using the orthogonal coordinates taken by the topographical maps, which are printed during XIX and XX centuries. All the scales of the maps were converted at 1:50 000 or 1:25 000 scale base and their content by graphical, or graph-mechanical methods. The field measurements were also presented in some cases. Nevertheless, the absence of analytical methods has negatively influenced in the exactness of the results. In the near future, we would appreciate the problem to be resolved only analytically.

In our study have tried to find the out fall of the five ancient rivers, using the geographical coordinates given by Ptolemy (7). Then, it is necessary to find the whole position of the coastline, establishing the history of the coastal sedimentation and changes, because: "An appreciation of the changes in cliffs and beach morphology is fundamental in understanding the very rapid erosion of the coastline." (9) In order to resolve the problem successfully, our specialists ought to rely their efforts, on the contemporary achievements of the photogrammetry, particularly for the coastal zones.

In our study there are used two cartographic methods:

1. cartographic graph-analytical
2. analytical.

SOME GENERALISATIONS OF THE STABILITY DEFINITIONS AND THEIR TREATMENTS BY NON-STANDARD ANALYSIS

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ABSTRACT

In this paper we generalise the definitions of the orbital stability and of the stability by Zukovsky from to the differential equation systems to the abstract dynamical systems. We formulate our claims on positive or negative invariance of the defined stable points sets. Some proofs of the most important theorems are given in details. Our main goal is to treat the stability theory developed here from the non-standard Analysis point of view.

Keywords: dynamical systems, stability, non-standard analysis

BASIC CHARACTERISTICS OF FLORA AND VEGETATION OF KOSOVO AND THE DANGER OF THEIR DISAPPEARANCE

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ABSTRACT

In this article are presented the most basic characteristics of flora and vegetation of Kosovo, as well as the danger that threatens their disappearance. The danger of disappearance of the earliest and autochthonous world plant in this territory is the result of its permanent destruction from anthropogenic factors, respectively zooanthropogenic and from desiccation which have almost covered all tree species.

Complete treatment of these problems requires the engagement of many experts in more detailed studies. Therefore, the aim of this article is to make a modest contribution in this matter which up to now has not been treated in the proper form. It will also influence to sensitize all scientific levels in order to help in rescuing plants of high value in many aspects.

POPULATION GENETICS / POLYMORPHIC SYSTEMS IN A SAMPLE POPULATION FROM AROMUNS IN ALBANIA

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ABSTRACT

The Aromuns is a population of unknown origin, however they probably represent the oldest one in the Balkan. During the 17th and 18th century they formed the majority of the population in some regions of Albania, Macedonia and Northern Greece. Today Aromuns villages are scattered in the mountain regions of Northern Greece, Albania, Macedonia and Dobruja Region of Romania. The origin of the Aromuns and their genetic relationships to other Balkanic populations are being examined through genetic markers (Blood groups, serum proteins, red cell enzymes, DNA markers) by an international research project. Preliminary results from Gjirokastra region, Albania, describing several genetic traits are presented in this paper. Typing of 5 blood groups (ABO, MNSs, Kell, P1 and Rhesus) is performed on two samples: I. from Aromuns living in the region of Gjirokastra (three villages are studied: Andon Poci, Palokaster and Umelice); II. the Albanians from Tirana (the control group).

PRESENT WATER USES AND THEIR EVOLUTION IN THE FRAMEWORK OF NATIONAL WATER STRATEGY FOR ALBANIA

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I. WATER RESOURCES

The Hydrographic Basin of Albania has a surface of 43305 km² from which only 28748 km² are situated within the state territory. The other part belongs to Yugoslavia,

Greece and FYROM. The water resources constitute an important natural resource in Albania, which is considered as one of the richest countries when compared with other European Countries. Thus, the mean annual precipitation is 1485 mm, and the mean annual runoff 891 mm is, or about 40 km^3 , which are discharged in the sea by rivers. The specific discharge is about 29 l/s.km^2 , which is almost the same as the corresponding one in Switzerland, considered as the "water castle" of Europe. Water regime is typical Mediterranean; about 82-85% of the annual runoff is observed during the wet season (Oct.-May) and only 6-9% during the dry season (Jul.-Sept.).

THE ESTIMATION OF NATURAL RADIOACTIVITY OF THE ALBANIAN CLAYS

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ABSTRACT

The paper deals with the natural radioactivity of Albania's clays that are raw materials for construction industry e.g. bricks, ceramics, cement, fillers etc. The clays of Albania are already investigated in geological and mineralogical aspects as well as their reserves and the physical-mechanical properties. Therefore it was necessary to investigate also their natural radioactivity in order to make their complete classification. The clays have good absorbent features, especially as clays colloids. They contain also natural radioactive elements and rare elements. The gamma dose of the emitted radiation from the clay is proportional with its U, Ra, Th, and K concentration. From the radiation's safety, the clays of Albania, are below the recommended limits for their gamma dose rate, therefore they can be used for all kinds of public buildings. The paper contains also the data for soil analysis of radioactive elements as well as the other elements.

ALBANIA - A CONTRADICTIONARY STORY OF APPLIED INFORMATION SYSTEMS

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ABSTRACT

There are two periods of Information Systems applications in Albania, "pre-1990" and "post-1990". These periods are influenced by political and economical factors, which have determined the directions and extension of applications and as a consequence their social impact. In the past there were political factors "in extremis" that conditioned the application of informatics in the technical domains, and actually a kind of democracy "in extremis" represents an obstacle for development of distributed applications. In this context the internet may represent a factor of integration among different organizations and communities.

AJNTS No. 6, 1999**THE CORRECTNESS OF TWO EVOLUTIONARY NONLINEAR PROBLEMS IN BANACH SPACES****Fejzi KOLANECI, Sitki MULLA**

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ABSTRACT

Under suitable assumptions, we study the correctness in the sense of Hadamard of two evolutionary nonlinear problems in Banach or Hilbert spaces. The results obtained are illustrated by mathematical examples. Several applications to concrete physical problems are given.

DETERMINATION OF THERMAL NEUTRON FLUX DENSITY FOR AN AM-BE SOURCE USING ABSOLUTE MEASUREMENT OF MN-CU FOILS BY $4\pi\beta\text{--}\gamma$ COINCIDENCE METHOD**Xhevdet MYTEBERI**

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ABSTRACT

The thermal neutron flux density at the standard activation geometry of $^{241}\text{Am-Be}$ (α , n) source of Institute of Nuclear Physics (INP) has been determined using the activity induced in manganese-copper thin foils. The $4\pi\beta\text{--}\gamma$ coincidence technique is shown to be applicable in spite of the complexity of the decay schemes of radioisotopes produced during the neutron activation. The comparison of results with those of other methods is given. Efforts are being made to investigate possible anisotropy of thermal neutron flux density.

Keywords: Neutron flux density, activity, absolute measurement, accuracy

ANALYTICAL PARAMETERS OBTAINED DURING THE APPLICATION OF EDXRF SPECTROMETRY IN GEOCHEMICAL MAPPING OF ALBANIA**Nikolla CIVICI**

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ABSTRACT

The analytical parameters obtained during the application of EDXRF spectrometry for the analysis of geochemical soil and sediment samples, are presented. The results are used for the geochemical mapping of Albania. Thick pellets of the samples were measured in a secondary target excitation EDXRF system, using Mn and Mo secondary targets for excitation of low- and medium-Z elements, respectively. Ba and some rare earth elements were determined using an Am-241 source. The program COREX was used for calculating the concentrations of the elements excited by secondary targets and the method of the Compton scattered peak for the elements excited by the source. Depending on the composition of the samples 20 to 30 elements were determined. The

recommendations of the International Geochemical Mapping Project IGCP-259 were used as guidelines for the evaluation of the analytical parameters. EDXRF spectrometry shows acceptable values of the detection limits for most of the determined elements. Precision and accuracy of the determinations were evaluated by the measurements of a series of standard reference materials recommended for use as primary standards in geochemical mapping. The intercomparison of the results with an independent laboratory is also discussed. In most of the cases, the results satisfy the statistical tests and the recommended criteria for geochemical mapping activities.

AN ASSESSMENT OF ATMOSPHERIC POLLUTION BY SULFUR AND HEAVY METALS USING PINE NEEDLES AS A BIOINDICATOR

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ABSTRACT

Results of the analytical investigation for an assessment of the atmospheric pollution by sulfur and some heavy metals (Cu, Zn, Ni, Cr, Mn, Pb, Cd and Fe) in three Albanian regions, by using chemical analysis of pine needles, are presented. In general, no important pollution was found in the studied areas. However, in some urban regions, particularly in Tirana City, relative high levels of S, Cu and Ni have resulted, and these could limit growth of some sensitive plant species. Low levels of zinc found in many samples and, as well as low levels of copper in samples collected in Korça region, show that important negative effects on plants may expected. Our study confirms the usefulness of pine needles as a bioindicator for atmospheric pollution monitoring.

Keywords: Atmospheric pollution, bio-indicator, pine needles, sulfur, heavy metals, principal component analysis

LIQUID CHROMATOGRAPHIC AND LIQUID CHROMATOGRAPHIC-MASS SPECTROMETRIC ANALYSIS OF CLAVULANIC ACID IN PRESENCE OF AMOXICILLIN AND ITS DEGRADATION PRODUCTS

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ABSTRACT

A reverse phase-high performance liquid chromatographic (RP-HPLC) method for simultaneous determination of clavulanic acid, amoxicillin and their degradation products in combined tablets of Augmentin® has been established. The system RP-HPLC was supplied with a computerized UV Diode-Array Detector 235 and specifies: a RP-18 column, a buffered mobile phase pH 4,5 (buffer phosphate 0,1M + methanol, 95:5), isocratic elution at a rate 1,0 ml/min for 30 min with detection range from 210-360 nm. The UV-spectra of all separated components were investigated. A number of components yielded from degradation of potassium clavulanate in combined tablets seem to be similar with products of degradation in aqueous solution. Further

investigations were focused on the identification of these products by means of combined technique of high performance liquid chromatography-mass spectrometry (HPLC-MS) which consisted of a Waters 600 MS multisolvent delivery system equipped with a U6K universal liquid chromatography injector and a RP-18 column. The elution was carried out with buffer acetate 0,01 M (pH 4) + methanol (95:5) at a flow-rate of 0,5 ml/min. The HPLC system was connected to a VG TRIO 2 mass spectrometer. The MS system was operating in electrospray mode (ES^+) with a scan control selected for interval 50-350 M/e ions. It was found out that one of the major products of degradation has molecular weight 103 and three others, in later stages of degradation, have molecular weights 168, 182 and 240; likely they are an aminoketone and three pyrazine derivatives, reported before as products of hydrolysis. The clavulanic acid results to be much more unstable than amoxicillin, even in solid formulations like tablets.

EFFECT OF SILVER NITRATE ON INDUCTION OF STAMINATE FLOWERS IN GYNOECIOUS CUCUMBER LINE (*CUCUMIS SATIVUS* L.)

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ABSTRACT

The study was carried out to investigate the effect of silver nitrate ($AgNO_3$) concentration and number of sprays on sex expression of gynoecious (parthenocarpic) cucumber line. Induction of staminate flowers is dependent upon $AgNO_3$ concentration and number of sprays. The greatest number of staminate nodes was produced on plant sprayed twice and thrice with 400 to 500 PPM $AgNO_3$ at one week intervals which makes hybrids commercial seed production feasible when male parent is a gynoecious line and maintaining gynoecious line in a homozygous condition. On the other hand all treatments at one spray were ineffective producing staminate flower after 10th node, and the treatments with 100 PPM were induced no staminate flower. Initial spray was applied at first true leaf stage. In a few days after spraying at 400 to 500 PPM concentrations some plants were observed injuring which were recovered after 7 to 10 days.

Keywords: cucumber, gynoecious, sex expression, hormone, silver nitrate

PHYTOPLANKTONIC DATA AND TROPICAL STATE OF LEZHA LAGOONS

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ABSTRACT

More than 90 phytoplanktonic species, composed mostly by diatoms and peridiniens are reported for the first time in preliminary examinations, from different environments in Lezha lagoons. High diversity, quantitatively dominated by diatoms, is found in Merxhani lagoon, evidencing an intense exchange of waters. The situation was totally

different for Ceka lagoon. Blooming populations of *Nitzschia reversa*, and peridiniens, some of them toxic, make evident its eutrophic state, mainly caused from the scarce communication with the sea. Continuous enlargement of channel might be quite necessary to prevent these phenomena. High eutrophic situation dominated abundantly by a centric diatom evidencing the less salinity and higher depth of Kenalla pond; the high presence of filamentous blue-green algae shows the negative effects of untreated sewage discharge from Shëngjini town. Stopping the wastewater input and a connection with Merxhani lagoon may improve these unpleasant conditions. Albania is a coastal country, where different lagoons are distinguished as sheltering and reproduction sites for many organisms of practical and ecological interest, acting also as important centres of fishing and many other activities. Knowledge and evaluation of their natural biological resources, food webs and relations among them, is very important and necessary for their protection, exploitation and improvement of their conditions.

CONSERVATION FARMING EFFECT ON SOIL AND NUTRIENT EROSION IN AGRICULTURAL LAND OF MOUNTAINOUS TERRAIN

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ABSTRACT

Data about soils in Albania show that, due to poor management in the past, a number of degradation processes are active. Soil erosion is particularly severe. The potential for improvements is enormous. Information is needed on the effects of different tillage, cropping systems and stubble management on surface runoff, soil, nutrient losses and soil physical properties. A study to obtain information concerning the effect of tillage and cropping systems on soil and nutrient losses was conducted from 1990-1992 in the Korca region, south eastern Albania. The objectives of this study were: a) to quantify water erosion from agricultural land in the mountainous terrain and to find efficient farming practices to reduce runoff, soil and nutrient losses; b) to evaluate the effect of conservation farming practices and to minimize the off-site environment impacts on the quality of water leaving the agricultural watersheds. Moldboard (MB) plowing was compared with two conservation tillage (CT) methods: disking (DK) and no till (NT). The two methods were evaluated on two crop rotations: Pasture-wheat (PW) and wheat-barley-grain legume (CC), and two stubble management treatments: stubble retained and stubble removed. The conservation tillage systems reduced soil and nutrient losses when compared to the systems using MB. CT was particularly good at reducing runoff, soil and nutrient losses when used in a cereal-pasture rotation. Crop stubble retention on the soil surface favored infiltration in comparison with stubble harvesting. The data of this work show that sound rotation, conservation tillage and retention of crop residue are important components of conservation land management and sustainable crop production systems. The quality of surface water is also improved.

Keywords: Conserving farming, erosion, soil tillage, crop rotation and crop residue.

SOME TECHNOLOGICAL PARAMETERS OF CULTIVATION OF TRIFOLIUM ALEXANDRINUM IN MIXTURE WITH LOLIUM MULTIFLORUM AND TIME OF MOWING FOR SEED PRODUCTION

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ABSTRACT

In this paper are presented studies made on the the technology of cultivation of *Trifolium alexandrinum*. The mixture of *Trifolium alex.* with *Lolium multiflorum* is of a special interest in the increase of forage crops. In this framework, studies have been made on seed norms in mixture of *Trifolium alex.*, doses of azotic fertilization, height of mowing and time of mowing for seed production. The results have shown that *Trifolium alex.* in mixture with *Lolium multiflorum* provides higher yield than traditional practice of its cultivation. It is noticed that the efficeincy of the mixture *Trifolium alex.* + *Lolium multiflorum* is conditioned from doses of azotic fertilization and height of mowing. The best time of mowing of *Trifolium alex.* for seed production is the period from 20 to 30 May. The increase of yield is 75% more than other variants mowed at different times of biological cycle of *Trifolium alex.*

HYDRODYNAMIC EFFECTS RESULTING FROM THE PRESENCE OF A VENA CAVA FILTER

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ABSTRACT

Several studies have shown hydrodynamic disturbances in the area of vena cava filters. The conclusions of these studies suggest that the vena cava filters can be responsible for the formation of secondary thrombosis.

In this study through a mathematical model and an experimental method, we were able to quantify the hydrodynamic disturbances which can be responsible in the formation of thrombus or clots breakdown.

STUDY OF ADDUCT STRUCTURES OF N-ACETOXY-ACETYL- AMINOFLUORENE (AAAF) WITH DNA

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ABSTRACT

The amino aromatic are cancerogene molecules for the human cells, and their role consists in binding some DNA derivatives created within the cell and in the destruction of DNA structure. Several studies show that the AAAF are one of the most very active derivatives, which attack the guanine nucleic base. In this study, we present the results of the mass-spectroscopy of the complex AAAF-DNA. All these results witness that

the modified structure is the nucleic base of guanine, and the binding with the derivative is happening in 2 and 8 carbon positions.

Lately, a new complex ion made up of two nucleic bases has been detected with this method, which could be responsible for a local transformer for the Z-DNA.

SOME HISTORICAL DATA ABOUT EARTHQUAKES OF 1851 YEAR IN ALBANIA

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ABSTRACT

In the period from January to December 1851, there were a series of strong earthquakes, which struck the towns of Vlorë, Berat and Elbasan, in Albania, causing considerable damages over an extensive area, as well as many victims and tsunamis along the Vlorë coast, in the Adriatic Sea. Within the framework of the project of New Seismic Hazard Assessment in Albania much effort has been put into documentary research of strong historical earthquakes (prior to 1900). In this study are given some historical data and results of our series of earthquake research, during the year 1851, as well as interpretation of the data-seismic intensity, macroseismic field, and migration of epicenters.

Keywords: historical earthquakes, tsunamis, and transverse fault

TRANSVERSE FAULTS IN ALBANIAN OROGEN FRONT

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ABSTRACT

The frontal part of the Albanian orogen, affected by compressional deformations and convergent with Adriatic microplate, is intersected by numerous transverse faults of strike-slip type. The following are the main transversals from south to north: The Borsh-Kardhiq, the Othoni Island-Dhërmi, the Gjiri Ariut-Dukat, the North of Sazani Island, the Lushnje-Elbasan, the Gjiri Drinit-Lezhë and the Ulqin-Shkodër transversals.

All transversals have a component of either shortening or extension across them and represent the elementary strike-slips or strike-slip shear zones. The transversals have cut and displaced the orogen thrust front, conditioning its diachronism. They are active and seismogenic in present-days.

Keywords: Albanian orogen, frontal part, transverse strike-slip faults

AN OUTLOOK ON THE INFLUENCE OF GEOLOGICAL STRUCTURES IN GEOTHERMAL REGIME IN ALBANIA

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ABSTRACT

The influences of geological structures in geothermal regime of Albania are analyzed in this paper. There are determined the geological factors that condition this regime

The geothermal gradient has a maximum value of 2.1 mK.m^{-1} in the Albanian sedimentary basin. This gradient changes from one formation to the other. The greatest value derives from the clay sections. The gradient is decreased up to 0.7 mK.m^{-1} in the sections that include up to 60% sandstone water-bearing. The tectonics of the region have also conditioned the geothermal gradient. The gradient is decreased in the limestone anticlines. It is decreased to zero or sometimes to negative in the limestone structure, where downstream cold surface waters flow. Over-pressure in the molasses section of the Albanian Sedimentary Basin, has its influence on the geothermal gradient. The depths of constant temperature surface belts are different in mountainous regions and in plain regions of Albania.

Keywords: geothermal, heat flow density, geothermal gradient, temperature, Albania

PHYSICAL ENVIRONMENT AND GEOMORPHOLOGY OF PRESPA LAKES BASIN

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ABSTRACT

Albanian lake coastal line, including the fresh water system of Ohrid and Prespa lakes is 72 km long and is dominated by steep mountain coming down to Ohrid, Big and Small Prespa lakes. Also, there is found a narrow flood plain opening to the South and Western part of Pogradec Lake. This diverse and dynamic land-lake interface has been for centuries a corridor of intense interaction between natural system and human activities. The rich diversity of lake coastal line and geomorphologic features, including beaches, marshes, wetland, harbors, rocky cliffs, caves and grottos, have provided an irreplaceable natural resource base for the people, since, Illyrian tribes first settled here over 3.000 years ago. The system consists of two parts: Big and Small Prespa lakes, which make up the upper part of the system, and Ohrid Lake, representing the lower part, with a relative difference in altitude of 157 m and separated by the mountain chain of Mali i Thatë mountain and Galichitsa with an altitude 2287 m and 1953 m each. The limestones of this mountain chain have a lot of underground tunnels serving as water pathways from one part to the other. The system is situated in the South -Western part of Albania, bordered with Macedonia and partly with Greece.

AB-INITIO CALCULATIONS ON THE STRUCTURE OF CYCLOBUTADIENE IN ITS QUINTET STATE

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ABSTRACT

The stability of cyclobutadiene molecule in organic chemistry is a very discussed subject. In this paper we are giving some results from the ab-initio calculations made on quintet cyclobutadiene. We have performed UHF and UMP₂, methods using different basis set. For UHF we have used the small basis set STO-3G, while for

UMP₂, we have used larger basis set 6-31G. We conclude that the most stable geometry of quintet cyclobutadiene is square with C-C bond lengths equal to each other and near to that in cyclobutane. So in quintet cyclobutadiene the delocalized π -component, which has a dual nature, is less important. Quintet cyclobutadiene skeleton is not a planar one. Seeing the effect of a distortion in quintet cyclobutadiene, while keeping the D_{2h} symmetry, we conclude that it has again square geometry with C-C bond lengths equal to each other and near to that in cyclobutane. While seeing its potential curve it is concluded that quintet cyclobutadiene behaves as if being composed by two parallel ethene molecules.

Keywords: quintet, UHF method, STO-3G basis set, UMP₂, method, 6-31G basis set, geometry optimization

Book Review

GEOHAZARDS AND THE ENVIRONMENT

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Proceedings of the Second National Conference Organized by the Albanian

Group of IAEG and held in Tirana 17-18 November 1997

Published by Universit^y degli Studi di Bari (Italy) in January 1999

Editors: G. Baldassarre, D. Shkupi, Sh. Aliaj, B. Muço & M. Çumani

The Albanian Association of Engineering Geology and Geoenvironment (AAEGG), where the best specialists of the earth sciences are gathered, has organized during recent years two national conferences on the problems of natural geohazards and environment protection in Albania.

"Geological Hazards and the Environment" was the theme of Second National Conference held in Tirana 17-18 November 1997. 48 papers were presented by the Albanian and Italian researchers. Different phenomena of geological hazards acting in the environment were treated by more than 80 specialists.

Located in a very active orogenic zone, Albania displays a large spectrum of destructive processes; except volcanic hazard, all the others are present-day acting in our country. We could mention here the seismic hazard and unstable terrains hazard where soil erosion, landslides, subsidences and collapses are included. The Adriatic shoreline changes and wetland regime changes are present too. Floods cause enormous material damages because they affect densely populated region of Western Albania.

AJNTS No. 7, 1999**ON SOME BANACH SPACES****Xhezair TELITI**

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Tirana, Albania

ABSTRACT

In this paper a sufficient condition that a Banach space be a Hilbert space, is investigated.

Keywords: Semi-inner-product, linear manifold, Banach space, Hilbert space

**WEAK* - COMPACT CONVEX SETS AND THE RADON -
NIKODYM PROPERTY****Vasil SKENDERI**

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ABSTRACT

We give a new geometrical proof of the fact that a w^* -compact and norm separable subset of a dual Banach space is dentable, which is the principal result of Bourgin [2]. In this proof we use the well-known "superlemma" of Namioka-Bourgain. Also a point of continuity criterion that characterises Asplund operators, is given.

Keywords: w^* -compact sets, Radon -Nikodym property, deniable sets

**COAL CHANGES AFTER ALAKALINE TREATMENT AT ROOM
CONDITIONS****Saimir A. LOLJA**

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ABSTRACT

A high-volatile coal sample was treated by a solution of 1M KOH at room temperature. Changes seen after treatment on the coal mass, contents of moisture, ash, volatile matter and total sulphur were separately studied in terms of both particle size and treatment period. The change in total sulphur content versus particle size after 70 minutes of treatment was studied. The removal of volatile matter over time was well described by kinetics of first order in relation to the reacted moles of volatile matter. The observed changes after 70 min of treatment were significant for coal particles below sieve sizes of 0.5-0.8 mm.

Keywords: brown coal, alkaline treatment, room temperature

THE DETERMINATION OF TRACE RARE EARTH ELEMENTS IN GEOCHEMICAL SAMPLES BY AES METHOD USING VERY REDUCTIVE A/N FLAME

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ABSTRACT

We have applied Atomic Emission Spectrometry (AES) using a very reductive A/N flame to the analysis of geochemical samples, for determination of concentration of 15 Rare Earth (RE) elements, having the aim the increasing of sensibility, accuracy, reproducibility and minimization of method's bias. The concentration values of RE elements are reported for Vig region (northwest of Albanian Alps). The possibility for selective determination of 15 RE elements in geochemical samples, simplicity and rapidity of this method, make it suitable for screening large number of samples and studying the anomaly phenomena in geochemical research.

Keywords: Lanthanide, AES, chemical analysis, geochemical samples

FINDING SIMILIARITIES IN ANCIENT CERAMICS BY EDXRF AND MULTIVARIATE METHODS

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ABSTRACT

We have studied 39 samples of fragments from ceramic roof tiles with different stamps (*Dimalas* and *Heraion*), dated between 330 to 170 BC and found at the archaeological site of Dimale, some 30 km from the Adriatic coast. The data from these samples were compared with those obtained from 7 samples of similar objects and period with the stamp "*Heraion*" found at the archaeological site of Apollonia. The samples were analyzed by energy-dispersive X-ray fluorescence (EDXRF), using instead of the elemental concentrations the ratio of the net intensities of the X-ray lines of the elements to the intensity of the Compton peak. The results have been treated with diverse multivariate methods. The application of hierarchical cluster analysis and factor analysis permitted the identification of two main clusters. The first cluster is composed from the "*Heraion*" samples discovered in Apollonia, while the second cluster comprises all the samples discovered in Dimale independent of their stamp.

Keywords: x ray fluorescence, archeology, multivariate methods

THE RECALCULATION OF WHITE DWARFS

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ABSTRACT

In this work, we have used the relativistic Thomas-Fermi model of the atom, in order to find out a new state equation for white dwarfs and to recalculate their structure. By numerical integration, we find ten percent smaller values for white dwarf masses.

Keywords: general relativity, white dwarfs, Thomas-Fermi model

CHARACTERISATION OF THE CATALYTIC ACTIVITY OF CYTOCHROME P450 IN DOG LIVER MICROSOMES BY MEANS OF 7-ETHOXYCOUMARIN O-DEETHYLASE ASSAY

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ABSTRACT

Liver microsomes were isolated from inbred Beagle and bastard dogs and the catalytic activity was characterised using 7-ethoxycoumarin O-deethylase assay. The O-deethylation of 7-ethoxycoumarin from liver microsomes has been assessed as a method for monitoring the activity of cytochrome P450. The principle advantage of this substrate is the formation of a fluorescent product 7-hydroxycoumarin. A comparative study of the activity of 7-ethoxycoumarin-deethylase has been carried out in dog and rat liver microsomes. Using this assay, we detected high-affinity 7-ethoxycoumarin deethylase activity in liver microsomes of both groups. Biphasic kinetics in 7-ethoxycoumarin metabolism was observed and the kinetic parameter K_m and V_{max} for high-affinity component were calculated. These values were similar to published values for hepatocyte suspensions of the same species. We have observed wide inter-individual variabilities shown for both dog groups. This variability was seen to be high also by inbred-beagle dogs as a homogenous group.

Key words: Cytochrome P450, dog liver microsomes, 7-ethoxycoumarin O-deethylase, catalytic activity, enzyme kinetics

STUDY ON THE CONTENT OF CU, ZN, FE AND MN TRACE ELEMENTS IN THE BLOOD OF THE RUMINANTS REARED IN INDUSTRIAL POLLUTED AREAS OF BERAT, ELBASAN AND KUKES IN ALBANIA

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ABSTRACT

Taking into consideration the pollution caused by the industrial activity of *Kukës, Elbasan* and *Berati regions*, the serum level situation of some relevant trace elements for the health of the ruminants as: Cu, Zn, Fe and Mn, were studied. For this purpose, 160 animals (cattle & sheep) were analysed. The results show that the blood content levels of the trace elements in the ruminants of the polluted areas don't present a critical situation, *in general*. For this reason, the ruminants of these areas may be reared

without problems. *In particular*, there are signs of disorders, which may be a consequence of industrial pollution in these areas. For *Cu* & *Zn* serum content, there is noted an increased tendency. The data of *Fe* & *Mn* serum content in the ruminants of Elbasan (Bradashesh), Kukës (Pobreg, Shtiqën, Gostil and Bozhe), show values, which reach deficiency levels, lower normal ones, as well as in some cases, much more higher levels than the normal values. These disorders don't show any regularity, but it is recommended the need for surveying a greater number of animals. The *Mn* levels resulted very low both for sheep (0.09µg/100ml serum) Elbasan (Bradashesh) and cattle (0.13µg/100ml serum) in Kukës (Pobreg). In these areas, surveys must be organised time by time by the NGO-s as AVA, etc. and by the state institutions, in order to take the necessary measures for improving the situation.

Keywords: trace element, human health, pollution, ruminant's production and reproduction

TICK BORN ENCEPHALITIS (ARBOVIRAL INFECTION) AT THE ANIMALS AND THE SPREAD OF THE INFECTION TO THE HUMAN

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ABSTRACT

In this article are introduced the observations made on the infection of Tick born Encephalitis on the animals through almost all the territory of Albania. The two years observation resulted in the conclusion that the spread of this infection (TBE) goes to all of the studies animals such as: she-goat, sheep, cows, and it also notices for the first time at horses (in one district of Albania). The percentage of the infection is different from one kind of animal to another one and from one district to another. The study of animals is done on 20 districts of our country. The high level of this sort of infection necessitates taking all the efficient steps to take it away. This infection goes from the animal to the human. Especially the children are the most exposed to such infection. Herein under are the ways this infection can be spread and the ways that can help in preventing or deducting the effects of this infection.

Keywords: Tick Born Encephalitis, arbovirus, arthropods, serum, animals, she-goat, sheep, cows, horses, sickness, infection

USING OF ELISA "BOMMEL" - KIT TEST MILK AS SCREENING TO INVESTIGATE CATTLE BRUCELLOSIS

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ABSTRACT

ELISA "Bommel" kit-test milk is used as a screening test in the cattle of Jube-Sukth area, milk of whose is processed by "Ajka" plant. 288 samples from 1445 heads of

cattle were obtained. The results of them were as follows: healthy cattle 1350 heads or 93.4%; suspected cattle 20 heads or 1.39% of total samples and 75 heads, or 5.19% infected cows. The more susceptible age was 2-3 years old and with regard to breed the Jersey one. The screening test on milk was used for the first time in this investigation carried out by us. This test demonstrated that it can be used successfully to establish a preliminary diagnosis in herds with a large number of animals. However, it should be applied along with other bacteriological and serological tests as well for a definitive diagnosis and an identification of agents.

Key words: screening, milk, ELISA, cattle

DYNAMICS OF NONEXCHANGEABLE NH_4 IONS RELEASE FROM AN AGRICULTURAL SOIL AS INFLUENCED BY CaCl_2 AND HCl

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ABSTRACT

The effect of successively 0.01 M CaCl_2 and HCl extract solutions on the dynamics of NH_4^+ release from an agricultural soil was investigated using continuous flow method. Soil samples were leached with 0.01 M CaCl_2 and HCl extract solutions and effluent was collected at 45 min time period to a fraction collector. The experiment lasted 90 hours. The extract solution was passed through the soil at a constant flow rate –20.33 ml/hour, using a peristaltic pump. Chloroform was added to the soil to inhibit microbiological ammonification. The NH_4^+ release rate from the soil is dependent on the time period and the kind of extract solutions. NH_4^+ desorption from Ca^{2+} , was initially rapid followed by a slower reaction. The percentage of NH_4^+ released during the first 15 h and the last 15 h of desorption process was 59.5 and 14.3% of total NH_4^+ released from this extract solution, respectively. This was ascribed to the different status of NH_4^+ in the soil system. Rapid desorption of NH_4^+ at the beginning of kinetic studies can be explained by water solution and exchangeable NH_4^+ release. The slower desorption at the end of kinetic studies can be explained by peripheral non-exchangeable NH_4^+ release. The sequence of NH_4^+ release from the soil differs when 0.01 M HCl was used as extract solution. NH_4^+ desorption from HCl , was initially rapid followed by a slower reaction. The percentage of NH_4^+ released during the first 15 h and the last 15 h of desorption process was 61.3 and 14.6% of total NH_4^+ released from this extract solution, respectively. The kinetics of release from the soil was well described by the Elovich equation for each extract solution.

Keywords: non-exchangeable ammonium, kinetics, release, CaCl_2 , and HCl extract solution

FRAGMENT LENGTH ANALYSIS OF MICROSATELLITE IN INTRON 11 IN MHC-DRB GENE OF RUMINANT SPECIES OF NORTHERN ALBANIA

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ABSTRACT

The microsatellite in intron II of MHC-DRB gene, are analysed for local populations of three ruminant species; cattle, sheep and goats of Northern Albania. The analysis revealed a great number of alleles. There were identified 17 alleles in cattle, 19 in sheep and 20 in goats.

Keywords: Length Analysis, Microsatellite

GEOMORPHOLOGICAL AND GEOBOTANICAL FEATURES OF THE COASTAL AREA IN THE SOUTH OF VJOSA RIVER MOUTH

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ABSTRACT

This paper is based on exiting materials collected during field trips and plant analysis from geobotanical data survey. The lithostructural, geomorphologic and geobotanical features of the coastal area in south of Vjosa river are given. The studied area is an original morphostructural, geomorphologic and bio-climate unit with a rich and various flora and fauna. It represents the plant communities according to habitats. We have to pay attention for risked plant communities, habitats and plants with the degree of danger based in IUCN categories. Some of those plants are endemic, like *Orchis albanica* Goelz & Reinhard /E/, in sands of Vlora, *Leucojum valentinum* Pau. ssp. *vlorense* Paparisto et Qosja /E/, in the fissures of calcareous rocks of the coast of Vlora (Kala).

Hypericum haplophyllodes Halacsy & Bald. /R/, in calcareous rocks of Llogara. Some recommendations for protection and sustainable management of the region, conservation and regeneration of the values of the vegetation diversity and the landscape are also given.

Keywords: geomorphology, geobotanics

POTENTIAL RISK EVALUATION OF GROUNDWATER CONTAMINATION FROM SOME SOIL APPLIED HERBICIDES IN WEED CONTROL OF MAIZE (*ZEAMAYS* L.)

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ABSTRACT

The environmental risk of some soil applied herbicides in weed control of maize was evaluated for three pedo-climatic situations in west part -of Albania. The possible chemicals treatments were identified for the main types of weed flora in maize, in order to evaluate their environmental risk. For the various weed control treatments a "Ground Water Danger Index" (GWDI) was calculated as the proportion of the active ingredient applied which leaches downwards, relative to the guidelines for drinking water calculated according to the WHO methodology. The fraction of the active ingredient which can leach was estimated with Groundwater Ubiquity Score (GUS) and Attenuation Factor (AF). The choice of the weed control treatment for a given scenario should be made from among these treatments, depending on the importance placed on environmental aspects.

Keywords: herbicide, pollution, groundwater, zea mays (L)

GROUNDWATER RESOURCE MANAGEMENT OF ERZENI-ISHMI RIVER BASIN

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ABSTRACT

The Erzeni-Ishmi river basin is located in Central Albania, and represents the most populated and most industrialized area of Albania. There are evaluated natural groundwater resources as a part of natural water balance of the area, as well as the exploitable resources, present water supply capacity and the future water demand of the basin by the year 2025.

Keywords: drainage basin, hydrogeological region, basin water balance, groundwater resources, exploitable water resources, present water supply system, future water demand

OVERLOOK ON VARIATIONS OF EARTH PHYSICAL FIELDS DURING SYNNY ECLIPSE, AUGUST 1999

Albanian Geophysical Association

Presented the data of variations of Earth Physical Fields during the Sunny Eclipse at August 11, 1999. Have observed variations of the ground and air temperature, of the electric self-potential, of the magnetic and gravity fields, natural gamma radiation and seismicity.

Keywords: eclipse observation, magnetic, gravity, electric spontaneous potential, natural radiation, temperature

THE POLYMERASE CHAIN REACTION AND ITS PRACTICAL APPLICATIONS IN MICROBIOLOGY

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ABSTRACT

The aim of this article is to present updated information about Polymerase Chain Reaction and the very important role of this technique in the different infection diseases diagnose.

Keywords: Polymerase Chain Reaction, virus, bacteria, protozoa

AJNTS No. 8, 2000**SOME MODIFICATIONS OF DURAND-KERNER METHOD****Fatmir HOXHA**

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University of Tirana

Philippe BERGER, Jean-Luis Lagouanelle Enseiht-France**ABSTRACT**

Some modifications of Durand-Kerner algorithm, which is obtained via a global optimization of root approximations [6], are presented. A new demonstration of quadratic rate of convergence of Durand-Kerner algorithm is proposed too.

**TRACKING THE DISTRIBUTION OF CHLORINATED
HYDROCARBONS IN THE AQUATIC ECOSYSTEMS AND THEIR
FOOD CHAIN BIOACCUMULATION IN THE BIOTA OF THE
KARAVASTA LAGOON**

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ABSTRACT

The chlorinated hydrocarbons like pesticides and PCBs are chemical substances, extremely persistent, bioaccumulating, toxic to surrounding environment and to human health. In the marine environment the chlorinated hydrocarbons may be physically distributed in different ways. The atmosphere is the major path for the delivery of these pollutants to the oceans. The chlorinated hydrocarbons dispersed in the atmospheric air are carried by air streams and settle down with precipitation onto the surface of particles and benthos, and then into the bottom sediments causing contamination of aquatic organisms. The concentrations and the chemical forms of chlorinated hydrocarbons change once they are added to bodies of surface water, as a result of four natural processes: dilution, sedimentation, biodegradation and biological amplification. The last one, the so-called bioaccumulation, is the most effective one.

In our case Study, Karavasta lagoon, the process of bioaccumulation of some chlorinated hydrocarbons in different aquatic species is discussed. We compared concentrations in sediment, mussels, fish and pelican eggs. Although transfer between these compartments of the food chain may involve transfer through intermediate compartments, comparisons of these selected ones can be used to assess partitioning trends and patterns. The sediment can be viewed as the source to the overlying water and the water as the source for phytoplankton, and so on. The bioaccumulation patterns of chlorinated hydrocarbons in biota of Karavasta lagoon, from their sediment source, resulted to be largely determined by chlorine content and their lyophilicity. This process seems also to be dependent on the kind of species being analyzed and their position in the food chain.

Keywords: bioaccumulation, chlorinated hydrocarbons, food chain, biological magnification, congeners, egestion

CORRELATIONS IN ALBANIAN COALS

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ABSTRACT

Seventeen Albanian coals grouped or divided in three regions have been analyzed in terms of water contents, proximate and ultimate analyses, sulfur forms, bituminous matter and humic acids yields and specific energies. Several equations were found helpful in predicting the value of a certain coal property.

Keywords: coals, compositions, correlations

INVESTIGATION OF TWO HIGHLY POLYMORPHIC DNA SYSTEMS OF THE STR TYPE (27Y39H AND HUM TH01) IN THE ALBANIAN POPULATION

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ABSTRACT

It is well known the importance of the investigation of the HVR (Highly Variable Regions, STR included) genetic systems for linkage analysis, personal and population identification, population genetics and anthropological studies.

In this paper we show the results of a survey of two such highly polymorphic genetic systems of the STR type (HUM TH01 and Y27H39) using the PCR techniques in Albanian population samples. The aims of our investigation were to identify and characterize the alleles for each system and to obtain the allelic and genotypic frequencies distribution in our population. It is the first time this kind of polymorphisms has been investigated in the Albanian population.

We identified a high polymorphism for both systems encountering 6 alleles for HUM TH01 (from 7 known worldwide) and 4 for the Y-linked Y27H39 (from 5 known until now). The rate of heterozygosity for HUM TH01 was 86.61% and our Population for this system resulted to be in genetic equilibrium. For the Y-linked system a different allele is common for our population while for HUM TH01 is found an allele which is very rare in other populations.

APPLICATION OF GIS PROGRAM IN EVIDENCING THE GENETIC DIFFERENTIATION OF THE ALBANIAN POPULATIONS BY THE ALLELIC FREQUENCIES OF ABO AND RHESUS LOCI

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Mazllëm BELEGU, Akif HOXHA

Prishtina University, Kosovo

Sheqibe BEADINI

Tetova University, FYROM

ABSTRACT

This article deals with the analysis of the genetic differentiation in the districts inhabited by Albanians (besides the Albanians who live in Çameri and Montenegro). The analysis is based only on ABO and RH loci.

Cluster analysis and especially GIS program (the averages of the genetic distances of Albanian districts have been taken into consideration) showed that about 80% of the Albanian populations are homogeneous. This homogeneity is expressed among the far geographical areas as well. Also the isolines built according to the GIS program allow also knowing the genetic proximity of each geographical point as well as the existence of the isolated populations.

Keywords: Albanian populations, ABO and Rhesus loci, cluster, GIS program, and genetic differentiation

CRYOGENIC ACTIVATION OF EGGS IN THE BODIES OF ALIVE SILKWARM *BOMBYX MORI* L. FEMALE FOR AMEIOGONIC PARTHENOGENESIS

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ABSTRACT

This paper deals with two experiments performed on the race A_{16} by keeping eggs in bellies of the alive females in cryostat with a (-6°C ; 8h) regime and later on coupling them with previously gamma irradiated males at an exposition of 50kR. The obtained data for race A_{16} in primary generation parthenogenesis, are compared with the data of hot water thermic shock (46°C ; 18 min) parthenogenesis experiments previously performed, on high aptitude race A_{16} , hybrid $A_1 \times A_{17}$ and the race A_{16} itself. In the first and the second cryogenic activation parthenogenesis experiment the race A_{16} had, respectively, substantially high hatching rates of 7.2 percent and 8.4 percent, in relation to those of races and hybrid, mentioned above, included in the segment from 0.7 percent to 3.1 percent. The experimentation of successive generation cryogenic parthenogenesis on races A_{16} , A_{17} and hybrid $A_1 \times A_{17}$ can lead to the establishment of parthenogenetic lines of great interests.

THE ETIOLOGICAL STRUCTURE OF SHIGELLOSIS IN TIRANA, DURING THE PERIOD 1986-1995

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ABSTRACT

During the period 1986-95, in Tirana, 3700 *Shiga* strains have been isolated in infected and carrier persons. Among these strains predominate *Shigella flexneri* (57.89%) and *Shigella sonnei* (38.70%), while *Shigella shmitzi* (1.83%) and *Shigella boydii* (1.56%) have rarely been found. Among the serotypes of *Shigella flexneri* the founding serotypes predominate: 2a (31.74%), b (20.49%), 4a (15.87%) and 3a (13.58%). Among the serotypes of *Shigella boydii* the predominant serotypes are 11 (64.91%) and 7 (17.54%), while among the biotypes: a (42.08%), b (18.03%), k (8.06%) and m (7.91%) predominate.

SELF-INCOMPATIBILITY TEST IN CABBAGE (*BRASSICA OLERACEA VAR. CAPITATA*).

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Vegetables and Research Institute

ABSTRACT

Nine different lines of head cabbage *Brusica olerucea* var. *Capitata*, were tested about their ability of self-incompatibility. To overcome the self-incompatibility, bud pollination stage was used. There were differences in fertility ratio between lines and especially in their behavior of self-incompatibility. Some have regularity in decreasing fertility ratio after each generation but some other have a high variability of it. Lines like line nr.3, nr.2, nr.5 and nr.4 have the strongest self-incompatibility i.e. are the best ones to use as parental line in any seed production program. The results of the fertility ratio over 4 years reveal that line nr.8, line nr.4 and line nr.2 after every generation of selfing they improves self-incompatibility, so it's possible to use there as a parental line in hybrids seed production. In this case it is supposed that that the self-incompatibility is controlled by a major gene system. There are some other lines that have the variability of the fertility ratio after each generation of selfing. In this case it is believed that the self-incompatibility is controlled by a polygene system and it is very difficult to obtain pure lines with a strong self-incompatibility.

Testing the self-incompatibility needs some years of selfing. The lines which in the first three years show variability in fertility ratio require to discard.

CONTRIBUTION TO THE STUDY OF IMMOBILIZATION AND REMOBILIZATION OF NITROGEN FERTILIZER IN SOILS BY HYDROLYTIC FRACTIONATION

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Ecole Nationale Supérieure d'Agronomie et des Industries Alimentaires-
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ABSTRACT

Nitrogen immobilization and remobilization from a fertilizer were determined by hydrolytic fractionation of organic nitrogen with 6 M HCl into acid-soluble distillable nitrogen (NSAD), acid-soluble nondistillable nitrogen (NSAnD) and nonhydrolysable nitrogen (NnH) on the Ap horizons of eight different soils from Myzeqe (Albania), eastern France, and tropical Mexico. The soils were fertilized with $K^{15}NO_3$ and then incubated at 28°C, and 80% of the water holding capacity for 1 month. Mineral N was removed by extraction with a solution of $CaCl_2$ after which rye grass was sown. The nitrogen taken up by rye grass was thus derived from soil organic matter. The three NSAD, NSAnD and NnH fractions participate in both immobilization and remobilization. The NSAnD fraction was shown to be the most active fraction. Remobilization of the biomass was greater in the sandy brown soils than in the clayey soil, in which intra-aggregate immobilization would predominate. Evidently, the physical and chemical properties of the soils have a real bearing on immobilization and remineralization of nitrogen fertilizer in cultivated soil.

Keywords: immobilization, remineralization, hydrolytic fractionation, NSAD, NSAnD, NnH, organic nitrogen, nitrogen fluxes

PRELIMINARY RESULTS ON LABELING TETRASULPHONIL-PORPHYRIN WITH ^{90}Y

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Endrit MALJA

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ABSTRACT

The potentiality of the preparation of tetrasulphonil porphyrin (TSPP) labeled with ^{90}Y has been studied and demonstrated. The complex $TSPP-^{90}Y$ is prepared with satisfying yield and radiochemical purity. The complex $TSPP-^{90}Y$ is stable in vitro in water solution. The quality of ^{90}Y -TSPP is checked by spectrometric absorption method, chromatographic and ion exchange methods.

APC-UNIVERSAL INTERFACE DESIGNED AND CONSTRUCTED AT INP TO INTERFACE PC-S TO ANALOG AND DIGITAL DEVICES

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ABSTRACT

The communication between the instruments in a laboratory, and their connection to computers is an increasingly important constituent in the organization of scientific work. The design and the construction of a PC- universal interface made at Institute of Nuclear Physics is an attempt using the personal computers (PC-s) to improve the quality of the work in connection to analog and digital data acquisition and processing, timing purposes, counting of nuclear events, process-controlling, etc.

FORMATION CONDITIONS OF THE LATERITIC PRODUCTION OF ALBANIA

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ABSTRACT

Brief geological data about iron-nickel and nickel-silicate ore in northeastern, central and southeastern regions of Albania are provided in this paper. The paleogeographical evolution and formation conditions of the lateritic productions of iron-nickel ore are also given here. The paleogeographical evolution from east to the west, between Bushtrica village and Xhumaga mountains is given by the schematical sections. This paper is mainly based on geological publications and on the field works and reports done by the author.

FACTORY ANALYSIS AND OPINION ON THE ENVIRONMENT OF SEDIMENTATION OF CRETACEOUS-EOCENE PHOSPHORITES OF ARABIAN - NORTH AFRICA PLATFORM

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ABSTRACT

R-mode factory analysis to 40 chemical analyses of phosphorites from different deposits of Jordan, Egypt, Israel, Syria, Tunisia, Algeria and Marocco is applicated. There are determined and interpreted five factors: I) The antagonism between "chemical components" and "detritic components": II) The factor of CO₂ reduction: III) Redox cycle (Eh) and Mg inhibition: IV) Stable isotope of sulfur of sulfate precipitation and V) The factor of "fluorine arrangement" of precipitation of Francolite. The above mentioned factors in cooperation and mutual influence have contributed for the formation of Francolite and other chemical detritic minerals and organic matter in anoxic, suboxic and oxic zones and later during diagenetic processes.

Keywords: Arabian-North Africa Platform, phosphorites, correlative-factory analysis, chemical components

MORPHOLOGICAL STRUCTURAL FEATURES AND GENETICS EVOLUTION OF BULQIZA CHROMITE DEPOSIT

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ABSTRACT

Bulqiza chromite deposit is the largest deposit in Albania and concerning its sizes, reserves, quality and morphological - structural features it one of the unique chromite deposits in the world. Bulqiza chromite deposit is distinguished by folding form of the ore body. It has an asymmetric anticline form of large dimensions. The formation of Bulqiza ultrabasic massif supposes the high scale of magmatic fusion of periodite mantle, where the impoverished refractory remains represent the biggest part of petrologic section of the massif with higher content of magnesium. In the framework of processes of generation of partially fusion formation of chromite levels concentrated in mantle sequence occurred. The folded form of the ore body is the result of tectonic-magmatic, gravitation, regional and inner forces of silicate - ore mass.

Keywords: Bulqiza chromite deposit, magmatic, evolution, silicate -ore fusion, folded ore body

TECTONIC STYLE AND HYDROCARBON EVALUATION OF DUPLEX KRUJA ZONE

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ABSTRACT

The Kruja Zone is included in the External Albanides. From the tectonic point of view, the Kruja Zone is represented with developed tectonics and is composed by some structural lines. The folds overthrust westwards and backthrusts in eastern flanks.

The stratigraphic section of the Kruja Zone comprises Upper Cretaceous to Paleocene-Eocene platform carbonate sequences and Oligocene-Aquitianian flysch-flyschoidal deposits.

Tortonian molasse deposits unconformable overly onto the above-mentioned formations of the western part of the Kruja Zone. From the petroleum point of view, numerous oil seeps are identified on Tortonian unconformity. The source rock horizons are related with Upper Cretaceous deposits.

Oil and gas accumulations occur both in carbonate and elastic reservoirs in Albania. Some regional studies carried out in Kruja Zone indicate that the carbonate reservoirs are of the same age as those in the Ionian Zone.

Keywords: Duplex structures, hydrocarbon exploration, Kruja Zone, Albania

AJNTS No. 9 / 2000**THE INFLUENCE OF EXTRACTIVE LIQUIDS ON VALERIAN
EXTRACTS COMPOSITION****Rilinda KLOSI**

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ABSTRACT

Rhizomes and roots of *Valerians officinalis* L. are largely used for the production of phytomedicines. The influence of three different extractive liquids on the composition of valerian extracts was investigated. Thin layer and high performance liquid chromatography were used for the separation, identification and the assay of bioactive compounds, such as valepotriates and valerenic acid.

Keywords: Sedatives, valerenic acid, valepotriates, high performance liquid chromatography, valerian extracts

**ASSESSMENT OF THE CONTAMINATION FROM
ORGANOCHLORINE PESTICIDES IN THE AREA OF PORTO-
ROMANO (DURRES), ALBANIA****Lindita TAJAJ*, Memush HABI** , Kosta KOCI** , Genc DAMANI****

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ABSTRACT

The area of Porto-Romano (Durrës), where the residues of a destroyed factory of lindane production are located, was studied through gas-chromatographic analysis of organochlorine pesticides in environmental samples. High levels of all the hexachlorocyclohexane (HCH) isomers, originating from the earlier production of lindane (γ -HCH) were found in soil, sediment and water samples. It was studied the range of the expansion of the pollution as function of the distance from the source of the pollution, as well as the penetration of the pollution in depth of the soil.

Keywords: environmental pollution, soil, sediment, water, organochlorine pesticides, hexachlorocyclohexane isomers, gas chromatography

**INFLUENCE OF ELECTRON-BEAM ON THE POLY-ETHYLENE
AND KAPTON ELECTRIC RESISTIVITY****Floran VILA*, Gerhard M. SESSLER*****Department of Physics, Faculty of Natural Sciences, Tirana University,
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ABSTRACT

In this work, we have determined the surface electric resistivity of some types of polyethylene and kapton, and the influence of electron-beam on them. For this reason there are constructed electrostatic probes unabling precise measurements. The maximal error of the method proposed for measuring is 7%.

Keywords: surface electric resistivity, electron-beam, polyethylene, kapton

OAKS IN ALBANIA AND THEIR REHABILITATIONS

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ABSTRACT

In this publication are given study results of study for converting of oaks coppice to high forests stands by seedling and rarefaction. The main objective is the study of the rehabilitation way of the oaks coppice in the places more typical of their development in Albania that are degraded because of overcutting and overgrazing mainly near the urban zones. The study brings research results of planting with acorns in three variations direct on the field, planting with plastic bags, and rarefaction in two intensities.

Keywords: Oaks, (Sessile oak, Turkey oak, and Hungarian oak) seedling, and rarefaction

AGRONOMIC EVALUATION OF FERTILIZER PRODUCT DERIVED FROM ALBANIAN PHOSPHATE ROCK

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ABSTRACT

The Albanian acid soils are known to sorb significant amount of phosphate. Superphosphorite (SSPP) can improve the usefulness of Albanian unreactive phosphate rock (PR) as phosphorous (P) fertilizer. A greenhouse study was conducted to evaluate nonconventional phosphate fertilizer-SSPP derived from a low reactive Albanian PR. SSPP product (made in laboratory conditions), had a ratio phosphate rock: single superphosphate = 25:75. Laboratory studies also undertaken to study the transformation of SSPP phosphorous and single superphosphate (SSP) phosphorous (of Laç plant), after their application to the acidic soil from Pogradec region (Cerave-Albania). Five levels of P were applied for SSPP and SSP. After two years of P fertilizer incubation, the soil sample were air-dried and soil P fractions were determined. Increasing rate of P fertilizers increased dissolvable P in water, active mineral bonding of P soil, and P content in plant. Soil amended with SSP results similar to SSPP but differences were, found out regarding their effect on the soil P fraction kinds. SSP affected more on the increase of P-Fe soil active mineral bonding. SSPP affected more on the increase of P-Ca soil active mineral bonding. This was ascribed to the different composition of P fertilizers. The influence of SSP and SSPP fertilizers on Ray-grass yield resulted similar.

Keywords: Superphosphorite; Single superphosphate phosphate rock; P transformation; P availability; Relative effectiveness.

KINETICS OF NONEXCHANGEABLE AMMONIUM RELEASE FROM AN AGRICULTURAL SOIL AS INFLUENCED BY SOIL SOLUTION PH, DILUTED INORGANIC AND ORGANIC ACIDS

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ABSTRACT

The rate of non-exchangeable ammonium ion release from soil can have a significant effect on N dynamics and environmental quality. The objective of this study was to determine the kinetics of non-exchangeable ammonium ions release from an agricultural soil, as influenced by successively 0.01 M CaCl_2 and 0.01 M HCl; 0.01 M CaCl_2 and 0.005 M HCl; 0.01 M CaCl_2 and 0.01 M citric acid extract solutions. Some kinetic models were used to describe NH_4^+ release from the soil under the study.

The fittings of experimental data into more than one kinetic plotting indicate that NH_4^+ release obeyed multiple kinetic models. The release of non-exchangeable ammonium ions as a percentage of total non-exchangeable ammonium ions in the soil ranged from 0.9 to 3.4% and was higher when 0.01 M and 0.005 M HCl were used as extract solutions. This could possibly be attributed to desorption of NH_4^+ from fine particle and/ or mechanically disturbed material.

Total ammonium ions release during the last 45 h of percolation time was much less when 0.01 M CaCl_2 was used as extract solution. This extract solution did not effect on the NH_4^+ sorption-desorption capacity and soil structure. The present data indicate that the sequence of NH_4^+ release rate from the soil varies with mechanisms of the release. The role of organic acid and the concentration of inorganic acids in effecting the NH_4^+ supplying power of soil thus merits close attention.

Keywords: Non-exchangeable Amonium; Kinetics Release; 0.01 M citric acid; 0.01 M HCl; 0.005 M HCl; Extract Solutions

SCREENING INVESTIGATION OF SOME INDICATORS ON MILK QUALITY OF DAIRY CATTLE IN SUKTH AREA

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ABSTRACT

This study is carried out as a screening test in cattle of Sukthi area, whose milk is processed by "Ajka".

The milk of about 300 cows was examined. The results of them were as follows: NSC of suspicious and positive samples were 441000 - 1313500 /ml and the % of neutrophiles were 16.8 - 37.7 %. Pathogenes were as follows: *S. aureus* (45.8%), *E.coli* (8.3%), *S. agalactiae* (4.2%) and *S.epidermidis* (4.2%), *A.niger* (20.8%), *A. fumigates* (29.1%). It should be established a NSC of a maximal value as a border line of a valuable indicator of milk for consumption.

Keywords: milk, screening, somatic cells, neutrophyle, CMT, Albania

MORPHOLOGICAL AND ANATOMICAL CHARAC- TERISTICS OF THE LEAVES OF QUERCUS TROJANA WEBB., SPECIES FROM SUHAREKA, ZHURI AND OHRID LOCALITIES

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ABSTRACT

Since the morphological and anatomical characteristics of plant organs, especially of leaves, are indicators of activity of ecological factors, we have carried out researches of morphological and anatomical construction of leaves *Quercus trojana* Webb., species from localities of Suhareka and Zhuri (Kosova) and Ohrid (FYROM). According to the achieved results, it is noticed that there is similarity, but also exist differences particularly in anatomical construction of leaves. The greater differences are noticed in the thickness of fence tissue, in the number of stomes and hairs (trichomes), which also show among others about different microclimatic conditions of settlements where the *Quercus trojana* species in spread. On the basis of these parameters, it is stated that the leaves have xeromorphic construction.

MODERN ASPECTS ON THE STRUCTURE AND ASSEMBLY OF THE PHOTOSYSTEM II

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ABSTRACT

Oxygen is essential for life. Almost all of it is produced by the photosystem II, a multiprotein complex that is present in green procaryotic and eukaryotic organisms. This complex has been developed approximately 4 billion years ago and initiated the development of the oxygen-dependent life on earth. In spite of many scientific efforts, the assembly and the function of this complex is not yet completely understood. This review summarizes the recent achievements to understand the photosystem II activity and its biosynthesis.

NOPCSA'S THOUGHT ON TECTONICS OF ALBANIA

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ABSTRACT

NOPCSA's contribution in tectonic studies for Albania is remarkable and unalterable, because his scientific thought has stood the test of time nearly for a century and is still actual. NOPCSA was the first scholar who divided the tectonic zones and demonstrated the nappe tectonics in Northern Albania since 1906. NOPCSA's scientific studies on geology of Albania allowed him to do the first classic synthesis on geology of Dinarides. His is one of the first scholars who, based on profound study of all existing data, showed that the Adriatic Sea is not a geosyncline but a submerged craton (called "Adria"), namely a promontory of the African craton, a model now generally accepted. NOPCSA always fascinates by his ideas. He explained the mechanism of three types of the magmatism through the continental drift theory of WEGENER, materializing so the subduction zones about a quarter century before coming to light the term "subduction". NOPCSA accepted the nappe model as well as the continental drift, using both very fruitfully.

Keywords: Franz Baron NOPCSA, tectonic concepts, Northern Albania

THE CORRELATION OF $\text{Fe}^{+3}/\text{Fe}^{+2}$ RATIO WITH PGE CONTENTS IN SOME CHROMITES OF GREECE AND ALBANIA

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ABSTRACT

Chromite samples from chromite ores were analyzed by Mossbauer spectroscopy and the correlation of their $\text{Fe}^{+3}/\text{Fe}^{+2}$ ratio with major elements and PGE was investigated. The coefficient of correlation between the $\text{Fe}^{+3}/\text{Fe}^{+2}$ ratio and major elements of chromites is not significant at 95% level. A positive correlation between $\text{Fe}^{+3}/\text{Fe}^{+2}$ ratio and IPGE/PPGE ratio is significant at 99% level suggesting the precipitation of IPGEs (Os, Ir, Ru) with increasing oxygen fugacity. The correlation between the Mössbauer $\text{Fe}^{+3}/\text{Fe}^{+2}$ ratio and IPGE/PPGE ratio of chromites seems to confirm the possibility of using this ratio for comparing the redox state of the parental melts, assuming that the difference in the temperature of the subsolidus equilibration of chromites is small. From the distribution of the $\text{Fe}^{+3}/\text{Fe}^{+2}$ ratio in the studied chromitites it may be concluded that the values until 0.5 are normal and the interval 0.2-0.4 being more common.

Keywords: $\text{Fe}^{+3}/\text{Fe}^{+2}$ ratio, IPGE/PPGE ratio, Mössbauer spectroscopy, oxygen fugacity

NEW GEOLOGICAL AND BIOSTRATIGRAPHICAL DATA ON EOCENE AND OLIGOCENE DEPOSITS IN THE SAZANI ZONE

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ABSTRACT

The stratigraphy of the Sazani zone deposits and its tectonic position has been continuously discussed by a number of geologists. This zone extends in northern part of Paksos Zone (Greece) and to the east of Apulian Platform (Italy) and it should reflect the same geodynamic development of the two above mentioned ones.

For the Sazani Zone, a basic question arises: what period of time does the carbonate cycle closing and the beginning of the terrigenous one belong to? Our study, treating the clay-marly deposits of the base of Gjuhëza Cape (Kepi Gjuhës) outcrop, indicates an older age of the installation of the detrital deposits in Sazani zone. The terrigenous sedimentation in Sazani zone starts in the Late Oligocene (*Sphenolithus ciperoensis* zone).

Keywords: Late Oligocene, terrigenous sedimentation, Sazani Zone, Albania

HACCP-A PRACTICAL APPROACH

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The purpose of this article is to explain what HACCP is and what it can do for any food business. It will lead you through the accepted international approach to HACCP and will show you how to do it from start to the end of the study. HACCP is the best optional control available to be implemented by customers or regulatory authorities [1].

HACCP is an abbreviation for the Hazard Analysis and Critical Control Point system [6].

In reality, use of HACCP approach may well offer a practical and major contribution to the way forward but if the people have the proper knowledge and expertise to apply it effectively. HACCP is a technique and needs people to operate it.

This system needs a certain level of expertise to carry out HACCP but this expertise includes a understanding of your products, raw materials and processes along with an understanding of the factors that could cause a health risk to the consumer. This technique is based on the prevention of problems.

In brief, HACCP is applied by taking a number of straightforward steps;

- look at your process/product from start to finish;
- identify potential hazards and decide where they could occur in the process;
- put in controls and monitor them;
- write it all down and keep records;
- ensure that it continues to work effectively.

AJNTS No. 10 / 2001

*This number of AJNTS is dedicated to the workshop on
 "Deterministic Approach of Seismic Zonation of some Balkan Countries", held in
 Tirana, Albania, April 26-27, 2001*

**SEISMIC ZONATION OF ALBANIA USING A DETERMINISTIC
 APPROACH**

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ABSTRACT

Albania is a country with high seismicity. Many towns and rural areas are devastated from time to time by different large and moderate earthquakes. Using the technology developed at the Department of Earth Sciences of the University of Trieste, Italy, for computing the complete synthetic seismograms by the modal summation technique, the seismic zonation of Albania has been carried out. Based on seismotectonic synthesis and available earthquake data, 8 seismogenic zones are defined and for each of them, one characteristic focal mechanism is selected. The seismic velocity model used in the computation is new and is constructed on the basis of existing studies for this region. The maps with calculated values of displacement, velocity and acceleration obtained, will contribute to the quality of aseismic design practice of Albania and to the mitigation of earthquake consequences.

Keywords: Seismicity of Albania, seismic hazard, synthetic seismograms, ground acceleration.

**ATTEMPT ON SEISMIC MICROZONING OF BUCHAREST. A
 DETERMINISTIC APPROACH**

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 Apostol F. BOGDAN**

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ABSTRACT

The mapping of the seismic ground motion in Bucharest, due to the strong Vrancea earthquakes is carried out using a complex hybrid waveform modelling method with combines the modal summation technique with finite-differences technique. For recent earthquakes it is possible to validate the modelling by comparing the synthetic seismograms with the records. The realistic modelling of the seismic input has been applied to a first-order seismic zoning of the whole territory of the Bucharest area. Using the hybrid method with a double-couple seismic source approximation and relatively simple path and local structure models we succeeded in reproducing the recorded ground motion in Bucharest, at a very satisfactory level for seismic engineering, in the case of May 30, 1990 Vrancea earthquake.

Keywords: microzonation, synthetic seismograms, deterministic modelling, Vrancea

A NEW ELABORATION OF EARTHQUAKES IN ALBANIA AND SURROUNDING AREA FOR THE PERIOD 1964-1995

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ABSTRACT

A new elaboration of earthquakes in Albania and surrounding area is done, in the framework of a project "Seismotectonic and Seismic hazard assessment in Albania" (SfP 972342 Seis-Albania). Arrival times for earthquakes in Albania and the surrounding area (39.0° – 43.0° N; 18.5° – 21.5° E) have been obtained from the seismological networks operated in Albania and Greece and of the neighbouring countries. The instrumental database covers the period 1964 - 1995. About 16.009 earthquakes have been collected in total. A revised velocity model for Albania is preliminary used to relocate all events. Magnitudes of all earthquakes are expressed in the unified magnitude. Preliminary results indicate that Albania is characterised by a high level of moderate size seismicity and for the period studied ~ 2 earthquakes occurred with magnitudes $M \geq 6.0$; 21 earthquakes occurred with magnitudes M between 5.0–5.9; 497 with magnitudes M between 4.0 – 4.9; 4026 with magnitudes M between 3.0–3.9 and 11.463 earthquakes with magnitudes $M \leq 2.9$. This new elaboration helps us to do a new earthquakes catalogue for this area. The construction of this new earthquakes catalogue will improve the seismotectonic picture of the study area.

Keywords: A new elaboration of earthquakes in Albania and surrounding area.

THE RELATIONSHIPS BETWEEN GROUND PARAMETERS OBTAINED FROM DETERMINISTIC APPROACH OF SEISMIC ZONATION OF ALBANIA AND MAXIMUM OBSERVED INTENSITIES

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ABSTRACT

The correlation relations between macroseismic intensity and ground motion parameters provide an easy way to use the information of historical seismicity in engineering design. They are especially useful in the case of Albania, where the strong motion data are lacking. Correlation relations between displacement, velocity and DGA obtained by the deterministic approach of seismic zonation of Albania, and maximum observed intensities are investigated for the Albanian territory. Seismic ground motion parameters and macroseismic intensity are poorly correlated for the whole set of data. The regression models are valid only if average data, calculated for a fixed value of intensity, are used.

Keywords: Seismic hazard, deterministic approach, ground motion parameters, macroseismic intensity.

**DETERMINISTIC APPROACH OF SEISMIC HAZARD AS-
SESSMENT IN BULGARIA; CASE STUDY NORTHEAST BULGARIA
- THE TOWN OF RUSSE**

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ABSTRACT

A review of the neotectonic and geological settings for the Bulgarian territory is compiled, and the seismic hazard, as determined by the deterministic and probabilistic approaches, is analysed at regional and local scales. The regional seismic hazard in NE Bulgaria is controlled mainly by the Vrancea intermediate-depth events. The local scale study is focused on the town of Russe and the soil classification and the construction of synthetic seismic signals have been instrumental to this investigation. The synthetic ground motion reproduces the main features of the observed data, even if in the modelling relatively simple models are used for the source and for the medium.

Key words: deterministic seismic hazard, strong ground motion modelling, site conditions.

**SOME PRELIMINARY EVALUATIONS OF THE SEISMIC
ACTION RELATED TO THE APPLICATION OF EC8 IN ALBANIA**

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ABSTRACT

Related to the requirements for a further improvement of the actual aseismic design code, the application of EC8 in Albania is seen as the best way to be followed. For this reason, a new presentation of the seismic hazard, which threatens the albanian territory by means of acceleration that is induced to the soil during the seismic action, is necessary. After a brief description of the state-of-the-art of hazard studies, which are based mainly on the MSK-64 scale, the classification of soil conditions according the influence they exercise on the seismic action used up to now in Albania and the need for its harmonization with the EC8 requirements, is discussed. Finally, the influence of bedrock's depth on the Dynamic Amplification Factor (D.A.F) for one typical soil profile of Durres town is shown.

Keywords: EC8, soil response, Dynamic Amplification Factor.

Q FOR THE TERRITORY OF REPUBLIC OF MACEDONIA**Lazo PEKEVSKI**Seismological Observatory, Faculty of Natural Sciences and Mathematics,
Skopje, R. Macedonia**ABSTRACT**

The Q values for selected directions of seismic wave-path propagation were calculated by using the wave-attenuation relation (1). The Q_s values were estimated from the attenuation of the S_g and L_g waves, recorded on the seismographs installed at the Seismological Observatory in Skopje (SKO) and seismological stations in Ohrid (OHR) and Valandovo (VAY). The input data A. was measured on the seismograms of selected earthquakes with epicenters on the territory of the R. Macedonia and its neighboring seismic active areas.

The attenuation and Q values have shown an azimuthal dependence. The attenuation is smaller along the tectonic structures in the Vardar seismogenic zone (along the direction SKO-VAY) than those for the directions SKO-OHR and OHR-VAY.

SEISMIC HAZARD ASSESSMENT IN ALBANIA**Eduard SULSTAROVA* and Shyqyri ALIAJ****

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**Institute of Seismology, Academy of Sciences of Albania
Tirana — ALBANIA**ABSTRACT**

The Project "Seismic Zonation of Albania in scale 1:200,000", sponsored by the Ministry of Economy and Privatization in the framework of the National Program for Research and Development, is under way for determining the seismic hazard of Albania. The Albanian scientists, adopting the methodology of GSHAP 1992-1999, put forward the idea of a genetic two-step seismic zoning and a probabilistic assessment of earthquake hazard. According to this concept, the first, seismotectonic step involves identification of seismic source zones, while the second, engineering step is concerned with the calculation of the seismic effect caused by these at the surface.

Keywords: Earthquake parameters, active faults, seismic source zones, seismic hazard, Albania

**THE LAW OF PROPAGATION OF SEISMIC VELOCITIES ON THE
MOLASSES AND FLYSCH DEPOSITS (THE WESTERN PART OF
ALBANIA)*****Jani SKRAMI and **Vullnet XHANGO**

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**Geophysical Department, Tirana

ABSTRACT

The valuation of velocities of seismic waves has been always a very important aspect in our seismic interpretation for evidencing the geological structure on Periadriatic De-

pression and on Cakrani-Amonica-Vlora region. Using "down-hole" method the velocity measurements of seismic waves in boreholes carry out. These results could be of use for constructing the velocity model of this area, which is very important for seismic hazard assessment.

Keywords: seismic velocity, "down-hole" method, law of propagation of seismic velocity, seismic hazard.

DESIGN RESPONSE SPECTRA-DETERMINISTIC AND PROBABILISTIC APPROACH

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ABSTRACT

Presented in this paper are the results from the investigations performed for definition of seismic design parameters, i.e., design response spectra for a rock site in the city of Skopje. The investigations were performed by use of two methodological approaches: deterministic and probabilistic.

The presented investigations of design response spectra by using the probabilistic approach date from recently, i.e., they were conducted in the year of 2000 [3], whereas the results from the deterministic design response spectra were obtained in 1998 within the frames of the investigations involving experimental shaking table testing of a physical model of the structure called "Sun Tower", within the patent project "Global Vibration Control Structural System - GVCS, by Prof. Dr. Danilo Ristic.

Keywords: ground motion models, regression coefficient, standard deviation, ground motion acceleration, response spectrum, recurrent relationships, hazard analysis, 84% non-exceedence spectrum, spectrum with annual probability of exceedence.

SOME ASPECTS OF THE POSSIBLE ADOPTION OF EC8 IN ALBANIA

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ABSTRACT

The problem of adoption of the entire group of Structural Eurocodes (EC-s) - in this context, the adoption of EC8 [1] - is recently estimated as an opportunity and actual need for our country, in order to update and improve the structural and geotechnical design, execution and control of buildings and civil engineering works, especially regarding the aseismic design. In this presentation, without ambition to provide solutions, some aspects and related problems regarding the adoption of EC8 in Albania are merely outlined and presented.

Keywords: Aseismic regulations, Eurocode 8, capacity design, ductility.

**SEISMIC SIGNALS REGISTERED ON THE LIVINGSTONE ISLAND
(ANTARCTIC SOUTH-SHETLANDS) AND SOME IMPLICATIONS
FOR THE SEISMIC HAZARD PURPOSES
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ABSTRACT

A temporal seismic station has been established for the first time on Livingstone island (Antarctic South Shetlands) near the Bulgarian Antarctic Base (BAS). The main aim was to register natural seismic signals generated by different geodynamic phenomena - wind, water waves, ice breaks, rock falls, earthquakes, etc. The attempt was very successful. More than 200 registrations of the natural or man-made seismic records have been done. The characteristics of these signals are investigated. Amplitudes, spectrums (Fourier and power), attenuation, 3-D representations, etc., help a lot for the seismic signals recognition and identification. For the first time local seismic signals generated by ice cracks, rock falls, ice falls have been registered and analyzed. Another very successful effect was the registration of the waves breaking hitting almost vertical rock site with measurable dimensions, for the purposes of the tsunami influence. All registrations give the possibility to use the information for the modeling of the different geodynamic phenomena (water waves, local tsunamis, ice cracking, ice falls, rockfalls, etc.,) as well as for the hazards purposes.

Keywords: Antarctica, seismic signals, wave generation and propagation, ice and rock falls.

AJNTS No. 11, 2001**PREPARATION OF MDP KIT FOR LABELLING WITH ^{99m}Tc** **Skender MALJA, Brunilda DACI**Department of Chemistry and Electronics, Institute of Nuclear Physics,
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ABSTRACT

The conditions for preparation of MDP (methylene diphosphonate) kit for labeling with ^{99m}Tc have been studied and it is produced routinely. Also the conditions of mixing of MDP with ^{99m}Tc such pH, content of ascorbic acid and also in-vitro stability, shelf life and biological distribution, have been studied. The high yield of labeling (more than 98%) is found for both versions (with and without ascorbic acid). The MDP kit fulfills the requirements of International Pharmacopoeia.

Keyword: Radio-pharmaceutical, yield, labeling, ^{99m}Tc , bio-distribution

**DETERMINATION OF ^{90}Sr , ^{241}Am , U, Th AND Pu
RADIONUCLIDES IN COAL SAMPLES AND IN IAEA REFERENCE
MATERIALS BY APPLYING A COMBINED PROCEDURE**

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ABSTRACT

A combined sequential procedure for the determination of ^{90}Sr , Am and Pu radionuclides is applied. In coal samples, in addition to the analysis of anthropogenic radionuclides, natural occurring radionuclides (U, Th) are also determined sequentially from the same sample. The analysis of alpha emitters is performed by isotope dilution alpha spectrometry using ^{242}Pu or ^{236}Pu and ^{243}Am tracers. ^{90}Sr is analyzed by liquid scintillation counting using the double energetic windows method. In the present work, the method has been extended to the determination of ^{241}Pu . The activity concentration of this radionuclide is measured by liquid scintillation counting using the same Pu source prepared for the alpha spectrometric analysis by micro precipitation with NdF_3 . Radiochemical procedure is tested using IAEA reference standard materials. The rapidity of the method is particularly advantageous for emergency situations.

Keywords: Actinides, Sr, concentration in coal, combined radiochemical procedure

ON SOME EPIDEMIOLOGICAL INDEXES OF PSORIASIS VULGARIS IN ALBANIA

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ABSTRACT

Some epidemiological indexes of Psoriasis Vulgaris such as prevalence, incidence, geographical distribution, etc., indispensable to prepare a future strategy for planning and evaluation of preventig and treatment services were determined. The epidemiological indexes are calculated by using the data from the existing clasic epidemiological studies for the population. Discussion of results and trend evaluation are performed by using statistical methods and trends.

Keywords: Psoriasis Vulgaris.

THE CONDUCTIVITY DEGRADIATION OF POLYPYRROLE COMPONENTS DURING THE AGING PROCESS

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ABSTRACT

In this paper we have considered the dependence of electrical conductivity of polypyrrole-polyaniline components upon the aging time. The duration of heating varies from 6 h to 312 h at 70° C. The decrease of electrical conductivity of these components was noticed during the increase of aging time in accordance with the relation:

$$\sigma = \sigma_0 \exp \left[- \left(\frac{t}{\tau} \right)^{1/2} \right].$$

Keywords: electrical conductivity degradation, aging time, polypyrrole, polyaniline

MODIFICATION OF THE SIMPLE AND COMPARATIVE ELISA TEST WITH BOVINE AND AVIAN PPD ANTIGEN, FOR SEROLOGICAL DIAGNOSIS OF TBC IN BOVINES

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ABSTRACT

The study presents the work results for improvement of ELISA test for Bovine TBC through identification of specific antibodies of *M bovis*, using Bovine and Avian PPD antigen, fresh chromogen substrate and Relative method for sera classification.

Specificity was 96 % in 267 TBC negative tested samples while diagnostic sensitivity 86.5% in 37 tuberculosis-confirmed cows. The test resulted with significant differences in OD values of TBC positive and suspected bovine sera. This has to be taken into consideration. The test confirmed as a specific reactions 82.4% of cases resulted non-infected with simple ELISA test. The ELISA test has applicable values for Bovines TBC survey in foci with infection in support to allergic test. It makes evident even cases with "Tubercular Anergy" phenomenon.

COPEPODS AND ZOOPLANKTON BIOMASS FROM THE OPEN WATERS OF THE SOUTH ADRIATIC SEA

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ABSTRACT

In the investigated stations, an overall zooplankton biomass of 3.74 mg/m³ of DW and 2.5 mg/m³ of AFDW was obtained. A total of 77 species were found in the open-waters in the 200-0 meters layer. The species number and composition resulted more similar to that of eastern Mediterranean areas. A group of 12 species were not found before in the epipelagic waters of the same stations. Two new species for the Adriatic Sea (*Centropages chierchiae*, *Gaidius tenuispinus*) are reported in the present paper for the investigated area. An evident tendency of increasing from north towards south can be noted for all the four parameters analysed (DW, AFDW, species number and abundance).

Keywords: copepods, zooplankton, biomass, Adriatic Sea.

DOSIMETRY AND IRRADIATION TECHNIQUE OF WHEAT AND ORNAMENTAL PLANTS SEEDS

Andon DODBIBA

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ABSTRACT

The gamma irradiation can be used to profit new mutants or for genetics improvement of the different plants. The most preferable gamma source for radiation process is Co-60 and Cs-137. The radiation quantity of interest is the dose and its uniformity. These quantities are usually measured by the dosimeters placed inside or around the product. The dosimetry and the irradiation technique of the products are the main problems that are treated in this paper.

Keywords: ECB dosimeters, ionization chamber, seeds of wheat and bulbs of some ornamental plants

DETERMINATION OF ELEMENTAL CONCENTRATIONS IN ATMOSPHERIC AEROSOL IN TIRANA BY ENERGY-DISPERSIVE X-RAY FLUORESCENCE SPECTROMETRY

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ABSTRACT

In the period between March and May 1998, fifty aerosol samples were collected in two stations in the city of Tirana. The first station was situated at the edge of the urban area, while the second one was near the Center of the city. The total aerosol samples were collected on TFA-41 filters using high volume pumps. An experimental EDXRF instrument was used for the determination of the concentrations of 15 elements in the loaded aerosol filters. The analytical data obtained, allowed the calculation of the mean elemental concentrations in the aerosol and their crustal enrichment factors. The application of multivariate methods (Factor Analysis) allowed the identification of the main aerosol sources. Along with the soil dust and sea salt particles, which are the main natural sources, there are clearly identified two other anthropogenic sources related with oil combustion and waste incineration.

Keywords: Atmospheric aerosol, aerosol sources, EDXRF, Tirana

GAMMA SPECTROMETRIC DETERMINATION OF U, TH, K AND SOME GEOCHEMICAL APPLICATIONS

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ABSTRACT

The application of "in situ" gamma - spectrometric method ("infinite" environment), made possible the simultaneous determination of U, Th and K. 4 channel gamma - spectrometric analyzer with NaI (Tl) scintillation counter crystal detector (103 cm³ $\phi=50 \times 50$ mm) was used to determine U, Th (more than 1- 2 ppm) and K (more than 1%) in laboratory conditions. The detector was inserted into a lead camera and calibrated for measurement geometry with vessel of "Marineli" type of a 170 cm³ volume. The study of main factors, which influence in the gamma spectrometric measurements, (the technical, physical, geometrical and time parameters) has been carried out. International standards of U, Th, K and internal monitoring standard samples are used for the calibration. External analytical control has been realized by other radiometric and chemical methods. The detection limits (1 ppm Th, 2 ppm U and 1%K) and the relative errors (17-20% for 1-10 ppm U, Th and 10-15% for more than 10 ppm U, Th and more than 1 % K) guarantee a quantitative analysis that may be used successfully in the geochemical studies. Some geochemical applications, based on the content of Th, U and Th/ U ratio in rocks samples that we have analyzed with this method, are shown in this paper. U, Th and their ratio are used as trace elements to indicate the differences between the acidic magmatic rocks of Albania (Th/U ratio= 2-6 and > 10).

The bimodal character of Th/U scattering in ignimbrides and monzonites (Korabi zone) shows that in addition to the "normal" rocks, there are also some ones enriched with Th. So, the differential analysis of Th, U, and K may be used as geochemical exploration criteria for the radioactive and non-radioactive mineralization, such as REE (Rare Earth Elements), phosphorites, bauxites, placers etc. The total content of REE in some mineralized trachytes has a good correlation with U, Th and K content: $\Sigma\text{REE} = 288.462 + 12.05\text{Th} - 12.82\text{U} - 21.66\text{K}$. So, the differential analysis with gamma spectrometric method may be used to prospect the ΣREE mineralization.

Keywords: Gammaspectrometry, radioelements, geochemistry

CHOOSING THE OPTIMAL COMPOSITION OF DRILLING MUD

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ABSTRACT

During the preparation of the drilling muds, it often happens that the characteristic parameters tend opposite directions, at the same time when some of them change for the better, some others worsen. The problem treated in this study is the identification of the best compatibility of the parameters of the drilling muds. Their number being relatively great, the selection of a small number of representative parameters was considered more practical. The experimental study was performed according to the methods of the theory of the experimental design and led to satisfactory results, never reached before by the Institute of Oil Technology in Albania for the concrete geological sections..

Keywords: drilling muds, correlation coefficient, D-optimal design, desirability functions.

STUDY OF THE CROSSBORDER GEOTHERMAL FIELD IN THE SARANDOPOROS- KONITSA AREA BY ELECTRICAL SOUNDINGS

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ABSTRACT

The geothermic field in Sarandaporos –Konitsa lies in the cross-border area between Albania and Greece. The field has several surface manifestations and extended geological investigations, including tectonic and geomorphologic studies have been carried out. This work presents the conduct and interpretation of vertical electrical soundings (V.E.S.) on both sides of the borders. It aims at studying the structure down to the depth of 1000m, in a relative large area, where information about the deep

structure would have an enormous cost if acquired by a network of boreholes. Two main geoelectrical formations revealed which coincide with the flysch and the limestone basement. The area appears faulted in the NW-SE and NE-SW directions and a few concealed graben and horst structures exist. Low resistivity values were observed above basement uplifts and major faults. These values were attributed to hot fluid circulation.

Keywords: geology, geothermy, geophysics, electrical soundings.

OUTLOOK ON PALEOCLIMATE CHANGES IN ALBANIA

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ABSTRACT

This paper presents the results of inversion of thermologs data for the ground surface temperature history in Albania. The analysis presented in the paper is based on 4 thermoplots, from different regions of Albania. The wells are located in Sedimentary Basin of Albania, at the field region in the west of Central Albania and in the ophiolitic belt in the mountainous region of the northeast Albania. Based on inversion data, it results that 3.5 centuries ago in Western Albania the climate was warmer. Later a cooling of 1°C occurred, until 1 century ago. During the 20th century an increase of 1°C is observed. Inexpressive climate warming in the second half of this century is observed in Northwestern Albania. This warming mainly after the second half of the 20th century, is presented also by meteorological data.

Keywords: Ground Surface Temperature, Paleoclimate Changes, Thermolog, Paleoclimate Reconstruction.

THE EFFECT OF THE FERTILIZATION OF THE INCREMENT OF THE PRODUCTION AND ON THE AMELIORATION OF THE QUALITY OF THE TABACCO

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ABSTRACT

Combination utilization of nitrogen -phosphates and potassium fertilization in the studied proportions has a direct impact on the production increment and in the amelioration of the quality of the tobaccos. Fertilization maintains a weight proportion between the carbohydrates and proteins, which should be 1.5 - 2 favoring the carbohydrates. The best proportion is in the variant N₄₀, P₆₀, K₄₀₋₆₀.

NOVEL RADIOISOTOPE APPLICATIONS IN INDUSTRY PROMOTED BY THE IAEA

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ABSTRACT

Presently, there is a lively activity in further development and use of radioisotope technology. Novel radioisotope applications in industry are promoted by the IAEA. Radioisotope technology is contributing significantly to improving and optimizing process performance bringing an annual economic benefit to world-wide industry of several billion US\$. Probably, an average benefit to cost ratio of 40:1 is reasonably representative of radioisotope applications in industry. There are few short - term investments, which will give a return of this magnitude. The cost effectiveness of radioisotope applications should be widely promulgated to encourage industrialists to take full advantage of the technology.

ESTABLISHMENT OF THE CHEMISTRY TEACHING TRADITION AT OUR HIGHSCHOOLS

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ABSTRACT

The chemistry as a school subject underwent a constant change in conformity with the social-economic development in Albania. As a result, the original teaching tradition of chemistry, which has its features conditioned by our specific circumstances it is established. Since, there was not a thorough study about this item, we considered it necessary to examine and give some opinions and recommendations for the future. We have analyzed carefully the chemistry teaching programs and the textbooks used by pre-university levels, according to the periods considered as the most prominent stages in the social-economic development of Albania. In order to reach the right conclusions, we have examined in details all the programs and textbooks of chemistry found at our National Library, as well as at the Library Ministry of Education. There were no chemistry textbooks, as well as detailed chemistry programs at all, in the high schools all over the country before the year 1945. The unified programs and the translated textbooks between the year 1945-1967 were prepared according to our proper educational level. From 1967 to 1982 great efforts were made to prepare our own chemistry textbooks. The stage from 1982 and on is characterized by the efforts to write the chemistry textbooks and programs in close conformity with the contemporary knowledge. The scientific studies on the teaching methods are also recently performed. These studies and the writing of teaching methods textbooks have greatly improved the scientific and methodological features of chemistry.

Keywords: chemistry, chemistry textbook, chemistry programs, pre-university schools, original chemistry textbook, stage, tradition, social-economic development, efforts, scientific studies.

AJNTS No. 12, 2002**STUDY FOR THE EVALUATION OF THE SERODIAGNOSTIC
METHODS OF SYPHILIS****Minella PAPAJORGJI,**

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ABSTRACT

For the period 1973-1995, there is not a single diagnostified case with syphilis in Albania, though serologic actions were carried out on regular bases. During the period of 1995-2000 are examined 72.000 serums for syphilis and are diagnosed 102 syphilitic primary and secondary cases. In this study there are evaluated different serological methods of diagnosis of syphilis in 86 of serums of syphilitic persons: RPR, TPHA, FTA- ABS dhe ELISA. The results of the study showed up that the sensibility of those reactions was at 96.5% per RPR, 100% per TPHA and FTA-ABS and 90.7% per ELISA.

Keywords: evaluation, RPR, TPHA, FTA-ABS, ELISA, syphilis, diagnosis, diseases.

**ISOLATION OF SALMONELLAS SPP. IN STOOL SAMPLES
AND THEIR SUSCEPTIBILITY TO DIFFERENT ANTIBIOTICS****Linda FUGA**Microbiological Service, University Hospital Centre "Mother Theresa",
Faculty of Medicine, Tirana, Albania**ABSTRACT**

The author presents the obtained results concerning the isolation and identification of *Salmonellas* in stool samples collected in Tirana City during a six months period (January 1996-June 1996). All the examinations were performed at the Microbiological Service of HUCT. The obtained results are confirmed at the EijkmanWinkler Institute AZU, Utrecht, NL as well. Microbiological findings indicate that *S. typhimurium* and *S. enteritidis* constitute the mainly isolated agents. The presence of *Salmonellas* was detected in all the fifty-eight examined strains. *S. typhimurium* was isolated in 77.6 % of the examined cases and *S. enteritidis* in 22.4 % of the total cases. The results of susceptibility testing of isolated salmonellas to different antibiotics are represented, too.

Keywords: Salmonellosis, Epidemiology, Biochemical Test, Susceptibility Test.

COMPARISON OF THRESHOLD VALUES OF SOME TESTS IN SEROLOGICAL DIAGNOSES OF BRUCELLOSIS IN CATTLE

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ABSTRACT

The capability of ELISA test is compared with traditional tests used, such as SAT, CFT, MRT compared with CFT. Their values are tested to stabilize the concordance between them. We used the threshold values for the diagnosis of brucellosis in the cattle of Kamza area. Milk and blood samples of 144 dairy cows were analysed. The two by two table confirmed ELISA-S - M (sp 98% and 99% respectively) are useful for detecting of brucellosis in the cattle farms. There were excellent concordances between ELISA-S - M compared with CFT. They can be "alert instruments" in surveillance of brucellosis in cattle farms.

Keywords: cattle, brucellosis, serological tests, concordance.

ANTIGEN PRODUCTION FOR DIAGNOSIS OF MAEDI-VISNAE DISEASE IN SHEEP

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ABSTRACT

Maedi-Visnae is a member of the lentivirus sub-family of the family Retroviridae. The disease has a very long incubation period and the onset of clinical signs is insidious. Introduction of virus in organism is followed by the infection of antigen presenting cells. On the basis of what is known about the distribution of this disease, its insidious character, and economic damage it is very important to produce diagnostic antibodies for Maedi. For this we have used the cell line LCP and the appropriate strain that produces Maedi antigen. Antigen standardisation was done by comparison to a standart antigen. On the basis of our results we can say that the antigen we have produced is of good quality, effectivity, and useful to be used by specialised laboratories for diagnostification of Maedi-Visnae disease.

Keywords: Maedi-Visna, cell line, agar-gel, ID (immunodifusion), precipitation line.

ASSOCIATIONS BETWEEN XRD ANALYSIS AND RHEOLOGICAL PROPERTIES OF WASHING CLAYS OF PRRENJAS

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ABSTRACT

The study brings to light distinctive characteristics of the structural level of clays in the area of Prrenjas, district of Librazhd, Albania, which are used as washing solutions in the oil industry. Their bentonite composition unified with the methylene-blue method is approximately 5.9%. The activation with Na_2CO_3 and NaOH shows that their rheology is comparatively developed with several imported clays (*Aquagel* and *Bulgarian*), which are some of the best of the international market. This result is supported by the strong association and correlation between XRD, DTA&DTgA and CEC results of the representative samples of the argil phase of Prrenjas clays with the imported ones.

Keywords: XRD and DTA analysis, montmorillonite, bentonite, rheology, significant similarity, particle-size, Cation Exchange Capacity.

BIOMETRICAL ANALYSES OF THE POPULATION OF TAPES DECUSSATUS (L, 1758) (MOLLUSCA: BIVALVIA: VENERIDAE) IN THE COASTAL LAGOON OF VILUNI

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ABSTRACT

In this paper there are presented the results of biometrics analyses of the population of *Tapes decussatus* (L, 1758) in Viluni Lagoon. Dimensional variable height is found to have a normal distribution, while length and width show a deviation from normal distribution. There are also derived the functional relations among these three parameters. An hypothesis has been put forth to explain the lack of morphometrical uniformity of this population in Viluni Lagoon.

There are also presented some theoretical considerations of relationships between fishing incidence and morphology of individuals, which show an applicative interest in fishing aspect of this species.

Keywords: Mollusk, *Tapes decussatus*, Viluni Lagoon, Biometry

THE EFFECT OF HEATING ON THE LIPID PEROXIDATION ACTIVITY OF MYOGLOBIN DURING THE REACTION WITH TRIGLYCERIDES AND POLAR LIPIDS IN THE MODELS AND MEAT SYSTEMS

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ABSTRACT

Solutions of the myoglobin were heated at 74 or 100°C for 30 min, some samples were frozen at -30°C and reheated under the same conditions. Heated myoglobin solutions were incubated with pure triolein or phosphatidylcholine-dilinoleyl and the hydroperoxide formation and prooxidant activity of the heated myoglobin on triglycerides and polar lipids were assessed.

Apart from this, heated myoglobin was incubated with triglycerides or polar lipid classes extracted from meat and the prooxidant activity of the heated myoglobin was assessed similarly to the pure lipids. For all the experimental sets, hydroperoxide formation was assessed fluorometrically along with the thiobarbituric reactive substances (TBA) formation as an indicator of the overall lipid oxidation.

To study the role of the heating temperature the meat samples were cooked at 74 or 100°C for 30 min. Similar to the cooking and storage of meat, some cooked samples were frozen overnight at -30°C and recooked under the same conditions. The hydroperoxide formation for phospholipids and triglyceride classes was assessed fluorometrically.

Hydroperoxide generation and TBA values for the incubation of the pure lipids with heated myoglobin suggested for a higher susceptibility of phosphatidylcholine-dilinoleyl compared with triolein. The same phenomenon was observed for the incubation of the heated myoglobin with polar lipids or triglycerides extracted from the meat resulted. However, the difference in the hydroperoxide and TBA formation between polar lipids and triglyceride classes was less sharp compared with pure lipids caused from the reduction of the hydroperoxide formation and TBA values for the polar lipids.

Increasing of the cooking temperature of meat aided the triglyceride hydroperoxide formation along with the decrease of the polar lipids hydroperoxide. The fluorescence-HPLC definitely exhibited the discrepancy in oxidative susceptibility of meat lipids between triglycerides and phospholipids.

Keywords: Phospholipids, triglycerides, heat denaturation of myoglobin, fluorescence, TBA values.

HYDROLOGICAL FORECASTING ON THE MATI RIVER BASIN**Koço GJOKA**

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ABSTRACT

The prediction of the discharge hydrographic from the precipitations and computation of flood routing on the catchments of cascades in Albania is treated using the mathematical model of unit hydrograph and Muskingung Method. The purpose of the forecast is to predict - the peak discharge of the Mati river stations and also to predict - the flood water stage in each of reservoirs of the Mati river.

The methods of forecasting in different regions of the drainage basins mainly comprise two parts: the computation of the effective rainfall amount and the computation of the flow concentration. Many examples for the short-term forecasts on basins of Mati River are given. The results of the predicted discharge hydrographic have been satisfied.

Keywords. Hydrological Forecasting, Discharge Hydrographic, Rainfall, and Flood Characteristics, flow

ASSESSMENT OF ATMOSPHERIC POLLUTION FROM HEAVY METALS IN TIRANA CITY, BY CHEMICAL ANALYSIS OF SETTLED DUST**Raimonda TOTONI**Department of Chemistry
Polytechnic University of Tirana, Albania**Alqi CULLAJ**Department of Chemistry, Faculty of Natural Sciences
University of Tirana, Albania**ABSTRACT**

Settled dust are known as significant source of heavy metals and other toxic substances. 18 dust samples taken in 12 street stations and 6 houses situated in various zones of different traffic and urbanisation level in Tirana city were analysing for content of 8 metals using two extraction procedures: "strong extraction" by aqua regia and "soft extraction" by 0.43M CH₃ COOH. The level of most heavy metals analysis results lower than those reported for other developed country, but a significant correlation exists between heavy metal content and traffic intensity in sampling sites. Despite relatively low metal concentration in dust analysed samples, the huge amount

of settled dust in Tirana city may constitute a potential source of heavy metals and other toxic compounds exposure.

Keywords: settle dust, particulate matter, heavy metals, air quality.

MASS MOVEMENT AND HAZARD ASSESSMENT IN SOUTH OF KUKESI REGION, ALBANIA

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ABSTRACT

This paper briefly describes the soils and rocks mass movement phenomenon and hazard assessment occurred in the north- eastern part of Albania (12 km in south of Kukesi town). It has played an important role in geomorphological shape on this area and both active and inactive landslides are common on most of the landscape. Several factors affect the soils and rocks stability among which are rainstorms, streams erosion, steep slope, high weathered bedrocks, disforestation and geology. The number of active landslides is increased dramatically after 1980 year. Widespread landslides along streams banks, hills and mountains slopes is often attributed to the rainstorms.

Keywords: Mass movement, debris slide, rock fall, rocks rolling, weathering crust, rainstorm, slope erosion, steep slope.

GEOCHEMICAL FEATURES OF GASHI ZONE PALAEOZOIC MAGMATISM.

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ABSTRACT

Magmatic rocks of Gashi zone (North-eastern Albania) are represented by volcanic rocks (basalts to rhyolites) included in sedimentary- volcanic and volcanic-sedimentary sequences and by plutonic, granodioritic rocks. Plutonic massif of Trokuzi is composed mainly by granodiorites. Plagiogranites, granites and gabbros are rare. The aim of this paper is to point out the main geochemical features of this Palaeozoic magmatism, based on the 25 new X-ray spectrometry analyses of granodioritic rocks and a review of the previous analysis of the volcanic rocks.

The Rb, Sr, Zr and Y, distributions show typical features of within plates magmatism. An acid magma generation in the Silurian - Permian continental plate is in accord with these geochemical data.

The geochemical maps of trace elements indicate a small but significant variation of their contents in the massif's surface. A Rb, Zr anomaly correlated with the anomalies of Rb/Sr and Zr/Y ratios seems to indicate an eastern extension of the massif.

Keywords: Geochemistry, trace elements, within plate magmatism, Palaeozoic magmatism.

COMBINING NUMERICAL AND EXPERIMENTAL SIMULATIONS OF HYDRAULIC PHENOMENA FOR THE STUDY OF A HARBOUR DESIGN

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ABSTRACT

The designers of hydraulic harbour development schemes were quick to realise the importance of simulating phenomena that could not be handled by purely theoretical approaches.

Early simulations involved the use of scale models only. More recently, development of computer technology and the great strides made in numerical computation methods have given rise to mathematical models. The Centre of Hydraulic Research has a good experience for studying maritime hydraulic phenomena by combining numerical and experimental simulations; today, these complementary scientific methods and facilities are combined to ensure increasingly effective study and design of a harbour [1].

Keywords: Semi-natural harbour, effective fetch length, hydraulic model tests, breakwater, wave crest, wave refraction diagram, wave orthogonal, wave diffraction, wharf, port-harbour, coast, shoreline, offshore, shallow water, deep water.

LTA (LEARNING MANAGEMENT SYSTEMS) TRANSFER AGENT) NEW TOOL FOR HETEROGENOUS ENVIRONMENTS

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ABSTRACT

The purpose of this paper is to trace the origin and development of LTA (Learning Management System Transfer Agent), showing in the process that an N-tiered client server model is viable. That this is true in a rapidly maturing, standards-based industry such as the LMS marketplace is additional evidence that the approach is sound. When an application is created, its justification must be to provide functionality which extends the portability and/or makes the job of those who must implement it easier. LTA does both.

Keywords: Learning Management System Transfer Agent.

AJNTS No. 13, 2003**DEVELOPMENT OF HIGH QUALITY PLANT PROPAGATION
MATERIAL FOR COMMERCIAL USES****Nikos LEVENTAKIS**Department of R & D, VITRO HELLAS S. A.,
NISELI ALEXANDRIAS, GREECE**ABSTRACT**

Specific and stable genetic composition, as well as absence of certain pathogens, usually imposed by local or European legislation, are the fundamental quality features for any plant material to be traded in developed agricultural markets. Products meeting the above standards are labelled and merchandised as "certified", being the current tendency in most modern markets. Material propagated through vegetative processes, such as the *in vitro* ones, is certainly free of any fungal or bacterial diseases and thus virus infections are the prominent issue aiming to meeting the above requirements. Well-organized mother plantations and nurseries, economical and effective virus detection protocols and efficient marketing strategies, are the keys to successful production, maintenance and trade of such material. Four main steps are followed by VITRO HELLAS S. A., which is a Greek private company involved in production and commercialisation of plant propagation material using mainly *in vitro* procedures, for the development of a new product. These steps have been followed for the introduction of a new garlic (*Al-lium sativum* L.) clone. Variation or absence of legislation related to commercial distribution of plant propagation material, even among EU countries, is a main problem related with the trade of these products. Lack of legal determination for technical protocols to be followed for auditing, acceptance and further registration in National Registers of Clones and Cultivars and respective lack of provision of commercial variety rights, for certain plant species with economic interest, is a problem to be overcome in Greece and other developing European countries.

**ESTIMATION OF SOME MICROPROPAGATION METHODS FOR
THE INTRODUCTION OF KIWIPANT (*ACTINIDIA* SPP.) IN
ALBANIA****Efigjeni KONGJIKA, Elvira ÇAUSHI, Blerta PREÇI, Zhaneta ZEKA**

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Andrea ÇEKONational Enterprise of Seeds and Samplings, Ministry of Agriculture and
Food, Tirana, Albania**Nikos LEVENTAKIS, Katerina GRIGORIADOU,
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ABSTRACT

It is well-known that certain difficulties exist in the propagation of the kiwiplant by conventional means. As a dioecious plant, kiwiplant can propagate by vegetative

propagation as an advantageous way. The aim of this work is to study the regulation of organogenesis by the balance of different plant growth regulators. Different initial explants such as petioles, internodes, stem tips and buds of *Actinidia deliciosa* var. Hayward and male clone Tomuri plants were used. These explants were excised from various parts of juvenile and adult branches. MS nutrient media with different plant growth regulators (cytokinins zeatin, BAP; auxins IAA, NAA and IBA; gibberellin GA₃) were used in the different stages of the organogenesis. Juvenile pieces of petioles are the most suitable explants to produce a great number of plantlets. The presence of the growth regulators in nutrient medium in the ratio zeatin/IAA 1:0.025 during the stage of callogenesis led to further formation of meristemoids and buds. The elongation of formed buds on a fresh medium with BAP 2 mg l⁻¹ is followed by the subculturing of all pieces of plantlets such as leaves, stem tips, axillary buds in the presence of zeatin 0.5 mg l⁻¹ and IAA 0.025 mg P. The preliminary treatment of plantlets with IBA and the simple medium without phytohormones, but with activated charcoal has induced a successful rhizogenesis. The "light climate" (darkening of the medium) of the culture changes and as result the root formation and growth can be modified. On the other hand, the presence of BAP 1 mg l⁻¹ and NAA 0.1 mg l⁻¹ in the culture of meristems, stem tips and axillary buds was essential for bud formation, while in the rooting stage these plantlets require the presence of IBA and GA₃ in the medium. The subculturing of the plantlets led to the production of a great number of plants in a short time. The data of our experiments show that the micropropagation results a suitable method to introduce in a large scale the kiwifruit plants in Albania.

Keywords: Kiwiplant, micropropagation, direct and indirect organogenesis, phytohormones

SOME CONSIDERATIONS ON KIWIPANT INTRODUCTION AT THE CENTRAL REGION OF ALBANIA

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ABSTRACT

The cultivation of kiwiplants in Albania is almost unknown, but Albania as a Mediterranean country has very favourable climate for the introduction of kiwiplants. The aims of this work is the study of the possibility of the introduction of kiwiplants in Albania through the study of the agro-ecological potentials, and of the compatibility

between the biological requests of the kiwiplants and ecological conditions of the Central Region of Albania. The second goal is the study of comparable tests on the best cultivars, which will serve also to demonstration aims for potential profits of Albanian farmers. From experimental data in three different districts of Central Zone, it is result that the Central Mediterranean Albania has optimal conditions for kiwiplant cultivation, especially at alluvional soils near the rivers. The variety Hayward and the male clone Tomuri, had a different development in the three areas chosen as experimental points. The biometric and physiological indicators, especially those which have to do with photosynthesis, showed that plants grown in Fier and Tirana had a better development than the ones grown in Elbasan where the soil (subclay composition) does not help a better development. The experimental areas should be wider in order to help the farmers understand that kiwiplants can be planted successfully in normal conditions in Central Albania.

DEVELOPMENT OF *IN VITRO* COMMERCIAL METHODS FOR THE PRODUCTION OF NURSERY PLANT MATERIAL, USING HIGH-TECH EQUIPMENT

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ABSTRACT

Micropropagation is an extremely labor-intensive method with over 65% of the expenses attributable to labor. It has been estimated that automation of the procedure can lower the cost. The use of liquid medium for *in vitro* culture has many advantages and is considered an ideal technique for mass production because it reduces handling and provides the possibility of automation. Many companies involved in micropropagation industry have developed different systems suitable for industrial production and research. LifeReactor®, a bioreactor system produced by Osmotek Ltd Israel, is a system that can be used for multiplication of organogenic cultures such as nodules, meristem clumps or compact shoot clusters as well as the culture of somatic embryos, bulblets, corms and microtubers in liquid medium. This system has been used in the laboratory of VITRO HELLAS S.A. for the production of potato microtubers and *Lagestroemia indica* microshoots.

PRODUCTION OF DISEASES - FREE PLANTS OF CARNATION BY THE MERISTEM CULTURE

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ABSTRACT

The experimental data of meristem culture of carnation are presented in this paper. Development of different types of explants (meristems without primordia and with 1 and 2 primordia) are studied. The influence of the season of explants isolation is also studied. The histological analysed of the direct organogenesis of carnation meristem have shown three developmental stages. The nutrient medium MS with phytohormones

auxin NAA 0.1mg l^{-1} and gibberellic acid GA_3 0.1mg l^{-1} is optimal for the meristem development in the first stage. The presence of the phytohormones in the medium is not necessary in the second stage. From experimental data it results that the meristems with for 2 primordia have the best development, while the men stems without primordia did not develop. The optimal season is the spring. The involvement of the subculturing has increased the number of plantlets.

Keywords: carnation meristem, phytohormones, histological analyses, direct organogenesis

PRELIMINARY DATA ON PRODUCTION OF VIRUS-FREE POTATOES PLANT BY MERISTEM CULTURE

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ABSTRACT

The classical system of seed potato production in Albania is very slow, expensive and with the risk of virus degeneration of sowing materials. The aim of this study is the use of meristem culture combined with the micropropagation for the sanitation of seed potato tubers and for the production of large quantity of sowing materials. Potato tubers cv Liseta were used as initial plant material. Tubers were forced to sprout by preliminary treatment with GA_3 2 ppm during 10 min. and were stored 20 days under 25°C with photoperiod 18/24 hours. Apical shoot meristems without primordia and with 1 or 2 primordial leaves, dissected from sprouted buds were inoculated in nutrient medium MS supplemented with calcium pantothenate 2 ppm, GA_3 0.25 ppm. Single node cuttings with 2 leaves were excised from small "in vitro" plantlets and were used in the subculture in MS medium with higher content of agar. The phytosanitary control of new plantlets and minitubers was performed by method of imaging of induced fluorescence. From experimental data, it is evident that the preliminary treatment with GA_3 and optimal photoperiod prepares the meristems for faster growth, development and differentiation in culture "in vitro". The most optimal period of meristem isolation is the spring, the end of bud dormancy. The presence of gibberellin GA in nutrient medium MS promotes meristem growth and the formation of rooted plantlets during 4-6 weeks. The combination of meristem culture with the micropropagation leads to the production of a great number of plantlets. From preliminary data of phytosanitary control of the leaves of plantlets "in vitro" and minitubers using the imagings of induced fluorescence and the imagings of fluorescence ratio resulted the absence of the change in blue and green bands related to detection of virus presence in plant tissue.

Keyword: micropropagation, minitubers, phytosanitary control, meristem, gerinplasin, phytolzonnone

MORPHOGENESIS AND HISTOGENESIS OF WALNUT (*JUGLANS REGIA* L.) CULTIVATED "IN VITRO"

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ABSTRACT

Walnut (*Juglans regia* L.) grown in Albania is a species endangered by diseases and a number of negative anthropological factors.

The development of the zygotic embryos of walnut is a powerful tool for the clonal propagation.

The best results for shoot induction, were obtained by zygotic embryos of walnut with cotyledon parts treated two times with HgCl_2 , planted in MS basal medium supplemented with phytohormones, BAP, zeatin, or BAP and IAA, of two Albanian populations of walnuts

Growth index, leaves index and micropropagation level were measured with the aim investigating the stimulation of morphogenesis and histogenesis of walnut explants in different levels of development.

Keywords: histogenesis, zygotic embryos, phytohormone, parenchymatic cell, somatic embryogenesis

PRELIMINARY DATA ON THE REHABILITATION OF MEDITERRANEAN FOREST ECOSYSTEMS, USING "IN VITRO" CULTURE TECHNIQUES FOR THE PRODUCTION OF FOREST SEEDLINGS

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ABSTRACT

In recent years, oak forests in Albania were damaged from human impact (random use of forests, intense agricultural activity many years ago etc). This situation lead to the destruction of ecological equilibrium, low productivity, making impossible the natural rehabilitation, creating the-premise for a long degradation and a irreversible changes.

The rehabilitation of degraded forests requires the use of efficient methods of seedlings production. Clonal propagation of the select strains is a useful method of accelerating clonal production and the improvement of oak trees. Our preliminary experiments aimed the comparison of different methods of micropropagation and embryo culture in order to produce oak seedlings in a great number and in a short time. Another objective is the study of the effect of temperature, light and humidity on seed germination.

MICROPROPAGATION AND GERMPLASM CONSERVATION OF SPONTANEOUS PLANT SPECIES (*RAMONDA SERBICA* AND *RAMONDA NATHALIAE*)

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ABSTRACT

In this paper, the data of micropropagation method used for two Balkanic species of European Gesneriads of the genus *Ramonda* (*Raiiioiida serbica* Panç. and *Ramonda nathaliae* Panq. & Petrov.) are presented. Two nutrient media were used to germinate the seeds of *Ranionda serbica* plants from six ori^ginal Albanian stands and the seeds of *Ramonda iicitlialiae* plants from the Mountain Matka near Skopije. The phytohorm one- free nutrient basal medium JG-B, poorer in salts comparing to MS medium, proved to be the most successful for seed germination. The use of the cytokinin 6-benzylaminopurine (BAP) affects the organogenesis of ramonda plants. Rapid promotion of axillary bud formation and the development of shoot bundles observed in the variants with JG-B medium supplemented with BAP at high level (1 mg l⁻¹) and especially in the medium with the combination of BAP and auxin IAA (0.5 mg l⁻¹ each). The pieces of the leaves in the juvenile stage were inoculated in MS medium supplemented with auxin (IAA and NAA) and cytokinins (BAP and Kinetin) in different combinations. Indirect organogenesis with the involvement of callogenesis stage are observed especially in the variant with NAA 10⁻⁵ M and BAP-⁵ 10 M. The formation of meristemoids derived from cell proliferation and differentiation of callus surface is followed by the regeneration of organs. The initiation of callus, formation of meristemoids and adventitious organs for two *Ramonda* species are very similar models. The method of minimal growth storage of the plants from different stands is the bases of the creation of a gene bank "in vitro" for two ramonda species. A simple phytohormone-free nitrate medium JG-B, normal temperature and light levels are used successfully for germplasm conservation of ramonda plants. The data from our experiments will permit us to evaluate the possibility for the improvement of decorative values by intergeneric hybridization within European Gesneriads.

Keywords: *Ramonda. serbica* Panq., *Reunoneki nathaliae* Panq. & Petrov, micropropagation, JG-B medium, NIS medium, callogenesis, germplasrn conservation, minimal growth method.

**IN VITRO CULTURE OF THE ANTHERS ON DIFFERENT
ALBANIAN WHEAT CULTIVARS AND LINES (*TRITICUM
AESTIVUM* L.)**

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ABSTRACT

The yield of haploid production in wheat anther culture is low. The percentage of callus formation is known to be controlled by genome of anther donor material. The objective of this study was to determinate the response of wheat cultivars in induction media. The liquid medium has increased the formation callus compared with agar-solidified medium, but the agar-solidified media P₂, P₂G have regenerated more the green plantlets. The Albanian cultivars have genotypes that responded lower then the responding cultivars. Agimi x C57, C57 x Kamza 9, Kamza 9 showed the best results.

Keywords: haploids, anther-culture, *Triticum aestivum* L.

AJNTS No. 14, 2003**AN EXPERIMENTAL FORMULA FOR PREDICTING
DRUG-INDUCED LUPUS****Eftim ADHAMI**Department of Anesthesiology, St Jude Children's Research Hospital,
Memphis, Tennessee**King-Thom CHUNG**Department of Microbiology and Molecular Cell Sciences, The University
of Memphis, Memphis, Tennessee, e-mail: kchung@memphis.edu**ABSTRACT**

Empirical evidence indicates that the drug-induced lupus (DIL) potential of a drug is a measurable intrinsic characteristic of the specific active group within the molecule of the drug. The probability of DIL appearance is proportional to the total dosage of the drug. We develop a mathematical formula that describes the relationship between the quantity of the drug taken by the patient and the probability of DIL appearance. This formula can also be used to predict the lupus-inducing potential of chemicals other than drugs.

**THE Q FEVER AT THE SHEEP: GOATS AND COWS OF OUR
COUNTRY****Mirela LIKE (ÇEKANI)**

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ABSTRACT

The infection of the Q Fever is spread with the help of the Tick *Ixodes Ricinus*. These infections, in animals cause pathology and miscarriage and fever in the persons. In this research, we have studied 1104 heads, (cows, goats and sheep) where the results of the positive cases of the infections are: for the sheep 8.85%, for the goats 8.80% and for the cows 10%. For 552 other heads the results of the infections are Sheep + goat 12.3 %, and for the cows 4.23%. The animals are studied from 18 districts of Albania. All the Serologic controls are made with the help of ELISA test, which are made for the first time in Albania. The comments and the conclusions are made as a consequence of the results.

Keyword: Q Fever, *Ixodes ricinus*, ELISA test, sheep, goat, cows, serological control, sera, infection etc.

VERIFICATION OF EXPECTED TRENDS OF ATMOSPHERIC NO₂ CONCENTRATIONS IN STREET CANYONS

- case study in Oxford City, [UK], during the summer of the year 2000

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ABSTRACT

Nitrogen dioxide is considered to be the most toxic of oxides of nitrogen (NO_x). There have been found correlations between increased NO₂ levels and increased traffic in different cities using single site exposures in street canyons. In this case study, multiple site exposures of Passive Diffusion Tubes [PDTs] were used to prove that there is a vertical and horizontal gradient of atmospheric NO₂ concentrations. Traffic reduction contributes to decreased NO₂ concentrations. Due to the spatial gradient of NO₂ concentrations multiple site exposures of PDTs should be used in order to define the critically polluted parts in cities.

Keywords: atmospheric NO₂ concentrations, spatial gradient, Passive Diffusion Tubes, multiple site exposures

PRESENCE OF VIRUS-VECTOR APHIDS SPECIES IN ALBANIA

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ABSTRACT

The experiment monitoring was done by counting the aphids in yellow trap and vegetative shoots. In order to catch the first colonies of aphids, one hundred shoots were analyzed every week. Analyzed shoots were taken randomly in experimental field. Two stick yellow chromatropic traps were put in the middle of the trees canopy. The infected shoots were put in plastic bags and were brought to the laboratory; where they were analyzed and some samples were deepened in 70 % ethyl alcohol for short time conservation. These samples were later observed under the stereomicroscope in order to identify aphid species present.

Keywords: Apterous virginopara, Alate virginopara, parthogenetic, cornicles, anholocyclic, cauda

SOME ASPECTS OF QUALITY CONTROL IN THE MEASUREMENT OF PROGESTERONE LEVELS BY RIA-METHOD

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ABSTRACT

The aim of this work to study some aspects of quality control in the procedure used for the determination of progesterone levels in human blood serum. The influence of temperature, incubation period, number of washings and radiolysis was studied in this measurement. It was found that the optimal temperature is 20-25°C, the incubation period is 2 hours, and washing steps are not needed. Due to autoradiolysis, the concentration of progesterone changes about 4% in a week. This is an important fact that must be taken into consideration during the procedure. The results obtained from this study are in accordance with clinical observations of patients.

A STOCHASTIC MODEL OF THE TUMOR GROWTH FOR DISPERSED CELLS REGIME

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ABSTRACT

A stochastic model is developed to describe the growth of a heterogeneous tumor for dispersed cells regime. The mathematical model is a quasilinear stochastic partial differential equation driven by a space-time white noise. The main feature of the model is that it takes into account random independent interactions between tumor cells, immune system cells and anticancer drugs. The existence of the weak solutions and a comparison theorem are established.

IRRIGATION WATER QUALITY IN SHKODER - LEZHË AREA

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ABSTRACT

This study estimates water quality in irrigation and drainage schemes of in Shkodër-Lezhë region. The original source of water for these schemes is the Drini River at the reservoir at Mjede. Seventeen water samples were taken on 5-th September, 1998 to represent irrigation and drainage water qualities for the schemes of this area. Samples were analysed for: pH, ECW, Ca^{++} , Mg^+ , Na^+ , K^+ , Cl^- , SO_4^- , HCO_3^- , NO_3^- , SAR and TDS. Results of chemical analysis showed that: irrigation water quality from the Drini and Mjede Canals is extremely good, with very low EC (0.3 dS/m), TDS (300 mg/l) and SAR (0.1) values. According to the FAO (1985) irrigation water classification, this water would have no problems for most parameters of salinity.

Some of the drainage water from Zadrime (Shkoder, Lezhe) and N/Shkoder fields is subsequently being reused for irrigation. Chemical analysis of these water samples again showed very good water qualities.

Also, high salinity levels observed on the lower Drini River, reflecting the degree of saline intrusion from the sea, in this part.

Keywords: irrigation, quality, salinity, infiltration, toxicity, schemes

SOME PROBLEMS ARISING DURING THE APPLICATION OF BIOCOMPOSITE BASED GLUCOSE BIOSENSOR IN REAL BLOOD SAMPLES

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ABSTRACT

The application of an amperometric biosensor for determination of glucose in real blood samples is reported. The biosensor is based on a biocomposite that is robust, polishable and easily mechanized. The biocomposite is made of graphite powder mixed with an epoxy resin and the enzyme glucose oxidase (GOD). Hydrogen peroxide produced by the enzyme reaction is oxidized electrochemically. The biosensor operates at an electrode potential of 1V (vs. Ag/AgCl in a 0.1 M phosphate buffer solution (pH=7) and 0.1M KCl. The linear response of biosensor lies between 1-5 mM of glucose concentration. The sensitivity is 0.412 ± 0.047 nA/mM being the correlation coefficient higher than 0.9982, which does not decline with time. Because of a complex matrix that characterizes the blood samples, the application of outer membranes that cover biosensors surface did not improves the biosensors response. The determination of glucose in blood samples is suggested to be performed by using calibration method based on certified samples.

Keywords: biocomposite, glucose oxidase, amperometric biosensor, glucose interferences

MONITORING AND SURVEYING OF BRUCELLOSIS IN CATTLE OF JUB-SUKTH AREA

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ABSTRACT

Brucellosis is a zoonotic infection with important effects on both public health and animal production. As a result of monitoring and surveillance of cattle brucellosis in area Jub — Sukth (1445 animals), carried out in steps with different laboratory tests, has been concluded that the disease seroprevalence is of 0.07 % (1 positive animal) and

the area has been classified as a "free conditional area". It's necessary to carry out a chain of ongoing analysis in order to take out all positive animals, as an infection source in the herd, to be led the way of healthy strategy on brucellosis infection.

Keywords: cattle, brucellosis, monitoring, surveillance, populations

MERCURY DISTRIBUTION IN SOILS, SOIL GAS AND ATMOSPHERE AROUND A CHLORINE-ALKALI FACTORY IN VLORA BAY (ALBANIA)

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ABSTRACT

For seven years, until 1993, vinyl chloride monomer, chlorine-alkali and lamps were produced at an industrial site about four kilometers from the centre of Vlora city. Mercury was used for this production. 75 samples of the atmosphere and the soil gas (in the depth of 40 cm) and 50 samples of soils/sands were taken in the surrounding area of the industrial site. The mercury content is analysed by Scintrex HGG-3 mercury spectrometer. The mercury in the atmospheric gas was below detection limit in the area, except next to the electrolyse unit of the factory where values of $2.5 \cdot 10^{-9}$ g/l Hg were recorded, consequently a high risk exists if the unit is not isolated. Mercury background concentrations in the soil gas is $< 2.5 \cdot 10^{-9}$ g/l. The anomalous values of $5 - 40 \cdot 10^{-9}$ g/l Hg are found in some sites. These sites may be considered as a medium term risk because of the eventual contamination of groundwater and plants through leaching. Some soil samples, immediately close to the chlorine alkali unit possess some tens to hundreds ppm of mercury and constitute a high risk in case these soils become wind blown or become inhaled or ingested by people. Other sites are less polluted with mercury, so some risk exists but it is considered not high, excluding the case of the use of these sites for children and play ground constructions. The site of the industrial water discharge in the sea must be isolated in a radius of at least fifty meters.

Keywords: mercury, pollution, soils, seashore sands, Vlora, Albania.

BEHAVIOUR OF UNDERGROUND CONTOUR ON THE FOUNDATION OF HYDRAULIC STRUCTURE AS A QUASI "PURE" ANTI-SEEPAGE CONSTRUCTION

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ABSTRACT

For the full underground contour, with horizontal and vertical extension on the foundation of hydraulic structure is treated only the particular of vertical anti-seepage construction, that can be a sheet pile or cut-off wall/grout curtain. Its behaviour into quasi "pure" anti-seepage construction is evaluated by means of data processing of numerical model for the seepage parameters, taking into consideration the permeability and thickness of anti-seepage construction. Analytical and approximate solutions are not completely filled and accurately in comparison with the results gained by mathematical modelling, with the exception of the cases included within the

recommendable limits. For fully penetrating and quasi "pure" anti-seepage construction the seepage parameters are processed graphically.

Keywords: underground contour, anti-seepage construction, exit hydraulic gradient, coefficient of seepage resistance, hydraulic head, permeability, thickness

A COMPARATIVE STUDY OF LAND SUBSIDENCE OF TIRANA AND KORÇA AREAS CAUSED BY INTENSIVE GROUND WATER EXTRACTION

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Albanian Geological Survey, Tirana

ABSTRACT

The land subsidence is a feature commonly related to groundwater-withdrawal sites. This process is accompanied by the compaction of aquifers and aquitards. Bear and Corapciogly (1981 a, b) have formulated one of most popular solutions to estimate the regional Subsidence due to pumping which is based on the effective stress concept introduced by Terzaghi (1925). This solution is applied for the assessment of the land subsidence in Turan well field near Korça city and in Valias well field near Tirana city. Both well fields are developed ⁱⁿ alluvial basins constituted of intercalations of gravelly aquifers and clayey layers. The estimated maximal land subsidence for the accepted pumping conditions resulted 35 cm in Turani well field and 29 cm in Valias well field.

Keywords: Land subsidence, groundwater withdrawal, aquifer drainage, aquitard drainage, vertical compressibility, horizontal displacement, aquifer and aquitard compressibility, forecast of land subsidence.

GEOPHYSICAL OUTLOOK ON STRUCTURE OF THE ALBANIDES **Alfred FRASHERI¹, Salvatore BUSHATI², Vilson BARE³**

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ABSTRACT

The structural analysis of the Albanides according to the seismological, reflection seismic, gravity, magnetic, electrical and geothermal surveys are presented in the paper. The Albanides represents the assemblage of the geological structures in the territory of Albania. Regional gravity anomalies and seismological studies results are arguments a block construction of the Earth crust, which are interrupted by a system of longitudinal fractures in NW-SE direction and transversal fractures. According to the geological-geophysical regional surveys, two major pelegogeographic domains form the Albanides: The Internal Albanides and the External Albanides. The relations between the Internal and the External Albanides have a nape character. Intensive Bouguer anomalies and turbulent magnetic field with weak anomalies is characterized ophiolitic

allochthone belt of the Internal Albanides. A joint characteristic of tectonic zones of External Albanides and their structural belt is their westward thrusting, too.

Keywords: albanides, geophysical study, bouguer anomaly, total magnetic field anomaly, heat flow density, paleomagnetic study, electrical soundings, seismic survey, and seismological studies

THE DETERMINATION OF THE CONTENT OF CAFFEINE AND PHOSPHORIC ACID IN DIFERENT NONALCHOOLIC BEVERAGES

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ABSTRACT

An evaluation of the content of caffeine and phosphoric acid in different nonalcoholic beverages is given. High-resolution spectrophotometer, Shimadzu UV – 2401 PC (UV – VIS Recording Spectrophotometer), combined with quartz cells is used for caffeine content determination. Direct determination in water solution and after chloroform extraction method is used for caffeine content determination. Both methods are characterized from high selectivity and sensitivity. The sensitivity of the method goes to 0.1 mg caffeine/L, against the content of caffeine in different beverage samples less than 350 mg/L. The content of caffeine in the beverage samples produced in Albania and imported products is located in the level of 0.017 to 0.035%, against the allowed content of 0.2%, according FAO/WHO regulation (1984).

Spectrophotometric determination of phosphoric acid after complex formation ammonium molybdate is used for beverage samples analysis. This is a specific and sensitive method for phosphoric acid content determination and sensitivity. The sensitivity of the method goes to 0.1 mg P/L, against the content of phosphoric acid, converted to phosphorus (P) content, in different beverage samples 0.02 to 0.06%. The content of phosphoric acid in the beverage samples produced in Albania and imported products is about 0.02 to 0.03%, against the allowed content of 0.02 to 0.06%, according FAO/WHO regulation (1984).

Keywords: caffeine, phosphoric acid, beverages, SF UV-VIS

THE ADVENTURES OF A NOTION: ALBANIDES

Asti PAPA

ABSTRACT

In the European geological literature until the 1960 was used the subdivision of the Dinarides (*s.l.*) at the Shkodër-Pejë Transverse Structure in two segments, the southern one was named Hellenides. Albanian geologists, taking into account that this major discontinuity in the geological structure of the Dinarides (*s.l.*) occurs within the Albanian territory, started employing the term Albanides in 1967. This term also respects the scientific priority. The notion of Albanides began gradually to take place in the geological literature, especially after the 1980. Since these years and particularly in

the 1990, the term Dinaric-AlbanoHellenic Arc was used for the denomination of the Dinarides (*s.l.*), which is more appropriate to the contemporaneous concepts of plate tectonics and also respects the scientific priority.

Keywords: Albanides, Dinarides, Dinaric-Albano-Hellenic Arc, Hellenides, Shkodër-Pejë Transverse Structure, Structural Geology, Tectonics.

AJNTS No. 15, 2004**THE STUDY OF CONDUCTIVITY MECHANISM IN THE
POLYPYRROLE-POLYANILINE COMPOSITES****Theodhor KARAJA**Department of Physics, Faculty of Natural Sciences,
University of Tirana, Albania**Partizan MALKAJ**Department of Physics, Faculty of Natural Sciences,
University of Gjirokastra, Albania**ABSTRACT**

The dc conductivity of polypyrrole-polyaniline composites was measured in the temperature range 80-300K for different aging time at 70°C in room atmosphere. The conductivity dependence with temperature follows the law $\sigma = \sigma_0 \exp [(T_0/T)^n]$, where $\alpha=1/4$, predicted by Mott's model of the variable-range hopping. The pure nonaged polyaniline $\alpha=1/2$, that's characteristic of Sheng's model and the pure nonaged polypyrrole sample follow the FIT model.

**SYNTHESIS OF NANOCRYSTALLINE FE-FEOXIDE SYSTEMS BY
MECHANICAL ATTRITION****Enio BONETTI, Luca PASQUINI**Dipartimento di Fisica, University di Bologna and Istituto Nazionale per la
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Ilia PRIFTI

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ABSTRACT

In this paper, the structural and chemical evolution of an equimolar mixture of iron and magnetite subjected to high-energy ball milling in shaker-type equipment has been studied. Samples milled for different times have been analyzed by X-ray diffraction and Differential Scanning Calorimetry and the results are compared with those obtained on a sample prepared by milling the same precursor mixture, in a planetary mill. The aim of this research work is to gain an insight into how the different mechanical energy transfer of the two devices may affect the synthesis process and the features of the final products. Moreover, information on the relationship between structural characteristics and thermal stability of the milled samples have been obtained.

THE PRESENT DISTRIBUTION OF THE COLEOPTERA ORDER IN ALBANIAN SEASIDE

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ABSTRACT

The distribution of *Coleoptera* species in Albanian territory has been studied since 1916 till 1968 from different Albanian and foreign scientists and expeditions. From 1968 till 1997 only some sporadic studies has been carried out and very few data are reported most of them in Albanian language. The present status on distribution and the abundance of *Coleoptera* fauna is studied through an entomological survey carried out in the period 1997-2001, in 28 collecting sites of six Albanian seaside districts. This study is reporting 408 species, 188 genera and 27 families.

Keywords: Coleoptera, specie, distribution

FIRST REPORT OF FELINE INFECTIOUS PERITONMMS (FIP) IN ALBANIA

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ABSTRACT

A cat suspected for effusive form of feline infectious peritonitis (FIP) was examined and HP was diagnosed by laboratory for the first time ever in Albania. A detailed clinical examination was performed and a number of laboratory tests were carried out. Although the case of FIP was definitively confirmed by confirmatory histopathologic examination, in addition to other tests, a RT-PCR assay was carried out in the Department of Clinical Veterinary Science, University of Bristol, UK, revealing that the virus was a type 1 feline coronavirus (FCoV).

Keywords: feline infectious peritonitis; feline coronavirus; cat; histopathology; electrophoresis

GENETIC PARAMETERS ON CROSSING IN PIGS BRED**Dr. Fidel GJURGI**Department of Animal Production, Agricultural University of Tirana,
Albania**ABSTRACT**

Genetic improvement of sow prolificacy is a major way to increase the economic efficiency of pig production in the near future. Different ways are now available to achieve this goal; among them, the valorization of the exceptional reproductive abilities of some pig breeds is likely to provide the largest improvement in sow annual productivity.

On the evaluation of genetic parameters on crossing of LWxDu the reproduction indexes, which are represented by 7 variables, are studied and production indexes are represented by two variables are also studied. For that the mix model (Henderson, 1984) is used as follows: $Y=Xb+Zu+e$.

On the basis of that model the influence of genetically and environmental effects are determined. According to this evaluation we can do the determination of main research areas in animal breeding work in pigs.

Keywords: pigs, crossing, parameters, and traits, breeding.

METASTATIC PULMONARY DISEASE**Jul BUSHATI, Jeta BELL, Natasha THANASI**

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ABSTRACT

One hundred and ninety-eight cases (104 males and 94 females) of metastatic pulmonary disease were studied. The disease originated from prostate carcinoma in the oldest mean age group (61 ± 8.4 years) and from fibrosarcoma in the youngest group (23.5 ± 9.1 years).

Most metastases originated from tumors of the genital tract (21 gastrointestinal (13.6%) and sarcoma (10%)), with 1% from the lungs and an unknown origin in 29.3% of cases. Lesions were bilateral in 125 (63.1%) cases, right sided in 20.2% and left-sided in 16.7%. Radiological ly-detected lesions were multiple in 144 (72.7%) cases, solitary in 33 (16.7%) and cavitated in 3 (1.5%) cases, while in 21 cases (10.6%) only pleural effusion was present (with concomitant pleuritic in another 21 cases). Reticulonodular and rounded opacities predominated. In most cases, there was a combination of various opacities, localized mostly in the lower zones.

Keywords: secondary lung cancer; metastatic lung cancer; lung methstases; metastatic malignancy

THE MORPHOPALYNOLOGY OF GYMNOSPERMIUM SHQIPËTARUM PAP.&QOSJA AND ITS FLORISTIC CONNECTION WITH THE OTHER SPECIES OF GENRE GYMNOSPERMIUM

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Gëzim KAPEDANI

University of Elbasan "Aleksandër Xhuvani", Department of Biology

ABSTARCT

It's presented the pollen morphological analysis of a relic endemic plant of Albania - *Gymnospermium shqipëtarum* Pap. & Qosja. At the same time it's given the relationship between the different species of Gymnospenium.

EXTRACTION OF MONTAN WAX WITH BENZENE AND METHANOL

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ABSTRACT

Crude Montan wax was leached out of a Albanian low-rank coal by a 50:50 vol. % mixture of benzene and methanol. An extraction yield of 35.5 % with respect to the available wax or 2.25 % with respect to the extracted coal was reached after 143 min. The wax production was well described by a kinetics with two consecutive steps. and the extraction column behaved as an ideal plug-flow chemical reactor.

Keywords: low-rank coal, Montan wax, extraction kinetics

CLIMATE VARIABILITY OVER PRESIPA ZONE AND THE EXPECTED CHANGE

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ABSTRACT

Prespa lakes, with a catchments area densely populated, are supporting an evident human pressure. The expected climate change will affect both the natural and man-made environment. The climate change scenario leads to an annual increase in temperature up to 1.8°C and to 3.6°C respectively by 2050 and 2100 related to 1990. The decrease in precipitation is expected to reach to -6% and -12.5% respectively by 2050 and 2100 related to baseline. Severe summers with high temperatures (up to 4.1°C) and low precipitation (up to -27%) are expected to meet over the territory that may cause negative or positive impacts.

Keywords: anomalies of temperature and precipitation, climate variability, climate scenario, GCM

INFLUENCE OF DIFFERENT ROOTSTOCKS ON THE YIELD AND QUALITY PARAMETERS OF CUCUMBERS GROWN UNDER GREENHOUSES

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ABSTRACT

Grafting is one of the most promising techniques used for the substitution of the pesticides for the soil disinfecting. If it is compared with the others, such as soilless culture, it is an environmentally friendly technique. There are many advantages in the case of important resistant rootstocks when there are problems in the soil with pathogens especially nematodes and vascular fungi. Being as routine method in developed countries, in order to avoid soil diseases and nematodes, it is considered as new technique in our country and the researchers are working hard to get results in Albanian conditions. It is used in many vegetable crops as watermelon, tomato, eggplant, pepper and cucumber too. Knowing that the Methyl Bromide it will be forbidden to use after 2005, it is one more reason to get alternative ways for the farmers. Four different rootstocks as the CMC (*Cucurbita maxima* x *Cucurbita moschata*), Squash (*Cucurbita pepo*), Gourd Black Seed (G.B.S) (*Cucurbita maxima*) and a selection of *Cucurbita ficifolia* (C.F.) and Diana F, hybrid cucumber, obtained in the Vegetables and Potato Research Institute, as a scion were tested. A control treatment, non-grafted cucumber was included, too. The grafting was done at the nursery of Vegetables and Potato Research Institute with the same system used for the other vegetables. Grafting reduce precocity, but the total yield increased significantly. The highest total yield was realized from CMC, which was 29% higher than non-grafted ones. The plants grafted with the other rootstocks, gave higher yields, than non-grafted ones, too (10-15%). Grafting didn't influence quality characteristics; the taste, size and shape of the fruit were similar for the different rootstocks and control.

Keywords: rootstock, grafting, cucumber, nematodes, vascular fungi

OIL AND GAS PERSPECTIVE OF THE TIRANA - PATOK REGION: A COMPARATIVE STUDY OF LAND SUBSIDENCE OF TIRANA AND KORÇA AREAS CAUSED BY INTENSIVE GROUND WATER EXTRACTION

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ABSTRACT

The important conclusions about the stratigraphy of the carbonate section such as the identification of the carbonate deep water sediments in the western part of Kruja zone (Ishem structure) as well as the presence there of the Paleocene —Eocene limestones, set in the normal stratigraphic relations between them, are provided by the carried out microfacial analyses. The new data on the Middle Oligocene up to the Aquitanian

flysch deposits [Ishem— 8 well] helped evidently on the interpretation of the anticline carbonate structures into the depth. The evident developing differences from one to another structures there exist in the Kruja zone, based on the palaeographical investigations. It's reached to the conclusion that the westernmost structures [Rinas — Gjurice one] represent a linear anticline with the tectonic and lithologo — stratigraphic characteristics similar to those of the Ionian zone.

Keywords: geological structure, seismic data, biostratigraphy, Rinas — Gjurice structure, Tirana — Patok region

COMBINE USE OF CITY REFUTES WITH FERTILIZER FOR MAIZE FERTILIZATION

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INTRODUCTION

The abolition of city remains is necessary for the people. We can elaborate them chemically and biologically, transforming them in organic materials utile for agriculture to use as fertilizer. "Refutes"(the name used) serves not only to add the organic elements in land, but as a nourishment for the plants, too. The purpose of this scientific research is to test the result of "refutes" of organic thresh of city, in increase of the maize production and improving of agriculture land feature. This is made possible exploiting the good results of the other countries (Italy - Bari).

Keywords: agriculture, environment, industry, trade, economic growth

THE IMPROVING PRODUCTIVITY OF DEGRADED FORESTS IN THE MAJA E ZEZË ZEPE MOUNTAINS OF KUKES REGION

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ABSTRACT

The mountains of north Albania are among the most densely forested and biologically diverse regions in the Mediterranean Basin. However, clear-cutting, overgrazing, and uncontrolled fires have degraded high forests of this region. This study identifies the key factors influencing forest growth and proposes strategies for increasing production of degraded forests in the region. Forest associations are strongly dependent on elevation with *Quercus*, *Pinus nigra*, and *Castanea sativa* occurring below 1500 m and *Abies alba* and *Fagus sylvatica* above 1500 m. Based on regression analysis, the dominant soil-site variables influencing tree growth are the percentages of stones on the surface and very fine sand in the topsoil, solum thickness, and steepness of slope. Rehabilitation of degraded sites should focus on differences in elevation (climatic) and soil-site requirements of the different species. Experiments should be initiated whereby specific soil-site factors (e.g., stones on the surface) are manipulated to improve tree growth. Oak (*Quercus* spp.) coppice comprises 28% of the area and offers the most potential for timber stand improvement.

NUMERICAL INVESTIGATIONS OF THE CAVITATION PHENOMENON IN THE HOLES OF THE DIESEL INJECTOR

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ABSTRACT

A numerical investigation has been carried out to highlight the effects of the hole shape in the generation of the spray, in high pressure diesel nozzles for automotive applications. In particular the effect of the cylindrical and non-cylindrical hole geometry on spray characteristics has been investigated in order to understand the relationship between nozzles geometry and in nozzle flow features. The numerical investigation has been run with the CFD code Fluent 5.5 for different hole shapes (convergent conical, divergent conical and cylindrical) at different fuel injection pressures. The investigated working conditions were pressure (between 20 MPa and 140 MPa) and 50µm needle lift. In the CI-D simulations the pressure contours, the flux line, velocity vectors and the mass flow rate of the fuel inside the nozzle have been studied.

Keywords: Computational Fluid Dynamics (CFD), fluent 5.5, volume fraction, mesh

Quantification of present - days tectonics of Albania

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Keywords: seismology; Continuous GPS network, dense GPS network, geodesy; geology, Geomorphological analysis of fluvial terraces, Coring of the Holocene SEDIMENTARY fill of the Shkodra lake, Technology Transfer, geodynamical movement

AJNTS No. 16, 2004**LOW GENETIC VARIABILITY IN THE SUMMER KORAN (*SALMO LETNICA AESTIVALIS* STEFANOVIC) OF LAKE OHRID****Iain WILSON**External Lecturer, Agricultural University of Tirana (AUT) at Kamza,
Tirana, Albania**ABSTRACT**

Three populations of the summer koran (*Salmo letnica aestivalis*) and a sample of hatchery-reared winter koran (*S. l. typicus*), two forms of a salmonid endemic to Lake Ohrid, were analysed for variation at genetic enzyme loci (allozymes). Samples were run alongside one another and alongside one individual Atlantic salmon (*S. salar*) to enable comparison of allele mobilities relative to those present in a well-studied species. In all, 31 loci were resolved. In this, the first genetic, study of different populations of the koran, one locus only (SOD-2*) was found to be variable. Overall, levels of genetic heterozygosity and polymorphism were exceptionally low for a saluonid. The allozyme pattern at GPI-P, -2* and -3* was the same as in *S. salar*.

Keywords: allozymes, *Salmo letnica*, genetic differentiation

OBTAINMENT OF ENRICHED CULTURES OF METHANOGENIC BACTERIA FROM SWINE MANURE**Mimoza STERMASI****Nevila JANA****Aleksandër PETRE**Department of Industrial Chemistry, Faculty of Natural Sciences, University
of Tirana, Albania**ABSTRACT**

Methanogenic bacteria are showing a great interest regarding their use in the anaerobic degradation of organic wastes like that of agricultural and food industry as well as urban and agricultural wastes: We are focused especially on: the determination of optimal parameters of cultivation of methanogenic bacteria; their verification; the obtainment of enriched cultures of methanogenic bacteria through the transfer techniques in the identified optimal conditions. It is concluded that the stored sample (in anaerobic conditions for 1 year) is more appropriate than the fresh one. The optimal temperature is verified as 55°C and the temperature is concluded to be a very selective parameter, which creates more favorable growing conditions in support of methanogenic bacteria versus the other species. The optimal values of pH are found to be 8.2-8.7 and the peak of their increase to be the 8th day of their cultivation. It is clear that after 5 transfers we achieve very good results in obtainment of enriched cultures of methanogenic bacteria.

Keywords: methanogenic bacteria, transfer technique, enriched culture, swine manure.

PERICULARITIES OF VARIETIES OF THE HASELNUT SPRIGS**Sylë SYLANAJ**

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Ivo MILJKOVIC

Agriculture Faculty of Zagreb Talat EFENDIJA

Anton SHALA

Agriculture Faculty of Prishtina

ABSTRACT

In this work are presented the results of the research of peculiarities of the hazelnut sprigs and leaf bud varieties of the strain Roman hazelnut (Romische Zellernuss), the Long one of Istra (Istarski dugoljasti), Hale (Halle Haselnut), White Lambert and Daviana (Duchesse of Edynburgh) in agroecological conditions of the Rrafshi i Dukagjinit.

Keywords: the peculiarities of the hazelnut sprigs and leaf bud

ANTIOXIDANT POTENTIAL OF MEDITERRANEAN PINES**Anilda GURI**

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ABSTRACT

Faavonoids occur ubiquitously in plants. Some flavonoids have attracted more attention because of their biological properties. There is growing belief that many phenolic secondary metabolites can possibly exert beneficial effects on human health. This can be attributed to a certain degree to antioxidant properties, but a wide spectrum of more specific pharmacological effects has also been proposed (Bravo, 1998). One area of studies has focused on the elucidation of the role of antioxidants and free radical scavengers in reducing the severity of degenerative diseases. Pycnogenol is a pine bark extract characterized as a powerful antioxidant. Extracted from *Pinus maritima* it contains a unique mixture of bioflavonoids. The constituents are broadly divided into monomers (+)- catechin and taxifolin and condensed flavonoids classified as procyanidins and phenolic acids. Studies indicate that Pycnogenol components are highly bioavailable. In the framework of this investigation for the determination/isolation of bioactive natural products we evaluated the antioxidant efficacy of six Pillus species (*Pinus pinea*, *Pbrutia*, *Pradaita*, *Phalepensis*, *Pattenuata*, *R nigra*) growing in natural stands in Southern Europe.

Specimens of bark and fresh needles were extracted with a variety of organic solvents and the efficient concentration and the radical scavenging efficiency of the extracts were evaluated using the chemiluminescence assay and DPPH test. Some extracts of *P. brutia* and *P. piney* showed significant levels of activity comparable to those of commercial products obtained from other Pine species.

Keywords: Pines, Pycnogenol, Antioxidants, Flavonoids and DPPH.

SOME ASPECTS OF AUTHENTICITY ASSESSMENT OF RAW MILK AND ITS TRANSMISSION INTO PASTEURIZED MILK, ROLE OF NEW METHODS

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ABSTRACT

Milk, this complex mixture, is a fellow-travel of the man since old days. The terms "quality", "safety" and "authenticity" are complement of each other. These terms are the community of different notions such as absence of impurities, absence of pathogenic microorganisms, existence of a normal number of somatic cells, absence of non original constituents. Analyzing the total quality is to evince it, throw testing, without separating from safety and nutritive value notions. In essence, keeping quality means keeping authenticity, which deals with technological interferences in addition to product originality. The final goal is to certify that the results meet the standard indices, which belong to the approved nomination of the product.

To damage the authenticity, means to intervene, to add, remove, or replace the natural constituents of an original milk, in order to defraud the consumer and produce extra profit. On the other hand technological process may damage the authenticity transmission. The goal of heat treatment is fully inactivation of pathogen microorganisms present in milk but in mean time heat treatment regimes must be strictly determined, since it leads to an alteration of constituents.

The study is done, by being supported on notions mentioned above. For this purpose, significant indices of quality, safety and chemical residues, are chosen. Approximation of procedures of examination and acceptance is essential to follow the chain from producer to the consumer. Procedures of examination have, without doubt, their importance in the process of acceptance of dairy products, on bases of the results taken, well-based on contemporary advanced standards. Methods used here, for sample examination are accurate tests, based on standard methodics of official organisms such as AOAC, ISO, IDF. These methods are implemented with the support of Land O' Lakes inc./USAID, Albania. Several equipments, which measure different constituents of milk, have gone to a complete automation. This has avoided the numerous steps which provide an raised mistake of the method. The accuracy is higher, and the time for giving the result shorter. A great development, pose methods such as ELISA (enzyme-linked immunosorbant assays) as well as quick tests based on principles of bioluminescence and fluorescence. Implementation of such methods for the first time in Albania, in the framework of developing programs, is reflection of a worldwide development. This has led to a deeper evidence of the traditional problems of quality,

dealing with chemical residues and pasteurization effect, based even on EU requirements. This study notices, that there is still problems dealing with quality, safety and authenticity in dairy. For a milk producing country such as Albania, is meaningful to make order, strengthen legal system and control in this field. This could give priority to Albanian producers and Albanian fresh products in order to satisfy the original traditional taste which Albanian consumer is used to consuming, since a long time.

Keywords: assessment, indices, cryoscopy, authenticity, safety, quality, alkaline phosphatase, added water, petrifilm, colon forming units (cfu), bioactivity, pesticides

DYNAMICS OF ANTIBODY TITERS INDUCED BY SEVERAL ANTI MYCOPLASMA AGALACTIAE VACCINATIONS

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SUMMARY

Sheep in five groups of nine heads each were vaccinated with the following vaccines: 1. Ag 1 vaccine; 2. Spanish vaccine A10H adjuvant; 3. Italian vaccine in oil adjuvant; 4. Italian vaccine in A10H adjuvant; 5. the fifth group was of controle. Antibody titers were studied in vaccinated ewes. Immunity transfers from dams to their offspring was studied, too. Italian oil adjuvant killed vaccine was proved to induce good antibody titers all through the year, where as the rest of the tested vaccines induced a 50 % antibody titers. Lambs descended from ewes of group 3 acquired better immunity (133%).

Keywords: sheep, contagious agalactia, ELISA

A REVIEW OF THE IMPACT OF NO₂ ON STONE DECAY AND THE RELATIONSHIP FOUND BETWEEN NO₂ CONCENTRATIONS AND STONE SOILING RATE IN A CASE STUDY IN OXFORD CITY

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ABSTRACT

NO₂ is only one of many possible oxidants present in the urban and rural environment which influence stone decay. Various factors influence the reactions such as stone type and its chemical reactivity, porosity and surface water, but it seems like the most important one is the presence of other oxidants, such as O₃ which stimulates

the reaction of NO_2 , in some conditions even more than the reaction of SO_2 with stone. Reaction of the stone with the gaseous compounds is accelerated at the gas-water interface by the presence of NO_x [1]. Soiling rate also shows a dependency on the traffic intensity with stones getting darker when exposed in streets with heavier traffic.

Keywords: NO_2 , stone decay, soiling rate

SOME APPLICATIONS OF A STOCHASTIC MODEL OF THE TUMOR GROWTH FOR DISPERSED CELLS REGIME

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INTRODUCTION

The "dispersed cells regime" indicates a situation where the tumor cells are not yet packed in a macroscopically observable tumor and interact with immune cells, anticancer drugs etc. (that is, when the interactions occur at a cellular level). The interest in this topic is clearly motivated by medicine for two main reasons

Firstly, at the early stages of tumor growth, when the tumor size is no more than small clumps of cells, the competition between tumor cells and immune cells (CTL cells and NK cells) can still be addressed towards the depletion of the tumor [1]

Secondly, after the curative resection of a tumor, a small quantity of residual tumor cells can stay in an organism, which can grow into secondary tumors or dormant metastases. This is a consequence of viable Tumor cells either in circulation or at local or distant sites that have metastasized prior to curative resection and which are undetectable by current radiological techniques [1,2]. Adjuvant chemotherapy entails drug treatment designed to eradicate microscopic foci of metastatic disease.

The tumor growth in dispersed cells regime is a random phenomenon. Main sources of the randomness are random independent interactions between tumor cells, effector cells and anticancer drugs, random mutations leading to increase of malignancy over time, random drug concentration within the tumor cells, random initial conditions, etc.

Resistance to chemotherapy represents a well-organized barrier to the effective treatment of cancer. Recurrent cancer and metastatic disease often results from the outgrowth of tumor cells that are resistant to chemotherapeutic agents [1,2,3]. The present paper deals with some applications of quasilinear stochastic model of the tumor growth for the dispersed cells regime and we will use (in the present paper) the same notation as in our previous paper [4]

CALIBRATION OF ETHANOL CHLOROBENZENE DOSIMETER

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ABSTRACT

For calibration of Ethanol Chlorobenzene Dosimeter (ECB) the oscillometry method combined with ionization chamber is used. The dosimeter solution is put inside the glass ampoules. The dosimeters are irradiated in the GU-3 gamma irradiator with Cs-137 , in a position where the dose rate is maximal, determined using the ionization chamber. The ECB dosimeters (four dosimeters for each dose) are irradiated with

different doses (2 kGy ÷ 46 kGy). Using the oscillatitator OK-30/2, the conductivity (meter-reading L) is measured for each irradiated dosimeter. The calibration curve, dose ÷ meter-reading (with its polynomial calibration function), is plotted. The total uncertainty of the method used is $\pm 6\%$. An intercomparison with Risoe National Laboratory (RNL) is made to verify the absorbed dose measured by our ECB dosimeters. The differences between the absorbed dose (D_a) of our ECB dosimeters, irradiated at Risoe National Laboratory, and dose measured in our institute (D_i) by using the calibration curve, $(D_a - D_i) / D_a$ is $\pm 5\%$.

Keyword: ECB dosimeters, ionization chamber, oscillatitator

POTENTIAL GROUNDWATER RESOURCES OF VJOSA WATERSHED

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ABSTRACT

Water regime of Albanian rivers is a Mediterranean typical one; about 85-90% of the annual flow belongs to the wet period and only 10-15% to the dry period. Since the flow of the wet period is mainly a result of the precipitation, having as its main characteristic the floods, the minimum discharge occurs during the dry to period, which is not influenced by the dry season precipitation. So the flow during the dry period represents the so called base flow that is the contribution of the groundwater. In this point of view the flow of the dry period is also an indicator of the underground water resource, having an hydraulic relation with the surface water.

Elaborating the records for a multi annual period, the recession curves are analyzed for all the hydrometric stations in the Vjosa river basin and the parameters of these curves are evaluated. Through this analyse is calculated the groundwater resource for the Vjosa river basin.

TOWARD A SPELLER FOR ALBANIAN LANGUAGE

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ABSTRACT

Nowadays an automatic spellchecker is a basic requirement to produce quality written text in every language. This paper addresses some of the issues encountered during developing such a tool for Albanian language. Albanian language uses a basic Latin alphabet with very few added characters. However, its linguistics features makes it different from any other language.

GEOCHEMICAL FEATURES OF THE VOLCANIC SEQUENCE OF VOSKOPOJA OPHIOLITES (SOUTHERN ALBANIA)

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ABSTRACT

The volcanic sequence of Voskopoja and Rehova ophiolite massifs in the southern Albania has been investigated. Geochemical data of lavas indicate a relatively wide range of geochemistry intermediate between typical MORB and island arc tholeiites erupted in a SSZ environment. This may indicate a geochemical variation from MORB to SSZ ophiolites, not only between the eastern and western zone, but also in a north-south direction along the main axis of the ophiolites on a regional scale.

Keywords: ophiolites, Albania, basalts, MORB, SSZ

SEISMIC SOURCE ZONES IN ALBANIA

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ABSTRACT

Albania is one of most seismically active countries in Europe. Most of strong earthquakes taking place in the country occur along such well-defined seismic belts as the Ionian-Adriatic coastal one, NW-SE extending, at the eastern margin of the Adria microplate. Two other powerful seismic belts include the Peshkopi-Korça one, N-S extending, and the Elbasani-Dibra transverse belt, SW-NE extending. Delineation of seismic source zones is a fundamental step in earthquake hazard analysis. Seismic source zones could be defined as areas that share common seismological and neotectonic attributes. The maximum magnitude for each source zone has been determined considering the size of past earthquakes and tectonic reasonableness of large earthquakes. General features of neotectonic setting and zonation as well as of active faults are given here. A revised catalogue of earthquakes of Albania for the period 58-2000, for events with $M_s \geq 4.5$ was used. Ten seismic source zones, characterizing the seismotectonic model of Albania, are distinguished.

Keywords: neotectonic structure, active faults, seismic source zones, Albania

**PETROPHYSICAL STUDY ON SOME AREAS OF MIRDITA
TECTONIC ZONE**

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ABSTRACT

The petrophysical features of the rocks and related sulphide mineralization belonging to some of the areas of the tectonic unit "Mirdita" (Albanian Ophiolites), better studied from the geological-geophysical aspect. This petrophysical study is based on the measurements of the physical parameters belonging to samples collected in the geological workings of surface and depth as well as to geophysical logging of the boreholes.

**THE STUDY OF COLLOIDAL NATURE OF SHALE BY CST
FILTRATION DEVICE**

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ABSTRACT

Laboratory and field results show that the Capillary Suction Time (CST) filtration device can be used to characterise the colloidal nature of shale particles, to determine optimal salinity for inhibition, and to analyse drilling-fluid filtrate effect on cuttings dispersion at the wellsite. The concept of potential energy developed between particles is advanced to improve the understanding of borehole stability.

AJNTS No. 17, 2005**THE POSITIVE POTENTIAL FORM OF THE TRACKER
SOLUTION AND THE "QUINTESSENCE STARS"****Mimoza HAFIZI****Halil SYKJA**

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ABSTRACT

Recently, observations seem to indicate that our universe is presently accelerating, due to the presence of a dark energy. A possible way to model this dark energy is quintessence. Here we present some discussions about the tracker solution for quintessence and suggest for the existence of its own selfgravitational configurations, quintessence stars, in analogy with the hypothesis of boson stars, developed during several decades.

Keywords: dark energy, scalar fields, stars

**ATTEMPT AT SOLVING THE INDUCTION EQUATION OF
KINEMATIC DYNAMO IN AN ANALITICAL WAY****Bejo DUKA**Department of Physics, Faculty of Natural Sciences, University of Tirana,
Albania**ABSTRACT**

Considering known the velocity field of the fluid inside a spherical shell like Earth's Outer Core, where the inner solid sphere and outer solid sphere rotate with different angular velocities, we tried to solve analytically the kinematic dynamo equation in the case when the magnetic diffusivity is neglected and when the boundary conditions for the magnetic field are known. We found an interesting result for the radial component of magnetic field that shows a possibility of reinforcement of this component. However, the found solution for the radial component is not compatible with the similar solution for the horizontal components of the magnetic field.

Keywords: spherical shell, kinematic dynamo, induction equation, magnetic field, partial differential equation, Earth's core

**AN EVALUATION AND SPECIATION OF HEAVY METALS IN
NARTA LAGOON****Alma ARAPI, Pranvera LAZO, Alqi CULLAJ**University of Tirana, Faculty of Natural Sciences,
Department of Chemistry, Tirana**ABSTRACT**

An evaluation of heavy metals and mercury content in water and sediment samples of Narta Lagoon is given. Monitoring of contaminant levels in water and sediment samples of the lagoon, as well as metal speciation procedure, was important for the evaluation of its environmental situation.

Because the use of total concentration of heavy metals is not sufficient to obtain relevant information to environmental studies aimed to evaluate the impact of anthropogenic or natural contamination sources, a three steps sequential extraction procedure, proposed by EU and known as BCR method, was applied for metal speciation studies. The state and mobility of heavy metals in sediments samples of Narta lagoon were studied. The most important species of metals present in sediments are in mobile forms and were determined after division into fractions, using appropriate chemical reagents such as:

I) acetic acid, for exchangeable metals or adsorbed to carbonates

II) hydroxyl amine hydrochloride, for metals bounded to Fe/Mn oxides

III) H_2O_2 , ammonium acetate, for metals bounded to organic matter and sulfides

Considerable levels of Mn and Cd are found to be in exchangeable form and adsorbed to carbonates. Fe, Zn, Cu, Pb are found to be bounded with Fe/Mn oxides. Ni and Cr resulted to be present in two stages A and B, or bounded with Fe/Mn oxides, sulfides and organic matter. The analyses of surface water samples conducted for this study did not identify any significant water pollution. Field parameters were also within acceptable ranges compared with international standards (APHA, AWWA, WPCF, NIVA). Total heavy metals concentration was found to be below acceptable values of international standards.

Keywords: AAS, metal speciation, heavy metals, field parameters, water, sediments, plants, background levels, normalization

CORROSION OF CARBON STEEL IN BRINE SOLUTIONS OF CRUDE OIL

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ABSTRACT

Corrosion in oil and gas production environments is not influenced by the presence of corrosive components (CO_2 , H_2S), but also by temperature and liquid flow rate. In this paper, a detailed study of the effect of temperature, and the effect of liquid flow rate on corrosion rate of carbon steel in natural brine solutions was carried out by using the weight loss method and Scanning Electron Microscopy (SEM). The corrosion coupons used throughout this investigation originated from the same carbon steel. Tests have been performed at 25°C and 60°C with and without stirring of solutions. The following conclusions can be drawn from the present work:

1. Corrosion rate increases when temperature increases from 25°C to 60°C;
2. Flow increases the corrosion rate and influences by changing the morphology of corrosion from local to uniform.

Keywords: Natural brine solutions, temperature, liquid flow velocity and inhibitor.

ON THE STATUS AND DISTRIBUTION OF THE LARGE CARNIVORES (MAMMALIA: CARNIVORA. BROWN BEAR, WOLF AND LYNX) IN ALBANIA

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ABSTRACT

This is a paper on the existing knowledge and the recent data about the status and distribution of the large carnivores (*Ursus arctos*, *Canis lupus*, and *Lynx lynx*) in Albania, based upon the last 10 years (1994-2003) field trip and work throughout the country. Each LC species is analysed separately, and for each species status, distribution, threats to and reasons for species decline are given and discussed. Some conservation measures to improve LC population are also proposed. Special attention should be paid to the Lynx, a critically endangered species in Albania, whose population is estimated at 20-25 individuals.

Keywords: large carnivores (Brown Bear, Wolf, Lynx) distribution, status, threats, and conservation measures

ANTIGENIC CHARACTERISTICS OF THE VIRUS OF THE INFLUENZA DURING THE EPIDEMIC OF 2003

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ABSTRACT

In this research, it is presented the causative agent of the epidemic of the influenza in our country during the year 2003. It also presents some of the main types of influenza, the most common ones, and also the antigenic differences that these types have gone through. For this thing we have taken in all, 45 analyses (tampon nasal- pharyngeal) from people suspected of influenza in the districts of Kuksi, Shkodra and Tirana, from people of different ages. These analyses are taken during March 2003.

To isolate the virus of influenza we have used two methods: the method of isolation of influenza in the embryo eggs of the hens and also the isolation of the virus of influenza in the cell line of MDCK. The identifications of the isolates were carried out through the reactions of the hem agglutination inhibition and also through the method of Immunofluorescence. The results of the virus analyses are given in the relevant figures. The positive isolates were sent to the International Center of Influenza in London to be confirmed and also to have a further analysis through molecular methods.

From the virus examinations during the year 2003, it came out that our country was affected by two test-tubes of influenza type A, subtype AH3N2, variant A/Egypt/ 13 0/02 and the subtype B variant B/ Hong Kong/330/01. Both of these subtypes of viruses had an antigenic difference from the previous antigenic subtypes, in the sequences of the amino acids. These variants have affected the majority of the countries in Europe and in the world.

Keyword: influenza, isolates, immunologic types, virus, analyses, acute infection, immunofluorescence, cell line etc.

MOLECULAR CHARACTERIZATION OF SALVIA OFFICINALIS AND SALVIA TRILOBA GROWN IN ALBANIA

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ABSTRACT

The Mediterranean Albania is rich in different aromatic plant species between which species of genus *Salvia* have been the most exploited during the last sixty years. Being among the aromatic plant species of high economical importance goes parallel with the fact that these species are classified as endangered. In this context a number of research activities are undertaken regarding the evaluation of all possible resources of aromatic plant species naturally grown in Albania. In the study reported here, RAPD and SSR markers were used to detect genetic polymorphisms among different albanian ecotypes of *Salvia officinalis* and *Salvia triloba*. The objectives of the present work were:

(a) to develop the RAPD and SSR analysis of *Salvia species* ecotypes using genomic DNA extracted from leaves

(b) to analyze the usefulness of the RAPD and SSR markers for the identification of polymorphism among salvia's ecotypes under study.

(c) to compare the results taken on ecotypes polymorphisms levels detected by the use of RAPD and SSR markers.

Keywords: genetic polymorphism, RAPD, SSR, ecotypes, PCR

DECORATIVE WOODY, BUSHY AND LIANA PLANTS AND THEIR ECOLOGIC VITALITY IN TWO URBAN CITIES OF KOSOVO — PRIZREN AND GJILAN

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ABSTRACT

In this paper are presented the results of researches of decorative plants in two urban cities of Kosovo with relatively change climate, respectively Prizren which is part of Dukagjin valley and Gjilan which is part of Kosovo's valley. Researches are done in vegetative periodes of plants during 2000, 2001 and 2002. There were concluded a

large number of ornamental plants taxa in two researched cities (570 taxa) which show for cultivation possibilities of this flora in urban conditions of our country. There is concluded a good ecological vitality of ornamental plants. Especially is a large number of species which are brought in last years, especially in Prizren and which are adopted very well in ecological conditions of our country.

Keywords: biology, environment

VALUATION OF THE ESCHERICHIA COLI BACTERIALE POLLUTION INDICATOR AND STAPHYLOCOCCUS UREUS PATHOGEN IN THE FRESH MILK OF THE TIRANA

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ABSTRACT

There have been analysed 120 milk samples, which were taken from two different factories in Tirana. 60 of these samples are unpasteurized milk, the other 60 samples are taken from the same milk, after the process of pasteurization. These samples have been analysed for the pollution and also the presence of pathogens, which can be very dangerous for the consumers health. The presence of *E. coli* was observed in 4 samples, 3 of which were unpasteurized milk and this represent 5% of the number of the samples of unpasteurized milk. While 1 sample was pasteurized milk and it represents 1.6% of the samples of pasteurized milk. From the isolated pathogens is identified and seen that 3 samples have *Staphylococcus aureus*, which represent 5% of the samples of unpasteurized milk or 2.5% of all the verified milk. The above results show that the unpasteurized milk taken from these two factories sometimes is represented with pollution and some cases even with the presence of dangerous pathogens for the consumers.

Keywords: Fresh milk, *Escherichia coli*, *Staphylococcus aureus*

IDENTIFICATION OF THE HAZARDS AND CRITICAL CONTROL POINTS IN THE DEVELOPMENT OF A HACCP PLAN

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ABSTRACT

The acronym HACCP stands for Hazard Analysis and Critical Control Point, which is a prevention- based food safety system. HACCP systems are designed to prevent the occurrence of potential food safety problems. The concept can be applied by small independents as well as national companies and can be integrated into the recipes and standard operating procedures of any size establishment. The purpose of this article is to give some information on hazard analysis and identification of critical control point in the development of a HACCP plan as a crucial point in the application of the autocontrol system.

Keywords: Hazard, risk, HACCP, CCP

NAILS AND ANESTHESIA**Eftim J. ADHAMI**

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ABSTRACT

This paper reviews the role of nail examination in the practice of anesthesia. In skilled hands, nail history and examination can be completed within a few seconds, and do not interfere with the pre-anesthetic evaluation. The information obtained can be crucial in assessing anesthetic risks.

Keywords: nails, anesthesia, co-existing disease

IN VITRO MATURATION AND FERTILIZATION (IVF) OF FOLLICULAR OOCYTES IN COWS**Valbona ALIKO**

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ABSTRACT

230 ovaries were obtained from slaughterhouses from which 1535 oocytes (6.67/per ovary) were collected and selected for in vitro maturation. After maturation the oocytes were inseminated and were cleaved to 2-8 cell stage with an average cleavage rate of 61.46%, 44-48 hours after insemination. The 2-8 cell stage embryos were co-cultured with granulose cell monolayers for 5-7 days and 436 blastocysts (1.89/per ovary) were recovered with an embryonic development rate of 45.08%. These results clearly indicate that in vitro embryo production can be a successful technique for yielding viable embryos in view to develop further researches on animal production, embryo manipulation and genetic engineering.

Keywords: bovine, oocytes, in vitro maturation, in vitro fertilization, embryo

ROLE OF PLASMALEMMAATPASE ACTIVITY ON N RELEASE FROM INTACT ROOTS OF SPRING WHEAT (TRITICUM AESTIVUM L.)**Evan RROÇO**

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ABSTRACT

The plasmalemma ATPase activity of the root cells was inhibited through application of vanadate and stimulated by fusicoccin. Their influence on the release of N compounds from the roots to the soil was studied.

¹⁵N labelled compounds released during the entire growth period into the soil (control) amounted to 12% of the total ¹⁵N in the plant at the beginning of the experiment [17] but was significantly higher under vanadate application (Plasmalemma

ATP-ase inhibitor). Fusicoccin hampered N release. Highest release rate were found in the period from ear emergence until grain filling.

Keywords: N release, ATPase activity, vanadate, fusicoccin, wheat

COASTAL MANAGEMENT OF THE ECOSYSTEM VLORA BAY- NARTA LAGOON - VJOSA RIVER MOUTH

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ABSTRACT

The results of an integrated study, performed in the framework of joint project concerning protection and management of Vjosa River and Narta Lagoon environment in Albania, financed by the Greek Ministry of Environment Planing and Public Works, and European Community, are presented in this paper.

Vlora Bay - Narta Lagoon - Vjosa River Mouth ecosystem is situated at the SE coast of the Otranto Strait. This ecosystem is distinguished for its particular natural individuality, and ecological values of international importance. The principal elements of the hydrological regime of the Vjosa River, the principal elements of the limnological regime of the Narta Lagoon, and the principal elements of the Vlora Bay in the Adriatic Sea in this paper are analyzed. The ecosystem biodiversity and human activity impact are important part of the study.

Keywords: Vjosa River Mouth, Narta Lagoon, Vlora Bay, biotic monitoring, abiotic monitoring

AJNTS No. 18, 2005**RECENT ACHIEVEMENTS IN SEISMIC HAZARD ASSESSMENT
IN ALBANIA****Eduard SULSTAROVA**

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Seismological Institute Tirana, Albania

Llambro DUNIDepartment of Engineering Seismology, Institute of Seismology, Academy
of Sciences of Albania**ABSTRACT**

Presented are the different approaches used for the assessment of seismic hazard that threatens the territory of the country carried out recently in the Seismological Institute of Academy of Sciences of Albania. Except the actually in force seismic hazard map of Albania that expresses the seismic hazard in terms of seismic intensity, efforts are being made to present the seismic hazard in terms of PGA, using both deterministic and probabilistic procedures. As far as probabilistic method is concerned, both classical "zone method" according Cornell (1968) methodology and "zoneless method" according to Frankel approach (1995) are briefly described.

**HEAVY METAL DISTRIBUTION PATTERNS IN SELECTED
OVERBANK PROFILES FROM MATI RIVER: A WAY TO ASSESS
NATURAL GEOCHEMICAL BACKGROUND DATA AND
POLLUTION HISTORY****Artan TASHKO**

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ABSTRACT

Based on the heavy metal's content in pristine [pre-industrial] overbank sediments, we have determinate the natural geochemical background [NGB] for Mati River sediments [Table 1]. The environmental impact on the Mati river sediments of the copper industry became evident normalizing the heavy metal's content in sediments by NGB, or normalizing in each sample the Cu content with Zn content, but there are not indications for a significant impact of chromium industry. The risk assessment makes evident the pollution of the sediments with Cu, Ni and Co concerning their total content. The history of the environmental impact of the copper industry on the sediments is quite the same as the industrial production during last years.

Keywords: geochemistry, Albania, environmental geochemistry, pollution, overbank sediments, heavy metals, Mati River

BIOSTRATIGRAPHY AND SILURIAN-LOWER DEVONIAN GRAPTOLIDS OF THE KORABI ZONE (ALBANIA)

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ABSTRACT

The Silurian-Devonian shales with graptoloids of the Korabi Zone, Caje Subunit, represent the unique locality in all the Western Balkan area. Graptoloids are described from the Muhurri Black Shale Formation (Silurian) and Fushe Muhurri tuffaceous Shale Formation (Lower Devonian). The graptoloids are strongly tectonized, rhabdosomes changed in length or width (mainly Monograptidae), often with deformatet clathria; the peri-derm rarely crushed. The distinguish of the majority of the Silurian-Lower Devonian (Lochkovian) biozones (20 biozones) has been made possible by the stratigraphic studies and the correlation with the stratotypes.

Keywords: graptoloids, biostratigraphy, silurian, llandovery, wenlock, lower devonian, lochkovian, korabi zone, caje subunit, Albania

THE INFLUENCE OF CHEMICAL – MINERALOGICAL COMPOSITION ON PHYSICAL PROPERTIES OF COHESIVE SOILS OF TIRANA-VORA REGION

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ABSTRACT

The results of chemical-mineralogical composition and their influence on some physical properties of the cohesive soils are presented in the paper. These investigations are performed last 3 years in the Tirana-Vora region of Albania. Chemical-physical analysis was carried out for the whole soils samples, while the mineralogical test are done for the more characteristic soils types, which are found in the studied area. Also, it shows some correlations between chemical-mineralogical compositions and clay activity, as well as liquid limit.

Keywords: cohesive soils chemical composition, mineralogical composition, physical properties, liquid limit, clay activity, cohesive soils, silty clay.

ENVIRONMENTAL ADAPTABILITY OF SOME DURUM WHEAT CULTIVARS

Foto KASHTA

Farudin GJONDEDA

Agim CANKO

ABSTRACT

The aim of this paper is to analyze the environmental adaptability of durum wheat cultivars and lines used in Albania, considering the stability parameters (b_i and S^2_{di}), proposed by Eberhart and Russell. The cultivars and lines evaluation for different environments is done, interpreting the values of regression coefficient, the mean square deviation from regression and the mean yield for each cultivar or line. Based on these

parameters the cultivars and lines are divided into five groups with different adaptability in various environments.

Keywords: environment, adaptability, stability, regression coefficient, standard deviation, genotype

COPEPODS COMMUNITY STRUCTURE VARIABILITY IN DIFFERENT AREAS OF THE EAST MEDITERRANEAN

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ABSTRACT

Important qual-quantitative differences have been found between the epipelagic Copepods communities of the Black Sea, Marmara Sea, Aegean Sea and Ionian Sea where 64 species had been found. The species number and abundance increased from North toward South. 19, 28, 51 and 45 species has been found respectively in the summer epipelagic waters of the Black Sea, Marmara Sea, Aegean Sea and Ionian Sea. The variations in species composition and abundance have been determinate by the differences in the physical characteristics and hydrological conditions of the waters, or by the influence of local biological factors, as in the case of the Black Sea. The species diversity, in the Marmara Sea, is determined from the influence of the Aegean Sea currents while the main biomass is composed from typical Black Sea species. Similarities, concerning the dominant species, have been observed between the communities of the Black Sea and the Marmara Sea, and between those of the Ionian Sea and the Southern Adriatic Sea.

Keywords: zooplankton, copepods, East Mediterranean

EFFECT OF NUTRITION ON REPRODUCTIVE PERFORMANCES IN CATTLE

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ABSTRACT

Nutrition is a mJOR factor affecting cow reproductive performances but the underlying mechanism are not yet fully understood. Chronic dietary restriction results in gradual reduction in dominant follicle (DF) growth rate. Animals become anoestrus when they loose on everage 22-24% of their initial body weight. In lactacion dairy and beef cows negative energy balance in the early post partum period affects the size and ovulatory fate of the dominant follicle. Increased DF growth rate and maximum diameter are associated with increased peripheral concentrations of IGF-I, pulsative LH and oestradiol. Direct nutritional effect on ovarian function appear to operate through hepatic rather than folikular responsiveness to LH and ultimately shutting down follicular oestradiol production. Indirect nutritional effects are apparently mediated through altering the GnHR pulse generator and in-turn selectively selectively reducing

pulsatile LH secretion without any apparent adverse effect on FSH secretory patterns. Endogenous opioid peptides NPY and glucose appear to play a role in the nutrition regulation of GnRH release and in turn pulsatile LH secretion.

Keywords: nutrition, ovarian follicle growth, circulating hormones

DIAGNOSIS OF ENZOOTIC BOVINE LEUCOSIS IN KOSOVO EVALUATION OF DIFFERENT TESTS FOR THE CLASSIFICATION OF HERD-LEVEL BOVINE LEUKEMIA VIRUS STATUS

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ABSTRACT

Enzootic Bovine Leucosis (EBL) is a disease of cattle. It's caused by the Bovine Leucosis Virus (BLV). A total of 94 serum samples were used. Sensitivity and specificity of tests were calculated. The kappa coefficient was found. Hematological data told 42 positive and suspicious animals (44.6%) (based on EC key). ELISA test detected 6 (6.4%) positive and suspicious animals. They were tested by AGID test and all resulted negative. However, there are some reasons:- young age of animals, -lack of the herds; AGID test is not the most sensitive one, especially for early stages of infection. Kappa coefficient was 0.84 (excellent).

Keywords: EBL, cattle, AGID, ELISA, kappa coefficient

CULICOIDES OBSOLETUS AS A POSSIBLE VECTOR OF BLUETONGUE VIRUS

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ABSTRACT

The incursion of Bluetongue virus (BTV) in the Mediterranean basin have implicated numerous Countries that had never experienced the infection in their territory before. To define the infection area and better control the infection, some of them have organized entomological and serological surveillance plans. At the moment four BTV serotypes, BTV-1, BTV-4, BTV-9, BTV I 6, have been reported in the Balkan area. No data on the presence and diffusion of BTV in Albania, however, were available. One of the targets of the "National survey on Foot-and-Mouth Disease and Bluetongue", was to survey a population of susceptible domestic ruminants for the presence of BTV antibodies in order to fulfil this lack of information. The circulation of bluetongue virus (BTV) was detected serologically in Albania in 2002. In the same season a survey for

Culicoides Latreille, 1809, was also made to establish whether *Culicoides imicola* Kieffer, 1913, the main vector of BTV in the Mediterranean Basin, or any other suspected vector species, were present. Here we report the results of this entomological survey (October-November 2002).

Keywords: bluetongue, surveillance, culicoides, vector

HIV SEROPREVALENCE IN ALBANIA BLOOD DONORS

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ABSTRACT

The aim of this study is to assess the seroprevalence of HIV in blood donors in the Blood Transfusion Centre of Tirana, Albania, where reported every year the number of donations and seropositive donors for anti-HIV. Samples are tested for anti-HIV by Elisa method and confirmed with WB method. The prevalence of anti-HIV in blood donors is 0.1 %. The anti-HIV prevalence was 0.08% in PD and 0.34% in UPD. The 22 donations were found to be anti-HIV positive. The age of positive donors ranged from 24 to 40 years. The prevalence of anti-HIV in blood donors is low, but increasing.

Keywords: anti-HIV 1/2 = antibody to human immunodeficiency virus type 1 and 2, ELISA = enzyme immunoassay method, WB= Western Blot, PD= paid blood donors, UPD= unpaid blood donors

THE EQUATIONS FOR ADJUSTING PRESSURE SUPPORT VENTILATION AND THEIR CLINICAL IMPLICATIONS

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ABSTRACT

Pressure support ventilation (PSV) is commonly used in mechanically ventilated patients to optimize the work of breathing. There have been no previous papers to describe the exact relationship between PSV and the work of breathing. Three different parameters of the work of breathing [work of breathing (WOB), power of breathing (POB), and pressure-time product (PTP)], were recorded in 80 adult mechanically ventilated critical care patients, together with the changes in PSV levels in 15-minute intervals. The relationship between PSV and work parameters was described by linear equations with high predictive power. Each equation included 4 variables: initial work (before PSV has changed), final work (after PSV has changed), initial PSV, and final PSV. The knowledge of 3 parameters was sufficient to predict the 4th variable. Specific equations existed for different diagnostic categories. Work of breathing in critical care patients can be optimized by using equations that predict the amount of PSV required to reach a target work level.

Keywords: PSV, pressure support ventilation, mechanical ventilation, COPD, ARDS, equations, restrictive disease

ROTAVIRUS INFECTION IN INFANTS AND YOUNG CHILDREN WITH GASTROENTERITIS IN ALBANIA

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ABSTRACT

The level of occurrence rotavirus infection was studied in 294 children who were suffering from acute gastroenteritis, between January 2003-December 2003 in Albania. Rotavirus antigen was detected by Latex agglutination in 15 (9.68%) of the stool samples examined, as compared to three (2.16 %) in a group of healthy controls. The frequency of rotavirus infection was significantly higher among patients under 24 months of ages (7.17%), than among children over 24 months (1.02%). The peak of incidence was in Autumn. This study revealed that rotavirus is an important etiological agent of acute gastroenteritis among children in Albania.

Keywords: rotavirus, latex agglutination, virus, cases, samples, etiological agent, etc.

DETERMINATION OF THE DIFFERENCE FOR PHASE SHIFTS S AND P FOR NEUTRON-PROTON AND PROTON-PROTON SCATTERING

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ABSTRACT

The difference for waves S and P for neutron-proton (n-p) and proton-proton (p-p) scattering is determined in this work. The experimental data used in this work are taken from the interactive SAID programme. The results obtained show that the difference for P waves continues to remain an open question.

Keywords: partial wave analysis, phase shifts

DETERMINATION, CALIBRATION AND NORMALIZATION OF THE "δ" VALUES OF CARBON DIOXIDE USING TWO STANDARDS

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ABSTRACT

The absolute abundance ratio of isotopes, usually, isn't measured in natural compounds, but is determined the relative difference in the ratio of the heavy isotope to the more abundant light isotope of the sample with respect to a reference or standard. The relative difference of the isotope ratio is designated "δ". The calibration and normalization of the "δ" values with respect to the international reference has become necessary, taking into the consideration of the "δ" determination and characteristics of the measurement techniques of isotope ratios. Otherwise the "δ" values of the samples may be different when determined on different mass spectrometers or on the same mass spectrometer with different operational settings. The paper presents the experience of the stable isotopes laboratory of the INP of Tirana concerning the process of determination, calibration and normalization of $\delta^{18}\text{O}$, which is expressed with respect to SMOW (Standard Mean Ocean Water) and $\delta^{13}\text{C}$, which is expressed with respect to PDB (Pee Dee Belemnite).

DOMINANTE RATES OF NATURAL RADIOELEMENTS AS AN INDICATOR OF CONCENTRACION AND PRECIOUS ELEMENTS AND POLYMETALS

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Gamma spectrometric surveys of natural radio elements have noticeably been developed in the recent years owing to the priorities they afford because of other geoanalytical methods. Except the values they have for the quantitative determinations of U, Th, K, a special importance assume the values of their ratio values, and first of all dominant of such values, that are directly connected with non radioactive elements concentrations in different geological formations.

Ratio Th/U, Th/K, or U/K has generally been used for different for the mineral bearing estimations of the rocky massifs.

In the paper are presented the examples of direct connections of the value of ratio $F=K*U/Th$ with:

- a) Concentration of "TR" in geo-radiometric samples, taken from the rocks or Korabi area (first case of Shtrezi's sand s-S h ishtavec)
- b) Concentrations of precious metals Au and Ag in rocks in boreholes at Rodopi massif in Bulgaria, evaluated by gamma-spectrometry.
- c) Shallow mineralization near Baikal Lake in Siberia and especially the discovery of a polymetallic ore body at the depth of 100 m in a geological site at Kurile Islands.

These examples as well as the others (in Ontario-Canada, Devonian-Belgian, Bohemian-Chet) that come out by geo-analytical results along with the Gamma spectrometric researches are open windows to further improvement of the research methods for metallic minerals and elements of practical interests.

ROLE OF PLASMALEMMA ATPASE ACTIVITY ON N RELEASE FROM INTACT ROOTS OF SPRING WHEAT (*TRITICUM AESTIVUM* L.)

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DISCUSSION

The results shown in Tab.2 evidence that the effect of vanadate was enormous. During the three days of application, vanadate caused a loss of ^{15}N of about 12% of the total ^{15}N present in the plants at the beginning of the experiment. This means virtually a leakage of nitrogen out of the roots under the conditions of a blocked plasmalemma ATPase (H^+ pump). It is obvious that the activity of this enzyme is of paramount importance for retaining amino acids in the roots. This is also of practical relevance since toxins may inhibit the plasmalemma H^+ proton pump as is the case for the toxin produced by *Cercospora beticola*, a non-host specific phytotoxin of unknown structure [1]. Schlösser [18] reported that this toxin induced the loss of amino acids from red beet root tissue which finding is in agreement with our results.

Plants were supplied with ^{15}N only at the beginning of growth until tillering. During this period they were cultivated in nutrient solution. Afterwards having them transferred into the soil medium they were exclusively supplied with mineral ^{15}N and at ear emergence the ^{15}N label was diluted to 1:15 in roots and shoots relative to the label at tillering [17]. It is therefore assumed that with the beginning of the ear emergence the concentration of mineral ^{15}N (ammonium, nitrate) in the roots was low. In addition ammonium is rapidly metabolized [14] and nitrate reduced or stored in vacuoles [10]. Translocation of nitrate via phloem is almost nil whereas high amounts of amino acids are translocated via phloem to roots [4]. We therefore assume that most of the nitrogen released by roots into the outer medium was organic nitrogen, mainly amino acids.

AJNTS No. 19-20, 2006**LEVEL DENSITY IN INTERACTING BOSON-FERMIONFERMION
MODEL (IBFFM) OF THE ODD-ODD -NUCLEUS ^{196}Au** **Skender KABASHI**

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ABSTRACT

The level density of the odd-odd nucleus ^{196}Au is investigated in the interacting boson-fennion-fennion model (IBFFM) which accounts for collectivity and complex interaction between quasiparticle and collective modes. The IBFFM total level density is fitted by Gaussian and its tail is also fitted by Bethe formula and constant temperature Fermi gas model.

**STUDY OF THE PROPERTIES OF DTPA KIT LABELLED WITH
 $^{99\text{m}}\text{Tc}$** **Skënder MALJA****Brunilda DACI**

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ABSTRACT

The aim of this work is radiochemical and biological investigation of DTPA (diethylene triamine pentaacetic acid) kit for labeling with $^{99\text{m}}\text{Tc}$ as a potential kidneys and brain imaging agent. It is produced routinely in sterile and freeze-dried form and have been studied the conditions of complexing of DTPA with $^{99\text{m}}\text{Tc}$ such as content of DTPA ligand, tin (II) chloride, ascorbic acid and also in-vitro stability, yield of labeling, shelf life, biological distribution, scintigraphic investigation, sterility, pyrogenicity, toxicity, etc. Also are performed human studies. Paper, thin layer, instant thin layer chromatography and gel scanning column method controlled the labeling efficiency and the stability of $^{99\text{m}}\text{Tc}$ -DTPA. The biodistribution of labeled compound was carried out using mice. Kidneys uptake is followed by planar and SPELT imaging in Beagle dog. All the results show that this kit is very stable and fulfills the requirements of International Pharmacopoeias.

ANALYSIS OF GEOCHEMICAL SAMPLES USING A FIELD-PORTABLE X-RAY FLUORESCENCE INSTRUMENT: ASSESSMENT OF ANALYTICAL PERFORMANCE

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ABSTRACT

The construction characteristics of a field portable XRF (FPXRF) instrument and the analytical parameters obtained during the analysis of geochemical samples in laboratory conditions are presented. The instrument is based on a thermoelectrically cooled Si PIN detector and a Cd-109 radioactive source which are set in a 90° geometry. The program COREX, which is based on fundamental parameters and backscattered peaks, is used for calculation of the concentrations. The calculated detection limits show values from about 2500 ppm for K to about 30 and 20 ppm respectively for Cu and Zn and up to about 5 ppm for the elements from Rb to Zr. The precision for major elements is generally better than 5% and for most of the minor and trace analyzed elements the values of precision are within 10%. The accuracy of the results was tested by measuring international standard reference materials and by participating in proficiency tests. Generally a good agreement between the measured and expected values was observed. The analytical parameters look quite acceptable and in many cases they approach the characteristics of conventional EDXRF systems.

Keywords: FPXRF, analytical performance, geochemical samples.

EXISTENCE OF WEAK SOLUTIONS TO QUASILINEAR STOCHASTIC PARTIAL DIFFERENTIAL EQUATIONS VIA GIRSANOV'S TRANSFORMATION

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ABSTRACT

In this paper, using Girsanov's theorem for space-time white noise, we generalize the Theorem 3.1 of [4] for the quasilinear stochastic partial differential equations. The obtained theoretical results are useful to model the tumor growth for dispersed cells regime in the presence of adjuvant chemotherapy.

Keywords: Quasilinear stochastic partial differential equation, space-time white noise, random field, Girsanov's transformation method, weak solution

SOAP TECHNOLOGY AS A POSSIBILITY FOR WEB SERVICES TO ENABLE EFFICIENT COMMUNICATION BETWEEN DISTRIBUTED SYSTEMS, WORKING ON HETEROGENEOUS PLATFORMS

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ABSTRACT

This paper describes the communication process between computer systems working on different platforms using Simple Object Access Protocol technology. Web Services represent a powerful mechanism for system integration in heterogeneous platforms, because they easily adapt to new situations, where an efficient communication is required between various systems. Many applications inside these systems use the internet to transfer data. However, many of these applications use protocol specifications that make it harder for them to communicate with each other. To resolve this problem, leading companies such as IBM, Microsoft, Develop Mentor and Userland Software addressed this problem by creating Simple Object Access Protocol (SOAP). SOAP is a protocol based on XML which enables applications to communicate easily on the Internet. SOAP can be structured between communication points on a decentralized environment using XML.

POTENTIAL RISK MANIFESTATION OF ALKALI-SILICA REACTIONS (ASR) IN CONCRETES PREPARED BY AGGREGATES FROM DIFFERENT RIVERBEDS IN ALBANIA

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ABSTRACT

The deterioration or failure of concrete besides of many reasons may be caused even by the use of unsuitable raw materials, such as high-alkali cement and alkali-active aggregate. The aggregate of a concrete mixture is not only filler or inert material. The nature of the aggregate and its chemical and physical characteristics are of a great importance for the future behavior of the concrete. On this regard, it has been studied the behavior of aggregates taken from some main riverbeds of Albania on various cement-aggregate combinations. The experiments are carried out according to the method of continuity of tests: petrographic examinations of aggregates and the rapid tests. The results are taken through measuring the expansion of mortar bars, stored for 14 days in NaOH solution (1N), in 80°C. The different behavior of samples in this alkaline environment is graphically shown and statistically tested and commented.

Keywords: Alkali-Silica Reaction (ASR), alkali-active aggregate, high-alkali cements

CORROSION FAILURE IDENTIFICATION OF ZN-SHEET, BASED ON METALLOGRAPHIC AND SEM, EDX ANALYZE

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ABSTRACT

Every case in corrosion failure has to be very specific relating to the material, environment and interface [2].

In this paper, corrosion of zinc sheet was studied. Zinc sheet is well known for the improving of material corrosion resistance because of the relatively slow corrosion of zinc. The corrosion of zinc in dry rural and submarine area is about 0,13 $\mu\text{m}/\text{year}$ and growing up to about 13-15 $\mu\text{m}/\text{year}$ in more moist industrial atmosphere conditions [3]. The reason for a low corrosion rate of zinc is the tendency to produce mixing on the surface layer of zinc oxide with hydroxide and carbonate products (slightly basic medium), which tend to stifle the attack. In the presence of Cl^- , Br^- , I^- , but also ClO_4^- , ClO_3^- , BrO_3^- , SO_4^{2-} , NO_3^- , CH_3COO^- anions, the corrosion attack rapidly increases pH of the environment an indicator of corrosion failures may drastically change the corrosion rate. Breaking down of protective layer, by sand and Fe particles, initiate the propagation of corrosion initially as erosion corrosion, after bimetallic corrosion between the Fe and Zn, takes place on the surface, and finally as localized corrosion in form of pitting. [3, 41]. Metallographic and SEM investigation were obtained to identify the corrosion failure of zinc sheet. Results (as well as discussion accompanied), with some recommendations to prevent the propagation of corrosion are presented in detail into the paper. Keywords: corrosion failure, corrosion rate, pH, zinc, medium content.

EXTRACTION OF Cd, Cu AND Cr WITH ALAMINE 336 AND ALIQUAT 336 AND THEIR REEXTRACTION FROM ORGANIC PHASE INTO AQUEOUS PHASE

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ABSTRACT

This paper is continuation of our earlier research for the application of liquid anion exchange extractants, for multi element extraction from the artificially prepared mix of elements. Research has been done in the selective nature of extractions reagents and

parameters have been established which determine the solvent extraction, the effectiveness of the extraction and the possibility of their application in establishing analysis of the elements. Detailed research has been done with regards to the effect of concentration of HCl and concentration of salts of KCl, KI and CH_3COONa in extraction of elements from aqueous solutions. Concentrations of salts in the aqueous solutions of acids contain important parameters which heavily effect the outcome of the percentage of the elements extracted. This can be considered as prerequisite that enabled controlled extraction of an element. Most of the extracted elements with the use of organic solutions for extraction can be returned to their former aqueous phase, thanks to the nature of reagents applied which behave as liquid ion exchange extractants. The solution applied for separation of the elements is NaCl, because ion Na^+ replaces cations from the complex, it then transforms into aqueous phase where its content can be determined with ease.

Applying re-extraction of the elements we can re-concentrate any element and bring its content to the level where it can be detected. This method of separation offers many selective possibilities.

COAGULATION OF BOVILLA'S RESERVOIR WATER BY USING PRE-HYDROLYZED POLY-ALUMINIUM CHLORIDE-SULPHATE Dhimiter HAXHIMIHALI

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ABSTRACT

Jar tests and industrial plant tests were applied to the raw water from Bovilla's Reservoir (the main water resource for supplying Tirana with drinking water) in order to determine optimal conditions for coagulation. The pre-hydrolyzed poly-aluminium chloride-sulphate (PALS) was used as coagulant and variables under examination were the dose of the coagulant, hydrochloric acid and sodium hypochlorite, as well as the optimal pH value. The pre-hydrolysis degree of the coagulant was $B=0.72$ ($[\text{OH}^-]/[\text{Al}^{3+}]$). The efficiency of the coagulation process was evaluated for the degree of turbidity removal and the residual elements in treated water. For raw water with turbidity 20 NTU and for the purpose of removing turbidity, the jar tests gave the following optimal doses: 1 mg/l Al_2O_3 of the coagulant (PACS), 3 mg/l HCl and 1.2 mg/l NaOCl, at the pH value of 7.5. The results found out in jar tests, for some of the most representative situations encountered in practice, were applied into the industrial water supply plant of Babrru (Tirana). The variables under the examination were the removal degree of turbidity, phosphorous and organic matter, as well as the content of residual aluminium and the other elements. Achieved results complied with the Albanian standard norms for drinking water.

Keywords: Coagulation, turbidity, drinking water, PALS, pre-hydrolysis

ASSESSMENT OF WATER QUALITY OF SOME ALBANIAN RIVERS USING DIATOM-BASED MONITORING

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ABSTRACT

Monitoring of water quality using benthic diatoms was carried out in the main Albanian rivers of the Coastal Adriatic Lowland. More than 270 species of diatoms were determined, dominated by pennatae and only 15 species belonged to centric diatoms. *Achnanthes minutissima*, *Amphora pediculus*, *Cocconeis pediculus*, *Diatoms moniliformis*, *Fragilaria capucina*, *Gomphonema tergestinum* and *Nitzschia dissipata* dominated in Mati (all stations), upstream Tirana, upstream Shkumbini and Osumi. In these river parts, high number of species and high species diversity was found. In Lana, Ishmi and Gjanica the diatom population was dominated by polysabrobic or pollution tolerant species like *Nitzschia pales*, *N. incospicua*, *Gomphonema parvulum*, *G. olivaceum*, *Navicula accomoda*, *N. veneta* and *N. saprophila*.

The trophic diatom index varied from 1.6 (mesotrophic, Mati) to 3.4 (polytrophic, Ishmi, Lana and Gjanica). High values were observed for Lana and Ishmi, the downstream part of Shkumbini (downstream Elbasani) and Gjanica, indicating a strong pollution of urban origin from the towns of Tirana, Elbasani and Fieri. In the mountainous part the water quality was found to be only slightly polluted, as it was observed in Bushkashi (1.4, oligo-mesotrophic). Strong measures for the restoration and protection of the water quality are required for Ishmi, Tirana and Lana rivers in short time. To provide more information and increase public awareness for the protection of these aquatic ecosystems, monitoring of the water quality is of highest priority.

Keywords: Albanian rivers, biomonitoring, eutrophication, diatom trophic index

MONITORING OF MICROBIOLOGICAL INDICATORS AND SALMONELLA SPP OF BIVALVE MOLLUSCS PRODUCTION ZONES IN ALBANIA ON 2004

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ABSTRACT

In Albania during 2004 have been monitored 8 production zones of bivalve mollusks for bacteriological indicators: *fecal coliforms*, *E. coli* and presence of *Salmonella spp.* 451 samples of bivalve mollusc were analyzed with standard methods respecting hygienic conditions mentioned on the EEC directive 91/492 for the bivalve molluscs control. 458 sea water samples were also analyzed for level of fecal coliforms and *E. coli*. The analytical control for the presence of *Salmonella spp.* has been realized in order to accomplish the analytical specter and also to protect the people from salmonellosis which is one of most widespread food borne diseases in world. Albanian product of bivalve mollusc is classified in some production zones as good product and sometimes this is classified in class B which means that this product should be depurated. Samples were collected from production zones where are mostly natural breeding of bivalve mollusks. From results was confirmed 1 sample of *Donax spp.* contaminated with *Salmonella spp.* which represent 0.2 % of total number of bivalve mollusk samples. Production zones of bivalve mollusk have been classified mostly in class B and some of them in class A, respecting the microbiological criteria for classification of bivalve mollusk production zones mentioned on Directive 91/492 of CCE. Production of *Mytilus galloprovincialis* in Butrinti Lake which is the biggest reservoir of bivalve mollusk in Albania was classified as A promising to export it in E. U countries. No *Salmonella spp.* has been determined in this production zone. Sea water samples were processed only for level of *fecal coliforms* and *E. coli*. High level of these pollution indicators were detected in BM3, BM5 and BM7 zones located respectively in Vlora, in Karavasta and in Durrës (BM7). The high value of *E. coli* was determined in Durrës on July supposing to be indicated from fecal water and high population in this area in this time. The maximum range values of fecal coliforms and *E. coli* have been confirmed respectively between 27-110/100ml and 14-80/ml of sea water. The high bacteriological pollution verified in summer time in some monitored sea water areas is caused mainly because of dense population in beaches and contaminated water of rivers.

Key words: mollusc, *E. coli*, *Salmonella*, monitoring

THE SURVEY ON THE GENITAL MYCOSES AT THE OBSTETRIC GYNECOLOGY CLINICS OF TIRANA

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ABSTRACT

The present paper present data regarding an epidemiological survey on genital mycoses in Tirana. The incidence of vaginal candidose was studied in pregnant women for the years 1999, 2003. Mycological investigations were performed on 594 genitally infected women at some Gynecological Clinics in Tirana on 1999 and 2003. Simultaneously 230 pregnant women at the Clinics for Obstetrics under went mycological examination through KOH 5%, pH determination and growth in Sabouraud-Chloramphenicol-Actidion media was used for the mycological examination of the vaginal secretions whereas the determination of yeast's was performed through the API 20 computerized method. The incidence of vaginal candidose in the investigated women ranged 31-32%. The principal responsible strains isolated from the vaginal secretions were *Candida albicans* 85.7 % and *Candida glabrata* 10,3 %. The presence of the other strains was rare. In 230 mycological examined pregnant women, vaginal candidose was present on 21 % of them during the second trimestrial of the pregnancy and on 36,2 % during the third trimestrial pregnancy period. The sexually active pregnant woman (20-35 years of age) was the most affected one from the infection (98 % of the case). The obtained data from the survey, suggest that pregnant women especially during the Third trimestrial pregnancy period should perform a mycological examination of their secretions. In case of positive outcomes it is important to treat the infections with local antimycotics of the imidazole group.

Keywords: *Candida albicans*, disease, treatment, API 20 computerised method, Pregnant women, genital mycoses, mycological examination, *Trichomonas vaginalis*.

INFLUENCE OF MUNICIPAL WASTE APPLICATION ON SOIL QUALITY

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ABSTRACT

There are presented in this article the results of the study of the sewage sludge influence in soil qualities in the field experiment of Korça District. For two years it has been cultivated the grain. There are determined some chemical and physical parameters

of soil and sewage sludge used in the experiment consistent with the experimental methodology. Based in the fertilization scheme there are applied some levels of sewage sludge, their optimal combination with chemical fertilizers as well. The results of experiment exposed the influence of sewage sludge in the grain yield and their effect is the same with one of chemical fertilizers. Furthermore the some parameters of soil have been improved during the municipality sludge use: the content of organic matter, phosphorous, potassium, permeability and microelements.

IDENTIFICATION AND CLASIFICATION OF POTATO VIRUS Y (PVY) IN POTATO SEED

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ABSTRACT

Three virus isolate of potato virus Y(PVY) have been isolated from elite potato seed cv. Desiree in the Kosovo. It has been established on the basis of test plant reaction, serology, ELISA test assay, virus stability in sap and electron microscope analysis of crude sap by dipping method and analysis of the leaf cells and analysis of type of virus particle.

Keywords: phytopathology, viruses, potato

CONTROL STRATEGY OF BRUCELLOSIS IN SMALL RUMINANTS IN ALBANIA BASED ON THE SEROLOGIC PROFILE

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ABSTRACT

It is a global truth that zoonoses and their impact on human and animal health, trade, agriculture, economical development, and tourism are increasing (7, 10), Zoonoses and their reservoirs in domestic and wild animals have brought about big problems for many countries and years, particularly on human populations living in rural areas. This situation is present in our country too, where due to poor implementation of control and eradication programs, particularly over the last decade brucellosis has been increasingly expanding (1, 3, 5). In this context, prevention humans and animals from exposition to the brucellosis infection constitutes a major task of veterinary medicine. Massive national and international programs have been implemented or are under way of implementation for eradication of brucellosis.

Keywords: Small ruminants, serologic profile, zoonoses, strategy, brucellosis

POLYMERASE CHAIN REACTION FOR THE DIRECT DETECTION BRUCELLA SPP IN ALBANIAN CHEESE

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ABSTRACT

In Albania, the occurrence of all zoonoses (anthrax, brucellosis, leishmaniasis, leptospirosis) during the period 1990-2001 shows a common increased trend more expressed from 1997 onwards, mainly because of a conspicuous increase of brucellosis frequency. The brucellae are gram-negative bacteria, obligate parasites of animals and humans and are located intracellularly. The disease in humans is consequence of accidental contact with infected animal feces, urine, milk and tissues. The common sources of infection for humans are unpasteurized milk, milk products (cheese) and professional contact with infected animals. In Albania during 2001, the incidence of brucellosis in humans was 85,5 cases per 100.000 inhabitants.(notified by Institute of Public Health) (3, 7).

A polymerase chain reaction test was developed to detect Brucella.spp directly in cheese and optimized using primers for BSCB-31 gene (5). This method is of remarkable epidemiologic interest because it is an indirect test indicating the sanitary quality of milk used in dairy industries. The method showed good sensitivity and specificity. It is faster and less expensive than the conventional bacteriological assays.

OUTLOOK ON SEAWATERS DYNAMICS AND GEOLOGICAL SETTING FACTORS FOR THE ALBANIAN ADRIATIC COASTLINE DEVELOPMENTS

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ABSTRACT

Results of integrated offshore and onshore hydrographical studies and geological-geophysical surveys in Albanian Adriatic Littoral are presented in this paper. According to the evaluation of the discharge regime in Albanian rivers system and its impact on the hydromorphology of Adriatic Sea, the river bed deformation, migration and new river mouths investigations, seismic and geoelectrical marine and onshore surveys, geological onshore mapping and underwater offshore sampling, boreholes and oil and gas depth wells, geodesic and bathymetric mapping have been classified the segments which have different geomorphology with in mainland and in marine area of Albanian Adriatic Shelf. Accumulative coastlines are extended at plain areas. Beautiful

sandy beaches and dunes are main elements of these areas. Marine Quaternary deposits from plain sea floor up to some kilometers in the land have a thickness from some to hundred meters. Lagoons are located in plain area of the littoral, and are formed in some sea bays, which are closed by solid sediments transported by rivers to the sea. Erosive coastlines are extended in the hilly base of some capes. The hills are presented northwestern part of the Neogene's anticlines. Sandstone banc are extended in the sea floor. Neotectonic development at the present has caused submergence of three sectors within the accumulative areas.

Keywords: Adriatic Sea, hydromorphology, geomorphology, coastline

NEW DATA IN GEOLOGICAL-TECTONICALLY CONSTRUCTION OF SOUTHERN PART OF KRUGA ZONE IN ELBASAN-LEKOVIK REGION

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ABSTRACT

In this paper are presented important achievements in field of stratigraphy and tectonic style of southern part of Kruga tectonic zone. According the geological phenomena and detailed deciphering of carbonate formations, there are defined some conclusions about facets of these rocks and done opinions about geological development of this region. Based on tectonic construction analysis and palaeogeographical development there are done opinions in coordination of anticline chain to the south of Qeshibeshi and to the south of Tervolli, underneath the tectonic thrust of Krasta-Cukali zone.

EVALUATION CRITERIA OF THE COGENERATION MASS INFLUENCE IN THE ENERGETIC AND ENVIRONMENTAL INDEXES OF THE POWER-STATION

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ABSTRACT

In this article we give to modest contribution in evaluating with scientific bases the efficiency of primary energy usage in the production of electrical energy with cogeneration, in methodologies and criterions that appraise the efficiency of the production by cogeneration in the combined production. The established criterions in this article are applied for the conventional power-station with first burning material of fossils and steam cycles scheme. The analysis is more concrete with the results in one of the energetic station block (with two bleeding steam and condensation) installed in the power station of Fieri (Albania).

Keywords: Evaluation criteria cogeneration mass thermo

LIMITING FACTORS FOR UTILIZATION OF THE REMAINING TECHNICALLY FEASIBLE HYDROPOWER POTENTIAL OF MONTENEGRO AND PROJECTED KEY HYDROPOWER CONCEPTS

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ABSTRACT

This study considers four limiting factors for utilization of the remaining technically feasible hydropower potential and projected key hydropower concepts defined in the Water Management Master Plan of Montenegro and development program documents of the Electric Power Industry of Montenegro, with the exception of HP Krusevo on Piva River that so far has not appeared in strategic power and water management documents. Individual consideration is given to effects of each primary limiting factor to the projected hydropower concepts: environmental, cultural-historical, interstate and sociological. Emphasis is placed on the environmental factor with a view to the feasibility of the projected hydropower concepts in canyons of Tara and Moraca rivers. The study outlines possible ways of elimination or mitigation of the limiting factors. The resulting opinions are presented through systematisation of combination of two key hydropower concepts. Systematisation of Case A contains 21 projected hydropower concepts as for Water Management Master Plan of Montenegro (WMMP) that are not subject to effect of the said four limiting factors as well as the hydropower concept Krusevo on Piva river. Systematisation of Case B comprises 24 projected key hydropower concepts that are not subject to effect of the four limiting factors and hydropower concept of integral use of water in the hydropower system Tara-Moraca.

ENVIRONMENTAL AND PLANT DIVERSITY OF BEECH ZONE IN DAJT (MALI ME GROPA)

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ABSTRACT

In this article are provided the data of environmental and plant diversity in Dajt-Mali me Gropa zone. The morphological, morphogenetical and bioclimatic features of this zone are analysed by observing the main laws of formation, evolution, and modelling

the actual relief related to the plant and flora. On this basis environmental and critic sectors are divided, as well as, species and endangered plant associations. The diversity of plants is characterized by forest associations like *Aceri-Fagetum*, *Asperulo-Fagetum*, meadow associations like *Cynosuro-Trifolietum pretense*, *Brometum hordeaceus*, *Pteridio-Agrostietum capillaris*, etc., as well as pasture grasses stony fields like *Festuco-Brometum erecta*, *Stipetum pennata*, *Moltkietum petraea*, *Ramondietum serbicae* etc. Flora is full of species that have multiple economical and scientific values, where we can divide 267 types of medical plants, 45 types of honey plants of more value, as well as 48 types of rare and endangered plants which they have special values for the biodiversity.

Keywords: Diversity, environment, plant association, plant

CLASSIFICATION ACCORDING THICKENESS OF WOOL FIBRES FROM ALBANIAN BREEDS

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ABSTRACT

The study is an effort made to in relation to the measurement of the thickness of local breeds wool fibres using the air penetrability method, according to ISO 1136:1976 [1] and IWTO-6-26 1986 [2], as well as their classification taking into account geographical and breed spread of the Albanian sheep. The thickness is one of the most important characteristics of the wool fibres, which represent (in our analysis) their average diameter - μm . This characteristic is decisive in defining the technology wise potential of the said fibres. In the air penetrability equipment (flow meter) the average thickness will be measured with the indirect method. Pressure decrease caused by the test specimen of the wool fibres (regularly spreaded) is in proportion with the average diameter of the fibre with a certain length. In order to get scientifically exact conclusions, a preliminary calibration of the equipment is needed. The method of thickness measurement of wool fibres, based on the air penetrability, is a complete scientific method. Air penetrability equipment is the same for all experiments, and measures fibres with a thickness which varies from 20 to 40 μm . Samples are randomly selected. **Keywords:** wool, diameter, flow meter, testing, international standards, Albanian sheep breeds

EDXRF ANALYSIS RESULTS OF SOIL SAMPLES IN AN INTERLABORATORY COMPARISON

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ABSTRACT

EDXRF spectrometry was used as the main analytical method in a geochemical mapping activity in Albania. About 25 major and trace elements were determined in soil and sediment samples. Apart from the quality control criteria recommended by the International Geochemical Mapping Project IGCP-259 an inter-laboratory comparison

of the results for eight local soil samples was organized. In this paper we will present the results obtained by all the laboratories. Their comparison is based on the criteria recommended by IGCP-259. As it will be seen, in most of the cases the results are in good agreement.

Key words: EDXRF, Soil samples, Inter-laboratory comparison

OPTIMIZING EXTRACTION OF FLUORESCENT TRACERS FROM ACTIVE CARBON SAMPLES

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ABSTRACT

Our paper is dealing with the active coal capacity to accumulate fluorescent tracers in order to detect them in trace levels, even in cases they cannot be found in direct, instant water samples. The method of active carbon sampling allows one to measure weaker tracer concentrations than the least detectable concentration of the same tracer present in a direct water sample. When measured on active coal bag extracts, the fluorescence intensity of the substances used as artificial tracers in studying water systems depends on some factors, such as components of the extracting cocktails, their ratios in certain mixings as well as the time of extraction. This paper presents the experience produced in this field in the Institute of Nuclear Physics, in Tirana. The problem is dealt with for the artificial tracers having been applied in karstic system studies of Mali me Gropa and Ohrid-Prespa area, such as Uranine, Rhodamine WT and Sulphorhodamine G Extra. The method we have elaborated to this purpose enables one to optimize analytic and measuring procedures in order to detect and measure trace levels of fluorescent dyes.

Keywords: Spectrofluorometer, fluorescence, sinchron scan, artificial tracer, extract, active coal, Uranine, Rhodamine WT, Sulphorhodamine G Extra (SRG), N, N-Dimethylformamide (DMF).

INVESTIGATION ON INHIBITIVE EFFECT OF SODIUM BENZOATE AND BUFFER PHOSPHATE ON THE CORROSION OF CARBON STEEL IN BRINE SOLUTION OF CRUDE OIL

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ABSTRACT

The aim of this study was to evaluate the inhibition performance of sodium benzoate and buffer phosphate ($\text{KH}_2\text{PO}_4 + \text{Na}_2\text{HPO}_4$) inhibitors at various inhibitor concentrations in natural brine solutions of crude oil. The corrosion coupons used throughout this investigation originated from the same carbon steel. The experiments were conducted for about 167 hours under stagnant conditions and natural convection at 24°C. The effect of inhibitors was investigated using the weight loss method. The tests showed that carbon steel can be satisfactorily inhibited under laboratory test

conditions using sodium benzoate and buffer phosphate inhibitors. Sodium benzoate is not as effective as buffer phosphate inhibitor. So, the inhibition performance of buffer phosphate in every inhibitor concentration tested is approx. twice as much as in the case of sodium benzoate.

Keywords: Corrosion, carbon steel, natural brine solutions, and inhibitor

ASSESSMENT OF THE POLLUTION OF DURRESI PORT FROM SOME ORGANIC COMPOUNDS

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ABSTRACT

This study was performed during March 2002, on the framework of a project for enlarging the port of Durres (Adriatic sea), the main port of Albania. It is done the assessment of environmental state of some organic pollutants (Total hydrocarbons (THC), Polynuclear aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB)) in sediments of Access Channel and Harbour Basin as well as in 5 proposed dumping sites, where dug mutenals from exchavation were supposed to be deposited.

Knowing the level of contamination of basin and channel sediments and environmental status of proposed dumping sites, would make possible to predict the impact of filling such areas with dragging material. An environmental survey is found out to give the right information about inland areas proposed as possible dumping sites.

Key words: sediments, geosamples, PAH, THC, dumping sites, harbour basin, access channel.

CONCENTRATIONS OF ORGANOCHLORINE PESTICIDES IN BUTTER SAMPLES FROM TIRANA CITY

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ABSTRACT

The study of these organic pollutants in butter samples is important not only as a foodstuff product, but butter is an indicator of local and regional presence of many POPs (Persistent Organic Pollutants). Residues of organochlorine pesticides (OCP) present in butter may indicate the occurrence of these contaminants in pasturelands (cattle, sheep, cow), and thus provide a useful environmental indicator of fluxes to pastures. There are many possible sources of contamination to pastures such as atmospheric component, a water-based contribution from irrigation or periodic flooding for animals on flood plains, and animal feed, but the primar of them is the human factor. Caution must therefore be observed when using this data as an indicator of local environmental contamination. Nevertheless, as previously noted for chlorinated pesticide residues, the potential for the use of butter as a convenient, widely available

and relatively uniform matrix for the determination of spatial trends in distributions of persistent organic pollutants warrants further research [1, 2, 3, 4, 5].

On the basis of pesticides levels recorded, concluded that... butter is sensitive to local, regional and global scale spatial and temporal atmospheric trends of many POPs and may therefore provide a useful sampling medium for monitoring purposes. However, to improve the quantitative information derived on air concentrations requires an awareness of climatic and livestock management factors which influence air-milk fat transfer processes [6]. This study examines the levels of organochlorine pesticides a total of 16 samples of butter collected from retail outlets (mainly supermarkets) in Tirana City. The organochlorine pesticides, hexachlorobenzene (HCB), hexachlorocyclohexane (HCH and isomers), dieldrin, endrin, heptachlor, heptachlor epoxide, methoxychlor, mirex and the DDT-related chemicals (op-DDE, pp-DDE, pp-DDD, pp-DDT) were detected. In butter samples, the most frequently detected pesticides were pp-DDE followed by α -HCH and HCB.

Keywords: Organochlorine pesticides; butter; gas chromatography analyze

SOILS RESOURCES IN THE ECOCLIMATIC AREA OF PRESPIA-ALBANIA

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ABSTRACT

The study on "Soils resources in the ecoclimatic area of Prespa, Albania" is a serious undertaking to evaluate soil resources having some fundamental characteristics of Prespa micro zone in the Albanian part. The achieved results have been based on data obtained from the field and from the laboratory tests. The comparison of the values of the analysed indicators has been done based on the FAO USDA standards. Soil resources have been studied in their physical, chemical and biological properties. Based on the evaluated values of the qualitative and quantitative indicators we want to emphasise that the soil resources are under the direct influence of the eco-climatic factors. The findings on the micro zone of Prespa may serve as the basis for more profound studies.

Keywords: Evaluation of resources, area, eco-pedology, GIS

EPIDEMIOLOGICAL STUDY ON THE PRESENCE OF CAMPYLOBACTER JEJUNI IN THE EGG BEARING CHICKENS

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ABSTRACT

This study took place in a private domestic fowl in the city of Shijak, with a capacity of 10,000 specimens with two batteries and breeding of two age groups of the egg bearing chickens. The cloacae tampons samples were random. The total sample numbers in this study was 175 cloacae tampons. 30 cloacae tampons were planted in the *Campylobacter* Skirrow Broth, in the absence of the CCDA, no isolation of *Campylobacter spp.* or *Campylobacter jejuni* was achieved in this scenario. There were two positive cases in the species of *C. jejuni*, with the appropriate specific code according to the Biomerieux. index. The intensity of the disease is increased with the age of the bird. More specifically, from a 40% level infection, in a crowd of 25-week old egg bearing chickens, increases in an 89% level of the same crowd that now is 45 weeks old. From the increase by 0.3% of the prevalence presence of *C. jejuni* in direct proportion with the age (age groups of 50- 60 weeks old are compared with the age group of 39-49 week old birds), it was found that the relationship between the incidences of *Campylobacter spp.* and their age is parallel. Also, being that the percentage of isolation towards *C. jejuni* in the cloacae tampons directly inseminated in the CCDA terrain, without prior richness is 3% compared to 0% in a *Campylobacter* Skirrow Broth terrain, results that the more effective procedure for the isolation of *C. jejuni* is the one without pre enrichment.

HEXACHLOROCYCLOHEXANE'S POLLUTION MONITORING IN ANIMALS AND FOOD OF ANIMAL ORIGIN IN PORTO ROMANO AREA

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ABSTRACT

The discovery of insecticidal properties of hexachlorocyclohexane (HCH) including Lindane before 1945, had immediate consequences and introduced the era of synthetic insecticides. It brought a remarkable impact in agriculture, public and animal health. However, using of them without any criteria, brought about their demise because of their persistence in the environment, and biomagnification within various food chain.

Pesticides were produced in our country, as well. Meanwhile, their production were banned until the start of the '90s, there were remained large wastes represent a serious threat to the environment and public health. The area of former Chemical Plant of Durrës, in which until '90s was produced HCH (Lindane, d-HCH) represents one of the "hot spots" of Albania. The toxic role of chemical waste was demonstrated in animals; they are presented in food of animal origin, too, doing a real risk for the community caused by HCH persistence in the food chain. The main objective of the present investigation was the monitoring of chlorinated hydrocarbon levels and the evaluation of presence of them and their isomers in blood, milk and egg. HCH were selected for their known properties of persistence, liposolubility and bioaccumulation in animals and their products such as milk and eggs. The study was carried out in Porto Romano area, during April - December 2005. There were studied 10 blood samples: 5 samples from cattle, and 5 samples from sheep, selected randomly in area. Blood samples were taken from jugularis vein, in unconservant test-tubes to quantify HCH in it. Finally, there were studied levels of HCH and their isomers in 10 cow' milk samples of animals breeding in area and ten egg' samples. All of them were analyzed with GC-ECD technique in Institute of Public Health. More than 70% of blood samples demonstrated convincingly high level of HCH. Their quantities varied from non detectable (n.d) until 960.87 µg/L; that means they are several higher than the maximum allowed concentration limit approved by actual national and international acts. a isomer shows higher levels (0.001 ppm allowed limit in blood).

The high levels of HCH and their isomers were found in milk and egg. They varied from non detectable (n. d) till 2803.56 i g/kg (0.005 ppm HCH allowed limit in milk). â isomer shows higher levels as well as. Quantity of HCH in eggs varied from 31.7 to 3390.86 i g/kg (0.01 i g/kg allowed limit in egg). According to the results obtained through the analysis program, Porto Romano has to be considered one of the most critical polluted areas in Albania. It has shown high HCH contamination values in animals' blood, milk and egg. Milk and eggs of these animals represent real danger as food source to community.

Keywords: Contamination, HCH, animal, blood, milk, egg

THE LEVEL OF PROGESTERONE IN OESTRUS CYCLE IN COWS **Ilir KARAGJOZI**

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ABSTRACT

The level of progesterone during the oestrus cycle is tested in 30 cows of a particular race called Laramane e Zeze, in Kamza farm, near Tirana. The samples needed for analyses were taken during the oestrus period (from the 2nd day to the 19th day), in the middle of the cycle (from the 16th day to the 18th day) and in the luteal period and at the beginning of the follicular period (from the 16th day to the 19th day) of the oestrus cycle.

The determination of the progesterone was carried in plasma and in screamed milk. At the same time, samples of blood and milk were taken from the same cows to undertake the RIA analyses. The aim of the study was to analyze the level of progesterone during the oestrus cycle in cows.

GEOLOGICAL SETTING AND OIL-GAS PROSPECTS OF SOUTHWESTERN ALBANIA

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ABSTRACT

Thrusting of the Albanides and Hellenides Orogeny onto the pre-Apulia platform has created some serious difficulties in respect of obtaining, connecting and interpreting complex geological-geophysical information. Nevertheless, it's possible to depict the spatial position of the thrust plane due to careful acquisition, processing and integration of all the data. So, acquisition improvements in seismic survey are realized owing to fold increase up to 4800, charge hole 30m depth, of 5-7kg, trace interval of 25m, etc. Also, farther integration of geo-seismic data through Iterative Modeling Approach will bring in better results.

Keywords: Tectonic, Thrust belt, platform, Albania, exploration, oil, gas, prospect

MODELLING CONTAMINATION AIR HISTORY BASED ON ELEMENT CONTENT IN ATTIC DUST SAMPLES

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ABSTRACT

Attic dust is the dust accumulated in time under roof conditions. This medium is defined as a unique archive for the chemical element contents in the solid particles in the air from the time when the roof was last time refurbished until the sampling time. Element concentration in these samples of different ages may be used to reconstruct the history of anthropogenic element emission in air. Using the Eq. 1 proposed by [7] we have demonstrated that the hypothesis, that iron metallurgy in Elbasani region is responsible for the emission of some heavy elements in air, is accepted (Figure 3). We propose, in this paper Eq. 8, 9, and Eq. 6 for the evaluation (in arbitrary units, a.u.) of, respectively, element and dust content in air for different years that correspond to the ages of the attic dust samples. Using Eq. 8 we have reconstructed the historical (1976 — 2003) trend of the air quality in the industrial area of Elbasani region (Figure 5).

Keywords: geochemistry, Albania, environmental geochemistry, air pollution, attic dust, heavy metals

THE USE OF A NEURAL NETWORK TO FORECAST DAILY OLEA POLLEN CONCENTRATION

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ABSTRACT

Spread of Olea pollen influence on the production of olive is here reported. In more general, there are a lot of pollen that cause the allergy. Medical studies report that a prior knowledge of pollen content in the air can be useful in management of pollen-

related diseases. The aim of this paper is to forecast daily Olea pollen amount in the air by using meteorological data and pollen quantity from previous days as independent variables. We have used the neural network to predict this pollen quantity, as one of most efficient forecast models.

Keywords: Neural network, forecast model, aerobiology, olea pollen

CURRENT ASSESMENTS OF THE HYDROPOWER POTENTIAL OF THE SURFACE WATER COURSES IN MONTENEGRO

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ABSTRACT

This paper systematizes average theoretical and remaining technically feasible hydropower potential of the major surface watercourses in Montenegro. Author's analyses are based on the results of the most recent analysis of the theoretical hydropower potential of the specialized studies and projects for development of strategic basis and urban plan of Montenegro. In this light, in the stroke of 5km along 9 major watercourses, the average theoretical hydropower potential is calculated to be 9846 GWh /year. So far, out of total available (theoretical) potential of 9846 GWh/y only about 1665 GWh or 17% has been realized.

Remaining technically feasible hydropower potential (E_{ti}) is assessed following analysis of the results of the existing research and design documents compared to the two existing and officially verified options for exploitation of the hydropower potential. Option 1 appears in numerous development programs, plans and design documents of the hydropower facilities of the Electric Power Industry of Montenegro that is managing total power supply system in the Republic. Option II is presented in the latest water management master plan of Montenegro in line with the Option I. Each option considers exploitation of the hydropower potential in a natural direction on the watercourse and with diversion of part of Tara River to Moraca River ($Q = I \ 5.2m^3/s$ or $Q = 22m^3/s$). Option I states slow-down section level of the frontal reservoir Adrijevo on Moraca River to be 285 m asl, while Option II sates 250 m asl for the same. Total assessed remaining technically feasible hydropower potential for the analysed options in the natural direction on the watercourse is within limit values of 3606-4162 GWh/year, while at diversion of part of Tara River to Moraca River is in limit values of 4589-4752GWh/year. These limit values of the remaining technically feasible hydropower potential assume its exploitation by means of the power facilities within territory of Montenegro. Based on analysis of the technically feasible hydropower potential of the tributaries examined at the study level and previously unstudied tributaries, total value of the technically feasible hydropower potential is estimated at 958 GW.

Total value of the remaining U technically feasible hydropower potential of the major surface watercourses and tributaries (E_{ti}) depending on the exploitation option in natural direction on the watercourse is estimated at limit values from 4564 to 5120 GWh/year. In case of diversion of part of Tara River to Moraca River, E_{ti} value appears within limits 5547-5715 GWh/year.

Keywords: total water potential, major surface watercourses, option 1, option 2, theoretical hydropower potential, remaining technically feasible potential

THE EPIDEMIOLOGY OF FOOT AND MOUTH DISEASE AND MEASURES TO BE TAKEN TO PREVENT ENTRY OF THE DISEASE IN ALBANIA

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ABSTRACT

The epidemiology of foot and mouth disease is reviewed. An up to date information covers the aetiology, host rang, geographical distribution, *transmission, pathogenesis and immunity, morbidity and mortality of the disease.*

Control of foot and mouth disease and the weakest points that affect the control policy of the disease and really constitute a danger of its introduction to Albania are described.

INDOOR RADON CONCENTRATION OF MALISHEVA AND SUHAREKA MUNICIPALITY SCHOOLS

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ABSTRACT

During the year 2003 in experimental way were determined the concentration of radon in some schools in Malisheva and Suhareka. The measurements included a secondary school and primary schools, altogether 19 classrooms with the dissipation in the different premises. The measurements were carried out with portable apparatus PRM-145, based in alpha scintillation method.

A large volume (1500 cm³) alpha scintillation cell to measure indoor radon is described. Air was sampled directly into the cell and gross alpha activity was measured. All of the air samples were taken under the same conditions, which excluded ventilation of the interior 12 h prior to sampling.

AJNTS No. 21, 2007

ND, PB ISOTOPE AND TRACE ELEMENT SIGNATURES OF THE TRIASSIC VOLCANISM IN ALBANIA. THE RELATIONSHIP TO THE NEOTETHYS OPENING

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ABSTRACT

The Nd, Pb isotope ratios and trace element geochemistry of the Triassic volcanism in Albania show that in Lower Triassic rifting phase, volcanic rocks are formed deriving from a depleted mantle source enriched by the subduction fluids of the paleothetys slab and EMI type sediments of the active continental margin (type 2 volcanics). These volcanics are characterized by lower eNdi values +2.22, high Th (9.1 ppm, in average), Zr (283 ppm, in average) and REE (20 -100 time chondrites) content, marked negative Eu, Ti and Nb- Ta anomalies. The Middle Triassic spreading phase begins with a volcanism enriched by subduction fluids and EMII component (type3). These volcanics are characterized by lower eNdi values +1.98, high Zr (102.5 ppm, in average) and REE (3 - 20 time chondrites) content, very low Th (0.1 ppm, in average), no marked Eu , and Nb- Ta anomalies. For all these volcanics the subduction and crust contamination components are evident from the fractionation of REE, LREE being clearly enriched compared to HREE. Subsequently the oceanic crust evolved to N-MORB as testimonies the type 1 basalts of volcanosedimentary series, characterized by higher eNdi values in range from +6.5 to +7.7, about 10 times the chondrites REE content, flat to LREE depleted REE patterns, no Nb-Ta negative anomalies and low Th contents (0.2 ppm, in average) and relatively high (1.3 %) TiO₂ content. These basalts, more likely, are formed in an opening of back-arc basins context (BABBs) as in Othrys [21]. We have not identified a HIMU component in these three volcanic types that may be present [6] in a final, Late Triassic (early Carnian - early Norian) phase. The observed trend from an OIB source volcanism in southern part of Eastern Mediterranean, to back-arc basin basalts associated with arc-related and within-plate volcanism in northern part, seems to evolutes to North (Albania) with a decreasing role or absence of oceanic within-plate volcanism (enrichment by HIMU source).

EVALUATION OF THE F1 AND BACKCROSSES OF LOCAL PIGS AND THE LARGE WHITE FOR LITTER CHARACTERISTICS

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ABSTRACT

A total of 162 farrowing records representing five genetic groups of pigs - local pigs (L), the Large White (LW), L×LW, (L×LW) ×LW, and (L×LW) ×L - were used to investigate the effect of pig genotype on litter performance under the season conditions of Albania. Past data records spanning a period of 2 years were collected from the different farm. Data were analyzed using least squares procedures. Effects in the model included genetic group of litter, year and season of farrowing, and genetic group × season of farrowing interaction. Traits evaluated included litter sizes and weights at farrowing and at weaning, including pre-weaning viability.

Results showed significant effect of genetic group for all the litter traits studied. The crossbred groups were superior in most of the litter traits studied except litter birth weight where the LW purebred group recorded the heaviest litter weights. Season of farrowing affected litter performance traits in LW×LW, L×LW and (L×LW) ×LW groups. In terms of pre-weaning viability, litters from the (L×LW) ×LW had 13.8% and 8.0% greater liveability at 42 days than litters from purebred L and LW respectively.

Keywords: Crossbreeding, Large White, litter traits, local pigs, season

STERILIZATION OF HEALTH CARE PRODUCTS AND FEED TREATMENT BY IRRADIATION

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ABSTRACT

Sterilization of health care products and the reduction of microbial load of feed are some applications of gamma irradiation facility of the Institute of Nuclear Physics (INP). To carry out these activities the INP has collaborated with Institute of Food Safety and Veterinary (IFS), Faculty of Veterinary Medicine and Institute of Public Health (IPH). Different types of health care products were irradiated with doses 22 kGy, 25 kGy, 27 kGy and 30 kGy for sterilization. On the other hand, fifteen feed samples were treated with gamma rays beginning with dose 3 kGy till to 5 kGy, for reduction of microbial load. The GU-3 Gamma Irradiator with Cs-137 was used for implementation the above mentioned radiation processing. For measuring the absorbed dose and its distribution, the ethanol chlorobenzene (ECB) dosimeters were used. The

oscillometry method combined with ionization chamber (as an absolute dosimeter) was used for calibration of ECB dosimeters. From results has been concluded that the use of gamma irradiation is effective method to ensure the sterility of health care products and to reduce total microbial load of more than 99% of present microorganisms in feed.

Keyword: ECB dosimeters, gamma rays, medical device, sterilization, feed, microbial reduction

LEVEL OF HEMOGLOBIN AND ITS ELECTROPHORETICAL FRACTIONS IN THE TROUT OF OHRID LAKE (*SALMO LETNICA*) AND ITS SUBSPECIES

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ABSTRACT

The hemoglobin of 100 specimens of *Salmo letnica* (Karaman 1929) and its subspecies (*S. letnica typicus*, *S. letnica balcanicus*, *S. letnica aestivalis*) from about 24 to 51 cm long, originating from Lake Ohrid, Albania, have been analyzed by horizontal agarose gel electrophoresis. All gels have been scanned. Electrophoretic patterns of *Salmo letnica* revealed the presence of multiple hemoglobins: three anodic fractions and two cathodic fractions. The hemoglobin patterns in *S. letnica* subspecies were identical. No variations in electrophoretic patterns of Ohrid trout hemoglobins were found regarding sex ratio and sampling season. This study presents also the normal values of hemoglobin concentration of *Salmo letnica* subspecies. These data suggest that for the assessment of hemoglobin concentration of Ohrid Lake trout, it is sufficient to consider mean value of hemoglobin concentration of the species *Salmo letnica* (not necessary for each subspecies). The concentration of hemoglobin was found to be lightly higher in winter samples (9,361 g/dl) than in those of summer (8, 86 g/dl). Normal values of hemoglobin in male specimens (9, 433 g/dl) were higher compared to female specimens (8,623 g/dl).

THE APPLICATION OF RADIOCHEMICAL SEPARATION PROCEDURES TO DEPLETED U AND PU RADIONUCLIDES IN ENVIRONMENTAL SAMPLES

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ABSTRACT

The aim of this work is to search for possible Depleted Uranium (DU) and Plutonium (Pu) contamination in environmental samples (soil, water and grass) using radiochemical procedures.

NATO confirmed in February 2000 the use of DU during the Kosovo conflict and provided the United Nations with information consisting of a general map indicating the areas targeted and the total number of DU rounds fired. It is evident from this map that most of the targeted sites with DU are very close to Albania-Kosovo border, in the

north-east part of Albania. For the safety of the local population it is essential to obtain truthful and correct information regarding the environmental situation and any possible connected health risks. So, we decided to collect environmental samples (soil, grass, water) from the north-east part of Albania (Kukes). The samples are analyzed for DU and Pu-239/240. The analysis is performed by isotope dilution alpha spectrometry using ^{242}Pu and ^{232}U tracers. The sources for the alpha spectrometric analysis are prepared by micro precipitation with NdF_3 . IAEA reference materials are analyzed together with the samples for the purpose of Internal Quality Control.

Keywords: Depleted Uranium, Plutonium, concentration in environmental samples, radiochemical procedure

PC REMOTE CONTROLLER VIA BLUETOOTH IN JAVA

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ABSTRACT

"It is not just a question of connecting to the other side of the globe. It is as much a question of connecting to the other side of the room."

These were the words that came from the Swedish giant of the mobile phones, Ericsson Mobile Communications, and pretty much explains what this new wireless technology is for. In this article we will show how to take the first steps in developing a Bluetooth application in Java. We will demonstrate how to handle topics from the device discovery, service creation and discovery, to the sending and listening to Bluetooth messages.

Keywords: Bluetooth, remote controlling, Java, MIDLet

MERCURY CONTENT IN HAIR AND URINE SAMPLES OF THE PEOPLE LIVING INSIDE TERRITORY OF "VLORA HOT SPOT" POLLUTION, ALBANIA

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ABSTRACT

The determination of Hg content in hair samples of 72 Hg exposed people, as well as urine samples of 25 children living inside territory of "Vlora Hg-Hot Spot" for a period of 2 to 10 years was carried out. The influence of factors, such as time of mercury exposure, age, sex, fish consuming, has been in consideration. No relation between mercury content, exposure time, age and sex was found.

The mean value of Hg content in hairs of exposed people was found to be 0.806 mg/g. The mean content of Hg (0.855 mg/g) in hairs of the subjects of 37 children, 2-12 years old were found to be on the highest range of mercury content found for other groups of people under investigation. The mean content of Hg in hairs of 20 children (2-12 years old) was found to be higher (1-2 mg/g). The mean value of Hg content in hairs of exposed people was compared with the same parameter of 61 un-exposure people (37 children, 4-5 years old and 24 young people, 23-24 years old). The mean content of Hg in hairs of exposure people were found to be 2 to 3 times higher than the same age and sex of the unexposed people. The mean concentration of Hg in urine samples of the children under investigation was 3.95 mg/L, smaller than the allowed limit. No correlation between mercury content and sex was found.

Keywords: hair samples, Hg exposure people, Hg content, CVAAS

THE USE OF SEM (EDAX) TECHNIQUE FOR “SOUR” OR H₂S CORROSION STUDY OF CARBON STEEL

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ABSTRACT

The aim of this paper is to present the corrosion of a carbon steel after exposure to brine solutions saturated with H₂S (sour environment) at 25°C, pH=5,6 and with high speed stirring (900rpm) to ensure turbulent flow conditions. The results revealed that carbon steel is susceptible to pitting corrosion. The phases formed on the surface analysed by SEM(EDAX) technique.

STRATIGRAPHY OF THE UPPER JURASSIC AND NEOCOMIAN DEPOSITS IN THE MIRDITA ZONE (ALBANIA)

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ABSTRACT

After uplift and emplacement of the ophiolites on continental margins during the Late Callovian and Early Oxfordian, the Internal Albanides emerged and were intensively folded (Cimmerian orogeny). Kimmeridgian-Tithonian-Neocomian flyschoidal and flysch deposits lie transgressively above closely folded different levels of either ophiolitic formations or Triassic-Middle Jurassic deposits. As a rule these deposits commence with wildflysch, with sandstone-pelitic, pelitic-sandstone, pelitic or calcareous-marly layers in the middle and upper parts. Kimmeridgian-Tithonian-Berriasian deposits are developed in a small part of the area of the Mirdita zone (in the villages of Voskop, Polena and Kamenica, Korça area, South Albania). Tithonian deposits lie transgressively in a larger area (western part of the Inner Albanides), and the largest area is occupied by Neocomian deposits. Other tectonic movements (Mirditaean) during the Hauterivian result in the emergence and folding of all formations of the Inner Albanides. A new transgression (Barremian) extends across a

great angular unconformity above tightly folded ophiolitic rocks, Triassic-Middle Jurassic deposits, or Upper Jurassic-Neocomian flysch deposits.

Keywords: Upper Jurassic-Neocomian; stratigraphy; flysch; paleogeography; Inner Albanides; Mirdita zone; Albania

COMPARISON OF DIFFERENT TYPES OF INTELLIGENT AGENTS: A CASE STUDY AND A SIMULATION

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ABSTRACT

The word 'agent' has become very popular inside the computer science community and especially the agent-based community. The world is living a revolution in information technology, thus resulting in huge amounts of raw dynamic information. Intelligent agents seem to introduce promising developing methods for a lot of complex applications. This paper is focused in studying the behavior of different intelligent agents' types. This is accomplished by the construction of two kinds of agents: a simple reflex agent and a goal-based agent. The simulation will compare the behaviors of these two agents in an environment with obstacles. The agents have to find their way out in this environment. We will put in evidence the advantages of the goal-based agent versus the simple reflex agent.

Keywords: intelligent agent, simple reflex agent, goal-based agent

ALBANIAN-BULGARIAN PROJECT FOR STUDY OF SEISMOTECTONIC DANGER IN SEVERAL CULTURAL MONUMENTS

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According to the Agreement between the Albanian and Bulgarian Academies of Sciences was developed four year project (2003-2006), titled 'Seismotectonic Danger in Cultural Monuments of Tirana-Shkodra Region (Albania) and Sofia Region (Bulgaria)'. The authors of this paper are the heads of the above-mentioned project.

The Balkan Peninsula has numerous cultural monuments. They mark the long-time development of the civilization in the SE Europe. A big part of the monuments takes place in regions with active tectonics, including destructive seismic manifestations. These monuments need seismotectonic investigations and special cares for the protection from the natural hazard.

The seismotectonic investigations are based on neotectonic and seismological information. The neotectonic information includes data for the regional and local structural units as well as for active faults or fault zones. The seismological information uses data for the strong regional and various local earthquakes and their effects in the studied sites. The Albanian colleagues make seismotectonic studies in several ancient and mediaeval monuments. The Amphitheater in the town of Durres, the Castle of Petrela in the southeast of Tirana City, the Kruja Castle, the Rozafa Castle and the subsided Lead Mosque in the town of Shkodra are among them.

FOCAL MECHANISM SOLUTIONS AND STRESS FIELD DISTRIBUTION IN ALBANIA

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Albania is situated in the Alpine – Mediterranean seismic belt and comprises part of the junction between the Adriatic microplate and the Eurasian plate. The country is characterized by intense microearthquake activity and small and medium-sized earthquakes and only seldom by large events. The earthquake foci are concentrated mostly along active faults and the collision between Adria and Albanian orogen is the main generator of seismic activity.

The close relationship between the earthquakes and the active fault zones is evidenced in many cases and determines the expected maximum seismic potential of these zones (Aliaj, 1988; Aliaj and Muço, 1996).

Based on the seismotectonic synthesis, three main longitudinal seismoactive zones and three main transversal ones, are identified: (1) the Ionian-Adriatic longitudinal zone, which marks the boundary between the Adriatic microplate and the Albanian orogen, (2) the Mat-Moker-Bilisht longitudinal zone, (3) the Drini-Ohri-Korça longitudinal zone, (4) the Shkoder-Peja transversal zone, (5) the Lushnja-Elbasan-Debar transversal zone and (6) the Vlora-Tepelena transversal zone (Aliaj, 1988; Aliaj and Muço, 1996). From the recent investigations, another transversal fault zone that of Bregu i Detit-Erseka, is inferred from the dynamics of epicenter migration.

THE PLACE OF DISINFECTION IN THE CONTROL OF INFECTIOUS DISEASES

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Keywords. Disinfection, disinfectants, infectious agent, disease control.

DEVELOPING AND ASSESSMENT TECHNIQUES FOR EVALUATION OF ^{99m}Tc -MIBI RADIOPHARMACEUTICAL

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ABSTRACT

There are several recommended methods in the literature for radiochemical purity control of ^{99m}Tc -MIBI radiopharmaceutical [1]. Though, it is unlikely that all methods are equivalent. The aim of this study is to evaluate some of these methods and others not recommended in the literature, taking into account different parameters such as: true separation, shape of the chromatographic peaks, time required, ease of handling, cost, etc., in order to verify and select the best methods for this radiopharmaceutical. The scoring system is established according to the relative importance of each factor considered. It would appear that instant thin layer chromatography (ITLC) is the best support for miniaturized methods, using acetone as solvent to check the content of technetium in colloid form and saline (NaCl 0.9%) as solution to check the content of free fraction of pertechnetate in ^{99m}Tc -MIBI kit.

POLAROGRAPHIC RESEARCH OF THE ZINC COMPLEXATION WITH ETHYLENE DYAMIN TETRA ACETIC ACID IN THE PRESENCE OF ACETATE BUFFER

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ABSTRACT

In this work the research of polarographic complexation of zinc with EDTA in acetate buffer by using differential pulse polarography has been emphasized. Polarographic titrations took place in an electrolytic solution of sodium perchlorate by concentration and ionic force of 0.1 mol/dm^3 . All measures are developed in $\text{pH} = 4.00 \pm 0.1$ using acetate buffer in solution and pH values are determined before and after polarographic draws. Quantity concentration of zinc ions during titration was kept constant ($2 \times 10^{-7} \text{ mol/dm}^3$) whereas concentration of EDTA has been changed from $1 \times 10^{-8} \text{ mol/dm}^3$ to $3 \times 10^{-6} \text{ mol/dm}^3$. From experimental results we can perceive that the zinc ions using DP Polarography gives good defined polarographic waves of free ions (first wave) and second waves of complexing ions. According to the experimental results, we have determined stability constants and ionic distribution of complexes for zinc (II) chelates, (Zn-EDTA). These calculated results from the current ratio of complexed zinc and uncomplexed zinc are compatible with the data one can come across in literature. Interpretations of metal complexation phenomena with organic chelators as it is EDTA complexant, is a contribute to determination and speciation of the state of complexation of traces of metal ions at low concentration levels, and their characterization in natural and model systems.

EVALUATION OF METAL SPECIES IN SEDIMENTS USING SINGLE AND SEQUENTIAL EXTRACTION PROCEDURES

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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 aquatic systems. Total concentration of heavy metals doesn't give enough information in environmental studies. An evaluation of heavy metals content in sediment samples of Karavasta Lagoon is given. Monitoring of contaminant levels in water, or sediment samples of the lagoon, as well as metal speciation procedure, was important for the evaluation of its environmental situation. Because the use of total concentration of heavy metals is not sufficient to obtain relevant information to environmental studies aimed to evaluate the impact of anthropogenic or natural contamination sources, a three steps sequential extraction procedure, proposed by EU and known as BCR method, was applied for metal speciation studies. The state and mobility of heavy metals in sediments samples of Karavasta Lagoon were studied. The most important species of metals present in sediments are in mobile forms and 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 flame and electro thermal atomic absorption spectrometry. Total heavy metals concentration was found to be in low content. If we consider the total extractable part of heavy metals, it is relatively low comparing with the total concentration of heavy metals and doesn't exceed 50 %. 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. Fe, Cr Mn are the metals which are extracted in less percentages and Cu, Cd dhe Pb are the metals extracted in higher percentages. Considerable levels of the total content of Mn (about 24%) and Cd (about 38%) were found to be in exchangeable form and adsorbed to carbonates, extracted mainly during the first step of extraction (phase A). Metals bound to this fraction are presumed to be more bioavailable and thus may present a potential risk for the biota and aquatic system of the lagoon. Considerable amounts of all of metals are found to be bounded to Fe/Mn oxides, which is a fact of a reductive dominating medium of these sediments. About 16.4% of Fe, 14.9 % of Zn, 25.8% of Cu, 23.1% of Pb and 7.2% of Cr are extracted mainly during the second step of extraction (phase B). A part of Ni (about 16.0%) and Cu (about 7.3%), were found to be bounded to organic matter and as sulphides forms, extracted mainly during the third step of extraction (phase C). In this case they can be released in solution in contact only in certain conditions.

Keywords: AAS, metal speciation, heavy metals, sediments, background levels, normalization, BCR method, sequential extraction

STUDYING THE SPREADING INHIBITION IN PITTING CORROSION PROTECTION OF ALLOYED CARBON STEEL, IN 0.1M NaCl SOLUTION AND H₂S PRESENCE.

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ABSTRACT

The combination inhibitor/surfactant is one of the latest choices for all entire pipeline corrosion protection. It is important for realizing the spread and adsorption of the inhibitor in all inner parts of pipeline, especially at the top. This article treats the determination of an optimal compose ratio commercial inhibitor/surfactant (the spreading agent) in corrosion protection of alloyed carbon steel . Experiments were conducted using electrochemical methods, measuring the current during the change in linear manner of the potential in anodic and cathodic side for alloyed carbon steel electrode immersed in deaerated 0.1 M NaCl solution, saturated with H₂S. Electrophoretic coating was used to avoid crevice corrosion of the samples.

Keywords: spreading inhibitors, optimal compose ratio, electrophoretic coating.

A BASIC EVALUATION OF TURBULENCE MODELS FOR TURBULENT FLOWS IN A WAVY CHANNEL

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ABSTRACT

In this paper different turbulence models for turbulent separated flows in a wavy channel are evaluated. The standard $k - \varepsilon$ (ske) model, realizable $k - \varepsilon$ (rke) model and Reynolds Stress Model (rsm) are tested using the finite-volume code *Fluent* and compared with Direct Numerical Simulation (DNS) data [5] in order to evaluate their accuracy. A second order accurate discretization is employed to solve the governing equation of the flow. A 2D domain is considered and the Reynolds number of the flow is 6850 based on the inlet velocity and channel height. The dimensionless results obtained for the flow parameters: velocity components (U , V), turbulent kinetic energy

(k) and Reynolds stress (uv) show a strong similarity between ske and rke models, while some differences when compared to the rsm. The analysis of results has shown that the main features of this complex flow can be predicted with reasonably reserve, at last with the rsm method. The major difference between turbulence models are related to k and uv near the wavy wall region.

Keywords: Wavy channel, turbulence models, Fluent, Reynolds stress, grid

PRE-BILAYER MEMBRANES ARE IMPORTANT TOOLS FOR THE STUDY OF THE LIPID BILAYERS

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ABSTRACT

Artificial bilayer membranes are a good model for the study of biological membranes and their components. Commonly, the artificial bilayers are created by using natural or synthetic lipids, mixed with hydrocarbon solvents. Pre-bilayer membranes (PBMs) are an intermediate state between the bulk solution and the bilayer itself. The study of the structure of PBMs may help for a better understanding of the structure of the bilayers. There is a periodic relationship between the specific capacitance of PBMs, and the number of carbon atoms in the molecule of the solvent used; and the PBMs may contain multiple layers of solvent molecules in their core.

Keywords: bilayers, membranes, pre-bilayers, solvents, lipids, structure

AJNTS, No. 22, 2007**CALCULATION OF PARTIAL FLUXES OF POWER WITH
COMBINED GRAPH'S METHODS ON GRID COMPUTING
PLATFORM****Dorian MINAROLLI, Ilir PALIKUQI, Betim ÇIÇO**Department of Electronics, Faculty of Electrical Engineering
Polytechnic University of Tirana, Tirana, Albania**ABSTRACT**

In this paper we present the research work on implementing on a grid computing platform an application for the "Calculation of partial fluxes of power with combined graph's methods". This work would be helpful for the Power Corporation of Albania in order to calculate fluxes of power that are given to every consumer from each electrical resource and also power waste on the network for each electrical resource with respective information. Calculation of variables of a power network that has a lot of nodes and branches with this method requires a huge amount of computing power, hence in this work we are focused in converting to parallel, in the form of a workflow of jobs, in order that an existing application that runs in a single computer, which takes a lot of execution time to be executed on a grid computing platform. Partitioning of this application in parts that can be executed in parallel on a grid will provide a smaller execution time and also an increased accuracy of results. The application is being tested and running on the cluster of the laboratory of Computer Engineering at Polytechnics University of Tirana and on the SEE-GRID infrastructure, part of which this laboratory is.

Keywords: Partial-fluxes, Combined graph method, Grid computing, Workflow.

**IMPLEMENTATION OF CRYPTOGRAPHIC ALGORITHMS ON
RECONFIGURABLE FPGA SYSTEMS (CASE STUDY: THE 3DES
ALGORITHM)****Betim ÇIÇO, Fisnik KRAJA**Department of Electronics, Faculty of Electrical Engineering
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This paper presents a new solution for the implementation of the network security algorithms using FPGAs. We implement the Triple-DES algorithm on an FPGA to verify an ideal match for algorithm independent security applications. Most modern security standards are defined to be algorithm independent; they allow a choice from a set of algorithms for the same function. Triple-DES, is currently the most widely used private key encryption algorithm. FPGAs are reconfigurable hardware devices that can switch algorithms on the fly. This paper discusses if cryptographic algorithms can run much faster on FPGAs than on software, while preserving the security of traditional hardware solutions. This paper also discusses the effect of this solution in the average rate of the encrypted or decrypted data.

Keywords: Triple-DES (Triple Data Encryption Standard), FPGA (Field Programmable Gate Array), Security Standards and Applications.

CAR-FREE AREAS IN TIRANA: FANTASY OR NECESSITY?

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ABSTRACT

For the first time in summer 2004, the dense, mixed-use center of Tirana (the Bllok) was converted into a pedestrian area during the evenings. Although popular, the experiment was short-lived. The first part of this article recounts the history and debate related to this project in Tirana. In the second part of the article, the author advances a number of arguments in favor of having a car-free center in Tirana. The environmental, economic, health, and social costs of car-dependence are enumerated. The third part of this article provides an overview of the history of pedestrian areas in other European countries.

Keywords: pedestrian areas Tirana; car-free areas; car-banning; the Bllok

RARE AND THREATEN PLANTS IN DAJT-MALI ME GROPA ZONE (TIRANA)

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ABSTRACT

In this article are providing data of rare and threaten plants, in Dajt-Mali me Gropa zone, which have special values for the biodiversity. Are evident 90 types of rare and threaten plants, which are companied by phytocenotic feature as well as categorization according to IUCN, 1996

Keyword: rare and threaten plants

REEXTRACTION OF AU, FE AND PB FROM ORGANIC PHASE INTO AQUEOUS PHASE

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ABSTRACT

Most of the extracted elements with the use of organic solutions for extraction can be returned to their former aqueous phase, thanks to the nature of reagents applied which behave as liquid ion exchange extractants. The solution applied for separation of the elements is Na₂CO₃, because ion Na⁺ replaces cations from the complex, it then transforms into aqueous phase where its content can be determined with ease. Applying re-extraction of the elements we can re-concentrate any element and bring its content to the level where it can be detected. This method of separation offers many selective possibilities.

EXTRACTION OF AU, FE AND PB WITH ALAMINE 336

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Mandushe BERISHA**

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ABSTRACT

This paper is continuation of our earlier research for the application of liquid anion exchange extractants, for multi element extraction from the artificially prepared mix of elements. Research has been done in the selective nature of extractions reagents [1] and parameters have been established which determine the solvent extraction, the effectiveness of the extraction and the possibility of their application in establishing analysis of the elements. Detailed research has been done with regards to the effect of concentration of HCl and concentration of salts of KCl, KI and CH₃COONa in extraction of elements from aqueous solutions. Concentrations of salts in the aqueous solutions of acids contain important parameters which heavily effect the outcome of the percentage of the elements extracted. This can be considered as prerequisite that enabled controlled extraction of an element.

OPTIMIZATION OF SURFACTANT/INHIBITOR CONCENTRATION RATIO FOR SPREADING INHIBITION OF TOL CORROSION UNDER STAGNANT CONDITIONS

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ABSTRACT

Spreading inhibition is reported to be an efficient concept for mitigation of top-of-the-line (TOL) corrosion with universal applicability under all surface conditions. According to the TOL spreading inhibition concept, inhibitor molecules creep with the help of a spreading liquid film against the gravity from the bottom of the line (BOL) along the wall to the top of the line (TOL). The new method for distribution of corrosion inhibitors over the entire surface (including TOL region) of a pipeline under wet gas transport conditions has been shown to work efficiently at laminar flow or even stagnant conditions [1,2]. Efficient spreading compounds include not only fluorinated compounds [2] which are environmentally questionable, but also modified fatty alkanols and fatty acid alkanolamides which are more environmentally friendly functional chemicals [1,2]. However, it appeared that the combination between spreading compound and corrosion inhibitor has to be selected very carefully with respect to generic type and molar ratio, as well.

The present work aimed at determining the optimum ratio between a commercial inhibitor A and a spreading compound (surfactant) B for TOL inhibition in NaCl solution saturated with H₂S under 1 bar pressure in stagnant conditions using cyclic potentiodynamic polarization and Electrochemical Noise (ECN) measurements. The cyclic potentiodynamic experiments were performed to study the adsorption/desorption of inhibitors in the presence of spreading compounds.

Keywords: Spreading inhibition, Top-of-the-line (TOL), corrosion, inhibitors, detergents, optimum composition ratio, electrochemical noise (ECN), cyclic potentiodynamic polarization.

PREPARATION OF ^{99m}Tc -MIBI RADIOPHARMACEUTICAL AND STUDY OF ITS SOME PROPERTIES

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ABSTRACT

Based on the importance of ^{99m}Tc -MIBI radiopharmaceutical (hexakis-2-methoxy-2-isobutyl isonitrile), gotten during last years in the field of nuclear medicine imaging, we carried out this work to study some of its properties after preparation. It has been studied the effect of pH in yield of labeling and it is performed a new procedure to check radiochemical purity. It is produced MIBI kit in sterile form and it is stored in deep freezer (-70°C). After that are checked in vitro stability, shelf-life, biodistribution, sterility, pyrogenicity, toxicity of this kit. All of these studies show that ^{99m}Tc -MIBI radiopharmaceutical is stable up to 4 hours after its formulation, pH= 5.6 is optimal to get highest yield of labeling and this kit fulfills all the biological requirements given from International Pharmacopoeias. The only problem is short shelf-life, so we recommended that this kit is to be produced in freeze dried form.

EVALUATION OF THE *IN VITRO* PERFORMANCE FOR TWO DIFFERENT FORMULATIONS OF AMLODIPINE – TABLET THROUGH DISSOLUTION PROFILE COMPARISON

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ABSTRACT

The aim of this work is to characterize the dissolution profiles of two different formulations of amlodipine besilate and use them to compare and evaluate the in vitro performance of the two products by means of the similarity factor f_2 . Dissolution profile comparison was carried out for two drugs: Amlodipine, 10 mg tablet, manufactured by PROFARMA Sh.A –Tirana, and Amlopin®, 10 mg tablet, manufactured by Lek -Ljubjana. Both products are conventional release drugs.

Keywords: dissolution profile, similarity factor f_2 .

MINIMUM 1D VELOCITY MODELS IN SEISMOGENETIC ZONES OF ALBANIA

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Academy of Sciences of Albania, Tirana – ALBANIA

ABSTRACT

One-dimensional (1D) velocity models are computed at VELEST software of system SEISAN, inverting re-picked P-wave and S-wave arrival time recorded in period of time 2002-2005 by the Albanian, Montenegro, Thessaloniki and Macedonia seismic network. The re-picked data yield resolved P-wave and S-wave velocity results and proved to be more suited than bulletin data for detailed tomographic studies. Although earthquake hypocenters from the ASN bulletin have location errors which are negligible for civil protection purposes and large scale seismotectonic analyses, more accurate hypocentral determinations are necessary for detailed seismotectonic and geodynamic studies. Using the improved velocity models, we relocated the earthquakes, which occurred in the Albania in the past 4 years, achieving constrained hypocentral determinations for the events in the Albania. The interpretation of the obtained 1D velocity models allows us to infer interesting features on the deep structure of the Albania. Smooth velocity gradients with depth and low P- wave velocities are observed beneath the Albania Orogen. These results represent a first step towards more detailed seismotectonic analyses.

Keywords: earthquake location -1D velocity model – Albanian seismotectonic zones.

AJNTS No. 23, 2008

THE APPLICATION OF PASSIVE SAMPLING SYSTEM FOR HEAVY METALS MONITORING IN NATURAL WATERS

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ABSTRACT

A number of alternative methods monitoring water quality has been developed to complement and/or replace spot sampling methods that provide only an instantaneous estimate of the concentration of pollutants at the time and point of sampling. Amongst these alternative technologies are passive sampling devices that use membrane diffusion method to separate a receiving phase (characterized with a high affinity for the pollutants to be present in water system) from the aqueous environment. A Chemcatcher variant sampler based on diffusion of heavy metals through a porous CA membrane to a receiving phase is used. Heavy metals are there removed by chelating process in a chelating Empore™ disk, which has been developed for metals monitoring.

The sampler reacts with dissolved and weakly complexes species which are species that dissociate within the diffusive boundary layer of the sampler. The system collects the bio available forms of heavy metals; mimicking bio monitors and immobilise the contaminants in situ avoiding speciation changes.

Three different stations of Shkodra Lake are selected for monitoring. AAS method using graphite furnace as atomizer was used analysing heavy metals concentration after the deployment of Chemcatcher samplers. There were identified a number of bio available forms of heavy metals concentrated in the collecting chelating disk as Cu, Mn, Zn, Fe, Co, Cr, Cd, Pb. The concentration of part of heavy metals (Cu, Zn, Pb, Cd and Ni, in $\mu\text{g/L}$), as well as absolute content of Fe, Mn, Co and Cr (in $\mu\text{g/L}$) reported. The results are in the same level of concentration compare with our previous studies performed with batch method of ion exchange. This study is realized for the first time in Albania in collaboration with University of Portsmouth, UK.

Keywords: in situ, environmental monitoring, Chemcatcher, CA membrane, Empore™ disk

CARYOLOGICAL AND MOLECULAR DATA REVEAL DIFFERENCES AMONG THREE CLOSELY GROWN POPULATIONS OF *LEUCOJUM IONICUM* OF SOUTHERN ALBANIA

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ABSTRACT

The goal of the present study was the determination of possible variation among three very closely situated populations of *L. ionicum* Tan, K., Mullaj A., Sfikas G., Strid A. (*L. valentinum* Pau. subsp. *vlorense* Paparisto et Qosja) by means of cytological and molecular tools. Plant material from populations were collected in the area of Vlora, south western coast of Albania (Uji i Ftohtë, Orikum and Dukat).

The chromosomic analysis was conducted via the standard techniques, karyograms and idiograms preparations, and molecular investigation was based on the analysis of RAPD-s results.

Both cytological and molecular investigations revealed differences among the three populations of *L. ionicum* of Albania, which were further analyzed in order to identify the proximity among the three. For this, the NTSYS software was used to build dendrograms of affinity based on Jaccard's coefficient of similarity.

MONITORATION OF BRUCELLOSIS DISEASE ON DAIRY HERD CATTLE

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ABSTRACT

Brucellosis is essentially a disease of animals, especially domesticated livestock caused by bacteria of *Brucella* group with humans as an accidentally host (9, 13,15,16). In other words it is a zoonosis (2, 3, 6). On genetic grounds the *Brucella* group can be regarded as variants of single species which for historical reasons is identified as *Brucella melitensis*. However, for practical purposes this approach is considered unsatisfactory and six main species are distinguished; *B.abortus*, *B.suis*, *B.melitensis*, *B.neonatomae*, *B.ovis*, *B.canis*. Strains isolated from marine mammals fall into at least three groups distinct from these and may be designated as new.

Unfortunately, the official data about exact prevalence of Brucellosis in our country still remain not well known for many reasons. The diseases in animals has been extend its geographic territory in Albania from South to North and the incidence of human brucellosis is in progress every years. The epidemiological survey of brucellosis is one of main route of control of it in animals and humans (8).

This paper gives the results of Milk Ring Test (MRT) in some dairy herds in Albania. The MRT is a simple, cheaply; sensitive and effective screening test to identify infected dairy herds in the various regions. The results of this study provide

information that the prevalence of infection is going to increase. It is important to emphasize that only slaughters of sera-positive animals the programme of control and eradication of disease will be not successful.

THE ROLE OF GRO E COMPLEXES IN THE PROTEIN FOLDING
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ABSTRACT

Molecular chaperones are a ubiquitous and abundant group of proteins that have shown to be implicated in the posttranslational folding and transport of newly synthesized proteins within the cell (Gething & Sambrook, 1992; Hendrick & Hartl, 1993). One of the best characterized members of this family is the *Escherichia coli* protein Gro E. There are many proteins which require the Gro E chaperoning system for correct folding. For further characterization of the activity and the work-mechanism of the chaperones is interesting to investigate the interaction of the GroE-proteins with a variety of non-native polypeptide chains in detail. In this case we used GAPDH (glyceraldehyde-3 phosphate dehydrogenase). In refolding experiments in presence of the complete GroE system the yield of correctly folded protein is increased up to 40% compared to 19% of the spontaneous reactivation.

PRELIMINARY SURVEY OF THE MAYFLIES
(EPHEMEROPTERA), STONEFLIES (PLECOPTERA) AND
CADDISFLIES (TRICHOPTERA) OF THREE ALBANIAN RIVERS
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ABSTRACT

Biological assessment effectively describes water quality and physical impacts from broad scale land use changes caused by forest practices, agriculture, and urbanization (R.W. Plotnikoff, 1994). As well as chemical indicators, bioindicators are used in to define the water quality. EPT (Ephemeroptera, Plecoptera and Trichoptera) richness (Bode et al. 1995, Parker & Salansky, 1998,) biotic index (Schmiedt et al; 1998; Somers et al, 1998) and TV. (Reiss et al., 2000) are used to classify the water quality level of three Albanian rivers (Vjosa, Shkumbini and Buna-north center and south Albania). Our data prove that SEPT is 15 and Biotic Index 2.55 for Vjosa River; SEPT 13 Biotic Index 1.98 for Shkumbini River; SEPT 19 and Biotic Index 2.67 for Buna River. Related to these results we can conclude that the water quality of those rivers is still very good.

Key words: EPT, TV, Biotic index, water quality.

MUNICIPAL SOLID WASTE MANAGEMENT TOWARDS SUSTAINABLE DEVELOPMENT IN OUR COUNTRY

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ABSTRACT

Sustainability is one of the key issues for any wealthy future development. Sustainability is inevitably linked with quality of life. Today's municipal solid waste (MSW) management is identified as unsustainable. Attempts to improve this management towards the objective of sustainability are very slowly. A basic solution taking this into account is presented. The key element for a sustainable future is the integrated management system (IMS) of MSW. Strategies taking only the particular municipal solid waste treatment have failed. The knowing and the understanding of these modern municipal solid waste management is very important to cope with the ever-growing complexities of handling large volumes of solid waste.

Keywords: sustainable development, municipal solid waste, integrated management.

AGENTS AS RATIONAL DECISION – MAKING SYSTEMS

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ABSTRACT

This paper is focused on studying agent's behavior as rational decision – making system that balances reactive and pro-active behavior. Modern systems are based on software that has to operate on dynamic environment and provide a greater flexibility. Current trends in software development show a move towards supporting autonomous, rational components (agents). We simulate the rational decision-making behavior by constructing an agent, which operates in a dynamic environment with random obstacles. He selects among plans to fulfill its goal – to find its way out in this environment.

Keywords: agents, rational decision-making systems, real rationality, ideal rationality.

NEAR-SURFACE OZONE IN TIRANA AREA

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ABSTRACT

A statistical analysis of ozone concentration in the city of Tirana, capital of Albania, was carried out for the period April 2006 – December 2007. The data analysis revealed that Daily Maximum Hourly (DMH) value of ozone concentration did not exceeding $180 \mu\text{g}/\text{m}^3$ during summer. It was observed that the maximum concentration is reached

between 12 and 15 AM. The weekly variance of DMH values of ozone is small, so the ozone levels are determined mainly by background levels.

ESTIMATION OF THE VJOSA RIVER WATER QUALITY

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ABSTRACT

The features of Vjosa River water quality were estimated by analysing some pollution indicators measured on ten stations along the river approximately bimonthly in the period February 2004 – December 2007. These indicators tell for a clear variation of water quality both in time and spatial way. The most stable situation is at Çarshova Station where indicators are in a little difference time by time and the trend of them is low. The unstable status is at Mifoli Station where the situation is very variable time by time and there is a big human impact as the discharge of wastewater, as the industrial and agricultural discharges. This study gives a real view of the chemical status of Vjosa River water.

Keywords: indicator of pollution, water quality, Vjosa River

DIRECT SEPARATION BY HPLC OF THE ENANTIOMERS OF LANSOPRAZOLE

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ABSTRACT

Proton pump inhibitors (PPIs) are widely used drugs that are clinically administered as racemates. Lansoprazole is a racemic benzimidazole derivative which inhibits gastric acid secretion and is generally used for the treatment of peptic ulcers and gastroesophageal reflux disease. In this study, the enantiomeric resolution of lansoprazole has been examined using two polysaccharide chiral stationary phases (CSPs) based on derivatives of cellulose (Chiralcel OD) and amylose (Chiralpak AD). Resolution was achieved using both CSPs and a mobile phase of hexane:ethanol (92:8 v/v), flow rate 1.0 ml/min, yielding separation (?) and resolution factors (R_s) factors of 1.5 and 3.1 (OD CSP) and 1.2 and 1.8 (AD CSP) respectively.

In order to determine the enantiomeric elution order, semi-preparative isolation of the enantiomers of lansoprazole was carried out. Characterisation of the isolated enantiomers by circular dichroism (CD) spectroscopy, using (S)-omeprazole as a CD reference compound, indicated that the elution order on both CSPs was (R)- before (S)-lansoprazole. It was found that omeprazole has the potential to be employed as an internal standard for the analysis of lansoprazole using the Chiralcel OD CSP and that the method could be used to analytically quantify nanogram amounts of lansoprazole enantiomers.

Keywords: lansoprazole, chiral, enantiospecific analysis, omeprazole, HPLC

TOWARDS CODE COVERAGE ANALYSIS FOR ASPECT-ORIENTED SOFTWARE

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ABSTRACT

The aim of this paper is measuring code coverage on AspectJ programs using existing coverage testing tools for Object oriented, principally Java. After AspectJ's creation as programming language, the next challenge was to test software realized using this approach and to improve it. In parallel with testing AspectJ we should perform the unit tests to measure its performance. Code coverage is part of a feedback loop in the development process. It highlights parts of the code which remain unexecuted or that are not adequately tested. There are a number of different ways of measuring code coverage for procedural and object – oriented languages, for example: Statement coverage – is any line of code executed; Condition coverage – is every possible condition output tested and executed; Entry or exit coverage – is every method entry or return's feedback executed. Mainly our work focuses on analysing AspectJ language constructs and we decide which are the points that should be subject for Coverage Analysis on Aspect –Oriented programs. We also study the structure of object-oriented coverage tools, proposing modifications for future usage in Aspect – Oriented field.

Keywords: Aspect J; Coverage Analysis; Aspect-oriented programming; Java; Coverage tool

STATIONARY SOLUTIONS OF NONLINEAR RANDOM EQUATIONS

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ABSTRACT

We study a nonlinear random parabolic problem in Banach spaces driven by a Markov noise and with random initial condition. The noise is defined as stationary solution of a stochastic differential equation in finite dimensional spaces (or Hilbert spaces). Under suitable assumptions, we prove the existence of a stationary solution for nonlinear random problem. The obtained theoretical results can be applied in nonlinear random reaction–diffusion equations as well as in nonlinear random Boussinesq–Glover equations.

THE ROLE OF MONTECARLO SIMULATIONS IN MODELING BIOLOGICAL PROCESSES IN SMALL ANIMALS

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ABSTRACT

Medical imaging techniques are playing an ever-increasing important role in medical diagnostics, since they provide anatomical or/and functional information. Those techniques allow the none (or minimally) invasive medical diagnosis of organ malfunction and cancerous lesion detection. Small animal imaging (mainly mice and rats) has become an exciting field for scientific research over the past decade, since rapid biological changes can be preclinically studied in vivo and new diagnostic and therapeutic pharmaceuticals can be studied. Those advances gave birth to the field of molecular imaging, which are the representation, characterization and quantification of biological processes occurring in a living subject at the cellular and sub-cellular level. The past decade the use of simulation in order to model imaging systems and biological processes has become a very useful tool: Technically, it provides the tools to predict the performance of an imaging system and it is used in order to optimize its materials and geometry. Medicaly, simulations can be used in order to calculate the optimal injected dose, optimize patient specific imaging protocols and treatment planning personalization. In this work we present the methods and tools for currying out simulation of imaging studies in small animals using nuclear medicine methods. The validations results for simulation studies, as well as simulated images are presented.

Keywords: Medical imaging, small animals, medical diagnostics, cancerous lesion detection, Monte-Carlo

ESSAY ON A MODEL OF THE LIVING SYSTEMS

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ABSTRACT

The ancient idea of a common Bauplan for all the animal kingdom may be represented in a model of the living systems; it can be composed by two functional units, linked together or from two types of modules, known respectively as the module of reproduction and the module of survival. The modules are Peircean triads in which a memory structure (S) intermediates the ‘ancestor – descendent’ relationship in the reproduction modules, and the ‘stimuli (O) – response’ or interpretant (I) relationship in the survival modules. As a result of triadic organization of O, S, and I elements, the modules perform their actions in informed manners. The modules of a living system

form biological networks and the model of the living system has been represented as a 'collective portrait, of these networks.

Keywords: model, module, Peircean triad, biological network

AJNTS No. 24, 2008**AUTOMATIC QUANTITATIVE ANALYSIS OF MRI BRAIN
IMAGES USING QBRAIN SOFTWARE****Edlira GJIKONDI**

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Marcel GREUTER, Paul SIJENSDepartment of Radiology, University Medical Center Groningen (UMCG),
Groningen, the Netherlands**ABSTRACT**

In this study, a new software package Qbrain is assessed for use based upon data from volunteers. This software was developed by MeDis, a Dutch producer of medical imaging software, to support radiologists in their daily task by providing objective and quantitative tissue morphometry values. Described are some of the characteristics, advantages and limitations of this fully automated segmentation method used in the quantification of Intracranial volume, CSF volume and the volumes of each lobe separately: frontal, parietal, occipital, temporal and cerebellum using three different MR images: proton density (PD), T2- weighted and fluid attenuated inversion recovery (FLAIR). To evaluate the validity of Qbrain package and differences in results between several MR imaging protocols and two MR-systems, 7 healthy volunteers were scanned on two clinical MR systems operating at 1T and 1,5T (Siemens Medical Systems Sonata and Impact MR scanners) and images were analyzed by both automatic and manual segmentation methods. Standard deviation values determine the limits of variability of Qbrain results for different sequence combination. The reproducibility of the segmentation was evaluated in two controls by scan –rescan in standard position.. an interclass correlation coefficient ICC of 0.97 was obtained for the intracranial volume and ICC value of 0.915 for the CSF volume. Qbrain showed to have a good reproducibility and stability. It also demonstrated to be dependent on scanning parameters such as strength of field and resolution. SPM2 was tried as a gold standard for evaluating Qbrain but it was not stable for our images so the gold standard was taken the expert manual delineation.

CHARACTERIZATION OF TWO DRUGS IN AMORPHOUS FORM AND THEIR STABILITY PREDICTION

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ABSTRACT

Formulation of poorly water-soluble crystalline drugs in their more soluble amorphous form is a common approach for improving their biodisponibility. In this study the amorphous forms of nicergoline and cabergoline and their solid dispersions with PVP K30 were obtained in Differential Scanning Calorimetry apparatus by supercooling of the melt and then their amorphous state investigated, in particular from the stability point of view. The average rate of molecular motion at any given temperature is probably the most important parameter used to characterise amorphous pharmaceutical materials, and can be used to explain and even predict the stability of many such systems. A quantitative estimate of product behaviour in storage can be obtained with additional data, such as the heat capacity of crystalline and amorphous samples and the distribution of molecular relaxation times. The physico-chemical stability of nicergoline and cabergoline in their glassy state was shown to be relatively low for industrial purposes, but long enough for laboratory studies. This study demonstrated a different ability of nicergoline and cabergoline to interact with PVP K30, which can be explained by the differences in their molecular structure.

Keywords: Nicergoline; cabergoline; PVP; physical mixtures; Gordon-Taylor equation; interaction

INCIDENCE OF STAPHYLOCOCCUS AUREUS IN CHEESE PRODUCED IN ALBANIA

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ABSTRACT

A total of 176 samples of cheese produced in Albania under different technological conditions over a three year period were tested for the presence of *Staphylococcus*. Forty one per cent were *S. aureus* coagulase positive while another eleven percent was positive for *Staphylococcus* spp. A total of cheese samples produced from pasteurized and raw milk, positive belonging to (28/116) 24% produced from pasteurized milk and 44/60 (73%) produced from raw milk. The most frequently level is 10^3 cfu/g and less 10^4 , 10^5 cfu/g. The staphylococcal enterotoxin can be produced at higher level than 10^5 cfu/g, based on analysis we didn't have this level.

Keywords: Staphylococcus aureus, cheese, pasteurized, raw milk, Albania

PRECIPITATION OF $Zn(II)$ WITH CITRIC ACID

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ABSTRACT

This paper examines the precipitation of $Zn(II)$ ion in water solutions of $ZnSO_4 \cdot 7H_2O$ ($1 \cdot 10^{-2} \text{ mol L}^{-1}$ and $5 \cdot 10^{-3} \text{ mol L}^{-1}$) with citric acid ($1 \cdot 10^{-1} \text{ mol L}^{-1}$, $1 \cdot 10^{-2} \text{ mol L}^{-1}$ and $1 \cdot 10^{-3} \text{ mol L}^{-1}$) in constant ionic strength of $0.6 \text{ mol L}^{-1} NaCl$. In this region of concentrations clearer solutions are found, and also where the solid phase is presented is determined. The solid phase is analyzed by IR spectroscopy.

SOME PALEOBATHYMETRIC CONSIDERATIONS FOR MIDDLE–UPPER MIOCENE DEPOSITS IN THE IONIAN ZONE

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Ismail Qemali University, Vlora

Luan HASANAJ

Albanian Geological Service

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National Agency of Natural Resources

ABSTRACT

Section analysis of plankton and benthic foraminifera from the middle–upper Miocene of the Ionian zone of Albania yielded satisfactory data on paleo depths. Results compared well to other recent studies undertaken in the Mediterranean Sea, and suggest these deposits were formed in a sea environment of depths from the upper abyssal to upper bathyal.

Keywords: Paleobathymetric data, plankton/total fauna ratio, plankton/benthos ratio, Ndroq, Zvernec, Serravallian, Tortonian, Ionian

MONITORING EFFECT OF SPREADING INHIBITION BY MODELING CORROSION OF CARBON STEEL IN GAS PIPELINES USING ECN

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ABSTRACT

The present study reports experiments modelling corrosion of carbon steel in gas pipelines in the presence of brine, hydrocarbons and H_2S in a temperature gradient to realize condensation in the upper part of the pipeline under conditions that reflect as near as possible the real parameters of a stagnant pipeline. The aim of the experiments was to compare the results of monitoring the modelling of corrosion protection of carbon steel by spreading inhibition with preceding studies realized in 0.1M NaCl in the presence of H_2S , using mass lost experiments, potentiodynamic polarization, cyclic voltametry and the Electrochemical Noise (ECN) method. Ten experiments were undertaken by simulating sections of pipeline using two half parts of a carbon steel tub connected with epoxy resin and fixed with Plexiglas sheets. The corrosion medium comprised 0.1M NaCl, with a layer of crude oil on top and H_2S in gas phase in de-aerated conditions. Each experiment lasted 28 days, monitored by ECN every five days. At the end of the experiments the steel tubes were microscopically inspected. Severe corrosion was detected in the upper part of the tube and also in the contacts of the liquid and gas phases. The effect of the inhibitorsurfactant mixture in different ratios was evident. Thus localized corrosion was avoided. The best results were achieved using a mixture of 750 mg/l inhibitor and 1 g/l surfactant. Light uniform corrosion was inspected in these cases and smaller corrosion currents were registered during continuous monitoring by ECN. According to the literature, absence of localized corrosion and re-uniform it is considered successful under such aggressive conditions.

Keywords: Corrosion modelling, Spreading inhibition, Top-of-the-line (TOL), optimum composition ratio, electrochemical noise (ECN).

KINETICS OF EXTRACTION OF GINSENG ROOTS WITH LIQUID AMMONIA

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ABSTRACT

This study investigated the kinetics of high pressure extraction of Ginseng (*Panax ginseng* L.) roots using liquid ammonia. Extraction was done following the Soxhlet principle, using some glass parts placed inside an autoclave. Ammonia was tested as a solvent under liquid-vapour equilibrium conditions at two points, with vapour pressure at 8 bar and 20 bar. Extraction yield was determined as a function of the extraction time and is described by a simple equation.

Keywords: liquid ammonia, ginseng, high pressure extraction

INTEGRATED GEOTECHNICAL AND GEOPHYSICAL APPROACH TO INVESTIGATE BOVILLA LANDSLIDE AT TIRANA REGION, ALBANIA

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ABSTRACT

The present paper reports about an integrated geotechnical and geophysical study of the problematic failed slope at Bovilla reservoir in the north-eastern part of Albania's capital city, Tirana. Analysis comprised engineering and geological mapping, geotechnical investigations of the site and geophysical investigations. The outcomes of this attempt are discussed and recommendations made.

STRONGEST EARTHQUAKES OF YEAR 2007 AND THEIR GJENERATION ZONES

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Two of the strongest earthquakes

LATE CRETACEOUS AND EARLY PALEOGENE IN NORTH ALBANIAN ALPS

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ABSTRACT

The Albanian Alps Zone represents the southeast prolongation of the High Karst platform of the Dinarides. During the Triassic, Jurassic and Cretaceous this was a shallow carbonate platform, which was replaced by pelagic and hemipelagic sedimentation at the end of the Maastrichtian and the beginning of the Paleocene. The margins of the platform subsided during the Jurassic and Cretaceous, forming a slope

with condensed and mixed sedimentation (Valbona Subzone). The Triassic, Jurassic and Lower Cretaceous deposits are transgressively overlain by Maastrichtian flysch, as the last sedimentary unit in this subzone. The Illyrian movements caused the rise and emergence of the Albanian Alps area at the end of the Middle Eocene (Lutetian).

Keywords: Stratigraphy, palaeogeography, Upper Cretaceous, Early Paleogene, Albanian Alps Zone, Albania

UPPER JURASSIC-BERRIASIAN CALPIONELLIDS FROM THE VOSKOP AREA, MIRDITA ZONE, ALBANIA

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ABSTRACT

Calpionellidae, Saccocomidae, Cadosinidae, Stomiospaeridae, etc., from Upper Jurassic- Berriasian mudstone-wackstone and rarely packstone were studied. These form the blocks and pebbles in the base of the Barremian-Aptian in the Voskop section, eastsouthern part of Albania, 16 species of the genera *Calpionella* Lorenz, *Crassicollaria* Colom and *Remaniella* Catalano. In the paper the following species were described for the first time from Albanides: *Calpionella alpina* LORENZ, *Calpionella grandalpina* NAGY, *Calpionella eliptalpina* NAGY, *Calpionella minuta* HOUŠA, *Calpionella elliptica* CADISH, *Crassicollaria massutiniana* (COLOM), *Crassicollaria parvula* REMANE, *Crassicollaria colomi* DOBEN, *Remaniella cadischiana* (COLOM), *Remaniella ferasini* (CATALANO), *Remaniella borzai* POP, *Remaniella durandelgai* POP, *Remaniella colomi* POP, *Remaniella filipescui* POP, *Tintinopsella carpathica* (MURGEANU & FILIPESCU), *Tintinopsella longa* (COLOM).

Keywords: Tithonian, Berriasian, calpionellids, Mirdita zone, east-southern Albania.

AJNTS No. 25, 2008

**Nd, Pb ISOTOPE RATIOS AND TRACE ELEMENT SIGNATURES
OF VOLCANIC ROCKS IN ALBANIA: MAGMA SOURCE
IDENTIFICATION**

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ABSTRACT

Three phases of the Mesozoic geodynamic evolution in Albanides could be distinguished based on the geochemical characteristics of the volcanic rocks: i) a rifting phase of the Early Triassic (Permo-Triassic?) to Middle Triassic, ii) spreading phase of the Middle Triassic to Middle Jurassic and, iii) a new spreading phase of the Middle Jurassic. Volcanic rocks were formed in Albania during the Early Triassic Age. Derived from an enriched mantle source (EMII) in the continental rifting phase, they are characterized by negative ϵNd values (-1.91), high Th, Zr and REE (20–100 times chondrites) content. In addition, they mark negative Eu, Ti and Nb-Ta anomalies. Middle Triassic volcanism is characterized by low Nd values (+0.69 to +1.98), high Zr and REE (3–20 times chondrites) content, a very low Th content, but no marked Eu and Nb-Ta anomalies. The magma source is an enriched mantle of type EMI. For all these volcanics crust contamination component is evident from the low Nd values and the fractionation of REE, LREE being clearly enriched compared to HREE. Subsequently, in the spreading phase, the oceanic crust evolved to the basalts of the volcano-sedimentary series (T2-J1), characterized by higher ϵNd values, ranging from +6.5 to +7.7, a REE content about 10 times chondrites, flat REE patterns to LREE depleted, no Nb-Ta negative anomalies, low Th contents (0.2 ppm, on average) and a relatively high (1.3 %) TiO_2 content. These basalts were probably formed in an opening of a back-arc basin context (BABBs) from a depleted mantle magma source (DM). The same magma source produces the basalts of Jurassic western ophiolite type that have the same geochemical characteristics as the basalts of the volcano-sedimentary series. Jurassic volcanics of the eastern ophiolite type show, in their lower part, the same geodynamic conditions (i.e. BABBs) but have a distinctively different and more depleted magma source (DMM) as evidenced by the lower REE, Ti and Zr content, though, the ϵNd values (+5.58 to +6.94) are quite similar. The Pb isotope ratios of all rocks studied do not testify to the existence of an HIMU component in the magma source. The observed trend, from OIB volcanism in the southern part of the Eastern Mediterranean (Cyprus) to back-arc basin basalts associated with arc-related and with in-plate volcanism in the northern part (Greece), seems to evolve in Albania with a decreasing role or absence of oceanic within-plate volcanism (enrichment by HIMU source).

Keywords: Nd and Pb isotopes, trace elements, volcanic rocks, geochemistry, Albania

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ABSTRACT

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Keywords: geophysical geothermal exploration, thermo-mineral basin, Llixhat e Elbasanit, Albania

INDOOR RADON MEASUREMENTS USING PASSIVE DETECTORS

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Keywords: indoor radon, alpha particle, passive detector, action level.

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Keywords: SimJ; programming language; compiler design; polyglot framework

EPIDEMIOLOGICAL AND CLINICAL PROFILE OF FOWLPOX IN PIGEONS IN TIRANA REGION

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Keywords: Fowlpox, pustule, cutaneous, diphtheric, epiteliotrop

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Keywords: Geothermal energy, geothermal regime, heat flow density, low enthalpy, thermal water, direct use

THE IMPACT OF PHYSICO-CHEMICAL PARAMETERS OF CHEESES MADE FROM RAW AND PASTEURIZED MILK IN ALBANIA TO INCIDENCE OF STAPHYLOCOCCUS AUREUS

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ABSTRACT

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Keywords: *Staphylococcus aureus*, cheese, raw milk, pasteurized milk, pH, salt, humidity

TAXONOMIC AND ECOLOGICAL INVESTIGATION OF MACROZOOBENTHOS OF PATOKU LAGOON

Enkeleda NIKLEKA (LLUKOVI)

Faculty of Biotechnology and Food, Department of Biology – Chemistry,
Agriculture University of Tirana, Albania

Sajmir BEQIRAJ

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ABSTRACT

The present paper investigates the macrozoobenthos composition and the evidence of species in Patoku Lagoon in the framework project INTERREG III B CADSES “Project of Reference NET – Management and sustainable development of protected transitional waters, 2004 - 2006” and the data regarding the phytoplankton species and their physical and the chemical profile and the impact the season variations (spring - autumn) have on species composition, population density are reported. In addition, distribution of this community inside the ecosystem is evaluated and lagoon to pre-lagoon compared. Samples were collected from four sampling sites; two pre-lagoon areas and two lagoon areas from November 2004 to April 2005. The results reported that the 17 taxa belonged to Molluska, Annelida, Crustacean and Insecta groups. Seasonal changes in the number of species and physical and the chemical profile of the taxa showed no difference between the two locations with regard to the density. Site 1 and 2 in the west and site 3 and 4 in the east showed clear differences regarding the coefficient of similarity.

Keywords: macrozoobenthos community, Patoku lagoon, species composition, density.

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ABSTRACT

The solvent extraction method is here applied to produce 90Y from 90Sr / 90Y liquid generator. The daughter radionuclide 90Y was extracted via 8-hydroxyquinolin in chloroform, a suitable extractor. In addition, the extract, a fast ITLC-method for the determination of 90Sr in 90Y extracted solution, was developed. The preliminary results showed that the solvent extraction method is available and promising for the 90Y production from a generator system.

Keywords: radiochemical purity, solvent extraction method, extractor

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Hamza RECI

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The 2-D electrical imaging has been used to explore the archaeological profile along a segment of Via Egnatia. The geoelectrical survey was carried out to explore a 200x160m area involving detailed 2-D resistivity measurements. Two tomographic profiles 100m long were carried out to detect parts of ancient road axis. The present investigation aimed at exploring the buried archeological objects and any possibility of their location along the axis of Via Egnatia. The investigation was carried out in close partnership with the Albanian Institute of Archaeology which determined the investigation area. The Electrical Resistance Tomography (ERT) was used for the resistivity mapping at different depths. The data were collected by the Geophysical Center of Tirana, Albania in 2005. Data were elaborated at the Geophysical Department of Aristotle University of Thessaloniki, Greece.

Keywords: 2D resistivity images, archeology, Rrogozhina, Via Egnatia

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Irena BUJARI

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ABSTRACT

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Enterococcus sp. Relative risk of catheter-associated NUTI was 13.27. The following conclusions could be drawn: i) amongst the uropathogens, the level of antimicrobial resistance was high, ii) NUTI relates to the use of urinary catheters and, iii) it causes huge extra costs for hospitals.

Keywords: nosocomial urinary tract infections (NUTI), prevalence, relative risk, catheter-associated, uropathogens

ANALYSIS ON THE GROWTH OF BROWN TROUT IN THE TRAGJAS AQUACULTURE UNIT USING GROWTH DATA OF RECAPTURED FISH

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Institute of Food Safety and Veterinary, Tirana, Albania

ABSTRACT

This paper provides the statistical models of the brown trout fish growth in order to describe a length-weight and age-weight correlation using growth time and length data. Fish samples were collected from a private hatchery in Tragjas, Vlora, Albania. The growth rate both in length (L) and weight (W) of the brown trout (*Salmo trutta*) was measured at various ages via regression-modelling techniques. The age-weight correlation and the length-weight correlation could be explained by the following equations:

$$W = -159.02t^3 + 3757t^2 - 29352t + 75983 \quad (r^2 = 0.9205),$$

$$W = 0.0003L^6 - 0.0429L^5 + 2.4913L^4 - 75.206L^3 + 1242.6L^2 - 10633L + 36803 \quad (r^2 = 0.9515),$$

$$W = 0.2283L^2.0861 \quad (r^2 = 0.9052), \quad W = 22.519e^{0.0828L} \quad (r^2 = 0.8935).$$

The growth equation of trout length that expresses the age-length correlation is as follows:

$$L = -4.2532t^3 + 99.76t^2 - 768.14t + 1966.2 \quad (r^2 = 0.889), \quad L = 0.0639t^{2.9096} \quad (r^2 = 0.8648).$$

The determinant coefficient analysis used allowed to consider some possible models in regression and evaluate the best model. The average value of instantaneous monthly growth rate (Gm) regarding the observations of two months varied between 3.9% and 3.4%. This indicator fluctuated based on age (t). In addition, the condition factors (C), specific growth rate (SGR) and daily growth rate (DGR) were calculated at the end of the investigation. The mean condition coefficient went up to 0.23037. The growth in weight and length was balanced and gradually increased during the investigation period.

Keywords: brown trout, growth, weight, length-weight correlation, regression method, instantaneous rate, condition factor, specific growth rate, daily growth rate etc.

DETERMINATION OF RA 226 IN WATER USING LIQUID SCINTILLATION COUNTING

Florinda CFARKU and Elida BYLYKU

Centre of Applied Nuclear Physics, Faculty of Natural Sciences, University of Tirana, Albania

ABSTRACT

Regulations regarding radionuclides in drinking water were drafted and details on the procedures are here reported. Existing analytical methods were considered and their applicability is here discussed. In addition, gross α/β survey was determined as a group parameter and ^{226}Ra , ^{228}Ra and ^{210}Pb were defined as key nuclides and the procedure was here included. Fast procedure and Liquid Scintillation with α/β Pulse Shape Discrimination for final counting was the basic analytical step. First results on natural and artificial water samples were confident with regard to the reference values. Generally, the natural radionuclides generally represent the main source of radiation exposure to the public. In the environment, they arise either from the direct release of radon from ground into ambient air or via dissolution of U-and Th-series members into water. As a result, investigating the natural radionuclides in water intended for human consumption is of crucial importance. Limits were set and simple and rapid procedures regarding their implementation became necessary.

Keywords: natural radionuclides, water sample, liquid scintillation, radium, radiation exposure, limit values

AJNTS-2009, XIV (2)**Nd, Pb ISOTOPE RATIOS AND TRACE ELEMENT SIGNATURES
OF VOLCANIC ROCKS IN ALBANIA: MAGMA SOURCE
IDENTIFICATION****Artan TASHKO**

Polytechnic University of Tirana, Rruga Elbasanit, Tirana, Albania

Georges H. MASCLELaboratoire de Géodynamique des Chaînes Alpines. Université Joseph
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ABSTRACT

This paper provides the statistical models of the brown trout fish growth in order to describe a length-weight and age-weight correlation using growth time and length data. Fish samples were collected from a private hatchery in Tragjas, Vlora, Albania. The growth rate both in length (L) and weight (W) of the brown trout (*Salmo trutta*) was measured at various ages via regression-modelling techniques. The age-weight correlation and the length-weight correlation could be explained by the following equations:

$$W = -159.02t^3 + 3757t^2 - 29352t + 75983 \quad (r^2 = 0.9205),$$

$$W = 0.0003L^6 - 0.0429L^5 + 2.4913L^4 - 75.206L^3 + 1242.6L^2 - 10633L + 36803 \quad (r^2 = 0.9515),$$

$$W = 0.2283L^2 - 0.0861 \quad (r^2 = 0.9052), \quad W = 22.519e^{0.0828L} \quad (r^2 = 0.8935).$$

The growth equation of trout length that expresses the age-length correlation is as follows:

$$L = -4.2532t^3 + 99.76t^2 - 768.14t + 1966.2 \quad (r^2 = 0.889), \quad L = 0.0639t^2 - 0.9096 \quad (r^2 = 0.8648).$$

The determinant coefficient analysis used allowed to consider some possible models in regression and evaluate the best model. The average value of instantaneous monthly growth rate (Gm) regarding the observations of two months varied between 3.9% and 3.4%. This indicator fluctuated based on age (t). In addition, the condition factors (C), specific growth rate (SGR) and daily growth rate (DGR) were calculated at the end of the investigation. The mean condition coefficient went up to 0.23037. The growth in weight and length was balanced and gradually increased during the investigation period.

Key words: brown trout, growth, weight, length-weight correlation, regression method, instantaneous rate, condition factor, specific growth rate, daily growth rate etc.

DETERMINATION OF RA 226 IN WATER USING LIQUID SCINTILLATION COUNTING

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ABSTRACT

Regulations regarding radionuclides in drinking water were drafted and details on the procedures are here reported. Existing analytical methods were considered and their applicability is here discussed. In addition, gross α/β survey was determined as a group parameter and ^{226}Ra , ^{228}Ra and ^{210}Pb were defined as key nuclides and the procedure was here included. Fast procedure and Liquid Scintillation with α/β Pulse Shape Discrimination for final counting was the basic analytical step. First results on natural and artificial water samples were confident with regard to the reference values. Generally, the natural radionuclides generally represent the main source of radiation exposure to the public. In the environment, they arise either from the direct release of radon from ground into ambient air or via dissolution of U-and Th-series members into water. As a result, investigating the natural radionuclides in water intended for human consumption is of crucial importance. Limits were set and simple and rapid procedures regarding their implementation became necessary.

Keywords: natural radionuclides, water sample, liquid scintillation, radium, radiation exposure, limit values

AJNTS-2009, XIV (2)**EXPERIMENTAL ASSESMENT OF PHYSICAL
CHARACTERISTICS (LENGTH AND CRIMP) OF TEXTILE
PROTEINIC FIBERS FROM ALBANIAN BREEDS****Genti GUXHO**Department of Textile and Fashion, Polytechnic University of Tirana,
Albania**Ylli SHEHU and Vladimir NIKA**Department of Production and Management, Polytechnic University of
Tirana, Albania**ABSTRACT**

Fineness, length and crimps are the most important physical properties of textile protein fibres. Longer fibbers are easier to get processed and more yarn can be produced from them since there are less fibre ends in a given yarn length. A stronger yarn can be produced from them for the same level of twist. In addition, a yarn of the same strength can be produced with a lower level of twist, resulting thus in a softer yarn. The length of natural fibres and their fineness are not constant. However, the length of natural fibres has a huge range of values, even in samples taken from the same breed of animal, or plant. On the other hand, crimp is of technological importance as it determines the capacity of fibbers to cohere under light pressure, and so, in turn, determines : i) the cohesiveness of card webs, ii) the amount of fly liberating during processing and, iii) the hairiness of resultant yarn. Albania has a substantial production of textile protein fibres. In the present paper the results of an experimental study on measurement of the length and crimp of the textile fibres from Albanian breeds are reported. The investigation aimed at updating the data on textile protein fibres from Albanian breeds. The tests were carried out at the Laboratory of Textile Department, Polytechnic University of Tirana, Albania which is accredited according to ISO/IEC 17025:2005 for textile materials testing.

Keywords: length, crimp, textile fibre, standard, comb sorter

USE OF AN INTELLIGENT SYSTEM FOR A PREOPERATIVE EVALUATION OF THE PERIPHERAL NERVES SURGICAL RESULTS

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ABSTRACT

In the area of peripheral nerve surgery the predictability of a preoperative surgical result is very important as it helps tailoring an appropriate therapy. In the present investigation, data mining are used as a predictive tool to prognosticate the patient's postoperative course, before the surgery is undertaken. We analyzed the data records of the patients who underwent the surgery on peripheral nerves to identify the factors that mostly influence on the result of surgery such as the timing from the onset of nerve disease to surgery, the distance of repaired nerve from the muscle, the type of nerve repair, the age and gender. The application of the data-mining algorithm on the filtered data collected from the patients operated previously induces some clinical prediction rules. In the present investigation, the technique of decision tree learning within WEKA suite was applied to the records because of its predictive power. The predictability in surgery improves the overall results and the expectations both of the surgeon and patient, having a positive effect on their reaction showed also in the preoperative informed consent.

Keywords: data mining, WEKA, peripheral nerve surgery, decision tree, prediction rules.

COMPARISON STUDY BETWEEN PRE AND POST INTERVENTION DATA ON COLORECTAL CANCER

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ABSTRACT

The present investigation aims at evaluating the sensibility of different methods applied in the detection of colorectal cancer. The data obtained such as images technique, fibro-colonoscopy and biopsy have been collected in a specific file for every patient and were compared with those collected during the surgical process and post-operative examinations. Results reported a high sensitivity in the detection of the primary tumour by both palpation and rectal digital examination. The sensitivity is higher if both of them are performed. These data show that despite the computerized medicine era, the traditional methods are still important and of high significance.

Keywords: colorectal cancer, staging, examinations

**INTERSPECIFIC VARIABILITY OF RAPDs AND
MICROPROPAGATION OF SOME POMEGRANATE VARIETIES
(*PUNICA GRANATUM* L.) FROM CENTRAL AND NORTH-WESTERN
ALBANIA**

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ABSTRACT

The present investigation aims to: i) reveal the genetic relationships among ten varieties of pomegranate (*Punica granatum* L.) from central and north-western Albania via the Randomly Amplified Polymorphic DNA (RAPD) and, ii) find an optimal micropropagation protocol. Five of 20 random decamer primers tested showed good amplification and a good level of polymorphism; 187 RAPD markers were produced. 60 out of 187 RAPD markers were polymorphic. The Jaccard's similarity coefficient was used to assess the genetic relationships. An efficient proliferation medium for auxiliary budding was found to be MS supplemented with 0.3 mg/l BAP, 0.1 mg/l IBA and 0.3 mg/l GA. Optimal growth and multiplication were achieved on a medium containing 0.5 mg/l BAP and 0.1 mg/l NAA, while optimal rooting was induced in a half-strength MS medium with 1.0 mg/l IBA. This protocol serves to establish an *in vitro* genetic bank.

Keywords: pomegranate, RAPD markers, genetic diversity, micropropagation, auxiliary buds, phytohormones

RISK ASSESSMENT AND POLLUTION IMPACT OF HYDROCARBON SECTOR IN THE HYDROLOGICAL SYSTEM OF FIERI-BALLSHI REGION

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ABSTRACT

Continuous oil exertion is very concerning for the hydrological system located in the oilfields of Albania. One of the major environmental problems today is hydrocarbon contamination. The results reported that oil industry and in particular the oilfields and refineries in Ballsh and Fier are of great environmental concern for the Fier- Ballshi region.

Key words: petroleum, oil decantation plant, refining, oil field, environmental impact

GENOTYPING OF CAPRINE K-CASEIN VARIANTS IN TWO ALBANIAN GOAT BREEDS, DUKATI AND KALLMETI AND ASSOCIATION WITH PHYSICO-CHEMICAL CHARACTERISTICS OF THEIR MILK

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ABSTRACT

In the present paper, polymorphism of kappa-casein gene in two autochthonous goat breeds and the impact on the physicochemical composition of milk is investigated. Blood samples of 25 individuals of two goat breeds in Dukati and Kallmeti, Albania were collected. Genomic DNA extraction occurred in the blood samples. The coding region of the κ -CN gene was analyzed to determine the genotypes and allelic variants in both goat breeds. A protocol for rapid simultaneous genotyping of all known κ -CN variants, the primer extension method, was used and a total of 50 animals were genotyped. Alleles B and C were found in the Dukati breed. Here, the B variant allele predominated (82%), followed by the C variant with 18%. No A allele variant was found in the sample of Dukati breed. A and B alleles variants were found to be 84% and 16%, the respectively, in the Kallmeti breed. Alleles A and B are the most frequent variants occurring in the majority of breeds. The B variant has highest prevalence. 186

milk samples were collected from the 25 individuals for each goat breed in the months of lactation. Once collected, the samples were divided into genotypes the physicochemical and rheological characteristics were investigated. Results reported that genotype BB variant of the kappa-casein gene has a higher impact on monthly fat percentage, in both of Dukati and Kallmeti goat breeds. The present investigation is the first attempt to associate the genotype with phenotypic data. Genotyping and determination of the κ -casein variant alleles was performed for the first time in Albanian dairy breeds.

Keywords: genetic polymorphism, genotyping, goat, κ -casein, physicochemical characteristics, autochthonous resources

OPTIMIZATION OF PHYSICAL-MACHENICAL PROPERTIES OF THE THREAD DURING THE SEWING PROCESS

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ABSTRACT

The deformation of the fabric during the sewing process is a continuous problem, while the quality control methods are being improved with difficulty. The conventional methods of the optimization often tend to be subjective. In addition, they are time demanding as they depend on the skills of the technicians. Sewability, seam performance, seam appearance, availability of the sewn product and cost are determinant factors in the selection process of the seam specifications. In the present paper, seam performance is investigated as the combination of only two factors.

Keywords: input factors, output responses, seam strength, seam puckering, fabric damage, optimization, experiment design, desired area of work

FAILURE OF EARTH DAMS CAUSED BY USE OF SOFT SOIL

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ABSTRACT

Since 1990, several earth dams in Albania have been damaged due to landslide. The damage is of great concern for both the population and economy. Geodynamics of Thana dam has been investigated from 1999 to 2002 by the Albanian Geological Survey using maps at the scale 1:2000. Nineteen drillings were completed from the crest to the bottom of the dam. Once collected, the soils were taken at the laboratory to investigate their physico-mechanical properties. The results are here reported and recommendations for remediation work are made.

Keywords: landslide failure, geotechnical parameters, compressible soils, soft soils, dam slope stability, organic silts and organic clay, slide plane, hazard assessment

ECO-PHYTOSOCIOLOGICAL STUDY OF THE MAIN OF SOUTHEASTERN ALBANIAN ECOSYSTEMS

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ABSTRACT

In the area of eco-phytosociology, investigating the vegetation of a given territory and its impact on the ecosystem and the geographic factors influencing its distribution is of a great interest. The ecosystem in the southeast of Albania is considerably variable. The grassland western slopes of Morava Mountain are covered by dwarf vegetation. A possible wild fire, as the result of degradation, was predicted, but referring to the current vegetation situation and the well-known theoretical succession stages after the wild fires, this hypothesis fails. Meantime the reforestations with Black Pine have not been successfully augmented. The present investigation reveals the dependency of the vegetation spatial distribution from the temperatures of March, April and May.

Keywords: eco-phytosociological studies, ecosystem, vegetation

SMART PROTECTION FROM ENVIRONMENT POLLUTION CAUSED BY GAS AND OIL EQUIPMENT BASED ON CORROSION KNOWLEDGE MECHANISM

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ABSTRACT

Environmental contamination caused by stored, refined gas and oil equipments is a continuous concern for the economy of a country and its population. The present paper investigates the reasons of equipments breakdown. Once broken down, corrosion occurs as hydrocarbon liquid, toxic H_2S gas and other contaminant substances are not appropriately ejected. In 25-30% of the cases, the cause of corrosion was the equipment breakdown in oil and gas industry. Investigation of corrosion process was carried out in regions rich in gas resources, during oil transportation through the pipe under stagnant conditions (where the possibility of failure is higher). Here, a modelling of pipe during the three phases (brine solution, oil and gas in up part) and under dynamic variation of temperature (T), presence of condensate concentration of H_2S in gas phase etc. was used. Electrochemical noises (ECN) measurement and metallographic research of cross section of the tube were involved to investigate the corrosion.

Keywords: corrosion, pollution, mixture inhibition, ECN, metallographic research

HEAVY METAL POLLUTION IN DURRES HARBOR AND POTENTIAL ENVIRONMENTAL IMPACTS OF DREDGING AND DREDGED SEDIMENT DISPOSAL ACTIVITIES

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ABSTRACT

Sediment dredging and disposal operations may adversely impact the surrounding environment due to pollutants accumulated in sediments. Sediment samples collected from Durrës harbour were analysed for heavy metal contamination and compared to background levels in the Mediterranean Sea and Adriatic Sea. In addition, international guidelines were applied. Heavy metal contaminated sediments were identified only in the uppermost levels within the harbour area and east and west quays. Concentrations in channel sediment samples were similar to the background levels, except for from Ni and Cr which had high levels. Nevertheless disposal of slightly contaminated sediments is not considered dangerous for civil construction purposes.

Keywords: Durrës harbour, dredging, sediments, heavy metals, harbour basin, entry channel

INCIDENCE OF NOSOCOMIAL INFECTION IN PEDIATRIC INTENSIVE CARE UNIT (PICU) IN UNIVERSITY HOSPITAL CENTER (UHC) OF TIRANA

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ABSTRACT

The present paper provides information about the epidemiologic indicators of nosocomial infection (NI) in Pediatric Intensive Care Unit (PICU) and the relationship between the extrinsic risk factors and the appearance NI. 405 and 79 patients out of 484 patients who were admitted to the University Hospital Centre (UHC) were nonsurgical and surgical, respectively. 42 patients had 1 episode of NI and 5 had 2 episodes (the total number 52). 19 surgical patients and 33 nonsurgical ones had NI. The incidence rate of NI during the studying period was 10.5%. NI was most encountered in urinary, respiratory tract, bloodstream, with a rate of 4%, 3%, 1.4% respectively. The etiologic profile was: gram negative 71.15%, gram positive 23.1%, fungi 5.75%. NI influences on hospital in-patients stay, morbidity and mortality in the PICU.

Keywords: extrinsic, incidence, etiologic profile

THE ANTIMICROBIAL SUSCEPTIBILITY OF PSEUDOMONAS AERUGINOSA ISOLATED FROM THE SPUTUM OF PEDIATRIC PATIENTS WITH CYSTIC FIBROSIS (CF)

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ABSTRACT

Cystic fibrosis (CF) is an inherited disease with morbidity and a decrease in the life span of patients. *P. aeruginosa* infection is a leading cause of deterioration of lung function in patients with cystic fibrosis. This is a prospective study which estimates the antimicrobial susceptibility of *P. aeruginosa* isolated in paediatric patients with CF. 26 isolates of *P. aeruginosa* were collected. We found out that all strains of *P. aeruginosa* were β -lactamase producer; the isolated strains are all sensible to imipenem and ciprofloxacin. 20% of strains were resistant to carbenicillini, 12.5% to piperacillin, 12% to gentamycin and 2% to amikacin.

Keywords: morbidity, lung, pediatric, antimicrobial

OPTIMAL CONDITIONS OF EXTRACTION'S PROCEDURE FOR THE SEPARATION OF ^{90}Y FROM ^{90}Sr - ^{90}Y EQUILIBRIUM MIXTURE

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ABSTRACT

Several $^{90}\text{Sr}/^{90}\text{Y}$ generator systems have been used to produce the ^{90}Y . Determining the method to separate ^{90}Y from $^{90}\text{Sr}/^{90}\text{Y}$ equilibrium mixture is very important. The procedure based on solvent extraction method has been previously described. In the present investigation, this procedure is modified in order to choose optimal parameters required for high extraction efficiency. As a result, the optimal pH, content of 8-hydroxychinolin in chloroform, shaking and centrifugation time, temperature and number of extraction are determined. Under these conditions, the extraction efficiency was approximately 80%.

Keywords: Solvent extraction, equilibrium mixture, ^{90}Sr , ^{90}Y , radioisotope

EXPERIMENTAL STUDY ON THE APPLICATION OF THE INDUCED POLARIZATION METHOD IN GEOTHERMAL EXPLORATION

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ABSTRACT

Induced polarization (IP) was applied to investigate the thermal waters at the geothermal field of Llixhat e Elbasanit and the results are here reported. Many scientific papers provide information about the weak positive polarizability anomalies over geothermal fields. These anomalies are related to the alteration of disseminated pyrite and rock argillization. Complex chargeability anomaly – low values at the centre and high ones at its flanks are here reported. Negative values were obtained as the depth increased and low resistivity values characterize the IP anomaly (both presented as “Real Sections”). The present paper aims at defining the correlation between the IP/resistivity anomaly and the presence of thermal waters in the Elbasan region.

Keywords: Induced polarization (IP), weak positive polarizability, IP/resistivity anomaly, correlation, thermal waters

LNG-IUD, A NEW THERAPEUTIC ALTERNATIVE IN DYSFUNCTIONAL UTERINE BLEEDING, LEIOMYOMA AND ENDOMETRIOSIS IN ALBANIA

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ABSTRACT

Twelve months after the insertion, the menstrual bloody loss (MBL), leiomyoma size and hemoglobin concentrations, are still affected due to the LNG – IUD. Mirena consists of a T-shaped polyethylene frame (T-body) with a steroid reservoir (hormone elastomer core) around the vertical stem. It contains 52 mg of LNG, a progestin, and is intended to provide an initial release rate of approximately 20 mcg/day of LNG. It is a good choice as a contraceptive method and as a therapeutic one as well, whose effects are based on the local effects of levonorgestrel in the uterine cavity: i) thickening of the cervical mucus; ii) inhibition of normal sperm motility and function inside the uterus and the fallopian tubes, preventing fertilization; iii) prevention of endometrial proliferation. The previous methods of treatment of perimenopausal menorrhagia were the synthetic progesterone, only pills (progestins) and NSAIDs. The leiomyoma and abnormal uterine bleeding are considered the major causes of hysterectomy in Albania. In this prospective study, carried out from January 2007 to March 2009, 32 cases were evaluated: 10 cases of multiple myoma (A), 9 of solely leiomyoma with a diameter less than 4cm (B), 13 of menorrhagia (C). This study was carried out using records and self-reported bleeding table. Each case was evaluated via transvaginal ultrasound and hemogram test. All the researchers were to self-report their measurements on a

paper sheet as usual. These patients' health conditions were evaluated exactly 3, 6 and 12 months after the insertion of Mirena, on the basis of self-reported bleeding history and hemogram test. Five patients out of 32 failed being followed up (three months after the insertion of Mirena). Until March 2009, 27 patients were followed up 6 and 12 months after the insertion of Mirena. The mean age of the patients was 46.78 years old (from 42.2 to 49.8 years).

Keywords: LNG – IUS or Mirena - Levonorgestrel – releasing intrauterine system, menorrhagia -long or heavy menstrual flow, leiomyoma - benign tumor of uterus, NSADs - nonsteroidal anti-inflammatory drugs

CHARACTERIZATIONS OF Γ -NEAR-FIELDS

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ABSTRACT

In this paper, we establish two characterizations of Γ -near-fields: i) the zero-symmetric Γ -near-ring M with more than one element is a Γ -near-field if and only if for every $\gamma \in \Gamma$ M has a γ -left identity e_γ and has no proper M - Γ -subgroups and, ii) the zero-symmetric Γ -near-ring M with more than one element is a Γ -near-field if and only if for every $\gamma \in \Gamma$ M has a γ -cancelable element contained in a minimal M - Γ -subgroup of M .

Keywords: Near-ring, Γ -near-ring, near field, Γ -near-field

AJNTS 2010, XV (I)**SOFTWARE ENGINEERING JAVA EDUCATIONAL SOFTWARE
BY COMBINING INTEGRATED DEVELOPMENT ENVIRONMENT
(IDE) AND VIRTUAL LEARNING ENVIRONMENT (VLE)****Bekim Fetaji, Majlinda Fetaji**

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Betim Çiço

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Jovan PehcevskiFaculty of Computer Sciences, European University, Skopje 1000,
Macedonia**ABSTRACT**

The hypotheses on the integration of virtual learning environment (VLE) and integrated developing environment (IDE), their impact on the efficiency and quality of learning Java programming language (because of the enhanced graphical user interface and the 'hands on approach' and user-satisfaction increased by the designed graphical user interface of the virtual learning environment along with the attention during learning about benefits of the Java) is here verified. In addition, a new software engineering approach using e-learning indicators to develop Java Educational Software solutions was investigated. Java interactive virtual environment that provides a code editor with intelligence support was provided. It has the options for running Java applications or applets and capturing and validating syntax errors of the user and integrated help required by learners. It is unnecessary leaving the application framework while learning Java program. This approach promotes a Java learning environment as self-sufficient to achieve its objective. The software solution has been used in the framework of an object-oriented programming and the data are here reported.

Keywords: software engineering, Java, e-learning processes, integrated development environment

**INVARIANT MEASURES FOR NONLINEAR RANDOM
PARABOLIC EQUATIONS DRIVEN BY REAL NOISE****Llambri Sota**

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ABSTRACT

In this paper we study the nonlinear random evolution equations in Banach spaces driven by a real noise and with random initial condition. The real noise process is defined as stationary solution of a stochastic differential equation in finite dimensional spaces (or Hilbert spaces). The aim is to prove the existence of invariant measures. The

obtained theoretical results are applied in nonlinear random Boussinesq–Glover equation as well as in nonlinear random reaction –diffusion equations.

Keywords: random parabolic equations, real noise, invariant measure, nonlinear random Boussinesq–Glover equation

AN INVESTIGATION INTO ICT USE BY ALBANIAN BUSINESS IGLI HAKRAMA, ÖZCAN ASILIKAN and ARTUR KOÇI

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ABSTRACT

Albania has in the last few years seen enormous activity in the field of the implementation of information and communication technologies (ICT) both in public and private sectors. The present paper reports on the usage of ICT by the Albania business. The Global Information Technology Report helped analyse the situation the country. A survey was carried out among different types of businesses and the results reported different approaches of ICT implementation from the Albanian business. The ICT investments and software usage for analyses, management and marketing are also investigated.

Keywords: information technology, information and communication technology, Albania

SPECTRAL SEPARATION OF EOSIN-RHODAMINE WT AND EOSIN-SRG EXTRA FLUORESCENCE IN WATER SAMPLE BINARY MIXTURES

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ABSTRACT

The fluorescence ability of Eosin, Rhodamine WT and Sulphorhodamine G (SRG) Extra enables their use as artificial tracers in water system studies. Injecting one, two or more dyes in different points in a chosen water system helps obtain the results easily. Once, the dyes are separated, supplementary chemical treatment would be necessary. In the present paper, spectral separation based upon pH variation of these dyes is reported and the data showed which dyes can be used together in the same water system.

Keywords: artificial tracer, fluorescence intensity (I_F), synchronous scan, Eosin, Rhodamine WT (RWT), Sulphorhodamine G (SRG) Extra

RADIOACTIVITY MEASUREMENT OF RADIUM ISOTOPES IN DRINKING WATER USING RADIOCHEMICAL METHOD

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ABSTRACT

The present investigation aims at measuring the radium levels in drinking waters in Albania. Samples were collected from eight different locations; from north to south Albania Liquid Scintillation Counting was involved to measure the ^{226}Ra and ^{228}Ra . Radium was co-precipitated into MnO_2 from 6 L samples of drinking water using ^{133}Ba as tracer. EDTA was used to redissolve the precipitate. A mineral-based scintillator cocktail (OptiFluor O, Packard BioScience) was used to collect radon. Three weeks later, the samples were analysed using a Wallac Quantulus 1220 liquid scintillation spectrometer. The values of ^{226}Ra ranged from 10 mBq/l to 30 mBq/l, while those of ^{228}Ra ranged from 6 mBq/l to 10 mBq/l, within the permissible limits as defined by European Union.

Keywords: radioactivity measurements, radium isotopes, liquid scintillation, drinking water

XPS INVESTIGATION OF CORROSION OF CARBON STEEL IN CO_2 MEDIUM

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ABSTRACT

Identifying species in thin films on corrosion steel surfaces is very important for corrosion studies as this is where the corrosive attack begins and ends. High resolution X-ray Photoelectron Spectroscopy (XPS) helps assess properly the composition and chemistry profile of corrosion films. Here, it is used to analyze typical films formed on low carbon steel after exposure to a brine solution saturated with CO_2 at 25°C in dynamic conditions at 900 rpm, and compared with previous studies using Scanning Electron Microscopy. The spin-orbit separation $\Delta=13.6$ eV from the Fe (2p) spectra identified the presence of Fe_2O_3 in the corrosion products, and spectra line fits for C 1s, O 1s and Fe 2p confirmed this finding. The XPS characterization results of carbon steel under these flow conditions are in accordance with the previous SEM results on the effect of flow on the corrosion process.

Keywords: films, corrosion studies, thin films, corrosion steel surfaces

ORIGIN AND TEMPERATURE PROFILES OF THERMAL WATERS FROM THE DEPTHS OF THE ALBANIDES

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ABSTRACT

In this paper, geological data describing the origin and temperature profiles of thermo-mineral waters are reported. Albania is rich in geothermal resources of low enthalpy with geothermal energy and thermo-mineral waters of sulphate, sulphide, methane and iodinate-bromide types located in three geothermal zones. The location of geothermal springs, their reservoirs and physico-chemical properties of the waters, geothermal regime of the geological structures of the Albanides based on temperature at different depths, geothermal gradient and heat flow density are here accurately investigated. This study is an integrated part of the interpretation of geological settings in Albania, addressing: i) regional geological field of the Albanides, depth ruptures, etc., and ii) regional and local studies focused on potential of thermal and mineral water resources and the geothermal market in Albania. Both of these aspects are here reported and investigated.

Keywords: thermo-mineral water, heat flow density, geothermal gradient, geothermal zone

RADIOLARIAN SPECIES FROM JURASSIC CHERTS OF ALBANIA

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ABSTRAC

Well-preserved radiolarian faunas were extracted from different sections in Middle and Upper Jurassic cherts of the sedimentary cover of ophiolites in Mirdita region, northern Albania. The radiolarians are of late Bajocian–early Oxfordian age and were examined in the following sections of chert: Blinisht–Kullaxhi, Perlati i Eperm, Qershiza, Kaçinari, Peshqesh i Siperim, Kthella, Simoni, Stalosi, Bukemira, Kalur, Lumthi, Lumi i Zi. Twelve new radiolarian species found in Albania are here illustrated and described for the first time.

Keywords: Radiolarian species, Jurassic cherts, ophiolites, Albania

LAND EVALUATION AND SITE ASSESSMENT-ENGINEERING GEOLOGICAL MAPPING FOR REGIONAL PLANNING AND URBAN DEVELOPMENT IN VELIPOJA

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ABSTRACT

The present paper provides some information about land evaluation and site assessment using engineering-geological mapping at the scale 1:25000. The investigation was carried out in Velipoja region from 2001 to 2005 by the Civil

Geology Centre of Tirana, Albania for regional planning and urban development purposes based on the needs of the administrative body of the region and the lithological, morphological, hydrogeological, geodynamic phenomena and physical-mechanical properties characterizing the region. Consequently, the area was divided in several engineering geological zones providing some data of crucial importance for regional planning and urban development.

Keywords: engineering-geological mapping, geodynamic phenomena, lithology, morphology, hydrogeology, physical-mechanical properties, organic soils, clays, silts, sands, gravels, peats, flysch and limestone.

IN VITRO ORGANOGENESIS OF BALKANIC GESNERIAD SPECIES (RAMONDA)

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ABSTRACT

Both *Ramonda serbica*, typical Albanian Gesneriad species, and *R. nathaliae* typically growing in FYROM, belong to the group of “resurrection plants” and need to be preserved as ornamental plants by cultivation. The present paper aims at comparing different micropropagation methods. JG-B medium was used to germinate the seeds for direct organogenesis. Axillary buds and plantlet bundles formation were observed in the presence of BAP and IAA (0.5 mg l⁻¹ each). A high multiplication rate is of fundamental importance for production of a large number of plants. Callogenesis and meristemoid formation during indirect organogenesis in leaves pieces inoculated in MS medium with 10⁻⁴ M NAA and 10⁻⁵ M BAP were observed, while the formation of new plantlets was obtained in MS medium with a high ratio of cytokinin:auxin (10⁻⁵ M NAA and 10⁻⁴ M BAP). Direct and indirect organogenesis of *Ramonda* species are very similar models.

Keywords: *Ramonda serbica*, *R. nathaliae*, organogenesis, micropropagation, JG-B medium, phytohormones

MOLECULAR MARKERS DISCRIMINATE OLIVE CULTIVAR CLONES FROM CENTRAL ALBANIA

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ABSTRACT

The Albanian olive cultivar diversity has been investigated over a long period of time and information for most of them is morphologically reported in the National Catalogue of Olives of Albania, and the rest, ranked among oleasters and homonymous cultivars. Since 2000, RAPDs, AFLPs, SNPs and SSRs have been also used for their genetic diversity. The present paper provides a comparative analysis of two clones or cultivars—Micka and Ulliri i Bardhë i Krujës—using RAPDs and AFLPs. The UPGMA cluster analysis was a means to address the genetic relationship among the cultivars. Although there is a high percentage of similarity among Albanian cultivars and clones, some differences still remain, representing an important element regarding discrimination of autochthonous pure cultivars of Albania.

Keywords: fingerprinting, genetic diversity, molecular markers, *Olea europaea*, olive germplasm, AFLPs, RAPDs, SNPs, SSRs

ASSESSMENT OF FOREST ACCESSIBILITY USING GIS TECHNIQUES

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ABSTRACT

The use of geospatial technology has increased rapidly in recent years. Sustainable management and rational administrative management of territory unavoidably involves road infrastructure. Creating forest roads for harvesting, operations and other purposes has always been subjected to certain barriers and limitations. Forest accessibility is of great importance for the implementation of intensive silvicultural practices. Assessing forest accessibility is very important for the country and a means to address the present situation and a rational planning road network within a forest management unit. Here, GIS technique would be appropriate because it is precise, fast and economic. GIS techniques were applied in the forests of Fushkuqe–Zavalina (Elbasan) for forest accessibility. The Hippoliti equation was used to assess forest accessibility using database management units, geo-referencing of topographic maps and satellite images.

Keywords: ArcGIS 9, satellite imagery, forest accessibility, best path modelling, sustainable management

REVIEW OF HYDROGRAPH BASE FLOW RECESSION CURVE ANALYSIS

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ABSTRACT

In the area of planning and management of water resources, determining the low flow values for irrigation, water supply, hydro-power plant and water quality applications purposes is important. A fundamental part of a hydrograph is the recession curve, a useful tool to determine low flow values and provide a graphical separation of flow components, such as surface flow, sub-surface flow and base flow. In addition to the literature on the exponential decay function, widely used in recession curve analysis, the present paper reviews the graphical flow separation techniques and explains the base flow index, using examples from two Albania rivers, showing the development of a master recession curve of a basin or a typical recession curve.

Keywords: hydrograph base flow recession curve

COMPARISON OF TWO ANALYTICAL METHODS FOR THE DETERMINATION OF IRBESARTAN IN PHARMACEUTICAL PRODUCTS

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ABSTRACT

In the present investigation, two analytical methods of High Performance Liquid Chromatography isocratic techniques were applied to evaluate first the level of precision, accuracy, sensitivity and selectivity of each of the two methods and determine Irbesartan amounts in pharmaceutical tablets. The experiment was performed on tablet samples containing 150 mg/tab of Irbesartan. The same laboratory technician undertook the analysis to provide consistency in the tests. Assessment of performance of the two methods was made evaluating coefficient of linearity, accuracy and repeatability parameters. Samples were prepared from homogenization of 20 regular tablets, injected six times for each method ($N = 6$). Both analytical methods showed significant differences in terms of eluting stages and wavelengths used in UV detectors, and resulted in different retention times, $R_{t1} = 9.4$ and $R_{t2} = 26.1$, for the two methods, respectively, making Method I (following NOBELFarma, 2007) more suitable for routine laboratory analysis.

Key words: Irbesartan; HPLC, linearity coefficient, accuracy, quality control, retention time

COMPRESSION BEHAVIOUR OF KETOPROFEN AMORPHOUS FORMS

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ABSTRACT

In this paper, both the compression and the densification behaviours of ketoprofen-polyvinylpyrrolidone (Ket-PVP) co-precipitates, along with their physical mixtures (PMs), were investigated. Co-precipitates were obtained using a solvent evaporation method under reduced pressure at a temperature of 40°C. Solids were recovered, ground in a mortar (with recovery of the 0–100 mm-sieved fraction) and stored in a desiccator under P₂O₅. PMs of the two compounds were obtained in the same proportions by mixing them in a V-shaped mixer, which resulted in their homogeneity. A compression study was performed using a mini-rotary press equipped with a computerized control system to detect and analyse force signals (pressure and ejection force) and with ten flat 11.28 mm-diameter punches. Densification behaviour of the powders was studied using the Frogerais OA single punch tablet machine. Characterized by an increase in plastic deformability, which, inversely to PVP, is not accompanied by an elastic component, the Ket-PVP co-precipitates showed very different mechanism. Amorphous ketoprofen showed a different densification mechanism from that of the crystalline form due to a fragmentation tendency loss and a plastic deformability acquirement.

Keywords: compression behaviour, densification behaviour, ketoprofen amorphous form

INCIDENCE OF ADVERSE REACTIONS TO ANTI-TUBERCULOSIS DRUGS

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ABSTRACT

The recommended first line regimen for active tuberculosis treatment is associated with significant Adverse Drug Reaction (ADR). The incidence of ADRs among patients admitted at the University Hospital Center for Lung Disease, Tirana was investigated along with the risk factors for intolerance to anti-TB drug regimen. A retrospective survey of 124 patient files with TB who were hospitalized from 2004 to 2005 and treated with first line anti TB drugs was carried out. In total, 74 ADRs in 46 patients were identified. The currently available anti-TB drugs are associated with significant, sometimes serious, ADRs.

Key words: anti-TB treatment, adverse drug reaction, tuberculosis, side effects

AJNTS 2010, XV (II)**ON THE EXISTENCE OF AN INFINITE SET OF TRANSMISSION
EIGENVALUES¹****Fioralba CAKONI**Department of Mathematical Sciences, University of Delaware, Newark,
Delaware 19716, USA**ABSTRACT**

We prove the existence of transmission eigenvalues corresponding to the inverse scattering problem for isotropic media. Considering a generalized abstract eigenvalue problem, we are able to prove the existence of transmission eigenvalues for a larger class of interior transmission problems. Our analysis includes both the case of a medium with positive contrast and of a medium with negative contrast provided that the contrasts are large enough. The presented approach is easily extendable to other scattering problems.

Keywords: interior transmission problem, transmission eigenvalues, inhomogeneous medium, inverse scattering

ON CONTINUOUS QUASI-DISTANCES IN PRODUCT SPACES**Catherine PEPPO**CFA-Universit_e Pierre et Marie Curie 4, place Jussieu, Casier 232 75252
Paris, Cedex 05**ABSTRACT**

In this article, we construct a large class of continuous quasi-distances in product spaces, that are not distances, by the following formula, where:

$$d(P, Q) = \begin{cases} \sum_{i=0}^n a_i d_i(x_i, y_i) & \text{if } \sum_{i=0}^n \beta_i d_i(x_i, y_i) \geq 0 \\ \sum_{i=0}^n a'_i d_i(x_i, y_i) & \text{if } \sum_{i=0}^n \beta_i d_i(x_i, y_i) < 0 \end{cases}$$

We show that generally, it is remarkable, when > 0; d is a distance and when < 0; d is only a continuous quasi-distance, but not a distance. Moreover, they satisfy the improved triangle inequality:

$$d(x_1, x_n) \leq k[d(x_1, x_2) + d(x_2, x_3) + \dots + d(x_{n-1}, x_n)]$$

Keywords: continuous quasi-distance; quasi-metric space; improved triangle inequality

**OSCILLATION FOR FIRST AND SECOND-ORDER DIFFERENCE
EQUATIONS****Ioannis P. STAVROULAKIS**

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ABSTRACT

Consider the first-order and the second-order delay difference equations

$$\Delta x(n) + p(n)x(\tau(n)) = 0, \quad n=0, 1, 2, \dots, \quad (1)$$

and

$$\Delta^2 x(n) + p(n)x(\tau(n)) = 0, \quad n=0, 1, 2, \dots, \quad (2)$$

where $\Delta x(n) = x(n+1) - x(n)$, $\Delta^2 = \Delta \circ \Delta$, $p: \mathbb{N} \rightarrow \mathbb{R}^+$, $\tau: \mathbb{N} \rightarrow \mathbb{N}$,
 $\tau(n) \leq n-1$ and $\lim_{n \rightarrow \infty} \tau(n) = +\infty$

The most interesting oscillation criteria for Eq. (1), and Eq. (2), especially in the case where

$$0 < \liminf_{n \rightarrow \infty} \sum_{i=\tau(n)}^{n-1} p(i) \leq \frac{1}{e} \quad \text{and} \quad 0 < \limsup_{n \rightarrow \infty} \sum_{i=\tau(n)}^{n-1} p(i) < 1$$

for Eq. (1), are presented.

Keywords: Oscillation, delay, difference, differential equations

THE BANACH SPACE $m_1(l_p)$ ADMITS THE RADON-NIKODYM PROPERTY

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Let X be any Banach space and denote by $l_w^p(X)$ the vector space of weakly p -summable sequences in X , i.e. $(x_n) \in l_w^p(X)$ if $(hx_i; x_{-i}) \in l_p$ for all $x_{-} \in X_{-}$.

The space $l_w^p(X)$ is a Banach space with respect to the norm

$$\|(\alpha_i)\|_{p,p} = \sup_{\varepsilon_p((x_n)) \leq 1} \left(\sum_{n=1}^{\infty} |\alpha_n|^p < \infty \right)^{\frac{1}{p}}$$

The authors in [1] introduced the Banach (scalar) sequence space $mp(X)$.

In this paper, we verify that the space $m_1(l_p)$ admits the Radon-Nikodym property for $1 \leq p < \infty$. This important fact will follow after a short discussion of some known results in the literature...

COMPLETELY REGULAR Γ -SEMIGROUPS

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ABSTRACT

In this paper, we introduce the notion of the completely regular element and the notion of the completely regular Γ -semigroup and we prove some theorems dealing

with some characterizations of them using completely semiprime quasi-ideals. Finally, we prove a theorem which gives necessary and sufficient conditions for a Γ -semigroup to be completely regular.

Γ -PLANAR NEAR-RINGS

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ABSTRACT

In this paper, we define Γ -planar near-rings and prove a number of proposition about them. One of these propositions is a structure theorem for Γ -planar near-rings which is a generalization of the corresponding theorem for planar near-rings.

Keywords: Planar near-ring, Γ -near-ring, Γ -planar near-ring

ON THE PRODUCT OF TWO DYNAMICAL SYSTEMS

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ABSTRACT

In this paper, we deal with the product of two dynamical systems. We give some results related to properties of a point in the product dynamical system and show whether these properties also hold in the factor dynamical systems. We investigate the relationship between a point $(p_0; q_0)$ in the product system and corresponding points $p_0; q_0$ in the factor systems, first when the phase space is metric and then when the phase space is a topological space.

Keywords: limit point, dynamical system, Lyapunov stability

ON LATERAL HYPERIDEALS IN TERNARY SEMIHYPERGROUPS

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ABSTRACT

Ternary semihypergroups are algebraic structures with one associative hyperoperation. In this paper, we give some properties of lateral hyperideals in ternary semihypergroups. We introduce the notion of lateral simple and lateral 0-simple ternary semihypergroups and characterize the minimality and maximality of lateral hyperideals in ternary semihypergroups. The relationship between them is investigated in ternary semihypergroups.

Keywords: semihypergroup, ternary semihypergroup, hyperideal, lateral hyperideal, minimal and maximal lateral hyperideal, lateral (0-) simple ternary semihypergroup

COMMON FIXED-POINT THEOREMS FOR GENERALIZED FUZZY WEAKLY CONTRACTIVE MAPPINGS

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ABSTRACT

In this paper, a several common fixed-point theorems for generalized fuzzy weakly contractive mappings in a metric space setting are proved.

Keywords: fixed point, fuzzy mapping, fuzzy set, weakly contractive type fuzzy mapping

GENERAL FIXED-POINT THEOREM FOR THREE MAPPINGS ON THREE METRIC SPACES

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ABSTRACT

A fixed-point theorem in three metric spaces is proved. This result extends the results obtained in [3] from two metric spaces to three metric spaces. It generalizes the results obtained in [6, 7, 8]. A several corollaries are obtained according as the forms of implicit functions.

Keywords: fixed point, metric space, complete metric space

OSCILLATION OF SOLUTIONS TO SECOND ORDER NONLINEAR NEUTRAL DELAY DIFFERENTIAL EQUATIONS

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ABSTRACT

In this paper, we deal with nonlinear second -order neutral differential equation, which contains the unknown function both with and without delays, with several positive and negative coefficients.

$$(x(t) - R(t)F(x(t-\tau)))' + \sum_{i=1}^n P_i(t)G_i(x(t-\alpha_i)) - \sum_{j=1}^n P_j(t)G_j(x(t-\beta_j)) = s(t)$$

$$(x(t) - R(t)F(x(t-\tau)))'' + \sum_{i=1}^n P_i(t)G_i(x(t-\alpha_i)) - \sum_{j=1}^n Q_j(t)G_j(x(t-\beta_j)) = 0$$

Our criteria improve and extend many results known in the literature as results of Elabbasy, Saker [2], and Shoukaku [11]. In addition, we prove that under appropriate hypotheses, if every solution of the associated linear equation

$$z''(t) + \sum_{i=1}^n H_i(t)(1 - \varepsilon_i)z(t - \alpha_i) = 0$$

oscillates, then every solution of the nonlinear equation homogeneous also oscillates.

Keywords: oscillation, second-order neutral differential equations, neutral delay of differential equations

BIRKHOFF INTEGRAL OF BOUNDED FUNCTIONS

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ABSTRACT

In this paper, we define the Bf-integrability of functions taking values in quasi-complete locally convex topological vector spaces. We show the existence and uniqueness of the Bf-integral for Bf-integrable bounded functions. We present the relation between Bf-integral, Bochner and Pettis integral of functions taking values in a quasi-complete locally convex topological vector. A convergence theorem for Bf-integral is presented.

Keywords: Bf-integral, bounded function, Bochner integral, Pettis integral, quasi-complete locally convex topological vector space, convergence theorem.

TENSOR PRODUCTS OF ADDITIVE FUNCTORS

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ABSTRACT

The aim of this paper is to show that some basic results of homological algebra hold true if we replace modules by additive functors over a small additive category.

WEAKLY Γ -RINGS AND Γ -FIELDS**Petraq PETRO and Rigena SEMA**Department of Mathematics, Faculty of Natural Sciences, University of
Tirana, Albania**ABSTRACT**

In this paper, we introduce the notions of weakly Γ -ring and Γ -field and give some characterization of Γ -fields. We also define the maximal ideal in a weakly Γ -ring and prove that the ideal of a commutative weakly Γ -ring M is maximal if and only if the quotient weakly Γ -ring M/I is a Γ -field.

Keywords: ring, Γ -ring, weakly Γ -ring, field, Γ -field

**A GENERALIZATION OF SOME RESULTS ON STRICTLY
CONVEX 2-NORMED SPACES****Artur STRINGA**Department of Mathematics, Faculty of Natural Sciences, University of
Tirana, Albania**ABSTRACT**

In this paper, some generalizations on strictly convex 2-normed spaces are given. They are characterized in terms of p -semi-inner products.

Keywords: 2-normed space, strict convexity, p -semi-inner product

**MCSHANE TYPE INTEGRATION OF RIESZ-SPACE-VALUED
FUNCTION AND APPLICATION TO SANDWICH PROPERTY****Ismet TEMAJ**

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Agron TATODepartment of Mathematics Faculty of Natural Sciences, University,
Aleksandër Xhuvani, Elbasan, Albania**ABSTRACT**

One version of Mcshane integral with respect to a basis for the function with value in Dedekind complete Riesz space is introduced. The important properties are proved and also an application of the type of sandwich theorems is given.

Keywords: Riesz spaces, Mcshane and Henstock integration, derivation basis, fundamental theorem of calculus

AJNTS, 2011 XVI (1)**MATURITY OF ORGANIC MATTER BY VITRINITE
REFLECTANCE IN THE PERI-ADRIATIC DEPRESSION****Irakli PRIFTI and Engjëll PRENJASI**Faculty of Geology and Mining, Polytechnic University of Tirana, Albania
ABSTRACT

Consisting of Miocene to Pliocene deposits, two levels of natural gas pools were discovered in the Peri-Adriatic Depression: i) one level located in the Pliocene deposits and, ii) a second level belonging to Tortonian–Messinian sandstone bodies, named the “Divjaka suit”. Correlated with indicators such as pyrolytic (Rock-eval data) and hydrocarbon composition of natural gas, measurement and evaluations of vitrinite reflectance, an appropriate tool helping to define both the stages of maturity of organic matter and the type of hydrocarbon generated, were undertaken. Interpretation of these geochemical indicators helped distinguish three sequences of hydrocarbon generation of methane gas: i) biogenic gas of Pliocene deposits, ii) mixed gas (biogenic and thermogenic) occurring from Tortonian to Pliocene deposits, and iii) thermogenic gas of Langhian–Serravallian sedimentary section origin.

Keywords: depression, cuttings, polishing, hydrocarbon (HC) gas, dry gas, liptinite, vitrinite, maturity

**STUDY OF COMBINATION OF CAPACITIES FOR SOME INBRED
LINES OF MAIZE****Nazmi HASANI**

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ABSTRACT

In the process of genetic improvement of maize hybrids, achievement of high production capacity is a constant problem. The present paper provides information on a study into combination ability (production capacity) of 15 maize hybrids provided by the Agriculture University of Tirana, Albania, under the eco-climatic conditions prevailing in Istog, Kosovo. The tester-cross method was applied and results of interest were obtained after testing 106 lines. The outcomes show that the diversity of production capacity of hybrid combinations of crossed lines depends upon their genetic composition. Some of the hybrid combinations are of interest in agronomy and further work will be undertaken as a means to address new hybrid formulas.

Key words: combination capacity, inbreed lines, hybrid combinations

ATMOSPHERIC PATTERNS AND PREDICTING HEAVY RAINFALL IN ALBANIA

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ABSTRACT

Albania is often affected by heavy rainfall that sometimes causes severe flooding with consequential damage to the economy. Thus, an accurate short-range forecast of heavy rainfall is essential. This paper provides information on atmospheric patterns of extreme rainfall days in Albania over more than 15 years. Distinct cases of normal and extreme rains were recorded based upon thresholds applied in 36 meteorological stations that characterized different local precipitation regimes. Sixty-one cases of 24-hour rainfall with rainfall larger than the threshold were identified. Classification of these cases into six groups was undertaken according to similarities among the atmospheric patterns. A geopotential height of 500 hPa provided an effective forecasting tool for heavy rainfall.

Keywords: extreme rainfall, atmospheric patterns, geopotential field, cut-off, positively tilted trough, threshold

ADSORPTION AND RECOVERY OF RHODAMINE WT FROM ACTIVATED CARBON USED IN WATER SYSTEM STUDIES

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ABSTRACT

This paper aims at determining the adsorption and degree of recovery from bags of activated carbon of Rhodamine WT, a fluorescent tracer used in aquatic environmental studies. Traces of the dye are fixed strongly to the surface of the carbon grains. Activated carbon is here applied in different water systems studies comprising fluorescent tracer experiments. Carbon bags were first used in Albania in 2002 in karst system studies at Mali me Gropa and in studies of the Ohrid–Prespa system (and again in 2007). Adsorbed tracers can be extracted and analysed from carbon bags, and adsorption and degree of recovery is here estimated from Rhodamine WT fluorescence intensity, both in standard solutions and extracts. The carbon extracts detected extremely low levels of RWT normally undetectable directly from water samples.

Keywords: artificial tracer, fluorescence intensity (I_F), synchronous scan, rhodamine WT (RWT), activated carbon.

A REVIEW OF SOLID INORGANIC PHOTOVOLTAICS AND THERMOELECTRICS

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ABSTRACT

This paper provides an overview of recent progress made in the area of inorganic solid compounds (materials), their methods of syntheses and their structural characteristics with regard to increasing the efficiency of photovoltaic or thermoelectric applications, or both. Although optimization of their efficiency is developed in two parallel technologies—thin layer and crystalline materials—this paper emphasizes their structural characteristics related to physical properties more than the fabrication technologies themselves. To the increasingly extensive range of the existing elements and compounds (natural or synthetically produced) with the required properties, another group of ternary and quaternary mixed valence inorganic compounds from the elements of the III, VI and VII main groups can be added due to their promising structural characteristics and preliminary data requiring further measurements and applications in this field.

Keywords: photovoltaic and thermoelectric efficiency, inorganic solid materials, sulphosalts, mixed valence compounds, nanowire crystals, layered structures

PREVALENCE OF HEPATITIS B SURFACE ANTIGEN IN ALBANIAN BLOOD DONORS

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ABSTRACT

Hepatitis B is a virus normally transmitted through blood and blood products. The prevalence of hepatitis B surface antigen (HBsAg) was tested among 21,612 Albanian healthy blood donors using third generation test kits. The prevalence of the antigen was higher in family blood donors than among other voluntary donors, though less so than among commercial blood donors. Establishing a panel of regular voluntary blood

donors and improving the processing of blood screening methods would have a great effect in providing access to safe blood use.

Keywords: hepatitis B virus, voluntary non-remunerated blood donors, family replacement blood donors, autologous blood donors, commercial blood donors

CONTAMINATION WITH *LISTERIA MONOCYTOGENES* OF MUSSELS PRODUCED IN BUTRINTI (BUTHROTUM) LAGOON

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ABSTRACT

In 2009, 98 samples of live bivalve mussels *Mytilus galloprovincialis* were collected from three sampling points in Butrinti Lagoon and tested for the presence of *Listeria monocytogenes*. The mean incidence of the pathogen was 10.9% with analysis provided for three seasons spring, summer and autumn. The highest level of incidence was recorded in spring (13.5%) followed by summer (7%) and autumn (6.2%). The most contaminated area was the northern part of the lagoon, where 19% of the samples were positive. The results are to be addressed to the relevant national authorities.

Keywords: control, mussel, *Listeria monocytogenes*, Butrinti

TURNING WASTE INTO HIGHLY VALUABLE MATERIAL: CLINKER-FREE CEMENTS BASED ON CHEMICAL ACTIVATION OF SLAG

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ABSTRACT

In the present study, the possibility to develop clinker-free cements (binders) at low energy cost from waste material granulated blast furnace slag by means of chemical activation was investigated. The properties of the resulting binders, similar to those obtained with common clinker-based cements depended strongly on both slag and activator characteristics, while the optimization procedure to obtain high quality clinker-free cements for industrial purposes could be performed either through slag, or activator, or both at the same time. Relatively small variations in activator content

caused considerable alteration in the binder properties. Application outcomes show that the most suitable binder utilization available incorporated the activator in powder form.

Keywords: waste, ground granulated blast furnace slag, clinker-free cement, chemical activation

EFFICIENT ALGORITHMS FOR PRESERVING ENERGY AT NODES OF A NETWORK

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ABSTRACT

Introduced in different topologies and characterized by simplicity of application, averaging algorithms are of great interest for the researchers. Simulated behaviour of three algorithms—Standard, Broadcast and Geographic Gossip—are applied here in two topologies: Ring and Random Graph. Both simple and robust, these algorithms distribute information from one node to another, sending a few messages and elaborating only the average and the sum of the initial values at nodes. Convergence even in the presence of nodes that leave the network makes the algorithms robust. This paper aims at finding the shortest way of sending information from one network node to another, while at the same time preserving the energy, consequently enabling longer network lifetime. For shorter time convergence purposes, Geographic Gossip introduced localization of nodes by means of GPS, despite the cost of this network. Averaging algorithms are compared by means of simulation results.

Keywords: averaging algorithms, energy, simulations

EVALUATION OF EVAPOTRANSPIRATION AND ITS COMPONENTS IN SOME REGIONS OF ALBANIA

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ABSTRACT

Evapotranspiration has a great impact on climate, and its evaluation is of a great importance. In Albania, the mountainous relief, typical Mediterranean climate and its hydrographical system, which together characterize the country well, all effect evapotranspiration. This paper aims to provide some information about general evaluation of evapotranspiration and its components in some regions in the country. In this investigation, two different model methods were used to estimate ET_0 , namely a meteorological data FAO-56 Penman Monteith and a standardized ASCE Penman Monteith. Other methods, such as Thornthwait, Konstandinov, water balance, were also applied and the pluviometric deficit was estimated to evaluate real evapotranspiration.

Evaporation was here evaluated by computing its principal components, including potential or reference evapotranspiration (E_0), real evapotranspiration (E_r) and pluviometric deficit (ΔE), for field, hilly and mountain areas.

Keywords: evapotranspiration, real evapotranspiration, deficit evapotranspiration, FAO 56-PM

IN VITRO RAPID REGENERATION OF PLANTLETS OF WILD MAHALEB CHERRY (*PRUNUS MAHALEB* L.)

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ABSTRACT

Shoot tips of *Prunus mahaleb* L., promising as rootstocks for sweet cherry cultivars, were submitted to *in vitro* culture to test if micropropagation could be used for their rapid production. Two different media were applied containing the following: a) MS macronutrients, micronutrients, vitamins and phytohormones 0.3 mg l⁻¹ BAP, 0.1 mg l⁻¹ IBA, 0.3 mg l⁻¹ GA₃, and b) LP macronutrients, micronutrients, vitamins and phytohormones 0.25 mg l⁻¹ BAP, 0.6 mg l⁻¹ IBA, 0.3 mg l⁻¹ GA₃, 30 g l⁻¹ sucrose and 7 g l⁻¹ agar. Once multiplication was achieved on these media, medium containing MS macronutrients, micronutrients and vitamins, 0.7 mg l⁻¹ BAP, 0.01 mg l⁻¹ NAA, 0.1 mg l⁻¹ GA₃ was found to provide the best results. Varying from 10–90%, the rooting percentages of plantlets depended on NAA concentration in the rooting media.

Keywords: micropropagation, shoot tips, nutrient medium, phytohormones, rooting stage

THE IMPACT OF SEED AND VEGETATIVE ROOTSTOCKS ON THE INDICATORS OF PEAR SAPPLINGS

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ABSTRACT

Progressive developments have been currently met in Albanian arboriculture. In addition, great efforts have been made to establish linkages between Albanian and regional arboriculture together with technological developments in the area of cultivation, planting structure, sapling market, vegetative rootstocks, etc. Abate Fetel and Gentil Bianca, two rootstocks with vegetative seeds and pear cultivar have been investigated by the Department of Horticulture of the Agricultural University of Tirana for stimulation of production and the spreading of the sapling of the pear on the

vegetative rootstocks purposes. The number of plants / unit of surface and the economic effectiveness in the farm would prospectively increase. Results showed that the application of EMA, a vegetative clone, provided high planting indicators (87.33% and 92%) and saplings characterized by qualitative indicators (92.6% and 94.2%). The cost of production is 0.5€/sapling.

Keywords: vegetative rootstock, clone, potential reserve, EMA (East Malling Anger), qualitative and quantitative indicators, national standard.

POLYCYCLIC AROMATIC HYDROCARBONS IN FISH SPECIES FROM LAKE OHRID

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ABSTRACT

Polycyclic Aromatic Hydrocarbons (PAH) are widespread environmental pollutants originating from natural sources and formed during incomplete combustion of organic matter. Different parts of the environment show great variability in the occurrence of PAHs. The biota of Lake Ohrid is of great interest as it provides valuable data concerning correlations between accumulation levels of heavy PAHs and age of individual fish analyzed. Analysis of muscle samples from different species found that bleak contained the highest concentrations of PAH. This unique ecosystem can be considered as affected by local anthropogenic factors.

Keywords: Ohrid Lake, PAHs, freshwater fishes, Ohrid trout

GEOGRAPHIC INFORMATION SYSTEM DATA INTEGRATION AND WEB GIS DEVELOPMENT IN TIRANA MUNICIPALITY

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ABSTRACT

A Geographic Information System (GIS) is of great importance to provision and use of spatial data in local governments. For the Municipality of Tirana, once GIS becomes properly adapted for the web, it can be used to capture, integrate, combine, maintain, query and analyse (spatial) data fulfilling at the same time the needs of citizens and businesses. Web GIS supports, facilitates and accelerates the working process. An appropriate combination of existing data, with all the various types of information, including novel types, would be generated through GIS. This paper aims to provide information on the integration of geographic data from the existing GIS system in the municipality, helping the development of an optimized Web GIS. In addition, the paper aims to provide information on the following departments: Urban Planning, Engineering Network, Transportation and Asset Management.

Keywords: Geographic Information System, Web GIS, data integration, open source, spatial data, PostgreSQL

SITUATION AND PERSPECTIVE OF ALBANIA'S TEXTILE, GARMENT AND FOOTWEAR INDUSTRIES

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ABSTRACT

In the Albanian economy, from 1960 to 1990, the two main industries were the textile and garment industry and the leather and shoes industry. Previously, the enterprises in these industries provided a range of added value chain products from raw materials (fibres) to ready-made products (fabrics, garments, rugs, upholstery). Since the privatization process, which started in 1990, the production activities have been focused on ordered-material production (fully fashioned mode), a focal point for Albanian exports. In the country's economy, the leading sector is still the garment industry due to the great number of employees, though it ranks in fourth place of enterprise production, following the food, wood and furniture, and the metallurgic industries.

Keywords: textile and garment industry; companies' location; number of employees

BACTERIAL FLORA ISOLATED IN BURNS WARD AT UNIVERSITY HOSPITAL CENTRE, TIRANA, ALBANIA

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ABSTRACT

The present paper evaluates bacteriological examinations of burns wound patients treated at University Hospital Centre, Tirana. From January–June 2011, samples from wounds of 16 Intensive Care Unit (ICU) patients and 225 burns ward patients were collected. Information on antibiotic resistance of the strains isolated is also provided. Among the microbes identified, *Acinetobacter* sp. was predominant, while *Pseudomonas* and *Staphylococci* were also found to be common. The level of antimicrobial resistance was high, a typical feature of hospital strains.

Keywords: wounds, samples, pattern, strain

AJNTS, 2011 (2) XVII (31)**RECENT BREEDING RECORDS OF WHITE STORK (*CICONIA CICONIA* L.) FROM VURGU FIELD, SOUTHERN ALBANIA****Ferdinand BEGO**Biology Department, Faculty of Natural Sciences, University of Tirana,
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Agricultural University of Tirana, Albania**Valbona ALIKO**Biology Department, Faculty of Natural Sciences, University of Tirana,
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A survey into the presence and breeding success of the White Stork (*Ciconia ciconia*) was carried out in the summers of 2010 and 2011 in Vurgu field, southern Albania. Four breeding sites with four breeding pairs were recorded, three of which were successful, with between three and five fledglings raised per nest. Nests were located on worship buildings such as church or monastery belfries in the villages of Çuka, Phoneice, Vrioni and Çaushti, with an additional nest built on top of an old poplar tree in Vrioni. Çuka village recorded the most number of grown fledglings (5). In 2010, in the same nest, three fledglings have been noted. In one case there was no breeding success due to human disturbance.

Keywords: White stork, breeding success, Vurgu Field, South Albania

AN INNOVATIVE INFORMATION SYSTEM PROVIDING SECURE FINANCIAL SERVICES FOR ALL**Ana KTONA (RESULAJ) and Ilia NINKA**Department of Informatics, Faculty of Natural Sciences, University of
Tirana, Albania**ABSTRACT**

New applicative methods have been investigated and implemented in the area of information technology to provide qualitative, fast and secure financial services for all. Results of many studies show that broad access to financial services helps reduce poverty. The present paper analyzes various information collected by request and from face-to-face interviews to identify the underserved population in Albania in terms of financial services. We also apply traditional techniques in the last Living Standards Measurement Survey to identify the needs of underserved population about financial services and their living conditions. The information is of great interest to identify the most appropriate information system which provides secure financial services for all.

Reliable financial services are of crucial importance. Agents and mobile operators will make a major contribution in the proposed information system.

Keywords: information system, new technology, financial services, functional description

PASSIVE SAMPLING DEVICE IDENTIFICATION OF PERSISTENT ORGANIC MICROPOLLUTANTS IN WATER AND SEDIMENTS OF LAKE SHKODRA

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ABSTRACT

Over the last decade, passive sampling systems for monitoring the bioavailable fraction of persistent organic pollutants (POPs) in water have been designed and the outcomes reported. Many non-polar organic substances, such as polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs), may adversely affect aquatic environments. As these hydrophobic contaminants are readily absorbed to bottom sediments, surface waters report concentrations in the low ng/L to pg/L levels. Consequently, regulatory monitoring and risk assessment of hydrophobic contaminants in surface waters is generally hampered by the inability to measure reliably these low (and sometimes fluctuating) concentrations. An *in situ* passive sampling device (bare silicone rod) was exposed in Shkodra Lake for 14 days for monitoring of the bioavailable fraction of persistent organic micro-pollutants. Laboratory exposures of 2 cm SRs were carried out in the laboratory. The silicone rods were directly analysed by means of thermodesorption (GC/MS). A number of PAHs in ng/SR (e.g. phenanthrene, anthracene, fluoranthene, pyrene) were identified in water and sediment.

Keywords: silicone rod, PAHs, POPs

RECALIBRATION AND COMPARISON OF DOSIMETRIC SYSTEM

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ABSTRACT

A GU-3 gamma irradiator, an ionization chamber M 23331 (for absolute dosimetry), ECB dosimeters (as routine dosimeters) are used for calibration of dosimetric system and an oscillotitrator OK-302/2 were used to measure dosimeter response. ECB dosimeters, irradiated with doses from 2.91 to 38.75 kGy, were used to plot calibration curve. The total uncertainty of our dosimetric system was $\leq 5\%$. As the maximal difference between the curves was 2%, two calibration curves (through zero and not through zero) were used for measuring the dose. Comparison between the results obtained in the Center of Nuclear Physics Laboratory (CNPH) in Tirana and in the IRASM Radiation Processing Centre Laboratory at the National Institute of Physics and Nuclear Engineering (IFIN HH), Bucharest, Romania was carried out, with good conformity between the results.

Keywords: Recalibration, dosimetry, comparison

MARKET SURVEY ON LIFE SAFETY AND FLAME RETARDANCE OF TEXTILES IN ALBANIA

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ABSTRACT

In Albania, there has been constant development of the construction industry, and improved furniture materials. However, carpets, curtains, and other decorations are flammable often due to high polymer content. These materials convey heat to objects normally regarded as fireproof: building materials, concrete, iron, polystyrene foam, etc. Albania has made great efforts in establishing laws for fire safety of buildings. However, it is far from appropriate implementation of the legislation. Legislation in Western countries imposes the use of fire-retarding materials, helping reduce fire risk from ignition of textiles. Again, Albania is far from adoption of a series of international standards in this area. The present research selected and tested samples of curtain materials from the market. The results highlight the urgent need for appropriate legislation on textiles in Albania and its immediate implementation.

Keywords: flammability, textiles, ISO, EU legislation, survey, furnishings

RELATIONSHIP BETWEEN STRENGTH AND DIMENSION PROPERTIES OF WOOL FIBERS FROM ALBANIAN BREEDS OF SHEEP

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ABSTRACT

The present paper provides information on the mechanical properties of wool fibres from Albanian local breeds. Tensile strength is one of the five basic characteristics that help determine quality. Together with the strain on tensile loads (elongation) it impacts the quality and capability of processing (e.g. spinning) of the wool fibers. However, the finesses, length, crimp and colour are of great importance when it comes to quality grading of wool. This paper aims to look for correlations between the mechanical properties with other properties (e.g. dimensional) of wool from local breeds. The sampling, testing and reporting of results are in line with the statistical principles and standards of testing (ISO, IWTO, etc.). The investigations of assessment of textile materials were carried out in an accredited laboratory.

Keywords: tensile strength, elongation, strain, length, fineness, crimp, wool fibres, standards

THEORETICAL ANALYSIS OF QOS ROUTING IN NETWORKS AND EVALUATION OF STARVATION WITH PACKETS IN DIFFERENT CLASSES

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ABSTRACT

In this paper, a new approach that includes QoS routing architecture, implementable in the Dijkstra algorithm, is provided. Comparing Shortest Path Routing to QoS Routing is a tool to address performance of service. QoS routing eliminates starvation. The starvation between packets launched from source node with different priority is experimentally evaluated. Simulation with QoS routing is based on an ns-2 simulator.

Keywords: QoS routing architecture, Dijkstra algorithm, shortest path routing, starvation

GEOTECHNICAL STUDY AND ANCHOR PLEM DESIGN

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ABSTRACT

Computerised methods are used to evaluate offshore PLEM (Pipeline End Manifold) stability at a pipe and foundation in Vlora Bay. The original design, a steel–concrete structure, was replaced by four piles inserted in clamps placed at the edges of a steel frame. A geotechnical investigation provided information on the soil–pile interaction, a local and global spring model, impact of scour, soil stratigraphy and susceptibility to liquefaction. The type of foundation and forces acting on the PLEM were studied. A finite element model of the PLEM was determined, the joints tested and the structural elements were found to comply with international standards. Requirements for both environmental conditions and a sustainable structure were met.

Keywords: PLEM, geotechnical investigation, finite element model, load combination

FINDING LOCAL MINIMA IN THE ENERGY LANDSCAPE OF THE STABLE MARRIAGE PROBLEM

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ABSTRACT

The stable marriage is one version of the matching problem, a paradigm that finds applications in many different situations: matching interns with hospitals, university admissions, matching roommates, matching supply and demand in markets, etc. Traditionally in the computer sciences literature, where it originated, this problem is solved using the Gale–Shapley (GS) algorithm due to unique solutions, which always favour the proposing side. As there is a way to find all the stable matchings, a modification to the GS algorithm that allows a quick finding of a subset of solutions to the problem, in which one side does considerably better than in the traditional GS algorithm, while the other side does always worse, was introduced. Local minima in the energy landscape of the system represent the solutions of the stable marriage problem, which is similar to frustrated systems, and use at the same time of Monte Carlo annealing techniques helps find the best solution to the problem.

Keywords: stable marriage, Gale–Shapley algorithm, configuration energy

A COMPARATIVE EVALUATION OF ANALYTICAL METHODS FOR ^{90}Sr DETERMINATION

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ABSTRACT

A number of analytical methods for ^{90}Sr determination have been universally applied. Methods based on the solvent extraction of yttrium followed by the analysis of ^{90}Y which is assumed to be in secular equilibrium with ^{90}Sr , for rapid determination of ^{90}Sr are widely applied. Recently a novel selective extraction chromatographic material, consisting of supported crown ether, has been developed for the separation of strontium. In the area of radioactivity monitoring networks the “classical” method, based on the separation of strontium by a set of semi-selective precipitations, is still applicable. In the present paper, the three aforementioned methods for the determination of ^{90}Sr in various certified reference materials were applied. Parameters described in the present paper are indispensable to comparative evaluation of analytical methods for ^{90}Sr determination.

Keywords: ^{90}Sr , analytical methods, comparative evaluation, TBP, crown ether, classical method

IMPACT OF URBAN DEVELOPMENT IN THE TIRANA REGION ON CHARACTERISTICS OF TIRANA–ISHMI CATCHMENT WATERS

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ABSTRACT

In fluvial zone management area, information obtained from assessment and management of the riverine environments is of a great importance as it is a tool to address their restoration. The intent of this paper is to inform on applicability of the indicators framework Driving Forces–Pressures–State–Impact–Response (DPSIR) in a Hydrogeological–Hydrological Information System and GIS context. The indicators allow for assessment of the basins in Albania. In addition, it aims to provide some information about the impact Driving Forces–Pressures have to urban planning. Tirana–Ishmi catchment has been investigated and a set of indicators for the Driving Forces and Pressures categories was defined. In addition, indicators are calculated and discussed. New specific data obtained due to hydrogeological and hydrological investigation, a means to address a better methodology for the Tiranë–Durrës urban management system applying DPSIR model are here in this paper introduced. Moreover, the paper provides some information about preliminary results of a quantitative approach of a set of indicators of the first two models categories such as Driving forces and Pressures. Some sub-watersheds of the river are used as example.

Keywords: indicators, DPSIR model, Tirana-Ishmi basin

A CASE REPORT OF ANTERIOR SACRAL MENINGOCELE WITH RECTOTHECAL FISTULA

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ABSTRACT

Located anywhere along the neuronal axis, meningoceles are the most common neural tube defect. Acute bacterial meningitis as the presenting symptom of an anterior sacral meningocele due to a rectothecal fistula is extremely rare. A case report is here presented. Diagonis was manifested in a previously healthy child with polymicrobial meningitis due to coliforms and anaerobes.

Keywords: defect, meningitis, fistula, polymicrobial

IMPACT OF WATER AND NITROGEN PRICES ON THE IRRIGATION AREA

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ABSTRACT

Bio-economic models of agricultural activities were used to investigate the economic and environmental effects of water and nitrogen prices in the Bardenas irrigation district of Aragón, Spain. The models are based on crop production functions, estimated with the EPIC crop growth simulator. The model results gain further understanding of the impact of various environmental policies on key variables, such production, inputs use, water, nitrogen and labour, quasi-rent and environmental impact by percolation and nitrogen leaching. Farming costs are high due to high-priced water, and water price increases is an inefficient instrument to control nitrogen pollution. The new Water Framework Directive expands aquifer protection over all waters, and defines a mandatory compliance objective to reach “good condition of water”.

Keywords: bio-economic model, inputs price, water and nitrogen demand, environmental impact

ENGINEERING GEOLOGY MAPPING FOR MOTORWAY PLANNING AND DESIGN IN ALBANIA

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ABSTRACT

Engineering geological mapping provides a technical introduction to the principle activities involved in taking a motorway scheme from inception to construction. It

helps define geological environment in terms of potential implementation of a particular engineering project, including its anticipated interaction with the planned engineering works in the area. Many geo-factors, including lithology, geomorphology, hydrogeology, geodynamic phenomena and geotechnical characteristics were investigated for land-use planning purposes. Consequently, appropriate road axes for construction have been defined at low cost, with high standards intended to be met. For construction of the Tirana–Elbasan motorway, information on geotechnical and slope stability, together with accurate engineering measurements for route basements improvement are provided. This paper is designed to provide information, from inception to the construction phase, for the Tirana–Elbasan motorway.

Keywords: geo-factor, geo-risk, lithology, geomorphology, hydrogeology, geodynamics, geotechnical characteristics, slope stability, motorway, tectonics, mass movement, erosion

OVERVIEW OF TWO-DIMENSIONAL NANOMATERIALS AND THE CASE OF GRAPHENE

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ABSTRACT

The present paper provides some information about grapheme, a two-dimensional nanomaterial and some of its properties and possible future uses. The structure of tungsten disulphide is compared to that of graphene, suggesting that tungsten disulphide is a suitable material from which a two-dimensional sheet can be produced. After an introduction to Annular Dark Field Scanning Transmission Electron Microscopy (ADF-STEM), an electron microscope image of a single sheet of tungsten disulphide is analysed.

Keywords: two-dimensional, nanomaterials, graphene

CLASSIFICATION BY TOTAL BACTERIAL COUNT OF SOME RAW MILK SAMPLES IN ALBANIA

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ABSTRACT

The present provides information on the impact of total bacterial count on the classification of raw milk into three grades: I (<20,000 cfu/ml), II (20,000-1,000,000cfu/ml) and III (>1,000,000cfu/ml). Samples were collected from three sites across the country. Collecting of 30 milk samples from each of the three locations took place between June 2009 and June 2010. Ninety raw milk samples were taken in all and submitted to microbiological analysis for total colony count. Eighteen (20%) out of

90 samples were grade I, 28 (32%) grade II, and 44 (48%) grade III. In Albania, microbiological analysis and a quality-based payment for the milk need to be done prior to the processing of the milk.

Key words: classification, grade, total colony count, raw milk

EXTRACTION WITH SUBCRITICAL CO₂ OF *EUGENIA CAROPHYLLATA*

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ABSTRACT

Distillation is one of various methods used to extract substances such as essential oils from medicinal and aromatic plants. The present paper provides some information on obtaining essential oils by means of introduction of subcritical gases, which are not reported as used in the area of essential oils extraction. An apparatus used in the role of Soxhlet apparatus using subcritical CO₂ as solvent was constructed. Outcomes of extraction of *Eugenia carophyllata* using subcritical CO₂, and analysis of the chemical composition of these extracts, are here reported. In addition, research concerning the impact of the number of Soxhlet cycles on the yield of extraction is provided. The extract analyses involved gas chromatography, while identification of their components also involved the use of mass spectrometry.

Keywords: subcritical CO₂, GC-MS, essential oils, medicinal and aromatic plant

AJNTS, 2012 (1) XVIII (32)**DISCONNECTEDNESS OF DUAL TILINGS GENERATED BY
PISOT UNITS OF DEGREE 4****Nertila GJINI**

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ABSTRACT

The present paper investigates the connectedness of Pisot dual tilings generated by a Pisot unit with integral minimal equation $x^4 - ax^3 - bx^2 - cx - 1 = 0$ when $a+c-2|\beta|=1$. Results show that every tile is disconnected but with infinitely many connected components.

Keywords: disconnectedness, Pisot unit, dual tilings

**EVALUATION OF THROUGHPUT, DROP PACKET RATE AND
TIME DELAY IN FLOW AND NON-FLOW LABEL APPROACHES IN
IPV6 TECHNOLOGY****Igli TAFA, Hakik PACI and Aleksandër XHUVANI**Computer Engineering Department, Polytechnic University of Tirana,
Albania**ABSTRACT**

This paper provides information on the application of broadcasters characterized by flow labels and non-flow labels. A Ns-2 simulator demonstrated that each broadcaster consisting of flow label approach implemented in MPLS routing reported a better throughput (89.95%) than did those consisting of flow label (92.77%) implemented in IP routing technology. Some video stream packets between two broadcasters with dynamic numbers of router nodes were generated.

Keywords: MPLS technology, IP routing technology, throughput, flow-label approach, ns-2 simulator

**DETERMINATION OF DOSE RATE AND APPLICATION OF
IRRADIATION OF FOOD PRODUCTS WITH A GU-3 GAMMA
IRRADIATOR****Marsida KLEMO**Department of Engineering Sciences, Aleksandër Moisiu University, Durrës,
Albania**Andon DODBIBA**Center of Applied Nuclear Physics, Faculty of Natural Sciences, University
of Tirana, Albania**ABSTRACT**

Using wheat as a reference material, with composition and density values close to the products intended for irradiation by a GU-3 gamma irradiator, the dose distribution in the material is here reported. Calibration curves with and without zero assisted determination of the average dose rate. The average dose rate in a cylinder of diameter

100 mm and height 110 mm was calculated as 4.68 Gy/min with a calibration curve with zero, and 4.64 Gy/min without zero. The difference between the two values was very small (± 1). The effects of radiation on the growth rate of pepper plants is demonstrated, and the curbing of micro-organism growth on food products (tomatoes and strawberries) is clearly shown. The benefit of a nation-wide programme of irradiating food products is suggested.

Keyword: dose rate, ECB dosimeters, copper wire profile, wheat, oscillatitator, shelf – life

HIGH PRESSURE PHASE EQUILIBRIA AND DENSITIES IN A CARBON DIOXIDE–ETHANOL SYSTEM

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ABSTRACT

Densities and mutual solubility of a carbon dioxide–ethanol system at 333.15 K, 353.15 K, 413.15 K and 453.15 K, with pressure ranging from 4–14.5 MPa, are here reported. A critical density curve was constructed for the whole concentration range. Peng–Robinson, Soave–Redlich–Kwong and Dohrn–Prausnitz equations of state and the Panagiotopoulos–Reid mixing rule helped correlate the Vapour Liquid Equilibrium data for the system.

Keywords: high pressure, density, vapour–liquid equilibria, equation of state

DETERMINATION OF FLUORIDE LEVELS IN BOTTLED DRINKING WATER IN ALBANIA

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ABSTRACT

A simple and low cost technique involving ion selective electrode ISE-F⁻ was used for determination of fluoride ion concentrations in bottled water samples. ISE-F⁻ exhibited a relatively ideal Nernst behaviour with a high limit of detection (up to 15 ppb). The sensitivity of the method determined from calibration graph was 46.784 mV/ppm. The recommended buffer solution TISAB provided a constant background ionic strength during the measurements and adjusting of the pH solutions. Randomly chosen from seven different suppliers in the Tirana market, the bottled water samples were characterized by a fluoride concentration ranging from 0.28–0.48 mg/l, which is lower than the recommended daily fluoride intake for humans. WHO (1995) has a recommended daily allowance of fluoride of 2 to 4 mg per day.

Keywords: ISE-F⁻, bottled drinking water, Fluoride ions, sensitivity, calibration graph

CHEMICAL ANALYSIS OF HYDROLATES OF *JUNIPERUS COMMUNIS*

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ABSTRACT

Steam distillation is a process used in the separation of temperature-sensitive materials such as natural aromatic compounds involved in the manufacture of essential oils, such as perfumes etc. Discharged into the environment in Albania, the by-products of hydro-distillation are highly polluting, impacting the flora and fauna life. The present paper investigates the organic content in the water phase of *Juniperus communis*. The yield from recycling was investigated and its efficiency analysed and discussed.

Keywords: medicinal plants, GC-MS, extraction, hydrolytes, essential oils

IDENTIFICATION OF PHARMACEUTICAL DRUGS IN SURFACE WATERS USING HPLC-UV METHODS

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ABSTRACT

The present paper aims at verifying the presence of some of the most utilized drugs in potable and surface water samples. The HPLC-UV method was optimized for determination of these drugs by use of drinking-water Certified Reference Material (CRM) and target compounds such as amoxicillin, ampicillin, tetracycline, doxycycline, atenolol, diazepam, dexamethasone sodium phosphate, prednisolone sodium phosphate, isosorbide mononitrate. Each analyte standard solution was investigated using standard recommendations. Shimadzu HPLC-UV was employed for the analysis. A standard mixture for all analytes (0.100mg/L each) was prepared and investigated under the same conditions as for individual CRMs. The following results were reported: i) in the matrix where the drugs were present, slight shifts in analyte retention times were observed, making them identifiable, even in each another's presence, and ii) column L₂₁ led to the required performance of tetracycline and doxycycline standard mixture, while C₁₈ led to the required performance for the others.

Keywords: drug, potable water, HPLC, retention time, column

SOME ASPECTS RELATED TO ELECTROLYTES, MEASURED BY ION-SELECTIVE ELECTRODE (ISE)

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ABSTRACT

Measurement of electrolyte levels is very important in both the biological and medical sciences. The predominant electrolytes in the body are sodium, potassium, chloride and calcium. The ion-selective electrode (ISE) method is the most appropriate of the possible analytical methods (ISE, colorimetric (End Point), flame photometry, atomic absorption spectrophotometry), as it is fast, accurate and inexpensive. In the present investigation, one hundred patients were tested for their levels of Na^+ , K^+ , Cl^- and Ca^{2+} , as well as pH. The mean value \bar{x} , standard deviation SD, interval of normal values $\bar{x} \pm 2$ SD, the Anderson-Darling (AD) test for normality and t-test were applied. Differences between men and women were detected.

Keywords: ion-selective electrode (ISE), sodium, potassium, chloride, calcium, interval of normal values, electrolyte meter SINO 005

METHOD OF HYDROCHEMICAL STUDY OF GROUNDWATER FROM ALLUVIAL WATER-BEARING LAYERS: TIRANA BASIN

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ABSTRACT

Hydrochemical study of the groundwater of the Tirana alluvial basin is here reported. Physical-chemical parameters of groundwaters, cations, anions, Total Dissolved Solid (TDS), Total Hardness (TH) and water type were analysed and elaborated. In addition, their spatial distribution was analysed. The physical-chemical composition of groundwater and the impact of natural and artificial factors were determined. For each chemical parameter, relevant maps are compiled and provided as a means to visualise the hydrochemical composition of groundwater in the Ishmi river basin.

Keywords: hydrochemical study, methodology, groundwater, alluvial water-bearing layer, chemical parameters, special maps, hydrochemistry

ISOTOPIC DATING (ABSOLUTE AGE) OF GRANITOIDES OF GASHI ZONE

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ABSTRACT

Three samples, two from the Trokuzi massive grandiorites and one from the Juniku granite outcrop, Kosovo were dated by applying the U–Pb method in zircons. The analysis was carried out in the Istem, CC 066 Laboratory of the Montpellier II University, France. Results reported two kinds of granitoid rocks: i) Juniku granite dating 329.6 ± 2.1 Ma (Carbon, Mississippian, Serpukhovian), and ii) grandiorites of the Trokuzi massive dating 242.2 ± 1.5 and 244.5 ± 1.5 Ma (Middle Triassic era, Anisian age). The Geological Map of Albania, at a scale 1:200 000 illustrates the granitoids of the Trokuzi massif dating to J₂₋₃. The present results confirm the formation of the plutonic rocks in the Middle Triassic Age when volcanic rocks were typically formed. Recent geochemical and isotopic investigations report that these volcanic systems were first formed in a rifting zone that evolved into a spreading ridge. Plutonic and volcanic rocks formed under the same geodynamic conditions during the Early–Middle Triassic period characterize the Dinarides. These dates are prior to the range of the age (160–165.5 Ma) of the Jurassic ophiolite plagiogranites and microdiorites dated by the same method by Dilek *et al.*, 2008.

Keywords: absolute geochronology, isotopic dating, granodiorite of Trokuzi massif, Gashi area, Junik granite

OBSERVATIONS OF MONTHLY VARIATIONS IN PHYSICO- CHEMICAL AND MICROBIOLOGICAL PARAMETERS OF LAKE SHKODRA AND RIVER BUNA

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ABSTRACT

Lake Shkodra is the largest lake in the Balkan Peninsula. The lake drains in the south-east into the River Buna, which flows to the Adriatic Sea. Anthropogenic pollution is the most important concern from a water management stand point because it is the major source of water quality problems and thus subject to control. Effluent

generated by the industries and livestock, etc., are sources of pollution. This paper aims at providing some assessment of water quality in terms of physicochemical and microbial content of the River Buna and along the shore of Lake Shkodra at Zogaj and Kamica and in the middle of the lake (on the Albanian side of the border). European Union and World Health Organization (WHO) recommendations were followed to address appropriate analyses. Samples were taken from the aforementioned sampling sites on a number of occasions in 2011, and parameters investigated in the Centre for Microbiological Diagnostics, University of Shkodra, Albania. The findings are that *Escherichia coli* and intestinal *enterococci* have a great impact on the quality of the water in the Lake Shkodra system.

Keywords: anthropogenic, livestock, intestinal *enterococci*, faecal *coliforms*

EFFECT OF SALT CONCENTRATION ON *IN VITRO* MICROPROPAGATION OF GF-677 PEACH ROOTSTOCK (PEACH X ALMOND)

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ABSTRACT

Information on the micropropagation of stone fruit tree species is reported, specifically for the GF-677 peach rootstock. The paper aims at identifying the rooting percentage and multiplication rate on three nutrient media—MS, MS/2 and DKW—consisting of different macro- and micro-salts concentration. The most favourable nutrient medium in the propagation stage through subcultures was found to be the universal nutrient medium MS, which helps the normal growth of plants. The level of rhizogenesis was found to be 82%.

Keywords: micropropagation, rootstock, nutrient medium, macro- and micro-salts, rhizogenesis

ETIOLOGICAL TREND OF MAJOR TRAUMA BASED ON CONTEMPORARY STATISTICAL ASSESSMENT

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ABSTRACT

This paper aims at classifying etiological factors of the major trauma group established at National Trauma Centre, Military University Hospital, Tirana, and interpreting statistically the data obtained. For analysis, Pearson χ^2 and Nominal Logistic Regression were applied using SPSS.

Keywords: maxillofacial surgery, etiology, road traffic accidents, falls, assaults, gun injuries

PROBABILISTIC SEISMIC HAZARD DEAGGREGATION AND ASSESSMENT OF LIQUEFACTION SUSCEPTIBILITY OF LOOSE SEDIMENTS. A CASE-STUDY.

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ABSTRACT

Earthquake loading is one of the most important factors influencing the soil susceptibility to liquefaction. For this reason, except thorough geotechnical site characterization, the assessment of liquefaction hazard for construction sites requires a credible estimates of the ground motions caused by strong earthquakes. The most used ground motion parameter for such analysis is the peak ground acceleration (PGA). In order to use properly the acceleration values from hazard studies we present in this paper the results of the analysis called “probabilistic deaggregation of seismic hazard” which is necessary for the estimate of the relative contribution of each seismic source and size of earthquake on liquefaction-related phenomena. We started our analysis with the definition of the seismic characteristics of the site using the most recent technique called MASW and based on the scenarios defined by the deaggregation procedure we applied two approaches for the definition of the PGA at the site selected: the first is based on the Boore *et al.*, (1997) ground motion prediction equation (GMPE), while the second is based on the standard procedure of the Eurocode 8. At the end the results of the liquefaction analysis at the Semani site are presented.

Keywords: deaggregation of seismic hazard, liquefaction potential, mean-event, modal-event

AJNTS, 2012(2) XVIII (33)**DOSIMETRY OF LINEAR ACCELERATOR AND ITS USE IN A
TREATMENT PLANNING SYSTEM: A REVIEW****Ervis TELHAJ, Erjona BAKIU**

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ABSTRACT

The linear accelerator (linac) is the accepted workhorse in radiotherapy. Two medical linear accelerators Elekta Synergy Platform are installed in Hygeia Hospital Tirana for radiotherapy purposes. The high voltage of the linac varies from 6–18 MV. Dosimetry of the beam of X-rays of the two accelerators is performed on a regular basis by the small volumes ionization chambers. The data of the dosimetric measurements enters into a database of an XIO treatment planning system (TPS) and, along with the computed tomography (CT) data, serve as initial data for TPS preparation, carrying out the irradiation process of the target volume with high precision using one or some radiation fields. The results are that 100 monitor units (MUs) produced a dose of 1.009 Gy for a high voltage of 6 MV and 1.004 Gy for a higher voltage of 18 MV, with uncertainty of one percent.

Key words: linear accelerator, high energy X-ray beam, ionization chamber, radiotherapy, radiation dosimetry, monitor unit

**DETERMINATION OF THE TRACE ELEMENT SELENIUM IN
MULTIVITAMIN PREPARATIONS BY SPECTROPHOTOMETRIC
ANALYSIS OF SLURRY SAMPLES****Ilda MALKUCI**

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Pranvera LAZO and Lida PJESHKAZINIDepartment of Chemistry, Faculty of Natural Sciences, University of Tirana,
Albania**ABSTRACT**

A simple and low cost spectrophotometric method is applied for selenium (Se) determination in food supplements. In the present investigation, the slurry (0.1–0.2% m/v in 6% v/v HNO₃) sampling technique was used for Se analysis in multivitamins preparations. The analysis was characterized by good sensitivity and accuracy. The standard addition method, with good performance and a linear calibration graph ($R^2=0.9996$), was applied to avoid interference of the sample matrix in Se determination. Two different food supplements were collected from different pharmacies in Tirana (5 samples for each food supplement). Se concentration per tablet ranged from 25.38 ± 1.47 – 54.86 ± 1.36 µg/tablet. The concentration fell within the range of the concentration reported in the patient information leaflet for both food supplements analysed (25 µg/tablet and 55 µg/tablet). The accuracy of the analysis was

checked by recovery of the spikes which was in the range of 97–102%. The method yielded reproducible results with $RSD < 4.66\%$.

Keywords: spectrophotometry, food supplement, selenium concentration, calibration graph, coefficient of linearity

ASSESSMENT OF TRACE ELEMENT POLLUTION AROUND VLORA BAY

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ABSTRACT

Recently, environmental assessment consisting of air and seawater investigation has been carried out in Vlora coastal area. Air quality survey involved active biomonitoring, where the moss *Hypnum cupressiforme* was employed as a long-term biomonitoring system. Moss bags were exposed parallel with ditches for six months at nine sites in Vlora, along the main streets. Moss biomonitoring at coastal and inland sites was used for investigation of the distribution of heavy metals in the air. In addition, deposition of anthropogenically mobilized trace metals was investigated. A seawater quality survey was also carried out (see accompanying paper) and determined of heavy metals content in water samples from 15 sites in Narta and Orikumi lagoons and Vlora Bay. Measurements were carried out from April–May 2011 and in February 2012. Heavy metals (Cu, Pb, Zn, Mn, Fe and Cd) were determined via Atomic Absorption Spectrometry (flame, electrothermal systems). The area studied is moderately polluted as a result of high vehicular emissions and use of adulterated fuel in vehicles. Locations in the city were categorized on the basis of metal concentrations in the mosses and data statistical treatment. Comparison of exposed and unexposed moss helped assess the factors that adulterated the exposed moss samples. Correlation analysis helped determine the geochemically mobile elements and geochemically bound elements.

Keywords: active biomonitoring, urban area, seawater, heavy metals, accumulation factor, multivariate analysis, moderately polluted.

ASSESSMENT OF CONDITION OF NARTA AND ORIKUM LAGOONS BY DETERMINATION OF HEAVY METALS CONTENT IN WATER AND SEDIMENTS

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ABSTRACT

Narta and Orikum Lagoons are two of the most important lagoons in Albania, situated in an area of ecological importance. The present paper aims at evaluating their ecological condition via determination of levels of heavy metals in water and sediment samples. Ten samples, four from each lagoon and two comparative samples from the canals that connect each lagoon to the sea, were analysed. Concentrations of Hg, Pb, Cd, Cu, Zn, Cr, Fe, Ni and Mn were determined by means of Atomic Absorption Spectroscopy. Sediments contained a higher level of heavy metals than did water samples, which is to be expected as sediments act as a reservoir for pollutants that in certain circumstances impact water and biota. The high Hg concentrations in lagoon water, particularly in Narta due to the past discharges of industrial waste from a chlorine–alkali plant (now out of work) and the Pashaliman naval base near Orikum, is of great concern. Assessment of water quality was based on quality standards of the Norwegian Institute for Water Research.

Keywords: heavy metals, pollutant, water, sediment, AAS, chlorine–alkali plant, NIVA

THE STUDY OF ATMOSPHERIC DEPOSITION OF HEAVY METAL IN EASTERN ALBANIA BY MOSS BIOMONITORING TECHNIQUE

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ABSTRACT

Biomonitoring issues of air pollution for the environmental evaluation in the eastern Albania are here reported. Mosses possess many properties that make them suitable for monitoring air pollutants. Sampling was performed in accordance with the LRTAP convention-ICP protocol and sampling strategy of the European Program on Biomonitoring of HM Atmospheric Deposition. The moss species used as biomonitor was *Hypnum cupressiforme* and was collected at 19 sites distributed over the eastern Albania, in urban and rural zone, in the summer 2011. The location of the sampling sites were determined by GPS and represented by maps. Nineteen elements (Al, As, Ba, Ca, Cd, Cr, Cu, Fe, K, Li, Mg, Mn, Na, Ni, P, Pb, Sr, V, Zn) were determined. ICP

technique was used to determine the content of elements in mosses including HM (Al, As, Ba, Ca, Cr, Fe, K, Li, Mg, Mn, Na, Ni, P, Sr, V, Zn). Pb, Cd and Cu were determined by AAS/ETA. The results reveal local emission point. The intensity of metal mean values in moss samples follows the trend $As < Cd < Li < Pb < V < Cu < Zn < Ni < B < Sr < Mn < Ba < Na < P < Fe < Mg < Al < K < Ca$. Principal component analysis (factor analysis with VARIMX rotation) was used to identify and characterize different pollution sources and to identify the areas receiving the highest metal pollution load. The data of the factor analysis were applied to distinguish elements mainly of anthropogenic origin from those predominantly originating from natural sources. An additional goal of this study is to complete Albanian map in regard to distribution of HM, identify the main polluted areas and determination of their level in different sites.

Keyword: mosses, atomic absorption spectrometry, bio-monitor, heavy metal (HM), factor analysis.

LEVEL OF ANTIBIOTIC RESIDUES IN ALBANIAN AQUACULTURE PRODUCTS

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ABSTRACT

The Albanian aquaculture industry, including the culture of freshwater fish, has expanded rapidly in recent years. Fish and shellfish are a rich source of nutrients and embody a healthy lifestyle. However, like all organisms, aquaculture fish are subject to a large range of diseases, though can be quickly prevented or cured using chemicals or veterinary drugs. No study of the risk presented by antibiotic residues has been conducted in freshwater aquaculture fish in farms and markets in Albania. The present investigation aims at assessing the level of such residues through use of Premi®Test. The results taken from samples obtained in different periods of the year showed that contamination by antibiotic residues occurs only at the farm but does not continue through to the markets, demonstrating that freshwater aquaculture fish from Albania are safe for human consumption.

Keywords: aquaculture, veterinary drugs, antibiotic, maximum residue limit (MRL)

A PREPARATION METHOD FOR WELL-DEFINED CRYSTALLITES OF $MgCl_2$ -SUPPORTED ZIEGLER-NATTA CATALYSTS, FUNDAMENTAL ASPECTS AND THE ROLE OF ELECTRON DONORS IN PROPYLENE POLYMERIZATION

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ABSTRACT

An active model for a Ziegler-Natta propylene polymerization catalyst has been prepared by spin coating of a $MgCl_2$ /donor solution in ethanol on a planar silica wafer,

followed by crystal growth by Ostwald ripening to give well-defined $\text{MgCl}_2 \cdot \text{donor(s)} \cdot n\text{EtOH}$ crystallites. When a diether donor was used in the crystallites growth only 120° edge angles were formed, indicating formation of a particular crystallite face for the MgCl_2 .

Keywords: Ziegler-Natta catalysts, electron donors, MgCl_2 crystallites

PRODUCTION AND CHARACTERISTICS OF GREEN BRICKS FROM WASTE SILICEOUS FLY ASH

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ABSTRACT

In the area of high-pressure technology no additional heating and energy consumption is needed for fly ash to be compacted into bricks. A normal curing makes them as strong as ordinary fired clay bricks. At least 75% fly ash can be used. Nevertheless, the percentage of fly ash in the brick depends on the fly ash characteristics. With proper constituent proportioning and curing, these bricks can reach compressive strengths comparable with those of common clay bricks. Adequately proportioned bricks can reach compressive strengths of the order of 20–30 MPa in laboratory conditions within a few days of curing. A minimum normal water curing period of seven days is of great importance for the bricks to attain high strength. The main parameters that greatly impact the quality of compacted fly ash bricks are; i) the ratio of fly ash (binder) to water, ii) compaction pressure, iii) curing conditions, and iv) the curing time. It appears that there is an optimal composition range and proportioning of constituents for producing the best performing bricks in terms of strength, freeze–thaw durability, mouldability and water absorption characteristics. The bricks produced in this study were uniform in shape with a smooth finish, and were lighter and less porous than ordinary clay bricks.

Keywords: green brick production, waste materials, siliceous fly ash, water curing, perforated brick

STUDY OF PHOSPHORUS AND NITROGEN COMPOUNDS IN BOVILLA DRINKING WATER TREATMENT PLANT

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ABSTRACT

The main sources of nutrient (phosphorus and nitrogen) loading to water include human sewage, cultivated fields, forests, storm water runoff, municipal wastewater treatment, fertilization of crops and livestock manure. It leads to degraded water quality and ecosystem health. The present paper aims at characterizing the parameters controlling water chemistry-such as anthropogenic activity (agriculture, urbanization, point source pollution, and atmospheric deposition). In addition, in the present paper, the impact of geomorphology and biogeographic factors on stressor-water quality relationships is assessed. The tributary of Bovilla reservoir is the Tërkuza River which flows to northeast direction, one of the most important water supplies for Tirana. Water quality characteristics of the reservoir, investigated from May 2002 to December 2010, were a means to address the impact of waste loads on water quality of the river. Concentrations of nutrients (total phosphorus TP, soluble reactive phosphate SRP, total nitrogen, ammonium nitrogen and nitrate +nitrite nitrogen) in the water of the river were analysed. The results reported that the chemical and physical quality of water samples comply with the standard norms for drinking water in Albania.

Keywords: water nutrients, organic matter, total phosphorus, ammonium nitrogen, nitrate+nitrite nitrogen

EVALUATION OF HEAVY METALS IN THE SHARRA LANDFILL WATER SYSTEM IN 2012

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ABSTRACT

Designed and constructed in line with current requirements of environmental quality investigation consisted of planning and operation, the Sharra landfill has for a long time been one of the five main hot spots in Albania in terms of environmental pollution. Remediation of the site began in late 2007 early 2008. Specific standards regarding landfill operation involve investigation of chemical-physical parameters of

ground and surface waters. Chemical investigation has been periodically carried out since late 2007. Results demonstrate that the levels of heavy metal pollution have decreased several fold. Currently, most of the parameters are in line with environmental standards. In the present paper, toxicity assays were used for investigation of heavy metals. High levels of Pb^{2+} , Cu^{2+} , Co^{2+} were reported at the beginning of the operation of the landfill. Once the first phase of remediation was completed, improvements in leaching parameters of heavy metals levels were clear, and their drastic decrease in ground and surface water systems demonstrated.

Keywords: environment, heavy metals, landfill, water system

MOLECULAR IDENTIFICATION OF THE FOETAL *RHD* GENE IN ALLOIMMUNIZED RH D-NEGATIVE MOTHERS

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ABSTRACT

The D antigen encoded by the *RHD* gene is highly immunogenic and induces an immune response when transfused in D-negative recipients. In most countries D typing is routinely performed in all blood donors, transfusion recipients and pregnant women. Consequently, clinical complications due to mismatched transfusions are infrequent, but despite the use of immunosuppressive therapy with anti-D immunoglobulin prophylaxis, D alloimmunization in pregnancy still occurs. The present paper aims at correlating the positive indirect antiglobulin test (IAT) in D-negative Albanian mothers with the *RHD* gene status of the foetus. Twenty positive IAT mothers with high value of antibodies titration were in the present investigation selected. With consent, foetal DNA was extracted from amniocytes to identify the foetal *RHD* gene-specific sequence with the use of PCR. All amplifications were subsequently analysed using agarose gel electrophoresis. Seventeen samples (85%) out of 20 amplified the *RHD* exon 7 sequence. Only three samples (15%) did not amplify. The foetuses were respectively qualified as RhD positive and RhD negative. These results correlated perfectly with the serological Rh typing of the new-borns. A significant number of women in Albania still become alloimmunized during pregnancy for a variety of reasons, including unknown Rh blood group, no administration of Rh immunoglobulin, or unrecognized miscarriage. Here, a method for determination of the *RHD* status of the foetus from amniotic fluid was standardized. Establishing appropriate methodical guidelines would

be important due to the medical significance and high economic costs associated with RhD alloimmunization.

Keywords: RhD alloimmunization, Rh-blood system, RHD genotyping

USE OF DSC AND HPLC IN ASSESSING NIMESULIDE- EXCIPIENT COMPATIBILITIES

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ABSTRACT

In the present paper, interactions and compatibilities between nimesulide and some commonly used excipients (Magnesium Stearate-MGST, Lactose Monohydrate and Polyvinylpyrrolidone-PVP) are investigated by means of two techniques: the Differential Scanning Calorimetry (DSC) and High Performance Liquid Chromatography (HPLC). The properties of the pure compound untreated or technologically processed (co-ground, kneaded or tableted), were compared with those of binary mixtures nimesulide-exciipient, which underwent the same treatment. DSC and HPLC were used to examine indications of interactions within the mixtures, hence potential incompatibilities.

Keywords: Nimesulide, DSC, HPLC, drug-exciipient

SIMULATION OF A BURNER OPERATING AT MILD COMBUSTION

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ABSTRACT

A combustor with high air preheating and strong internal exhaust gas recirculation is numerically simulated. The combustor operates in the mild combustion mode, characterized by relatively low flame temperatures, low NO_x emissions, no visible flame and no sound. A computational fluid dynamics (CFD) model is set up comprising the input of geometrical model, mesh-refining process, setting up physical model, handling of algorithms of solution, and the incorporation of appropriate user subroutine that was linked to the fluent code. Predictions of the mean velocity components are compared with experimental data. It is found that the predicted profiles reproduce the data reasonably well, but some small discrepancies were found. It is found that the calculated temperatures reproduce experimental data reasonably well. Predictions of the mass fraction of CO₂, mass fraction of H₂O, turbulent kinetic energy, turbulent dissipation rate are found.

Keywords: MILD combustion; Flameless Burner; CFD

GEOCHEMICAL SIGNATURES OF BALKAN CARBONIFEROUS (JUNIKU, KOSOVO) AND MIDDLE TRIASSIC (GASHI ZONE) GRANITOIDS

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ABSTRACT

The region of Juniku in Kosovo comprises carboniferous granites dating to 329.6 ± 2.1 Ma. These are thin slices of Palaeozoic basement not yet encountered in a normal position. Chondrite-normalized REE patterns rich in Ni and Cr show relative depletion in heavy REE and lack of a negative anomaly of Eu ($\text{Eu} / \text{Eu}^* = 0.9$). Based on these geochemical features, the magma which crystallized these granites must be generated deep in the mantle, leaving a garnet peridotite residue. These type A1 granites, having high contents of Ba, U, Th and Sr, are characterized by crystallization of the magma in the continental crust. These granites were formed either under continental rifting conditions, or within the continental plate. In contrast, the granitoides of the Trokuzi Massif (Gashi Zone) of the middle Triassic (Anisian; 242.2 ± 1.5 to 244.5 ± 1.5 Ma) are characterized by: i) flatter chondrite-normalized REE compositions, ii) strong Eu negative anomalies ($\text{Eu} / \text{Eu}^* = 0.5$), and iii) a low content of Ni and Cr. The extended multi-element variation plots normalized to primitive mantle emphasize enrichment of magma with continental crustal material, because these type A2 granites were formed either in post collision, or under spreading conditions.

Keywords: carboniferous granites, granitoids, Gashi zone, Albania

GEOTECHNICAL EVALUATION AND CONSTRUCTIONS SITE IMPROVEMENT IN AREA OF SHËNGJINI, ALBANIA

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ABSTRACT

The present investigation aims at finding appropriate solution to the geotechnical issues associated to the construction industry in the area of Shëngjin where more than 50 percent of the surface area comprises peat soils characterized by extremely low bearing capacity. The area is one of the most attractive coastal zones in Albania, and is considered a top priority tourism destination. Using soil compaction in medium loose soil and geotextiles for this peaty area is appropriate. In the present investigation, geotextiles helped stabilize and separate the fill from the basement of a very porous lithological environment such as the peat soils. Results obtained via field work and geotechnical investigation found that the underground water table is close to the surface (0.1–0.2m). In the area of soil reinforcement, steep slopes, roadway bases and foundation soils, application of geogrids are appropriate: plastic materials, often

reinforced with glass fibre, are able to carry considerable tensile loads. This method has found wide and successful application in ground stabilization cases, and is recommended for constructions in the area of Shěngjin.

Keywords: physical and mechanical properties, geotechnical evaluation, soft soils, site improvement, foundation's calculation, finite element method, software plaxis

AJNTS, 2013 (1) XVIII (34)**EFFECTIVENESS OF FLEET MANAGEMENT SYSTEM—A
REGIONAL STUDY CASE****Dashmir ISTREFI**Faculty of Information Technology (FIT), Polytechnic University of Tirana,
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ABSTRACT

Communication between machines enables innovative advances in technology. Currently, machine to machine (M2M) capabilities that are improving and simplifying the way of doing business are developing. An M2M portfolio is enabling solutions in industries ranging from health care, retail services, smart energy, transportation, logistics and automobiles. In addition, the highest level of security, reliability and low-cost services is provided to ensure successful deployment in the complex M2M ecosystem. The system scales to all possible fleets, of all sizes, and provides business with a best-in-class, robust, highly reliable solution for deploying business-critical applications. We report data on the M2M market in SE Europe and make recommendations for its introduction here. The system offers features such as vehicle history, reporting, fuel efficiency module, directions, alarms and geo-fencing. A case study concerning taxi companies is reported. The investigation involved interviews to identify the problems the companies face. The results indicate this technological innovation supports businesses at their earliest stage of growth, and provide a seamless path of expansion.

Keywords: Fleet management solution, innovation tools, cost reduction, operation efficiency

**CALIBRATION CONTROL OF ELEKTA LINEAR ACCELERATOR
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ABSTRACT

The linear accelerator (linac) is the accepted workhorse in radiotherapy and its calibration is of the greatest importance for the prescribed dose delivery. Dosimetrically the linear accelerator photon beam output is the main parameter. Periodic monitoring of linac is essential as it promotes optimization of radiological procedures with respect to patient dose and image quality by detecting unplanned changes in dose levels or when local or national diagnostic reference levels are exceeded, when remedial action is required. A postal audit dosimetric service through the SSDL network for improving the status of radiotherapy dosimetry worldwide

purposes is offered by IAEA/WHO. Installed in Hygeia Hospital in Tirana, Albania, the photon beam from 6 MV and 18 MV Elekta linear accelerator was audited via this postal audit dosimeter service using thermo luminescent dosimeters. The result of the audit of differences between the hospital reported dose and the IAEA/WHO SSDL dose measurement was less than 2 percent. This audit served as a means to address proper calibration procedures developed for linear accelerator beam in Hygeia Hospital. It is recommended that the postal audit is used by other radiotherapy services in Albania.

Keywords: calibration, Elekta linear accelerator, photon beam, radiation therapy, postal audit

A SELF-MADE LAB-SCALE SYSTEM FOR CHEMICAL SYNTHESES IN SUPERCRITICAL CO₂

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ABSTRACT

In the present paper, information on a self-made lab-scale system for inorganic and organic syntheses in supercritical CO₂, consisting of a metering and filling glassware subsystem suitable for metering and filling desired amounts of CO₂ in special shaped quartz ampoules, and two other subsystems is provided. The quartz ampoules, serving as reaction vessels, and two cylindrical batch reactors, as the main parts of the set-ups, are designed and constructed for periodical use. CO₂ inside the quartz ampoules plays the role of the reaction medium counter pressured by the amount of CO₂ outside the ampoules. Reaction conditions up to 400 bars and 673 K can be reached with the only restriction being the autoclaves sealing. The system was successfully employed using supercritical CO₂ as a reaction medium for a variety of reactions between inorganic species.

Keywords: lab-scale system, supercritical CO₂ syntheses, batch reactor, reaction medium

PECULIARITIES OF ULTRABASIC ROCK MAGNETISM AND PALAEOMAGNETISM OF ALBANIDES OPHIOLITES

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ABSTRACT

Based on magnetic susceptibility measurements in outcrops in the field, together with determination of induced and remnant magnetization in the samples collected in ultra-basic rocks, gabbro and volcanic rocks in six characteristic profiles from south to the northern Albania carried out by Frashëri and Bushati 1995, the present paper provides information on the peculiarities of the ophiolites magnetization in the country's Alpine folded belt, especially on paleomagnetic studies and results. Magnetic

properties of the rocks were determined in the Geophysical Department, Faculty of Geology and Mining, Polytechnic University of Tirana, and Geophysical-Geochemical Centre of Tirana. In addition, paleomagnetic were carried out, and the data analysed in the Paleomagnetic Laboratory, Leoben University, Austria, and that of Aristotle University, Thessaloniki, Greece, as well as in the Institute of Geophysics, Academy of Sciences of the Czech Republic. The fresh dunites and hartzburgites of the tectonic sequence did not exhibit magnetic properties. In addition, as their degree of serpentinization is equal, they cannot be distinguished by their magnetization. Moreover, their magnetic properties vary by about the same amount. The richer in ferromagnetic minerals the rocks (such as secondary magnetite) are, the higher magnetic values are. An induced magnetization ($80\text{--}13 \times 10^{-5}$ units SI) can be conditioned by the presence of 0.1 per cent of magnetite. Depending on the degree of serpentinization, serpentines magnetism values are from unmagnetic to strongly magnetic. Firstly, the physical properties of the ultramafic rocks vary within broad limits. In some cases a group of rocks is distinguishable by its physical properties being different from the surrounding rocks. Pyroxenite magmatism exhibits quite big differences. However, most of pyroxenite is weakly magnetic. Different types of massifs have different gabbros magnetization, on average $I_r = 52.825$ A/m. Chromite ore deposits and occurrences are characterized by an inverse vector of magnetization. Here, negative magnetic anomalies can be met over magnetic chrome spinel ores. Studies on orientation of the remnant magnetization vector of the ores and the surrounding rocks are a means to address formation conditions and changes over time. For some massifs is preserved approximate orientation of vectors of remnant magnetization. In the north-eastern edge of the ophiolitic belt of Albanides, in Komani, the volcanic rocks have a clockwise rotation, analogous with the external Albanides. The direction of magnetization of gabbros in the massifs of Qafzes in South-East of Albania is approximate with the orientation of the magnetism vector of gabbros massifs in Chalkidiki, Greece.

Keywords: peculiarities, ultrabasic rock, magnetism, palaeomagnetism of Albanides Ophiolites

COMPARISON OF DIFFERENT RESISTIVITY ARRAYS USING ERT AT TWO ARCHAEOLOGICAL SITES IN ALBANIA Hamza REÇI and Idriz JATA

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ABSTRACT

Electrical resistivity tomography (ERT) was applied in geoelectric surveys carried out in Bylis and Apollonia—two archaeological sites in Albania—in 2010 and 2011. Two squares of size 30 x 25 m, close to the old gymnasium, and 30 x 20 m, near to the old theatre in Bylis, as well as five squares around the Roman baths in Apollonia were surveyed. To the NE, NW, SW and SE of the Roman baths squares of dimensions 30 x 20 m and 30 x 30 m were surveyed. One square of size 60 x 50 m was also surveyed using 60 connected electrodes. The geoelectric surveys of the squares involved use of

2-D parallel profiles 1.5 m from each other, with electrodes spaced apart by 1 m. The squares were surveyed using two geometric configurations: Wenner and dipole–dipole arrays. The collected data were interpreted with use of the inversion resistivity method involving Software Res2dinv for each profile. True resistivity of the subsurface was obtained, with use of nonlinear equations defined with the least-squares inversion method, from the measured apparent resistivity values. 3-D interpretation of profiles was carried out and maps of different depths were compiled. The use of both arrays helps to better understand the spatial extent of resistivity anomalies. The true resistivity models taken from the inversion of apparent resistivity measurements, are almost the same, with little changes, where the Wenner array gave better results to vertical changes, whereas the dipole–dipole array to lateral ones. The ERT method was found to delineate very well a thickness of cultural layer and buried archaeological objects inside it. Rich in limestone, the basement in Bylis revealed high resistivity features, while comprising a clay layer, the Roman bath area in Apollonia had low resistivity values.

Keywords: Geoelectric, Electrical resistivity tomography, archaeological site, apparent resistivity, true resistivity, inversion

APPARENT STRESS DETERMINATION FROM BROADBAND SEISMIC ENERGY AND MOMENT OF SMALL AND MODERATE EARTHQUAKES IN ALBANIA

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ABSTRACT

Apparent stress for different seismotectonic conditions in Albania is determined based on records of small to moderate earthquakes recorded by Albanian Seismological Network (ASN). The method is based on Wyss and Brune (1968) definition which employs broadband radiated seismic energy and seismic moment as the main macroscopic physical parameters characterizing a seismic source. The method is a means to address correction of seismic source spectra locally, for attenuation and radiation effects. Consequently, a set of 69 earthquakes has been selected, for which the waveforms recorded on both horizontal components are only processed. Source parameters are determined from displacement source spectra using Brune ω^{-2} model. Radiated seismic energy is computed based on PSD velocity spectra, by discrete integration in frequency domain. Sources are grouped according to tectonic areas characterized by different stress regimes. Each of the group is coded as al001, al002, al003, al004 and al005, respectively for longitudinal Adriatic and Ionian seismogenic zones, transversal Elbasan–Dibra seismogenic zone and Mirdita zone as part of the inner domain. The achieved apparent stress varies in an average within the interval 0.01–10 MPa. Variation in apparent stress values for Albania, generally in accordance with global ones (0.03–6.69 MPa) was observed. Apparent stress scales with the

seismic moment with the assumption of a constant shear modulus in each area ($\mu = 0.3 \times 10^5$ MPa). Also, a mechanism dependent scaling $\sim M_0^{[(-0.1)-(-0.26)]}$ for oblique faults and $\sim M_0^{[0.69-1.75]}$ for pure thrust and normal faults has been achieved as well, showing the importance of this physical source parameter in the seismotectonic characterization of a seismically active region.

Keywords: apparent stress, radiated seismic energy, seismic moment, scaled energy

ULTRAMAFIC INTRUSIONS IN ALBANIAN OPHIOLITES: PETROLOGICAL IMPLICATIONS

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ABSTRACT

Partially rooted in the uppermost part of the mantle sequence, ultramafic intrusions in Albanian ophiolites occur mainly within plutonic sequence of both western and eastern ophiolites where heteradcumulate poikilitic plagioclase wehrlite and wehrlite dunite within western and eastern ophiolites could be respectively met. Pyroxenites form an aureole of the ultramafic intrusions, or small irregular segregations within ultramafic intrusions. Formation of the ultramafic intrusions relates to melt generation and mantle–melt interaction processes in the uppermost part of the mantle sequence. This crystal mush of ultramafic composition has intruded the plutonic sequence of the western and eastern ophiolites. The crystal mush by which the MOR-type western ultramafic intrusions crystallized was supposed to be derived by disintegration of a relatively less depleted mantle section, whereas eastern ultramafic intrusions with IAT and partly boninitic affinity are formed due to the consolidation of a crystal mush derived by disintegration of a highly depleted mantle section.

Keywords: ophiolite, poikilitic wehrlite, pyroxenite, melt–mantle rocks interaction, latest stage magmatism

IMPACT OF NATURAL ZEOLITES ON THE GROWTH OF RYEGRASS ON SANDY SOIL

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ABSTRACT

Zeolites from Munella in Albania were used as supplements in the sandy soils of Divjaka region (central-western Albania) in an experiment to assess their effect on plant growth. The impact of natural zeolite in combination with NPK on the ryegrass growth and on the chemical properties of sandy soil was carried out in an experiment in the greenhouse at Agricultural University of Tirana. *Lolium multiflorum* was used as

the experimental plant. Natural zeolites of Munella occur as separate layers hosted by andesite-dacite volcanic sequence of the eastern-type Albanian ophiolites. The zeolitic mineralisation consists of Stilbite-Stellerite solid-solution. Their cation-exchange capacity ranges from 192–242 meq/100g showing a strong affinity for the cations of Pb^{2+} , Cu^{2+} and Zn^{2+} . The respective concentrations of the exchangeable cations in zeolite were 137, 81 and 65 meq/100g, below the measured cation exchange capacity values. Divjaka is rich in undeveloped sandy soils characterized by a thin active layer, low content of humus and other essential nutriment of plants. Seven combinations of Munella zeolites with chemical fertilizers were used in the present experiment as a means to address the impact of zeolites in the increase of fertility of poor sandy soils. Soil and plant samples were analysed for pH, humus, cation exchange capacity, available P and K, total N, Cu, Zn, Mn, Fe, Ca and clay, as well as for total P, K, Ca, Mn, Cu, Zn and Fe. Zeolites are of great importance for agriculture as they enhance plant growth, improve the efficiency and value of fertiliser, improve water infiltration and retention, improve yield, retain nutrients for use by plants, improve long-term soil quality and reduce loss of nutrients from soil. In addition, zeolites act as a buffer in improving the water capacity of soils, especially during the driest period of the year (July–August). Zeolites conserve longer soil humidity, and consequently healthier plant was obtained.

Keywords: zeolite, inorganic amendment, sandy-soil, Stilbite-Stellerite solid-solution

EFFECTS OF COMBINED ADMINISTRATION OF TWO ORAL CONTRACEPTIVES ON PROTEIN C PATHWAY IN A GROUP OF ALBANIAN WOMEN

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ABSTRACT

Combined oral contraceptives, oral hormone replacement therapy and thrombophilia are recognized risk factors for venous thromboembolism in women. The present investigation aims at determining the effect of two combined oral contraceptives on the protein C pathway in the coagulation system of a group of healthy Albanian women. In this investigation, 36 women between the ages of 24 and 51 years, twenty of them taking ethinyl estradiol 30µg and gestodene 75µg and 16 of them taking ethinyl estradiol 30µg and levonogestrel 75µg for 1–2 months were included. The subjects had no history of thromboembolic disease. Plasma was used for measuring levels of PT, fibrinogen, protein C, factors V and VIII, both prior to and after stopping pill use. We used coagulometry to measure PT, factor V, factor VIII and fibrinogen, while protein C was measured using *enzyme-linked fluorescent assays (ELFA)*. Data were analysed with SPSS 20 software. Comparison of values of the parameters between before and after treatment showed that concentrations of fibrinogen, protein C and factor VIII were significantly increased following treatment ($p < 0.05$), while no significant changes in the levels of factor V, PT and APTT ($p > 0.05$) were reported. The results show that changes in the haemostatic system and protein C pathway after oral contraceptive use

might increase the risk of thrombotic situations. For women prescribed oral contraceptives predictive testing of haemostatic parameters is recommended.

Keywords: oral contraceptives, protein C, factor VIII, factor V, thrombosis risk

HUMAN PAPILLOMAVIRUS (HPV) AND CERVICAL CANCER KNOWLEDGE AMONG FEMALE ALBANIAN STUDANTS

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ABSTRACT

Human Papillomavirus (HPV) is the most common sexually transmitted infection affecting one-half to three-fourths of sexually active individuals over the course of their lifetime and the cause of 99.7% of cervical cancer cases. The present paper investigates awareness among Albanian female students about HPV and its relationship with cervical cancer. A questionnaire survey of students (N=568) between ages 18 and 26 years in the Faculty of Natural and Technical Sciences was conducted between December 2012 and January 2013. Nearly one-half of students (46.5%) affirmed that sexual activity is associated with cervical cancer, but only slightly more than one-third (37.9%) identified HPV as the leading factor in the disease. More than one-half (56.7%) of students were aware of cervical cancer detection with the Pap Test, just less than one-third (30.5%) were aware of the availability of protective vaccination, and nearly two-thirds (64.1%) were interested in being vaccinated. The results were analyzed by two different age groups—18-21 years and 22-26 years. Member of the younger group were more aware of risk factors ($p < 0.05$) such as having genital warts, smoking cigarettes, use of oral contraceptives, poor diet or nutrition and use of tampons.

Keywords: risk factors, HPV, Cervical cancer, Albanian students, vaccine

DISTRIBUTION OF SOME TRUE BUGS MIRIDAE (HEMIPTERA) IN DIFFERENT ECOSYSTEMS IN COASTAL ALBANIA

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ABSTRACT

Systematic and ecological data on true bugs (Miridae, Hemiptera) collected during 2011 and 2012 from coastal habitats near Kavaja, Albania, were compiled. Seventy-six individuals, representing 21 species from 15 genera, were analysed. *Deraeocoris* was the most represented genus, with three species (frequency, 14%) present. Fifteen species (two-thirds of those studied) were found in habitats at Mali i Robit, which had a level of diversity similar to nearby Golem (based on the Jaccard similarity coefficient), about 44 per cent. Nine species (43%) were Palearctic.

Keywords: True Bugs, Albanian *Hemiptera*, coastal habitats, Durrës

TIME TRENDS IN STATINS USED IN CARDIOLOGICAL CLINIC AT MOTHER TERESA UNIVERSITY HOSPITAL

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ABSTRACT

Hyperlipidaemia represents an important modifiable risk factor in the development and progression of coronary heart disease (CHD). Identification and treatment of patients with hyperlipidaemia play an essential role in the primary and secondary prevention of CHD. Inhibitors of HMG-CoA (3-hydroxy-3-methylglutaryl-CoA) reductase—statins—significantly reduce cholesterol synthesis. Their efficacy in reducing cardiovascular morbidity and mortality has been demonstrated in large intervention trials. The paper provides information about the trends of statin used to improve LDL cholesterol management and controlling risk factors. A retrospective study including randomly selected files (300) of the Clinic of Cardiology, Mother Teresa University Hospital Center was carried out from 2008 to 2010. Detailed demographic data, risk factors for coronary artery disease, presenting clinical characteristics, initial diagnosis, medications within 24 hours, medications at discharge, cardiovascular procedures, and hospitals characteristics were collected. When statins used, the prevalence of disease increased as age increased. Fluvastatin was used throughout 2008. From 2009–2010, atrovastatin and simvastatin were used in 51 percent (46–56%) and 32 percent (27–36%) of the cases, respectively. Statins are strongly recommended in patients with co-morbid CHD to achieve a target LDL goal < 100 mg/dL, and LDL < 70 mg/dL for very high-risk individuals with multiple risk factors. Diagnosis and treatment of hyperlipidaemia with statins in this high-risk group of patients has improved over time.

Keyword: coronary heart disease, hyperlipidaemia, lipid lowering, primary prevention, statin therapy

A REVIEW OF LOAN PORTFOLIO MODIFIED DURATION— DEFINITION AND MEASUREMENT

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ABSTRACT

Modified Duration indicates the percentage change in the price of a bond for a given change in yield. While it is an important and useful tool in investment decision making, it is often not well understood by retail investors. The present paper summarises and explains the concept of Modified Macaulay Duration (hereinafter referred to as modified duration), the most applied mechanism of measuring the sensitivity of the price (the value of principal) of a fixed-income investment to a change in interest rates in financial institutions.

Keywords: Modified Duration, measurement, sensitivity of the price

CLASSIFICATION OF BUILDING QUALITIES AND THEIR INVOLVEMENT IN PROPERTY MARKET VALUATION

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ABSTRACT

Real estate is most commonly defined as land and any improvements made to or on the land, including fixed structures and infrastructure components. The term is also used to describe the 'bundle of rights' associated with the ownership and use of the physical characteristics of space and location. Finally, real estate may be described as the business activities related to the development, construction, acquisition, operation, and disposition of real property assets. Real estate appraisal is the process of valuing real property. The value usually sought is the property's market value based on: i) market environment changes, ii) location, iii) construction quality, iv) maintenance, and v) architecture, which relates to size, parking space etc. As an example of real estate appraisal in Albania, a qualitative report that provides information on the evaluation criteria for the quality of the real estate, is here summarised. It is recommended that market evaluation be undertaken using a weighted scoring model as a resource for the required standards.

Keywords: building qualities, market value, rental income

REACTION OF TWO SUBSPECIES OF *ASTER ALBANICUS* DEGEN TO DIFFERENT MEDIA DURING *IN VITRO* CULTIVATION

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ABSTRACT

The present paper investigates the reaction of bud explants of two Albanian subspecies of *Aster albanicus* Degen (subspecies *albanicus* and *paparistoi* Qosja) during *in vitro* cultivation. Explanting of apical and lateral buds was carried out via direct organogenesis in two stages. Stage I involved the proliferation of explants in half-strength Murashige and Skoog (MS) culture medium in the presence of auxin NAA (0.1mg l^{-1}) and gibberellic acid GA_3 (0.1mg l^{-1}), on which *paparistoi* Qosja developed better than *albanicus*. Stage II involved subculture in MS culture medium in

the presence of cytokinin BAP (1 mg l^{-1}) and auxin NAA (0.1 mg l^{-1}). Height growth and the production of secondary adventive buds were recorded during subculture for *Aster albanicus paparistoi* Qosja (Divjaka) but not for *Aster albanicus albanicus* (Shkopet). After one week all plantlets displayed marked chlorosis.

Keywords: *Aster albanicus* Degen, explants, MS culture medium, micropropagation, subculture

AJNTS, 2013(2) XIX (35)**A GENERALIZATION OF EXISTENCE OF FIXED POINTS IN
QUASI-METRIC SPACES****Ilir VARDHAMI, Kristaq GJINO, Kujtim DULE, Artur STRINGA**Department of Mathematics, Faculty of Natural Sciences, University of
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ABSTRACT

In this paper results on fixed points that are related to a special class of functions are reported. Based on the results of the fixed points of two functions in metric spaces, a theorem on fixed points of three functions in quasi-metric spaces was proved.

Keywords: fixed point, quasi-metric space, complete space, continues functions, class G_k'

**AN OVERVIEW OF RADIOACTIVE WASTE MANAGEMENT IN
KOSOVO****Besire Cena**

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ABSTRACT

The current situation in Kosovo with regard to radioactive waste management, a waste inventory, classification, and interim storage based on IAEA recommendations is reported. There are more than 80 sealed radioactive sources out of use in the country, including radioactive lightning, other than radioactive waste generated in nuclear medicine departments of hospitals. With the absence of essential different methods were applied to identify the type of radionuclide and its activity. Methods of safe management of different groups of waste, including interim storage, were determined using IEA waste classification scheme.

Keywords: radioactive waste inventory, waste classification, waste management, interim storage

RADIATION DOSES BY NATURAL SOURCES TO THE POPULATION OF PRISTINA, KOSOVO

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ABSTRACT

An investigation to determine radiation doses to the population of Pristina, Kosovo, caused by natural radioactive sources in the environment is reported. The investigation was carried out at five sites in Pristina, located in different locations indoors. The results are that the radiation dose to the Pristina population is 2.54 mSv/year, within the range of values of radiation dose for populations in South-east European countries.

Keywords: radiation dose, natural radioactive sources, indoor radon, external and internal radiation sources

DETERMINATION OF A CTV-PTV MARGIN FOR THE PELVIC AREA USING AN ELECTRONIC PORTAL IMAGING DEVICE (EPID)

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ABSTRACT

Evaluation of setup uncertainties and determination of margins between the clinical target volume and the planning target volume (CTV-PTV) in different parts of the body is of great concern for professionals and administrators involved in the area of radiotherapy. An Electronic Portal Imaging Device (EPID) was in the present investigation involved to determinate these margins for the pelvic area. The plan created in the treatment system consisted of four-beam box technique. A Digitally Reconstructed Radiograph (DRR) of the anterior-posterior (AP) field and one lateral field was sent to an iView system, where portals from EPID were also sent to compare differences when carrying out checks for patient positioning. The 20 patients participating in the investigation were submitted to 240 measurements in right-left, superior-inferior and AP directions at the Radio-Oncology Centre, Hygeia Hospital, Tirana. Once, 40 DRRs and 120 portals were created, measurements were carried out on the CTV-PTV margins with the results showing differences between the different dimensions.

Keywords: margin, portal image, DRR, pelvic area, radiation beam

ASSESSMENT OF ENVIRONMENTAL SITUATION OF VLORABAYBASED ON NUTRIENTS AND HEAVY METALS CONTENT OF WATER SAMPLES

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ABSTRACT

The marine and coastal environment around the city of Vlora is of great economic and ecological importance for the country. Considerable amounts of waste have been discharged directly or through river flows and atmospheric deposits into the sea as a result of mismanagement. The present paper aims to evaluate the water quality and the environmental situation in Vlora Bay. Determination of the amounts of heavy metals and nutrients in seawater samples are essential for an appropriate assessment. Samples were collected from five sampling sites in the coastal area of the bay. Sample stations were chosen carefully in order to assess the general environmental situation and evaluate the possible sources of pollution. Nutrients were determined spectrophotometrically. The results were within the levels permitted under the EC Directives. Inorganic nutrients levels indicated that the studied areas were generally oligotrophic. Heavy metals concentrations were determined via Atomic Absorption Spectroscopy (AAS; by use of flame or an electrothermal system, or both). Heavy metals content were in decreasing order: Zn>Cu>Cr>Pb>Cd>Hg.

Keywords: coastal environment, Vlora Bay, heavy metals, nutrients, AAS

ENVIRONMENTAL SITUATION OF SHARRA AREA BASED ON CHEMICAL PARAMETERS AND ON APPLIED QUALITY STANDARDS

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ABSTRACT

Important chemical-physical parameters, ground surface water (nutrients and heavy metals) and particularly gas emission (TSM, PM10, NO₂, H₂S, CH₄, VOC) have been investigated for assessment of environmental situation of Sharra landfill. In addition, specific standards regarding the landfill's operation were applied. The present investigation has been periodically carried from late 2007 to June 2012, when field campaigns concerning the present investigation finished. Results demonstrate that the parameters have decreased several fold from 2008-2012. Currently, most of the parameters are in line with environmental standards (except Ni²⁺) for a normal landfill with good parameters to humans and environment. Designed and constructed in line with the Albanian legislation, Sharra landfill operates on basis of environmental

protection regulation comprising two stages: planning and operation. Regulation at the planning stage relates to gaining approval for the landfill. The following criteria considered of primary concern for the European Community and EPA in relation to landfilling operations have been taken into consideration: i) water pollution - discharges of pollutants to ground and surface waters, ii) air pollution - emissions of pollutants to the atmosphere, iii) land management and conservation and, iv) hazards evaluation.

Keywords: quality, management, environment problems, landfill, waters, nutrients and heavy metals

ANALYSING PROCEDURES OF SULPHUR CONTENT IN OINTMENT FOR SCABIES TREATMENT

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ABSTRACT

Sulphur is a common element used in a variety of ointments and creams that treat skin conditions including scabies, psoriasis, keratosis and mycosis. In addition, it is used as part of many ointments and creams to alleviate various conditions such as psoriasis, eczema, dandruff and acne. In the present investigation, ten samples from a single batch of a scabies-treatment cream were randomly collected and analysed. Elemental sulphur determination was performed spectrophotometrically. Elemental sulphur is soluble in many organic solvents, including CCl_4 , CHCl_3 and $\text{C}_6\text{H}_6\text{OH}$. Hexane was used to separate the organic ingredients present in medical pomade (white Vaseline and liquid Paraffin) prior to analysis. The spectrophotometric method we developed for quantification of elemental sulphur is based on the extraction of S^0 form with CCl_4 . The procedure is a modification of several existing methods and allows the extraction of elemental forms of sulphur. Spectrophotometric measurements were performed at 277 nm. The detection limit is 0.02 mg/L. The recovery of S is approximately 98 to 103%. The method is suitable for the determination of sulphur in different medicinal ointments and/or creams with a wide range of sulphur concentrations. It is rapid and suitable for routine analysis in laboratories without specialized equipment.

Keywords: elemental sulphur, spectrophotometry, anti-scabies drug, detection limit, recovery

DETERMINATION OF SOME VOLATILE ORGANIC POLLUTANTS IN WATER SAMPLES OF LANA RIVER

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ABSTRACT

Data on some volatile organic pollutants (VOC) in water samples of Lana River, which passes through the Albanian capital, Tirana, are in the present paper reported. VOCs were detected through use of the technique of headspace solid phase micro extraction (HS-SPME). The growth of Tirana, coupled with a large number of automobiles has led to environmental problems. One litre water samples were collected in October 2011 from nine stations along the river. The samples were analysed for methyl tert-butyl ether (MTBE), tert-butyl alcohol (TBA), benzene, toluene, ethylbenzene and xylene (known as BTEX) and chlorobenzenes applying gas chromatography (GC) technique with a flame ionization detector (GC/FID). A VF-1ms capillary column (30m x 0.25mm x 0.25µm) was used to separate the compounds. GC with an electron capture detector (GC/ECD) was used to determine chlorobenzenes, while an Rtx-5 capillary column (30m x 0.25mm x 0.25µm) was used to isolate and determine chlorobenzenes also. In both cases, samples injections were done in HS mode. Results reported that the primary man-made source of BTEX into water is via emissions from motor vehicles. Chlorobenzenes containing four to six chlorine atoms were detected in almost all water samples of the river.

Keywords: VOC, HS-SPME, GC/FID, water analysis

THE EFFECT OF ENVIRONMENTAL TEMPERATURE VARIATION ON MICROBIAL CHARGE OF DRINKING WATER OF THE SUPPLY SYSTEM IN TIRANA, ALBANIA

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ABSTRACT

In the present paper, total microbial charge indicator microorganisms *E.coli*, *E.faecalis* and *P.aeruginosa* of drinking water supply for the Tirana region is evaluated. Samples were collected from 24 different sample sites throughout the water supply distribution network in February and July for a better evaluation of the changes in each microbial charge in relation to the environmental temperature. Microbiological analyses involved membrane filtration system and cultivation in the respective selective media. Results reported that the total microbial charge increases by 20% from winter to summer, mainly due to temperature increase and interruption of water supply during the day. *E.faecalis* shows the major increase (42%) in charge.

Keywords: drinking water, safety, indicator microorganisms, network supply, environmental temperature

POTENTIAL TOXIC RISK FROM SOIL ELEMENTS IN BUTRINT LAGOON

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ABSTRACT

In the present investigation, the presence of toxic metals in soils, sediments, water and mussels at some points of the aquatic environment of Butrint Lagoon is reported. Rich in organic matter due to its origin, the Vurgu field is characterized by the highest values of heavy metals. In addition, Pb and Cu were found to be the most commonly available metals in the soils around Butrint, while Cd and Cr were the least bio-available. These elements have the possibility to leach from the soil. The presence of high concentrations of Cu extracted with water was detected because copper compounds are used as or in fungicides, insecticides and fertilizers. The mean value of Pb in sediments at some sampling stations was higher than in reference soils due to anthropogenic activities, with fertilizers and pesticides applied in agricultural activities and effluents coming from the urban area of Ksamil. Cr content in sediments at some sampling stations was higher than the maximum permissible limits. Natural weathering of rocks is considered as a source of heavy metals concentration in the sediments of Butrint Lagoon.

Keywords: Heavy metals, pollution, Butrint Lagoon, alga and bryophytes

MEASUREMENT OF SEISMIC WAVES IN THE FRAMEWORK OF THE HYDRO POWER PLANTS ASHTA-DRINI RIVER, ALBANIA

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ABSTRACT

Albania is characterized by shallow crustal seismicity. Separate strong motion relations are of great importance for the current tectonic regime that characterizes both eastern and western Albania. The style-of-faulting parameter is a means to address the source types. Estimating the greatest possible seismic hazard basing on fault types, which are the source sites of earthquake generation in or near the area under investigation are of great importance for critical structures such as the Ashta hydro power plant (HPP). Peak ground accelerations (PGA) on required soil sites of HPP

Ashta were accurately evaluated basing on the geotechnical profile from bedrock depth to the surface, V_{s30} , and SPT-N for Quaternary gravel sequence. Here, Palaeogene flysch formation could be met. Seismic field measurements to determine the shear wave velocity V_{s30} for both gravel thick deposits and flysch rock deposits were of great importance for seismic hazard calculation. In the area of geotechnical investigations, seismic refraction and surface waves methods are of irreplaceable importance for long-term implementation of hydro-power projects, etc.

Keywords: surface geologic conditions, Zadrime lowlands, affect ground motions

CURRENT THREAT STATUS OF BIRD SPECIES OF DAJTI MOUNTAIN

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ABSTRACT

The ornithofauna of Dajti Mountain comprises 122 species. The International Union for Conservation of Nature (IUCN) considers that 30 of these species (24.6%) are endangered: two are classified as critically endangered, eight endangered, six vulnerable and nine low risk, while data are deficient for five species. The main habitats for each species in these categories are identified. The habitats with largest number of endangered species are forests and open field-forests, with nine species each. The sensitivity coefficient evaluates the sensitivity of the area in accordance with the taxonomic groups investigated here. The SC for Dajti Mountain ornithofauna, based upon the number of CR, EN and VU species, was found to be 13.1 percent. Twenty-nine threatened species out of the 30 endangered are listed in Annex II of the Berne International Convention. Species conservation involves physical and habitat protection, and such management needs to be established for Mount Dajti.

Keywords: ornithofauna, threatened species, sensitivity coefficient, habitat, Dajti Mountain

TRANSMISSIBLE VIRAL PROVENTRICULITIS (TVP) IN ALBANIAN BROILER CHICKENS

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ABSTRACT

Transmissible viral proventriculitis (TVP) is a recognized cause of production losses in broiler chickens. In the present investigation, TVP was identified based on histopathologic detection of characteristic microscopic lesions. In the present investigation broiler chickens of 20–35 days were analysed. Microscopic lesions in proventriculi of affected hens consisted of glandular epithelial acute necrosis, ductal epithelial hyperplasia, polymorphous lymphocytic infiltrations of the interstitial tissue of the proventriculus replacement of glandular epithelium with ductal epithelium, and diffuse interstitial lymphoid infiltration. The results are similar to those reported in the literature.

Keywords: transmissible viral proventriculitis, TVP, Albanian broilers

COMPARATIVE STUDY OF MACROZOOBENTHOS OF ROCKY AREAS OF THE ADRIATIC SEA IN ALBANIA IN SPRING AND SUMMER

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ABSTRACT

Species composition, quantitative characteristics of the populations and their seasonal variations of macrozoobenthos from the shallow rocky areas of the Adriatic Sea in Albania are reported in this paper. Sampling was conducted at Shën Pjetër, Kallm, Spille and Triport in the spring and summer of 2011. 173 taxa were recorded. Gastropods, bivalves and crustaceans were predominant in species number in both sampling seasons. Seasonal variations were considerable and trochid gastropods had the highest abundance in all sites. A possible important factor influencing the species presence and quantitative characteristics of macrozoobenthic populations in the studied area may be related to the algal cover.

Keywords: macrozoobenthos, Adriatic Sea, Albania

MULTIPLEX-PCR AND SITE-SPECIFIC PCR USED SUCCESSFULLY FOR DETECTION OF ASYMPTOMATIC PHASES OF VIRAL DISEASE IN APPLES

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ABSTRACT

Apples are packed with rich phyto-nutrients that are indispensable for human health. Economically, apple is the most important fruit tree cultivated in the district of Korçë, Albania. Climatic conditions, systematic management are very important for successful cultivation of apples. However, these plants have been subject to viral disease, such as Apple mosaic virus (ApMV), apple stem pitting virus (ASPV), among others. Efforts made for early detection of viral infection by ApMV during asymptomatic phases by applying PCR-based methods are here reported. Amplification of viral genomic fragments during standard site-specific PCR procedure and using Multiplex-PCR for different viral genomic fragments in the same reaction mix proved to be successful for

detection of ApMV. The targeted plants were the two cultivars Gold and Starking grown in private collections in the district of Devoll, Korça. PCRs were performed on genomic DNA extracted from leaf tissue. With few modifications for the Multiplex-PCR, reaction mixtures followed the recommendations of manufacturers for RT-PCR Kit SIGMA and Myrta, (2012) for site-specific PCR for ApMV. In both cases the products were of expected size, and for ApMV fragments found in the template DNA. Starking cultivar samples did not give products in either case, while all the samples of cultivar Gold gave products, indicating they had been infected.

Keywords: Apple Mosaic Virus (ApMV), Multiplex-PCR, viral genomic fragments, Gold and Starking apple cultivars

PULMONARY INVOLVEMENT IN RHEUMATOID ARTHRITIS

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ABSTRACT

Rheumatoid arthritis (RA) is a systemic autoimmune and inflammatory disease that affects not only the articulations, but also various organs. Pulmonary involvement is one of the extra-articular manifestations of RA and the cause of morbidity and mortality in patients with the disease. The present investigation aims at: i) identifying pulmonary injuries in patients with RA, ii) assessing them in relation to alterations of immunological examinations and arthritis activity and, iii) defining their association with gender. This was a cohort and prospective investigation that involved 63 patients. All the patients underwent laboratory tests. Disease activity score 28 (DAS 28) was used to RA activity. Patients underwent pulmonary high-resolution computed tomography and pulmonary function test. In addition to 17 patients with restrictive ventilator insufficiency and 4 (6,3%) patients with obstructive ventilator insufficiency, there were 22 (34.9%) patients with interstitial lung disease, 7 (11,1%) patients with

bronchiectasi and, 3 (4,8%) patients with pleural effusion. Pulmonary manifestations are common in RA. These injuries are anatomical and functional. In addition to immunological alterations and disease activity, gender has a large influence on pulmonary injuries.

Keywords: rheumatoid arthritis, pulmonary manifestations, interstitial lung disease.

SPIROMETRY IN A GROUP OF ALBANIAN ASTHMATIC CHILDREN: DOES FEV1 CORRELATE WITH ASTHMA SEVERITY?

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ABSTRACT

This paper investigates the relationship between forced expiratory volume in one second (FEV1) values and asthma severity. Fifty-six children (18 girls; 38 boys) suffering from asthma are in the present investigation included. The age of the children ranged from four to fourteen years, with a mean age of 8.9 years. The clinical history was collected from each patient. All the children were assessed for FEV1 by means of spirometry; among them 7.1% had mild intermittent asthma, 34.6% had mild persistent asthma and 57.6% of children had moderate persistent asthma; none had severe persistent asthma. The mean baseline FEV1 were: mild intermittent, 114%; mild persistent, 94.9%; moderate persistent, 94.5%. Most (80.7%) of the children had FEV1 >80%, and all of those with intermittent asthma had FEV1 > 80%. Of those with mild persistent asthma, 20% had FEV1 <80%, and 77.7% had FEV1 > 80%. Of those with moderate persistent asthma 20% had FEV1 <80%, and 80% had FEV1 >80%. The majority of asthmatic children had FEV1 values within normal range. The severity of asthma did not correlate with single measurements of FEV1.

Keywords: FEV1, correlation, asthma severity, asthma

EPIDEMIOLOGY OF CMV INFECTION IN DIFFERENT GROUPS OF PATIENTS IN ALBANIA

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ABSTRACT

Cytomegalovirus (CMV) infection is the most frequent congenital infection of a blood donor population. The present investigation aimed at exploring the epidemiology of this infection in a patient population in Albania and included the main risk groups—multitransfused patients or thalassemia patients (MP, 136), and patients with hematologic malignancies (PHM, 86)—, as well as a control group (CG, 76). All patients were tested for CMV IgG and IgM. Patients with IgM positive were tested for IgG avidity. The prevalence of CMV infection in MP was 96.3%, significantly higher than in the control group (85.5%). MP treated with leukoreduced blood showed a lower prevalence of CMV IgG and IgM compared to MP treated with unfiltered blood (90.5% vs. 100% for IgG, a significant difference, $p=0.01$; 8% vs. 15% for IgM, ns). All PHM cases were IgG positive and 18.6% were IgM positive, significantly higher than in CG (4.1%). IgM prevalence for PHM treated with pre-storage filtered blood was significantly lower than for patients treated with unfiltered blood (6.1% vs. 26.4%). The prevalence of CMV infection was significantly higher in MP patients and in immunocompromised patients undergoing transfusion of unfiltered blood. In countries with a high prevalence of CMV infection, where finding CMV negative blood is very difficult, filtration of leukocytes from transfused blood provides protection against CMV infection in at-risk patients.

Keywords: CMV epidemiology, CMV in MP, CMV immunocompromised patients

MODELLING AND MULTIFACTORIAL SENSITIVITY ANALYSIS OF ELECTRICITY PRODUCTION COSTS FOR THE ENERGY SUPPLY SYSTEM OF KOSOVA (2012–2030)

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ABSTRACT

In the future, a sustainable energy supply will be a central theme in terms of development in all spheres. Recently, modelling of energy systems has been marked by increasing progress towards sustainable energy supply to customers. In Kosovo, the

energy supply system, ruined since 1989, requires immediate reformation. Accurate scientific modelling and studies are of great importance. Meanwhile, the scheme of alternative energy supply system would be very appropriate.

Keywords: modelling, systems analysis, indicators, energy and supply, predictions, sustainability, risk theory and analysis

JNTS, 2014 Volume (XIX) 1**SOME RESULTS OF GREEN'S RELATIONS \mathcal{L} AND \mathcal{R} IN RINGS**
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ABSTRACT

In this paper, firstly we show certain relations that hold between the equivalence classes of the relations \mathcal{L} and \mathcal{R} in a ring A and the respective equivalence classes of the Green's relations $\mathcal{L}(\cdot)$ and $\mathcal{R}(\cdot)$ defined on the multiplicative semigroup of the ring A . Further, using these relations we study a case when a minimal left [right] ideal remains the same in the multiplicative semigroup of the ring A . Lastly, we study the behavior of a ring which does not have the identity element and does not have zero divisors, also rings, which are \mathcal{L} and \mathcal{R} simple.

Keywords: Ring, division ring, semigroup, left ideal, right ideal, Green's relations

**THE NUMERICAL SIMULATION OF NONLINEAR COBWEB
MODEL IN MATLAB**
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ABSTRACT

The cobweb model or cobweb theory is an economic model that explains why prices might be subject to periodic fluctuations in certain types of markets. It describes cyclical supply and demand in a market where the amount produced must be chosen before prices are observed. The case when the supply and the demand are nonlinear functions is here reported. In addition, the stability of the system is analyzed via numerical simulations.

Keywords: cobweb, nonlinear, demand, supply, stability, market

**IMPROVING THE CALCULATION RESULTS OF LATTICE
SPACING FROM $Q\bar{Q}$ POTENTIAL**

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ABSTRACT

In the area of Lattice Quantum Chromodynamics, the potential between a static quark and antiquark that can be calculated using the Wilson loops is of considerable theoretical interest. High-Performance Computing Infrastructure for South East Europe's Research Communities (HP-SEE) has recently carried out project on the calculation of lattice spacing and the results are here reported. Parallel computing with

FermiQCD software to recalculate the static quark-antiquark potential is here applied. Consequently, the method has been improved. Improvement concerns the symmetrisation of Wilson loops, as in the Euclidian space-time there is no specified direction for time or space, and the improvement of statistical errors of lattice spacing using weighted coefficients with Jackknife method. Simulation involving SU(3) gauge field configuration was used to obtain the quark-antiquark potential for different values of coupling constant and for 8^4 , 12^4 and 16^4 lattice volume. The calculations were performed for 100 configurations, statistically independent, of the gauge fields of the lattice. The behaviour of calculated potential from quarks distance, shows that quarks are confined into hadrons. Here, the results of lattice spacing for different lattice volume and the respective statistical errors are reported. The calculated values of lattice spacing are compared with the values of lattice spacing from Sommer's parameterization and results show that they are within the range of errors found.

Keywords: lattice spacing, quark-antiquark potential, symmetrisation of Wilson loops, weighted coefficients

CONCENTRATION TRENDS OF PRIMARY AIR POLLUTANTS, THEIR PHOTOCHEMICAL TRANSFORMATIONS AND ENVIRONMENTAL IMPACT

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ABSTRACT

Concentration trends of primary air pollutants, their photochemical transformations and environmental impact is in the present paper investigated. Monitoring sites chosen within each zone reflect the risk of being exposed to elevated levels of primary air pollutants. The results are here reported and compared to the upper and lower assessment thresholds as reported in the eu air quality framework directive 2008/50. These thresholds show a potential risk of exceeding limit values fixed for protecting human health. They trigger specific monitoring requirements. Trends and behaviours in the datasets for each primary component and period of record were examined with monthly average concentration behaviour. These represented plots of average concentrations for each month available and aid in understanding average seasonal behavior of measured pollutants.

Keywords: primary pollutants, photochemical transformations, concentration trends

RADON CONCENTRATION IN SOIL AND INDOOR IN QUATERNARY DEPOSITS

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ABSTRACT

The present paper investigates on the radon concentration levels in the soil and indoor for the city of Fier, one of the main cities of Albania. Radon is a naturally occurring gas that results from the radioactive decay of uranium. Radon breaks down into odorless and colorless particles that are often present in the home. In addition, it is very dangerous for the health, as when inhaling it or its decay products, sensitive lung tissues are stricken causing damage that can lead to lung cancer. Consequently, an accurate assessment of radon level is very important. In the present investigation, radon concentration levels and soil permeability measurements have been made. Measuring time varied between 24 and 72 hours and active radon detectors were used. Results reported that in the 52 sites where measurements were made, the level of radon concentration ranges from 2000 up to 43000Bq/m^3 . In addition, 19 sites out of 52 are characterized by high soil permeability. Moreover, three categories of radon risk are here reported. In Fier, 11.54% of the territory is identified as high radon risk area.

Keywords: natural radioactivity, radon, permeability, Becquerel, Quaternary deposits, Fier

ASSESSMENT OF RADON LEVEL IN SOIL, INDOOR AND WATER IN ALBANIA

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ABSTRACT

Radon (chemical symbol Rn) is a naturally occurring radioactive odorless, colorless and tasteless gas found in soils, rock, and water throughout the world. In addition, it is very dangerous for the health, as when inhaling it or its decay products, sensitive lung tissues are stricken causing damage that can lead to lung cancer. Consequently, an accurate assessment of radon level would be of irreplaceable importance. The present paper provides information about the radon concentration in soils, indoor radon concentration and radon concentration in water in Albania. Several indoor measurements at urban centers have been carried out for an accurate investigation. Results reported three categories of radon risk in the country-low radon concentration risk, medium radon concentration risk and high radon concentration risk. In addition, the concentration radon indoor level varies between several becquerels per cubic meter

to thousands of Bq/m³. Concentration levels go up to 508 kBq/m³ at specific geological setting.

Key words: permeability, radon, soil, gas, red clay

DEVELOPMENT OF A SUCCESSFUL PROTOCOL FOR *IN VITRO* PROPAGATION OF *PRUNUS WEBBII* VIERH. USING DIFFERENT SEEDLING EXPLANTS

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ABSTRACT

Wild almond (*Prunus webbii* Vierh.) is a woody species, which is difficult to propagate either generatively by seed or by vegetative methods (grafting or cuttings). Micropropagation or tissue culture is a means to address the production of disease-free, high quality planting material and the rapid production of many uniform plants. Multiplication of wild almond was carried out using zygotic embryos, cotyledons or shoots as primary explants to develop a successful propagation protocol. New plantlets were induced from explants cultured on basal MS medium in which PGRs combinations varied according to the explants. Results reported that zygotic embryos can proliferate through direct or indirect organogenesis (depending on embryos isolation) cotyledons developed through somatic embryogenesis in BAP 0.5 mg l⁻¹ concentration, meantime shoots developed via direct organogenesis. A great number of new plantlets identical to mother plants derived from embryos, cotyledons or shoots culture was obtained in the subculture stage. This protocol might be of great benefit for mass propagation and for genetic manipulation of wild almond.

Keywords: wild almond, micropropagation, direct and indirect organogenesis, somatic embryogenesis, growth regulators

POSSIBLE CORRELATION BETWEEN THE DIVERSITY OF 16-23S RDNA-ITS OF *SYNECCHOCOCUS* POPULATIONS AND QUALITY OF WATERS AT DURRËS BAY

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ABSTRACT

Genus *Synechococcus* gathers organisms of considerable genetic diversity, which are classified into groups based on their physiological diversity, on the presence of the

accessory pigment phycoerythrine, and the diversity of the 16S-23S rDNA internal transcribed spacer (ITS) regions. Correlation between the physical and biological indicators at six sampling stations from the Durrës Bay, Albania, which represent hot spots of different sources of pollution, and the diversity of populations of *Synechococcus* based on the dimensions of ribosomal DNA- ITS, was explored. Chlorophyll a (*Chl a*), nitrogen (as NO_3^-), and phosphorus (as PO_4^{3-}) were measured monthly from April to October 2011 and from June to October 2012 to investigate the quality of waters. Four different ITS-a and three ITS-b regions were amplified. Results reported that in Plepa Channel there was an extra ITS, informing on a new population not present at the other stations. In addition, there is a positive correlation between the total phosphorus and diversity of populations and a negative correlation between nitrogen and diversity of populations of *Synechococcus*.

Keywords: internal transcribed spacer (ITS) region, *Synechococcus spp.*, nitrogen, phosphorus, *Chl a*, trophic state.

THE SURVEILLANCE OF THE FREQUENCY AND THE RESISTANCE OF ACINETOBACTER BAUMANII ISOLATED IN HOSPITAL'S BURN INTENSIVE CARE UNIT (BICU) BETWEEN JANUARY 2010 AND DECEMBER 2012

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ABSTRACT

The present paper aims to evaluate the changes in frequency and resistance of *Acinetobacter baumannii* to different antimicrobial agents. The bacterial strains here involved were isolated from January 2010 to December 2012 in the Hospital's Burn Intensive Care Unit (BICU). The strains were mainly isolated from the burn wounds and also blood catheters. The susceptibility testing involved the disc diffusion method (Kirbi-Bauer), the sensi-test gram-negative (Liofilchem) and partly Witek-2. The proportion of *Acinetobacter baumannii* isolated in the burn unit, increased from 23.6% in 2010 to 30.3% in 2011 and to 43.2% in 2012, becoming a very frequent isolate in all gram negatives in burn wounds. The resistant rates to imipenem increased from 20% in 2010 to 90.1% in 2011 and remained the same level throughout 2012. The surveillance of antimicrobial susceptibility testing showed a significant increase of multi-drug resistant strains of *Acinetobacter Baumannii*. Known the antimicrobial resistance of *Acinetobacter*, preventing infections from occurring and therapy of infections could be followed. Consequently, hospitalization rate would be decreased and faster recovery could be obtained.

Keywords: *Acinetobacter baumannii*, carbapenems, multidrug resistant, susceptibility testing, Intensive Care Unit

EVALUATION OF TEMPERATURE COEFFICIENT OF RESISTANCE OF ELECTROCONDUCTIVE TEXTILES

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ABSTRACT

The emergence of smart textiles in recent years has revealed the need for electroconductive textiles. Characterised by flexibility and cost effectiveness, the potential of screen printing textiles with conductive ink is in the present paper reported. The electroconductive properties of printed textiles are investigated as a means to address evaluation of the Temperature Coefficient of Resistance (TCR).

Keywords: smart textiles, temperature coefficient of resistance (TCR), electroconductive textiles

EVALUATION OF EXTENSION SET OF DIFFERENT ALBANIAN LEATHERS

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ABSTRACT

Its high extensibility, tensile strength and other desirable qualities make leather of considerable importance for different industrial sectors. The present paper provides information about the determination and evaluation of extension set of different Albanian leather intended to use in car upholstery and home furnishing. In the present investigation, the international standard ISO 17236:2002 was followed for the determination of extension set. An accurate evaluation of the extension would be of great importance for the industry.

Keywords: leather, extension set, parallel direction, perpendicular direction, upholstery, furnishing

ENERGY INVESTIGATION OF THE FLAT PLATE SOLAR COLLECTOR DURING ITS DAILY OPERATION IN CLEAR DAYS OF SUMMER AND WINTER

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ABSTRACT

The daily operation and thermodynamic properties of the liquid flat are in the present paper investigated. The data were collected during a clear-day, in summer and winter. The first law of thermodynamics was applied when evaluating the thermal efficiency of the liquid flat plate solar collector. Thermal efficiency of the liquid flat plate solar collectors during its daily operation in summer and winter was evaluated basing on the data obtained from the acquisition and storage system.

Keywords: flat plate solar collector, global solar irradiance, clear days, thermal efficiency, daily efficiency

CAN WE PREDICT CPAP FAILURE IN PRETERMS WITH RESPIRATORY DISTRESS SYNDROME?

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ABSTRACT

Continuous positive airway pressure (CPAP) is a non-invasive treatment in preterm newborns with respiratory distress syndrome (RDS). However, some preterm infants fail with CPAP treatment. In the present investigation, the Bubble and Biphasic NCPAP were used to evaluate the risk factors and neonatal outcomes associated with Nasal CPAP (NCPAP) failure in preterm newborns with RDS. This is a prospective randomized study that involved 200 infants with gestational age (GA) 28-35 weeks, treated for RDS. They were assigned to Bubble NCPAP (n=100) and Biphasic NCPAP (Infant Flow) (n=100), using short bi-nasal prongs. Data about gender, way of delivery, gestational age, birth weight, Apgar score at 1st and 5th min., need for resuscitation, antenatal corticosteroids and Surfactant use were recorded. Need for ventilation (CPAP

failure), incidence of air leaks, incidence of intraventricular hemorrhage (IVH) and persistent ductus arteriosus (PDA), FiO₂ at admission, mortality rate were measured. The relation between CPAP failure and gestational age, way of delivery, need for resuscitation, corticosteroids and surfactant use; was in the present paper investigated. In addition, relation between pneumothorax, IVH, PDA, FiO₂ demand and CPAP failure was assessed. Newborns in 2 groups had similar characteristics (gender, way of delivery, gestational age, birth weight, Apgar index, corticosteroids, Surfactant use); $p > 0.05$. Results reported that CPAP failure was 20/100 in Bubble vs 20/100 in IF CPAP; pneumothorax 4/100 vs 4/100; IVH 12/100 vs 11/100; PDA 19/100 vs 18/100; FiO₂ at admission 0.4 ± 0.1 vs 0.3 ± 0.1 ; mortality rate 8/100 vs 10/100 ($p > 0.05$). Using binary logistic regression analysis, CPAP failure resulted moderately related with lower gestational age [Od 1.26 CI 95%: 0.38-4.21] ($p=0.07$); CPAP failure was moderately related with the need for resuscitation after birth ($p=0.056$); no statistic relation was found with way of delivery, corticosteroids and Surfactant use. Infants with pneumothorax and IVH had significantly higher risk for CPAP failure [Od=3.35, CI95% :1.29-5.84] ($p=0.002$), [Od=6.8, CI95% : 2.06-7.96] ($p=0.002$); persistent ductus arteriosus moderately increased risk for CPAP failure [Od=2.89, CI95% :0.99-4.05] ($p=0.61$); every increase in FiO₂ was moderately related with CPAP failure [Od=2.42, CI95% :1.00-3.62] ($p=0.057$). Factors that can predict CPAP treatment failure in preterm newborns with RDS are extreme prematurity, need for resuscitation, higher FiO₂ requirement, severe complications as pneumothorax and intraventricular hemorrhage.

Keywords: CPAP, failure, predict

AJNTS, 2014, 2**GREEN'S RELATIONS \mathcal{H} AND \mathcal{Q} IN RINGS****Rigena SEMA and Petraq PETRO**Department of Mathematics, Faculty of Natural Sciences, University of
Tirana, Albania**ABSTRACT**

In this paper, firstly we show certain relations that hold between the equivalence classes of the relations \mathcal{H} and \mathcal{Q} in a ring $(A, +, \cdot)$ and the respective equivalence classes of the Green's relations $\mathcal{H}(\cdot) = \mathcal{Q}(\cdot)$ defined on the multiplicative semigroup (A, \cdot) of this ring. Further, using these relations we study a case when a minimal quasi-ideal of the ring $(A, +, \cdot)$ is again minimal regarded as a quasi-ideal of the multiplicative semigroup (A, \cdot) of this ring and we find another proof of Green's theorem for rings. Lastly, we study the behaviour of a ring, which does not have the identity element and zero divisors, regarding relations \mathcal{H} and \mathcal{Q} . Also we discuss the case when two non zero elements of a ring are \mathcal{H} and consequently \mathcal{Q} equivalent.

Keywords: ring, division ring, semigroup, left ideal, right ideal, Green's relations

**QUALITY CONTROL OF NUCLEAR MEDICINE AT THE
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ABSTRACT

Daily, weekly, monthly and annual different tests have been carried out at the Department of Nuclear Medicine, University Hospital Centre in Tirana, Albania for the quality control of gamma camera and the results are here reported. The duration of the tests varied from 20 minutes for the peak power test, up to 1 hour which is the annual test for the uniformity of the system. The results reported a good performance of the gamma camera.

Key words: quality control, gamma camera, nuclear medicine.

PRELIMINARY INVESTIGATIONS ON TERNARY AND/OR QUATERNARY CHALCOGENIDE-HALIDES WITH THE ELEMENTS OF THE IIND B AND IVTH A GROUPS

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ABSTRACT

The results of preliminary investigations regarding some solid state reactions between the elements and/or binary compound containing elements of the IInd B / IVth A and VIth + VIIth groups are reported. Within the selected stoichiometric combinations and reaction conditions, four of them revealed some peculiarities. In each case, the reactions aiming the syntheses of Tin-selenide-dichloride/dibromide resulted in air sensitive products. Low-crystallinity/amorphous character of the products affected by decomposition/hydrolysis makes quite difficult the phase identification, represented mainly by the starting elements and binary compounds. Within the trial of unsuccessful reactions, two new phases are observable from the reactions intending the synthesis PbSeI₂ and PbTeI₂ along with allotropic forms of identifiable binary compounds.

Keywords: Solid state reactions, new phases, tin-selenide-dichloride/dibromide, lead-selenide/telluride diiodide, air sensitive, amorphous character

A REVIEW OF FLAVIVIRUSES AND FLAVIVIRUS VACCINES

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ABSTRACT

Flavivirus is a genus of viruses in the family *flaviviridae* that include the West Nile virus, dengue virus, tick-borne encephalitis virus, yellow fever virus that cause encephalitis. Some of the vaccines against flavivirus are used to protect the population living in endemic regions or those who travel in such regions and some others are in different phases of development. The present paper reviews on effective human vaccines in use for the prophylaxis of yellow fever (YF), dengue, Japanese encephalitis (JE), West Nile (WN) in order to provide an accurate information about the risks of flavivirus infection.

Keywords: infection, virus, vaccine, fever

PHYSICOCHEMICAL QUALITY OF RAW MILK FROM DAIRY FACTORIES IN 5 ALBANIAN REGIONS

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ABSTRACT

The present investigation aims at evaluating the physicochemical quality of raw milk in 5 different regions of Albania. 79 raw milk samples were collected twice a day (in the morning and at evening) from Milk Processing Plants and transported to the factories in October 2013. Various physiochemical properties of milk were analyzed and compared with Albanian standard. The results showed fat 3.85 ± 0.96 (%), protein 28.6 ± 2.1 (g/l), solid-not-fat (SNF) 8.77 ± 0.88 , (%) density 1.0298 ± 0.002 (kg/l) and acidity 17.37 ± 3.02 °T. The data were statistically analyzed and the results did not report any significant difference between the present results and Albanian standard at the level of $p < 0.001$ which implies good quality raw milk. In addition, no adulteration of milk was found. Consequently, the raw cow milk entering in factories has good physicochemical qualities.

Keywords: raw milk, fat, protein, SNF, density, acidity, milk quality

THE STABILITY OF PASTEURIZED MILK IN ALBANIA FROM 2011 TO 2013

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ABSTRACT

Pasteurization is applied to increase the shelf-life of milk and guarantee the microbiological safety via inhibition or reduction of total charge and elimination of pathogens bacteria. Practices for assessing the pasteurization status are based on heat labile of some milk components like enzymes (alkaline phosphatase, lactoperoxidase) and proteins of whey. Alkaline phosphatase is used as an indicator for the effects of pasteurization, although its thermal stability corresponds to the temperature which pathogenic microorganisms are eliminated. In the present investigation, Lacto scan was used to investigate the physicochemical indicators of quality of milk such as density, pH, percentage of proteins, fat (or triglycerides), lactose, dry matter and water added. **Added water** is the most commonly used falsification. In such a case all physicochemical indicators decreased. The analyses were carried out on the first day of opening of commercial milk and in the last day of its shelf-life, based on indications for the production and expiry date. Cultivation in standard and selective medium involving total count aerobic bacteria in PCA with skim milk; coliformes and enterobacters, also the evidence of *E. coli* in a selective Mac Coney medium was applied to investigate the

microbiological indicators. Yeasts were enumerated in PDA and moulds in Capek. The samples were heated at 85°C for 10 minutes to evaluate thermophilic microorganisms in milk. Once heated, the microorganisms were cultivated in PCA. Thermo resistant bacteria such as *Bacillus stearothermophilus* were cultivated in DTA medium. The lecithinase activity *Bacillus cereus* is an important means to address the quality of milk. In the present investigation, the quality of milk is evaluated by cultivating the bacteria in selective medium with yolk egg emulsion. The results comply with the standards defined for the total count bacteria and thermoresistant bacteria.

Keywords: milk, pasteurization, shelf-life, thermo-resistant bacteria, alkaline phosphatase.

ASSESSMENT CONCENTRATION RATE OF HEAVY METALS IN ROASTED COFFEE AND HUMAN CONSUMPTION

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ABSTRACT

The Atomic Absorption Spectrometer (AAS) is in the present investigation used to determine heavy metals concentration rate in roasted coffees. Small amounts of these elements are common in the environment and diet and are actually necessary, but large amounts of any of them may cause acute or chronic toxicity (poisoning). They enter human body through food, water, air, or absorption through the skin when they come in contact with humans in agriculture and in manufacturing, pharmaceutical, industrial or residential settings. The present paper investigates the concentration rate of heavy metals in roasted coffee and the impact to human consumption. Heavy metal concentration in coffee depends on soil properties and the method used to prepare the coffee. Samples of a blend of Turkish and Espresso coffee were collected from 2010 to 2013 in an Albanian roasting company. The results reported an insignificant concentration of heavy metals in coffee—<0.2 mg/kg. In the Espresso and Turkish phase the quantity of heavy metals, present in liquid, decreased by more 90% in compare with the solid phase.

Keywords: roasted coffee, Turkish and espresso phase, heavy metals

A REVIEW OF HUMAN ACTIVITY AND THE DAMAGES TO THE MICRO PRESPA LAKE

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ABSTRACT

Situated in SE Europe, Prespa forms a single high altitude (850 m a.s.l.) tri-border basin shared by Albania, Greece and the Former Yugoslav Republic of Macedonia. The basin covers a total area of 1,519 km² and encompasses two interlinked tectonic Lakes - Macro and Micro Prespa - and their surrounding mountains. The region is mentioned for its outstanding biodiversity, natural beauty, good geographical position that make it of great social and economic importance. In addition, Prespa forms a unitary region with rich shared cultural and historical heritage. Archeological sites such as Treni Cave prove that the region has been populated since the Bronze Age. Moreover, it is characterized as wetland of international importance under the Ramsar Convention and the EC Directive on the conservation of wild birds (79/409/ EEC). However, human activity is quite concerning. The present paper reviews on human activity and the damages to the Micro Prespa Lake due to the role it plays in groundwater recharge. The main economic activities are sediment trapping, livestock rising, fishery, forestry and tourism.

Keywords: Macro - Micro Prespa and Ohrid Lakes System, anthropogenic impact

OPENING AN UNDERGROUND GAS STORAGE IN THE DUMRE REGION

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ABSTRACT

There is a continuous demand for gas consumption in Albania. Unfortunately, recoverable natural gas reserves and current daily production are limited.

Consequently, increasing gas production from existing fields, exploring new gas fields and connecting the existing Albanian gas pipeline with the European network through Trans Adriatic Pipeline are quite challenging. On the other hand, seasonal fluctuations for gas consumption and the needs of Kosovo and FYROM for gas supply, opening underground gas storages in the salt domes of Dumre region and extending gas pipeline to these neighboring countries is of immediate importance.

Keywords: natural gas, storage, salt, supply

COMPARATIVE CONSIDERATIONS ON THE RESPONSE OF SOME WHEAT VARIETIES ON LATE PLANTING

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ABSTRACT

Climate models predict an increase in the frequency and magnitude of rainy periods in the Albanian territory that are likely to occur during autumn months. Consequently, the planting process of wheat culture in the western part of the country is threatened. In addition to yield indicators, the present paper investigates on physiological and morphological characteristics of crops in three wheat varieties sown in November and January to estimate their reaction against late planting. Results reported that the crops of STF4 and DxM varieties have a better response to late planting as compared to LB7 variety. Regarding the adaption of varieties to late planting, the key features to be improved have resulted to be photosynthetic system in LB7 variety and development speed in DxM and STF4 varieties.

Keywords: wheat, heavy rainfall, climate change, photosynthetic pigments, yield

COMPARISON OF THE LEVEL OF SIMILARITY AMONG GRAPEVINE CULTIVARS OF KOSOVO BASED ON MORPHOMETRIC AND MOLECULAR DATA

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ABSTRACT

In the present paper, the grapevine cultivars Vranc (Vranac), Prokup, Rrush Keci, Rrush Melik, Thanz i Kuq and Thanz i Zi from three areas of Kosovo (Rahovec, Gjakove and Prizren) are investigated based on molecular and morphometric characteristics. Recommendations of the International Plant Genetic Resources Institute (IPGRI), of Consultative Group on International Agricultural Research (CGIAR) were followed for the ampelographic analyses and the results reported 31 morphological and agronomical characteristics. The Ward's method for hierarchical clustering was applied for the statistical analysis and a dendrogram of similarity among the cultivars was produced via JMP platform. The same data were used to prepare a three-dimensional graphic, which elucidated further the variation of morphometric data from one cultivar to the other. Ten decamer Randomly Amplified Polymorphic DNA (RAPD) were used as molecular markers and the results helped prepare the dendrogram of similarity via the soft NTSYS 2.1. The ampelography data and molecular markers data inform about the level of similarity among the six cultivars. In addition, they report correctly on the level of phenotypic and genotypic variability. Meanwhile, both categories of data discriminate clearly the six cultivars, proving that none of them is homonymous of the other. Four out six of cultivars have the same level of similarity. The cultivars Melik and Kec have a different clustering.

Keywords: grapevine cultivars, ampelography, RAPDs, genotypic similarity

EVALUATION OF BLOOD DONOR DEFERRAL CAUSES

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ABSTRACT

Currently, causes of donor deferral for both male and female have been retrospectively evaluated. The data were collected at the National Blood Transfusion Center (ANBTC) and outdoor camps in Tirana, Albania from January 2011 to January 2013. In the present study, 12,306 blood donors are involved. Each donor was selected by a medical officer based on detailed medical history and brief physical examination with regard to haemoglobin, blood pressure, temperature, and pulse regularity and rate. Detailed information about the donor deferral including the cause of deferral was recorded in the deferral register. Relative proportions to detect the rate and reason for donor deferral have been found. 1449 out of 12,306 voluntary non-remunerated donations were deferrals (11.7%). 1127 (77.8%) were temporary deferrals and 322 (22.2%) permanent deferrals. Investigations on temporary deferrals revealed 698 (48.17%) anemia, blood pressure or pulse 350 (24.2%), 81 (5.5%) other medical conditions. In addition, it revealed 92 (6.37%) donors deferred for high risk behaviour/exposure, 228 (15.73%) for chronic diseases and 65 (4.48%) for other pathologies including history of jaundice. Currently, in Albania all the voluntary non-remunerated donors are collected at mobile session, and even if to temporary excluded donors is given a date for next donation they never return to donate. None of the 1 □ 127 voluntary non-remunerated donors temporary deferred from 2011 to 2013 and came back to donate.

Keywords: blood donor deferral, permanent, temporary

THE CORRELATION BETWEEN LIPID PROFILE IN PREGNANCY AND HYPERTENSION IN PREGNANCY IN TIRANA REGION (ALBANIA)

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ABSTRACT

Pregnancy induced hypertension (PIH) represents a major obstetric problem in healthcare practice. The role of lipid metabolism in the development of PIH and preeclampsia is gaining increasing attention. The present paper aims at assessing the role of lipid profile in the aetio-pathogenesis of HIP and preeclampsia. The study involved 122 pregnant woman divided into 3 groups: pregnant hypertensive women (n=26); pregnant normotensive women (n=68); and non-pregnant normotensive women (n=28) [control group]. All of them did not have previous history of chronic hypertension, renal disease, dyslipidemia or diabetes mellitus. Serum triglyceride, total cholesterol, LDL Cholesterol and HDL cholesterol levels were measured. The results

showed that mean serum levels of triglyceride, total cholesterol and LDL cholesterol were significantly higher among PIH women compared to pregnant normotensive women and control group whereas HDL cholesterol was significantly higher among controls. Total cholesterol showed a statistically significant correlation with gestational age ($r = 0.550$, $p < 0.001$). Diastolic blood pressure showed moderate negative correlation with HDL ($r = 0.494$) which was statistically significant ($p < 0.001$). In conclusion women with PIH showed mild hypertriglyceridemia and a significantly deteriorated lipid profile compared to pregnant normotensive and healthy non-pregnant women. Further studies need to be undertaken in order to ascertain the temporality of associations between lipid profile and PIH.

Keywords: Pregnancy Induced Hypertension (PIH), preeclampsia, triglycerides, LDL cholesterol, HDL cholesterol

OPERATIONS BREAKDOWN AND PUTTING THE PRODUCTION TARGETS IN CLOTHING INDUSTRY

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ABSTRACT

Production targets are of great importance for the management system as it allows for a better use of human and material resources. Consequently, work can be performed as efficiently as possible. A good management is undoubtedly related to time table and continuous training of employees. Production targets are carried out by putting operations breakdown and time measurement of every work operation to establish standard minute value. Standard minute value is the time allocated to an individual to perform a particular operation or process. Time measurement consists of description of work systems, especially of processes, methods, work conditions and the level of performance.

Keyword: production targets, operations breakdown, time measurement

PHYSICO-CHEMICAL FEATURES OF COASTAL AQUATIC ECOSYSTEM OF NARTA LAGOON IN ALBANIA

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ABSTRACT

Situated in the south-west of Albania, Narta Lagoon is the second largest lagoon and one of the most important sites in the country. The lagoon is mentioned for its amazing biodiversity. In the present paper, physico-chemical parameters of water in the Narta

Lagoon such as pH, transparency, temperature, BOD, COD, $\text{NO}_3\text{-N}$, $\text{NO}_2\text{-N}$, $\text{NH}_4\text{-N}$, P-PO_4 and P total are investigated. Samples were collected from 8 sites, respectively in the Lagoon and in the sea, four times 4 times a year throughout the investigation period. Results reported that: i) the level of physico-chemical parameters is the same at all the sites, ii) the anthropogenic activity affects greatly the dissolved oxygen and nutrients (nitrogen and phosphorus). The data in the present investigation collected are quite variable. However, information about the impact of anthropogenic activity on the inland waters that flow in the lagoon could be reported and, iii) the trophic state indexes (TSI), total phosphorus and the transparency (Secchi disc) define the mesotrophic state of the Lagoon.

Keywords: Narta Lagoon, Albanian wetlands, water quality, trophic index, mesotrophy

JNTS 2015, 1**THE EILENBERG-MAC LANE COHOMOLOGY OF AN INVERSE MONOID AND THE MAXIMUM GROUP IMAGE****Anjeza KRAKULLI**Department of Mathematics, Faculty of Technology and Information,
University Aleksandër Moisiu, Durrës, Albania**Elton PASKU**Department of Mathematics, Faculty of Natural Sciences, University of
Tirana, Albania**ABSTRACT**

The present paper investigates the extent homological properties of an inverse monoid determined from those of its maximum group image. We provide several evidences that the maximum group image contains vital homological information which can be used to study certain properties of the monoid itself. For instance, we prove that an inverse monoid S is of type FP_∞ , if and only if it contains a minimal idempotent and its maximum group image is of the same type. Regarding cohomological dimensions, we show that the cohomological dimension of a free Clifford monoid and that of its maximum group image agree and are equal to one. Also, we define the index of a full submonoid of an inverse monoid in terms of their maximum group images and show that if the index is finite then, the monoid is of type FP_∞ if and only if its submonoid is of the same type.

Keywords: Inverse monoid, semilattice, maximum group image, cohomology groups, Ext, Tor, homological finiteness condition FP_∞ , direct limits, direct products, unitarily finitely generated, cohomological dimension

Mathematics Subject Classification: 18G10, 18G15, 13D02, 16E30, 18A30, 20M12, 20M18

THE EFFECT OF COOLING FLOW (CF) ON THE TEMPERATURE PROFILE OF THE HOT ELECTRONIC GAS AND THE CALCULATION OF THE COMPTON PARAMETER γ_0 **Enkelejd ÇAÇA**Department of Physics, Faculty of Mathematics Engineering and Physics
Engineering, Polytechnic University of Tirana, Albania**ABSTRACT**

Building more accurate profiles for temperature and density of hot electronic gas which is concentrated at the centre of clusters of galaxies is a constant problem for the survey of the Sunyaev Zel'dovich effect (SZ). The latter consists of the inverse Compton effect of the hot electronic gas interacting with cosmic microwave background (CMB) photons passing through intra cluster medium (ICM). So far, the isothermal model is used for temperature profiling in the calculation of the inverse

Compton Effect. Recent improved observations from satellites showed that the hot electronic gas presents a feature that is called the cooling flow (CF). Temperature in this model is different towards the edges of the clusters of galaxies, leading to a change on the Compton parameter in comparison with Isothermal model. In the present paper the data provided by Chandra, the X-ray satellite, are investigated based on two models for the electron density and temperature profile. A sample of 8 clusters of galaxies was analyzed. The results reported that the differences on the Compton parameter are 10-100% in comparison with Isothermal model when building the temperature profiles using CF model. Consequently, the change of the electronic gas temperature which affect both, CMB spectrum and temperature, from SZ effect is very important for an accurate evaluation of the Compton parameter.

Keywords: cluster of galaxies, X-ray, comptonization, cooling flow, S-Z effect

OPTIMIZATION OF MEDICAL EXPOSURES IN INTERVENTIONAL RADIOLOGY

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ABSTRACT

Optimization of medical exposures is of immediate importance for the interventional radiology as it seeks to avoid detrimental effects of radiation. Here, staff training and optimization of these exposures would be of immediate importance, as high doses procedures are in some cases required. Three principles of radiation protection must be followed: i) justification, ii) optimization and, iii) dose limits. Periodic check of the components in a diagnostic x-ray imaging system is very important. In addition, recommendations of Basic Safety Standards (BSS), regarding the classifications of areas dose limits must be followed. Moreover, thermoluminescent dosimeters (TLD) that monitor personal doses are in constant use by the medical staff working at University Hospital Centre (UHC). Periodical check of physical and geometrical characteristics of X and the use of shielding screens are unavoidable for the diagnostic radiology as they divide areas which are unrelated to the examination. Applying periodically the quality control (QC) methods is necessary for an accurate ionizing radiation or use of radioactivity materials and monitoring patient dose (by evaluating Entrance Skin Dose (ESD)). In the present investigation 100 patients (adults and children) suffering from heart and brain diseases are involved and the exposure data were recorded fluoroscopically. The type of procedure, fluoroscopic time, higher values of voltage and current, the dose rate and dose-area product values obtained by Dose Air Production (DAP) of each patient were recorded. Staff radiation dose level should be monitored and reviewed in order to not exceed the permitted levels.

Keywords: quality control (QC), quality assurance (QA), interventional radiology, TLD dosimeters, miliSivert, dose, dose rate

THE ASSESMENT OF SODIUM AND POTASSIUM CONCENTRATRION IN THE BLOOD SERUM OF ALBANIAN WOMEN

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ABSTRACT

The present paper aims to investigate the concentrations of sodium and potassium in the serum samples of pregnant and non-pregnant women and prove the effectiveness of the therapy with substitute of sodium and potassium during the pregnancy. In the present investigation 76 women divided into two groups; pregnant (n=36) and non-pregnant women (n=40) were involved. Sampling took place from February to March 2013 following the World Health Organization (WHO) protocol. The serum samples were prepared using the high speed centrifugation (3600 rpm, in gel tubes) of blood samples after the dilution at 1:10 ratio with 0.25% Triton X-100 prepared in de-ionized water. The flame Atomic Emission Spectroscopy (FAES) was involved to investigate the serum samples. Results reported normal values of sodium and potassium on most of blood samples of pregnant women compared with those of non-pregnant women, and a normal recommended range of concentration of K and Na in blood samples. The pregnant women underwent the treatment with substitute of sodium and potassium and effectiveness of the therapy was proved.

Keywords: sodium, potassium, female, pregnant women, blood sample, FAES

ASSESSMENT OF TRACE METALS LEVEL USING LIGUSTRUM LUCIDUM, FAM: OLEACEAE AS VASCULAR PLANT Rudina TRIKSHIQI and Mimoza REXHA

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ABSTRACT

Ligustrum lucidum, Fam: *Oleaceae* is in the present investigation used as bio-indicator to monitor the level of trace metal in Tirana, Albania. Eleven leaves samples were collected from different urban areas with different anthropogenic impact in March 2013. Heavy metals (Cu, Pb, Zn, Mn, Fe, Na, K, Mg, Ca and Hg) concentrations in the leaves' samples were determined via atomic absorption spectrometry (AAS). Wet digestion technique was applied for sample digestion in half pressure Teflon tubes. Correlation analysis was carried out on the data set of heavy metals to describe their behaviour and association. Results reported a weak correlation ($R^2 < 0.45$, $p < 0.05$) between Cu-Fe and a high correlation between Cu-K. The source is the dust particles. The correlation between Pb- Ca and the high correlation between Zn – Mn, Mg and Ca

relates to traffic emission. Multivariate analysis (Cluster Analysis) helped identify similar patterns of groups of elements. Plant species and their location affect trace metals distribution. The principal component analysis (PCA) helped identify the main source categories of contamination and elements' distribution.

Keywords: *Ligustrum lucidum* Fam: Oleaceae, vascular plant, heavy metal, furnace AAS, urban environment, air pollution

VENTILATOR ASSOCIATED PNEUMONIA IN THE PEDIATRIC CARE UNIT OF UNIVERSITY HOSPITAL CENTER IN ALBANIA

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ABSTRACT

The present paper aims to describe the rate, risk factors, and the outcome of ventilator associated pneumonia (VAP) in the Paediatric Intensive Care Unit (PICU) of University Hospital Center (UHC). We performed a prospective study on the incidence of VAP from May 2011 to December 2012 in a single 15 bed-PICU. Among six hundred and fifteen patients admitted to PICU, those who received Mechanical Ventilation (VM) for 48 hours or more were enrolled and monitored for VAP till discharge from PICU or death. VAP was defined as per CDC criteria. Data of patients with VAP was compared with those without VAP. Outcome was measured as length of PICU stay (LOS) and survival or death. During the study the use of devices (endotracheal tube [ETT], central venous catheter [CVC] and urinary catheter [UC]), enteral feeding, the use of antacids, parenteral nutrition were recorded to calculate the device associated infection rate (DAR), incidence density and device utilization ratio (DUR) and risk factors. There were 42 episodes of VAP among 270 ventilated patients, with an incidence rate 6.8 per 100 admissions or VAP rate 16 per 1000 patients-days. The incidence, incidence density, DAR and DUR among patients using ET/MV was as follows: 15.5%, 1.8 %, 34.4 per 1000 VM- days, 0.52, respectively. The group age mostly affected by VAP was children under one year old followed by other age groups ($p=0.019$). The mean duration of mechanical ventilation was 10.5 days for VAP patients and 3.5 days for non-VAP patients ($p=0.001$). The predominant isolates were gram negative ($n=30$, 71.4%) of which *Pseudomonas aeruginosa* was the most common, followed by gram positive ($n=12$, 28.5%) of which *Staphylococcus aureus* was the most encountered. Higher frequency and duration of device utilization of ETT, continuous enteral feeding, use of parenteral nutrition, primary surgical diagnosis, CVC use, CU use, were risk factors for VAP on univariate analysis. The median LOS was longer in patients with VAP with those without (16.6 vs. 7.2, $p=0.001$). The presence of VAP, was associated with a raise in mortality rate in patients with VAP compared without VAP respectively (57.1% vs. 32.9%, $p = 0.01$). In the present study the VAP

rate was consistent with that reported by other similar studies in developing countries. The device associated VAP was higher than international standards. The present paper is a benchmark for further studies of VAP in the pediatric intensive care population for future comparisons. The surveillance and guidelines must become a priority to lower this studied baseline rate.

Keywords: ventilator associated pneumonia, children

EVOLUTION OF KRUA CARBONATE PLATFORM IN THE SOUTH OF ELBASAN-DIBËR TRANSVERSE (TOMORRI AND DAJTI SUBZONES)

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ABSTRACT

The present investigation is based on a biostratigraphic study carried out by Koroveshi *et al.*, (1999) which provides information about marked changes of Cretaceous carbonate facies in the Kruja zone, south of Elbasan-Dibër transverse. The Kruja zone consists of two subzones with typical structural and paleogeographical evolution features: a) the Tomorri subzone which includes Tomorri, Kulmaka and Qeshibeshi brachyanticline structures, has evolutionary features of an internal carbonate platform up to the Lower Cretaceous (Albian), and an external platform with plunging tendency towards the Ionian basin from the Late Albian-Early Cenomanian to the Eocene age and, b) Dajti subzone which includes Valesh and Tërvollë crest anticlines, represented an internal carbonate platform from Cretaceous up to Eocene age. The Kruja zone structures during the Pliocene-Quaternary neotectonic stage were affected by an extensional tectonics that caused its fracturing via longitudinal and transversal normal faults.

Keywords: Kruja zone: Tomorri and Dajti subzones, structure, stratigraphy, paleogeographic and geodynamic evolution

VALBONA SUBZONE, THE POSITION AND RELATION WITH MALËSI E MADHE SUBZONE

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ABSTRACT

The Albanian Alps zone comprises the Malësi e Madhe and Valbona subzones. The Valbona Subzone is divided into two sectors: i) the first sector consisting of the Budaçe block and, ii) the second sector extending from north-east to south-west and consisting of Valbona, Thethi and Bishkaz-Shale tectonic blocs. As a result, the Valbona Subzone has been considered to surround the Malësi e Madhe Subzone from north, east and north-east, and interpreted as a linking slope of Malësi e Madhe platform with the

Vermoshi basin and Cukali basin (Xhomo *et al.*, 2002b). The position and relation of the Valbona Subzone with the Malësi e Madhe Subzone are in the present paper re-investigated based on geologic cross-sections of the Albanian Alps Zone. The facial characteristics and location of the Bishkaz-Shalë block, overthrusting the Cukali-Budva Zone, prove that it belongs to the Malësi e Madhe Subzone. The Valbona Subzone is located north-east of Malësi e Madhe subzone and comprises the Budaçe block overthrusting towards the south-west Kelmendi block of Malësi e Madhe Subzone, and the Valbona block that together with the Thethi block overthrusting towards the south-west Bishkaz-Shale block of the Malësi e Madhe Subzone. The latter overthrusts Cukali-Budva Zone for about 40 km, from north and north-west of Cukali Mountain up to Taraboshi Mountain foots, while the Valbona Subzone overthrusts the Malësi e Madhe Subzone at fronts of Budaçe and Thethi blocks. The Valbona Subzone has represented throughout its paleogeographic evolution a linking slope between the Malësi e Madhe neritic platform and the Vermoshi pelagic basin.

Keywords: Albanian Alps zone, Valbona subzone, position and relation with Malësi e Madhe subzone.

THE EFFECTS OF CROSSOVER AND MUTATION RATES ON CHEMOTAXIS DIFFERENTIAL EVOLUTION OPTIMIZATION ALGORITHM

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ABSTRACT

Nature inspired, bacterial foraging optimization algorithm (BFOA), and bio-inspired, differential evolution (DE), have been employed to solve complex search optimization problems. Researchers have been investigating the performance of different DE parameters (crossover rate and mutation factor) in solving optimization problems. In the present paper, the performance of a hybrid technique called Chemotaxis Differential Evolution Optimization Algorithm (CDEOA) which hybridizes BFOA with DE using different crossovers and mutation rates is reported along with the impact their combinations have on CDEOA in terms of exploration and exploitation of the population. In the present investigation, 6 unimodal and multimodal benchmark functions were involved.

Keywords: bacterial foraging optimization algorithm (BFOA), nature-inspired algorithm, differential algorithm (DE), chemotaxis differential evolution optimization algorithm (CDEOA)

THE STRATIGRAPHIC AND PALEOECOLOGICAL SIGNIFICANCE OF THE BENTHIC MICROFAUNA IN THE MIDDLE AND LATE MIOCENE OF CENTRAL PART OF EXTERNAL ALBANIDES INCLUDING DURRËS REGION

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ABSTRACT

Middle and Late Miocene foraminifera from various surface and subsurface sections inside and outside the Peri-Adriatic Foredeep (PAF) have been investigated and the results reported that bolivinitids and *Ammonia* genus became abundant and diverse in the Lower Miocene. Consequently, the regions have different foraminiferal assemblages features appeared. Likely, these different lithostratigraphic units (biofacies) developed due to: i) the eustatic changes of sea level during both transgressive and regressive cycles and, ii) the presence in time and space of the different restricted and open sea paleoenvironments. The vertical and lateral migration of biofacies makes them of great interest for paleoecologic studies. The separation of two neighbouring areas within the External Albanides (EA) could be distinguished not only by their different tectono-sedimentary regimes but also by the presence or absence of keeled globorotalids taxa and the vertical migration of most of the biofacies.

Keywords: microfauna, biofacies, paleoecology, migration, stratigraphy, Miocene, External Albanides.

A COMPARATIVE EVALUATION OF THE QUALITY OF ALBANIAN WHEAT CULTIVARS

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ABSTRACT

Chemical-technological properties such as humidity, ash, protein content, wet gluten, gluten Index and Zeleny sedimentation of four Albanian soft wheat cultivars sown in the experimental plot of Lushnja region from 2012 to 2013 are evaluated. Results reported a statistically strong positive correlation between the value of wet gluten and the protein content ($r = 0.971$) and between wet gluten and Zeleny sedimentation ($r = 0.985$). The present paper aims to: i) evaluate the qualitative properties of Albanian soft wheat cultivars and, ii) determine the ratio between wet gluten content and grain protein content in those cultivars.

Keywords: cultivars, soft wheat, wet gluten, gluten Index

DIMENSIONAL STABILITY OF MONOFILAMENTS AND THE PERFORMANCE OF ARTIFICIAL TURF

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ABSTRACT

Dimensional stability of monofilaments is very important for the performance of artificial turf. It could be obtained during the heat treatment of monofilaments along with the properties of the final product. Although the process itself is rather easy, the impact of weather conditions remains unknown. However, recent investigations have revealed that elevated temperatures are of primary importance. Dimensional stability and long standing properties of artificial turf are closely related to heat treatment.

Keywords: monofilaments, shrinkage, dimensional stability

ENERGY ECONOMY IN THE APPAREL SECTOR

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ABSTRACT

Energy consumption is very important for the apparel sector as all the machines work with electricity. As alternative energy is costly, using traditional energy sources remains beneficiary. Information on energy-efficiency printing technologies and measures applicable to the textile industry is in the present paper reported.

Keywords: energy, economize, apparel production companies, process

JNTS, 2015, 2**STATISTICAL PROPERTIES OF ALBANIAN MOBILE PHONE
COMMUNICATION NETWORKS****Eva NOKA and Fatmir HOXHA**

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ABSTRACT

Mobiles are a communication facility connecting people from around the world. As the use of mobiles has increased and the technology advanced, analyzing mobile phone communication networks is very interesting. The data collected from the mobile companies and the technological development made in the area help understand human interactions pattern and the society. In the present paper, we used data records of calls and SMS from a mobile phone company in Albania to construct and analyze these two communication networks: i) the directed network (DN), by linking callers or SMS senders and call or SMS receivers with directed edges and, ii) the undirected mutual network (MN) considering only the pairs of users with reciprocal communication events. In both cases, we assigned a weight on each edge, based on the number of communications occurred for the corresponding pair of users during the observed time period. Based on a carefully chosen set of topological and weighted measures, we present a detailed analysis of the networks under consideration, by exploring the component size, degree, strength, and weight distributions, topological and weighted degree assortativity and clustering coefficient. The correlations between these quantities were inspected, providing a better insight into the local structure and interactions, and the overall topology of the networks. This is the first study that attempts to analyze and discover the topological and weighted properties of mobile phone communication networks with Albanian users.

Keywords: mobile phone communication, network analysis, weighted networks

**USING DATA MINING FOR EMPLOYMENT PREDICTION OF
GRADUATES IN ALBANIA****Alba ÇOMO and Xheni MELO**Department of Informatics, Faculty of Natural Science, University of Tirana,
Albania**Jona MULLIRI**Department of Mathematics and Informatics, Faculty of Economics and
Agribusiness, Agricultural University of Tirana, Albania**ABSTRACT**

A survey was carried out to investigate the employment opportunities of Albanian newly graduated students and the data are here reported. The data mining classification techniques such as NaiveBayesUpdatable, Logitboost and Adaboost1 algorithms were in the present investigation applied. The data collected were investigated based on: i) prediction accuracy, ii) model building time and, iii) error rate. In the end, the most appropriate algorithm was determined.

Keywords: data mining, classification model, graduates employment, prediction

BIFURCATION ANALYSIS AS A USEFUL TOOL TO FISHERY MANAGEMENT

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ABSTRACT

Bifurcation analysis is a key tool for the analysis of dynamic systems in general and nonlinear systems in particular. If a parameter of a dynamic system changes, qualitative behavior of the system will change. New fixed points might emerge or current fixed points might disappear, or their stability properties may change. These sorts of qualitative changes in a dynamic system are called bifurcations, and the values of the parameters at which these changes take place are called bifurcation points. Bifurcation analysis also enables us to qualitatively estimate the behavior of trajectories without utilizing the analytical solution of the underlying differential equations. Most common types of bifurcations encountered in dynamical systems are saddle-node, transcritical and pitchfork bifurcation. In the present paper some of the types of bifurcations in one-dimensional dynamical systems and application of these bifurcations in population dynamics are discussed. The fish available for human consumption comes either from the ocean or the sea. On one hand, the natural supply cannot satisfy the human needs. On the other hand, cost of fish harvesting is increasing, making aquaculture an important source for fish supply. As Albania is rich in water resources, the market demand for fish could be easily met. Aquaculture production is playing an increasing role in satisfying the demand for human consumption of fish and fishery products. Once aquaculture production is increased, the endangered species would be safe, because interventions in the rearing process to enhance production are involved. The logistic growth model is used for population growth of fish, and the two following harvesting strategies are considered: i) constant and, ii) proportional harvesting. In each process, the optimal amount of fish harvested to protect the population from extinction was estimated. The results reported that harvesting in amount or rate higher than the bifurcation point leads to the extinction of population. The results are a means to address the growth of fish population and reduce of repopulation's costs.

Keywords: fixed point, stability, saddle- node, harvesting, logistic growth model

ESTIMATION OF THE ION AND AEROSOL CONCENTRATIONS AND THEIR RELATIONSHIP WITH METEOROLOGICAL PARAMETERS IN A SEASHORE SITE

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ABSTRACT

Cluster ions and aerosols are atmospheric particles, which participate and have a great impact on several global processes. On other hand, both these particles interact with each other via recombination and attachment processes. Monitoring the variation of their concentrations gives valuable information about their interactions and the impact on atmospheric processes that these particles take part. The present paper provides information about the variation of particle number concentrations of cluster ions and aerosol particles of sub-micrometric and super-micrometric size. Investigation was carried out from 2009-2011 at a site located in the Adriatic seashore and the results reported high values of cluster ions and aerosols. The source is anthropogenic activities, sea salt and other particles of long-range transport.

Keywords: Ion concentrations, aerosol concentrations, seashore site, anthropogenic activities

APPLICATION OF DIFFERENTIAL INTERFEROMETRY FOR ANALYSIS OF GROUND MOVEMENTS IN ALBANIA

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ABSTRACT

Albania is experiencing some geomorphological changes of great impact for the environment due to anthropogenic activity. These changes are considerably reflected in the tectonic zone of Pre-Adriatic Depression. Here, the area is characterized by erosion, landslides and movement of the Adriatic Sea shoreline. Anthropogenic activities have been intense in the hilly ranges running parallel to the sea shore which partly consist of lousy sandstone due to some catastrophic landslides occurred. Complicated

geomorphologic phenomena could be noted in the sea shore which is characterised by significant sea transgression in typically accumulative areas. These phenomena have been investigated for a long time using satellite imagery involving free archives of LANDSAT [Kotor], MODIS [Balwouis], SAR ERS and ENVISAT. In the present paper, some results recently obtained using SAR images are reported.

Keywords: differential interferometry, ground movement

APPLICATION OF REMOTE SENSING FOR THE ANALYSIS OF ENVIRONMENTAL CHANGES IN ALBANIA

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ABSTRACT

The present paper reviews some of the remote sensing studies carried out to investigate environmental changes in Albania. Simple methods and image processing software for general use and exploiting free internet archives of satellite imagery were applied. Data of significant importance regarding the hot areas of environmental changes such as sea coasts experiencing sea transgression, temporal variations of vegetation and aerosols, lakes, landslides and regional tectonics were obtained.

Keywords: remote sensing, environmental changes, Albania

NOSOCOMIAL BLOOD STREAM INFECTIONS IN PEDIATRIC INTENSIVE CARE UNIT IN ALBANIA

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ABSTRACT

The present paper aims to: i) determine the incidence of the most common NI namely blood stream infection (BSI), in the Paediatric Intensive Care Unit (PICU) of University Hospital Center (UHC) and, ii) define the risk factors associated with them and the appropriate prevention and control measures. We performed a prospective study on the incidence of BSI from May 2011 to December 2012 in a single 15 bed-PICU. Six hundred and fifteen patients admitted to PICU, who stayed more than 48 hours were enrolled and monitored for BSI till discharge from ICU or death. Primary BSI was defined as per CDC criteria. Data of patients with BSI was compared with those without BSI. Outcome was measured as length of PICU stay (LOS) and survival or death. In the present study the use of devices (endotracheal tube [ETT], central venous catheter [CVC] and urinary catheter [UC]) was recorded to calculate the device associated infection rate (DAR), incidence density and device utilization ratio (DUR)

and risk factors. The results reported: i) 26 episodes of BSI, with an incidence rate 4.3 per 100 admissions or BSI rate 5.7 per 1000 patients-days, ii) 4 clinical sepsis, 7 laboratory confirmed-BSI, 15 episodes of central line associated blood stream infections (CLABSI) among 108 patients using CVC more than 48 hours and, iii) the incidence, incidence density, DAR and DUR among patients using CVC was 14 %, 12 per 1000 patient days, 30.5 per 1000 central line days, 0.39 respectively. The group age mostly affected by CLABSI was children under one year old. The predominant isolates were gram positive (n=16, 73%) of which *Staphylococcus aureus* was the most common, followed by gram negative (n=6, 27%) of which *Enterobacter* spp. was the most encountered. Higher frequency and duration of device utilization of CVC, ETT, UC, use of parenteral nutrition, primary surgical diagnosis, younger age, were risk factors for BSI on univariate analysis. The median LOS was longer in patients with BSI compared with those without (17.1 vs.7.05, $p=0.0001$). However, the presence of BSI, was not associated with a raise in mortality rate which was similar in patients with and without BSI respectively 23.1% vs.17.3% ($p = 0.3$). BSI rate in our study rate was consistent with that reported by other similar study. The device associated BSI was higher than international standards. This study has established a benchmark for future comparisons. Preventive measures such as improvements in central line insertion and maintenance are necessary to lower this baseline rate in the future comparisons.

Keywords: nosocomial blood stream infections, children

REIRRADIATION OF PATIENTS WITH BONE METASTASIS

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ABSTRACT

The present paper aims to evaluate the clinical outcome of reirradiated patients with bone metastasis in terms of pain improvement, local control, and development of myelopathy. 20 patients with bone metastasis who complained pain have been reirradiated from 2012-2014. The median interval between the two irradiations was 17 months (range 10-38 months). Karnofsky performance score at the time of retreatment ranged from 50% to 80%, and median age was 46 years (range 26-74). The first radiation dose varied from 30 Gy to 50 Gy with daily fraction doses of 1.8-3Gy. The total dose of retreatment ranged from 8-30 Gy with daily fraction doses 3-8 Gy, and the cumulative dose ranged from 38 Gy to 70 Gy (median 53 Gy). All patients were followed up prospectively and all of them tolerated well reirradiation. The median follow up after the last treatment was 12 months (range 8-26 months). Here, 12 patients out of 20 had complete pain relief and the remainder had partial pain relief. At the last follow up only one patient was still alive and the others were dead from systemic disease progression. We didn't detect any serious acute side effect and no patient showed treatment-induced neurologic abnormalities. The results reported that reirradiation of spinal cord within the dose range we used is a feasible treatment that provides clinical benefits and improvements of quality of life.

Keywords: reirradiation, spinal cord, myelopathy

AN EFFECTIVE HYBRID OF BAT ALGORITHM AND HILL CLIMBING FOR GLOBAL OPTIMIZATION OF HIGH-DIMENSIONAL FUNCTIONS

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ABSTRACT

The present paper provides information about a hybrid optimization algorithm which is a combination of Bat Algorithm (BA) and Hill Climbing (HC). This algorithm incorporates the diversification ability of BA with intensification ability of HC. The hybrid optimization algorithm is verified by testing on a large set of numerical test functions and results obtained were compared with the results obtained by bat algorithm (BA) and three state-of-the-art BA variants. The results reported that the performance of the proposed method is better than the bat algorithm. In addition, it is comparable to three state-of-the-art modified BA algorithms in terms of the quality of final solution and its convergence rates for high dimensional problems.

Keywords: Bio-inspired algorithm, Numerical optimization, Bat algorithm, Hybrid bat algorithm

REST ARCHITECTURE STATE OF PRACTICE IN MACEDONIAN IT COMPANIES

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ABSTRACT

Rebuilding applications by reusing the existing ones is of primary importance for the IT developers. Every system uses resources such as Web pages, business information, etc. that can be represented in a computer-based system because the main purpose of IT department is making these resources accessible to its clients. Service architects and developers are interested in creating services that are implementable, maintainable, extensible and scalable. It is the RESTful design that promises this and a lot more. It has been more than a decade since the introduction of Representational State Transfer

(REST), and it seems to become one of the most important technologies for Web applications. Every major development language now includes frameworks for building RESTful Web services. Considering the importance of REST while reusing services, we have conducted a survey in IT companies in Macedonia, which relies upon collection of empirical data. The survey aimed at exploring developers' experience on REST Architecture in IT Companies and the data are here reported and evaluated.

Keywords: REST Architecture, service reuse, resources, empirical data

MECHANICAL AND HYDRAULIC BEHAVIOUR OF GEOTEXTILES

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ABSTRACT

The present paper provides information about the properties of geotextiles based on their application area. Geotextiles are planar structures consisting of synthetic or natural polymeric material, used in contact with soil and other materials. Geotextiles are widely used in the construction industry due to their physical mechanical and hydraulic properties and durability. The present paper reports on the most important mechanical and hydraulic properties of geotextile used in specific applications areas along with their respective test methods based on Albanian and European Standards.

Keywords: geotextile, properties, test methods, standards

CURRENT ROAD-SAFETY DELIVERY SYSTEM AND THE ALBANIAN SYSTEM APPROACH

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ABSTRACT

Road traffic today is inherently dangerous. Consequently, setting up a proper road safety system would be crucial. Road traffic relies more heavily on its users to keep accidents from occurring. Scientific programs for road safety are relatively new. Road engineering system and traffic management system were mentioned for the first time only in the '80s and the management of transport systems and systems analysis of road safety were carried out for the first time from 1985 to 2000. Improvements have been made since then. Today, the country leaders in road safety- US and Canada, have provided the scientific basis that summarizes the basic cognition and have developed methodologies and systems as Interactive Highway Safety Design Model (IHDMS) software, already well established in studies in the field in many other states. Change, as always, deals with obstacles. Especially in Albania, the main obstacle is the near absence of professionals who can be the transporters and providers of factual road-safety knowledge. The second important obstacle is the weakness of the knowledge in which these professionals would have to be trained. The third obstacle lies in the fact that we yet have not prepared and approved a framework of Albanian road safety

standards based on European Standards. All three of these obstacles are derived from the same source; in a society in which it is acceptable to deliver road safety on the basis of opinion, intuition, and paradigms, there is little demand for factual knowledge and for transporters. The transformation from a scheme of road-safety delivery rooted in belief, intuition, and paradigms into one that is based in science and based on evidence requires a profound cultural change.

Keywords: Factual road-safety knowledge, IHDMS software

ADDITIONAL INFORMATION ON SOME IMPORTANT DATES

Along with the 20th anniversary of the journal, we commemorate some important birthdays.

UN launches 2016 International Year of Pulses, celebrating benefits of legumes. In addition, 2016 marks some very important birthdays. Yuri Gagarin was born on March 9, 1934. He was the first man on space. Steve Jobs was born on February 24, 1955. Nicolaus Copernicus, the father of modern astronomy, was born on February 19, 1473. Pluto was discovered on February 13, 1930

Galileo Galilei was born on February 15, 1564. Charles Darwin, naturalist, was born on February 12, 1809. In February 7, 1984 Bruce McCandless becomes first man to fly in space. John Boyd Dunlop was born on February 5, 1840. He was a Scottish-born and educated inventor and veterinary surgeon who spent most of his career in Ireland. Familiar with making rubber devices, he re-invented pneumatic tyres for his child's tricycle and developed them for use in cycle racing. Albert Einstein was born on March 14, 1879.

Further information could be found at: <http://www.fao.org/home/en/and> <http://worldsciencefestival.com/> , respectively.

JNTS, 2016-1**TRACEABILITY OF MASS UNIT IN THE REPUBLIC OF ALBANIA****Luljeta DISHA, Dëfrim BULKU**General Directorate of Metrology DPM, Sector of Mass and Density, Tirana,
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Traceability is the property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties. It is of the greatest importance for applications demanding substantial accuracy - and modern technology provides a huge range of them - it is surprisingly easy to inadvertently end up with the wrong values through inadequate attention to the detail of traceability. Inaccurate or wrong measurement might lead to wrong decisions with economic consequences. National Metrology Institutes (NMI) such as the Mass Laboratory at the General Directorate of Metrology (GDM), Tirana, Albania have the prime responsibility of being the source of traceability of the highest metrological level to the SI, or if this is not yet feasible, to other internationally agreed references, for metrology users in their country and adequate to their needs. This comprises the development, maintenance and dissemination of national measurement standards traceable to the SI, or when this is not (yet) possible, to other internationally agreed references. A major part of this work is the international recognition of these measurement standards and of the calibration and measurement reports and certificates issued on the basis of internationally assessed and approved Calibration and Measurement Capabilities (CMC) in accordance with the rules laid down in the CIPM, MRA. Mass Laboratory has been part of some Key Comparisons organized by other National Metrology Institutes of the highest level. BIPM has the mission of establishing world-wide uniformity of measurements. *The kilogram* is the only SI unit still based on a physical object. The present paper provides some information about the method used to carry out and disseminate traceability of mass unit in Albania along with the results of a Key Comparison.

Keywords: mass, metrology, weight, calibration, weighing, key comparison, uncertainty

OPTIMISATION OF THE SYNTHETIC ANTIMICROBIALS ACTIVITY AGAINST MICROORGANISMS PRESENT IN BRAND AND GENERIC DRUGS FOR CARDIOVASCULAR DISEASES

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ABSTRACT

The safety and quality of pharmaceutical products, brands and generics which relates to their microbiological profile along with their respective regulations are here investigated. The pharmaceutical products used for cardiovascular diseases were here involved and all the genera and species adapted to their content and those taken from the environment, packaging systems or well-adopted, also in capsules or membranes of drugs determined. Isolated strains were purified and identified. Developed in different media cultures and in appropriate substrates, the isolated strains were tested using synthetic substances with antimicrobial properties such as vibramycin and oxytetracycline in order to observe their behavior towards different percentages of synthetic antimicrobials. Important changes in morphology, micelles, etc. and, a very good inhibition of molds were reported. A MIC value 25µl was determined in order to achieve a very good inhibition with the minimum value of used antibiotic. Some colonies treated with antibiotics experienced color changes, sporulation process, change of macro colonies, weak development of micelles and pseudomicelles.

Keywords: bacteria, yeasts, molds, antibiotics, antimicrobial, minimal inhibition concentration-MIC

RESOURCES OF LOW ENTHALPY GEOTHERMAL ENERGY IN ALBANIA AND EFFECTIVE APPLICATION AREAS

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ABSTRACT

Different investigations have been made with regard to geothermal energy of high and low enthalpy resources and thermal mineral water springs and wells in Albania which temperature goes up to 65.5°C. Geothermal energy has been harnessed for recreational uses for millennia, but for electricity generation only for a little over a century. Earth Heat is unique amongst renewable energies for its base load and renewable heat provision capabilities. Given the importance geothermal energy and technological advances, economic development could be achieved. Considering the geothermal situation of low enthalpy in Albania, space heating and cooling, and integrated and cascade use of geothermal waters energy would be appropriate. The present paper provides detailed data about the shallow ground heat resources in

Albania, application areas for buildings and greenhouses heating-spacing purposes, and direct use of geothermal waters recommendation. Geothermal space heating and cooling is often referred to as geo-exchange, geothermal or ground source heating. One of the sustainable energy technologies being considered is the ground source - heat pump system. Earth heat could be efficiently used for space heating and cooling using ground source heat exchanger system — borehole heat exchanger-geothermal heat pumps. In Albania, direct use of the ground heat by borehole heat exchanger-geothermal heat pump for space heating and cooling would be appropriate as both energy and heating and cooling cost could be saved.

Keywords: geothermal energy, heating and cooling, geothermic

3D MODELING AND INTERPRETATION OF FE/NI DEPOSIT IN SKROSKA MINE USING MICROMINE

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ABSTRACT

Geographic Information Systems (GIS) software nowadays are used in almost every area of industry and economy, central and local government, public and private services. Having as the main purpose the good management and decision making in the field where applicable, these systems and their application generate the integration of the tabular data with their geospatial position. The application of GIS software in 3D Modeling and interpretation of iron nickel deposit in Skroksa, is part of a study aimed at creating an innovative method by using Micromine software. Through the application of this software historical data will be analyzed together with the data collected during this study. Given that mineral resources are the focus of the mining industry, they will be analyzed using the data generated by 3D modeling. This model will present the historical data from the drilling and the ore bodies, interpreted and generated in Micromine, bringing thus new methods of modeling of ore deposits in the mining industry through Micromine.

Keywords: Micromine, Geographic Information Systems (GIS), 3D Modelling, Mineral Resources, Iron/Nickel Ore Deposit.

GROUNDWATER HYDROLOGY OF SHKODRA LAKE AND BUNA RIVER WATER SYSTEM

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ABSTRACT

Groundwater is the water that occurs below the surface of Earth, where it occupies all or part of the void spaces in soils or geologic strata. It is also called subsurface water to distinguish it from surface water, which is found in large bodies like the oceans or lakes or which flows overland in streams. Both surface and subsurface water

are related through the hydrologic cycle (the continuous circulation of water in the Earth-atmosphere system). Geological and hydrogeological studies were carried out in the Shkodra Lake – Buna River water-system in the framework of IPA Project, run from the Academy of Sciences of Albania and the Academy of Sciences and Arts of Montenegro and the results are here reported. The groundwater of the region is represented by quaternary gravels and karst rocks. It is fed from Drini River and springs flowing in the Albanian Alps. Syri i Gjonit, Syri i Sheganit, Rrjollit and Vraca springs flow into the Shkodra Lake. These springs are mainly fed by rainfall. Groundwater recharge, restoring and discharge are very important to the groundwater hydrology. They are affected by climatic factors, irrigation, pumping, rainfall intensity and distribution and surface runoff. *AquaChem water quality analysis* was carried and the results reported good quality of water.

Key words: groundwater hydrology, water system, quaternary gravels, phreatic wells, natural springs

MICROPROPAGATION OF SOME ALBANIAN CULTIVARS OF *MALUS DOMESTICA* BORKH. THOROUGHOUT DIRECT ORGANOGENESIS

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ABSTRACT

Tissue culture is the cultivation of plant cells, tissues, or organs on specially formulated nutrient media. In addition, it is seen as an important technology for the production of disease-free, high quality planting material and the rapid production of many uniform plants. Micropropagation, which is a form of tissue culture, increases the amount of planting material to facilitate distribution and large-scale planting. In this way, thousands of copies of a plant can be produced in a short time. Apple is a candidate species of micropropagation for large number of rootstocks and scion cultivars. Although, micropropagation is of great benefit, some problems still remain with its commercial applications such as the browning due to the exudation of phenolics into the medium as a response to wounding at excision. The present investigation aims to develop an efficient micropropagation protocol for two different apple cultivars (*cv. Golden Delicious* and *cv. Starking*) to the avoidance of polyphenic oxidation during the first stage of the application of the *in vitro* technique. As primary explants were used small apical and lateral shoots, 1 cm in size and their efficiency during the first stage of proliferation and regeneration was evaluated. The explants were cultivated in MS media combined with cytokinin BAP (1 mg l^{-1}) and auxin IBA (0.1 mg l^{-1}) and in a 16 h light/24 h regime. The regeneration level in the proliferation stage was not very high because of contamination found at high rates and polyphenolics release. In the subculture stage, a great number of new plantlets identical to mother plants for both apple cultivars were obtained. Best results on rooting

percentage were observed in apple explants cultured on I rooting medium containing $\frac{1}{2}$ MS macronutrients, MS micronutrients, MS vitamins supplemented with 0.1 mg l^{-1} NAA. Cultivar Starking showed better performance for all evaluated parameters, at all stages during subcultures and rhizogenesis. As the first stage of proliferation was good, an optimal development of the explants in the other stages of micropropagation was obtained.

Keywords: apple micropropagation, polyphenolic oxidation, growth plant regulators, rhizogenesis

IRIS RECOGNITION AND A NEW APPROACH IN ENCODING

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ABSTRACT

Biometric authentication systems provide automatic identification of people based on their physical characteristics. Iris can be considered as the one of the most reliable and accurate biometric identification system. Iris images can be analyzed based on their pixel intensity values or phase information. In this paper, we divide the phase space into eight equal regions, employ a new encoding for these regions and find the new matching metric by excluding noisy parts of the iris images.

Keywords: Hamming distance, Fourier transformation, encoding, quantization, iris matching

IMPROVING TRAFFIC CONTROL USING SOFTWARE DEFINED NETWORKING FOR INTER-DOMAIN ROUTING

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ABSTRACT

Software Defined Networking (SDN) is becoming a de facto paradigm in data networks. While smaller campuses and enterprises are not yet widely deploying SDN, larger campuses and data centers are already utilizing the advantages of SDN, primarily taking advantage of easier network management, better resource utilization, better load and traffic balance on network devices and routes. Denial of service has been another concern for the last decades, and in the current internet it has not been fully addressed. The present paper analyzes and tests possible applications of Software Defined Internet Exchange Point (SDX) for inter-domain routing. The results from simulated implementation showed that SDX as a platform offers a greater flexibility and allows for better traffic engineering than conventional techniques. In addition, it gives a possibility to fight denial of service attacks.

Keywords: Software Defined Networking, SDN Controller, IXP, SDX, SDX switch

ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY AND THE SWEAT/TEXTILE ELECTRODE INTERFACE

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ABSTRACT

Since about a decade, the necessity and potential to further increase the functionality of textiles has been revealed, especially in the field of health care. Intense research efforts have been made for the development of textile-based electrodes which can be integrated into garments. The present investigation provides some information about the behaviour of screen-printed textile electrodes when in contact with the human sweat, using electrochemical impedance spectroscopy.

Keywords: screen printing, textile electrode, Electrochemical Impedance Spectroscopy (EIS)

APPAREL PRODUCTION SECTOR IN ALBANIA AND THE NEED FOR INVESTMENTS IN TECHNOLOGY

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ABSTRACT

Apparel sector in Albania remains one of the most important sectors of the economy, leading to an increased number of exports in the area and enterprises. In addition, it has a leading role in the labour market by raising employment opportunities. The present paper aims at analyzing the apparel manufacturing sector and the impact of investments in technology. Thus, exports, investments and employment in the apparel sector have been investigated. A case study referring to the investments made in the cutting and printing sector is reported. Results showed that technology investments are always indispensable. In the end, recommendations are made.

Keywords: apparel sector, exports, employment, investments, technology

ANTISEISMIC DESIGN OF THE BRIDGE PILED FOUNDATION AND ANALYSIS OF THE SOIL-STRUCTURE INTERACTIONS

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ABSTRACT

A bridge has recently been constructed in Albania, in an area rich in soft soils and the impact of the soil-structure interactions (SSI) to the bridge piled foundation seismic design is here reported. The interaction depends on various parameters such as soil

properties— of fundamental importance for the static and dynamic calculations carried out for the foundation design and that of the entire bridge. A 3D analysis was a means to address the ground consolidation and the impact of seismic loading. Seismic data were obtained by filtering the time history of the acceleration of the foundation-soil interface plan involving a 2D model where a vertical shear wave propagates. The acceleration time history of the 2D model could be used for the seismic design of the bridge structure considering local conditions and interaction. Results of the models were compared and relevant conclusions for soil-structure interaction seismic modelling were provided.

Keywords: seismic analysis, bridge foundations, soil-structure interaction

USING RENEWABLE ENERGY TO SUPPLY DATACENTERS: A CASE STUDY FOR ALBANIA Enida SHEME and Neki FRASHËRI

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ABSTRACT

Large datacenters are becoming the most popular solution for meeting the increasing demand on IT applications and services. Along with the solution, power-hungry datacenters bring large electricity bills and cause significant impacts to the environment. To reduce costs and environmental effects, modern datacenters are considering integrating renewable energy sources into their power supply. The present paper analyses and evaluates the potential of using renewable energy for a datacenter located in Albania. A simulator was used to measure the workload energy consumption of a datacenter and estimate the quantitative relation between wind and solar energy sources needed to supply a certain percentage of its energy demand. The available daily renewable energy for a summer and winter day, clear and cloudy, was analyzed based on Albanian climate values and used as a supplier for 3 different datacenter sizes. In the end, the ratio between number of wind turbines and square meters solar panel was calculated to achieve a desired fraction of renewable energy supply for a given datacenter.

Keywords: datacenter, workload, simulator, renewable energy, sustainable computing, solar power, solar panel, wind power, wind turbine

JNTS, 2016-2**DETERMINATION OF TRACE ELEMENTS IN MOSS SAMPLES
WITH DIFFERENT MULTI ELEMENT ANALYTICAL TECHNIQUES,
SUCH AS ENAA AND ICP-AES****Shaniko ALLAJBEU, Flora QARRI, Sonila KANE**Department of Chemistry, Faculty of Technical Sciences, University, Ismail
Qemali, Vlora, Albania**Pranvera LAZO**Department of Chemistry, Faculty of Natural Sciences, University of Tirana,
Albania**ABSTRACT**

In the present investigation, instrumental neutron activation analysis (INAA) and inductively coupled plasma- atomic emission spectroscopy (ICP-AES) were used for the determination of trace elements (Na, Mg, Al, K, Ca, V, Mn, Ni, Cr, Fe, Zn, Sr and Ba) in moss samples collected from 44 sampling sites in whole national territory of Albania. Linear regression was applied to compare the results of the most significant elements obtained by both methods. No significant differences were found between the concentration of K, Ca, V, Mn, Ni, Zn, Sr and Ba (linear coefficient $r^2 > 0.7$), whereas for Na, Mg, Al, Cr and Fe the differences were significant (linear coefficient $r^2 < 0.6$). The sources of high similarity and/or differences between two methods are also here discussed.

Keywords: trace elements, atmospheric deposition, INAA, ICP-AES, moss samples, Albania

**A COMPARISON STUDY ON THE PRESENCE OF SOME
CHLORINATED ORGANIC POLLUTANTS IN WATERS OF MATI
RIVER, ALBANIA****Sidita MANÇE, Elda MARKU and Aurel NURO**Department of Chemistry, Faculty of Natural Sciences, University of Tirana,
Albania**ABSTRACT**

The present paper investigates the presence of different chlorinated organic pollutants in water samples of Mati River which flows in Northern Albania and has a catchment area of 2411km². Six water samples were collected along the river, in its western side, close to river delta. The PCBs included in this study were 7 indicator PCB congeners: CB-28, CB-52, CB-101, CB-118, CB-138, CB-153 and CB-180. The target pesticides were alfa-, beta-, delta- and gamma-isomers of hexachlorocyclohexane, heptachlor, heptachlor-epoxide, aldrin, dieldrin, endrin, endrin aldehyde, DDT-related chemicals (p,p-DDE, p,p-DDD, p,p-DDT), endosulphane, endosulphane sulphate, methoxychlor and mirex. Most of these have already been used widely in Albanian agriculture. After extraction and clean up, water samples were

analysed with GC HP 6890 Series II gas chromatograph equipped with a ^{63}Ni ECD and a split/splitless injector. The concentrations of individual PCBs and OCPs, as well as their distribution profiles are discussed here.

Keywords: chlorinated pollutants, water sample, Mati River, PCB indicator

EVALUATION OF DRINKING WATER QUALITY IN RURAL ADMINISTRATIVE UNITS OF FIERI DISTRICT

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ABSTRACT

Water is essential to sustain life, and a satisfactory (adequate, safe and accessible) supply must be available to all. Improving access to safe drinking-water can result in tangible benefits to health. Efforts must be made to achieve a drinking-water quality as safe as possible. The present paper provides some information about the quality of drinking water in Fier, Albania. 248 samples were monthly collected from January 2015 to August 2015, from 31 sampling points in the 13 rural administrative units in Fier district. NH_4^+ mg/l, NO_2^- mg/l, Cl^- mg/l, Cl_2 , pH (chemical parameters) and *Escherichia coli*, *Streptococcus faecalis* and *Clostridium perfringens* (bacteriological parameters) were investigated and the results were compared with the World Health Organization (WHO 2008) guidelines for drinking water. Most Probable Number index was used for the evaluation of *Escherichia coli*. The number of heterotrophic bacteria was determined by counting colonies on plates with PCA. Preliminary results for rural areas showed different positive samples on microbiological indicators. 26 samples resulted positive with at least one microbiological indicator; *E.coli*. 14 samples resulted positive for 3 microbiological indicators *Escherichia coli*, *Streptococcus faecalis* and *Clostridium perfringens*.

Keywords: physicochemical analysis, most probable number index, faecal indicators, water quality

THE ALBANIDES SETTING IN THE DINARIC-ALBANIAN-HELLENIC BELT AND THEIR MAIN GEOLOGICAL FEATURES

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ABSTRACT

Geological investigation about the Setting of the Albanides in the Dinaric-Albanian-Hellenic belt has been recently carried out in Albania and Greece and the results are here discussed and labelled. Albanides could be put into the segment between the Shkodër-Peja and Sperchios (Kremasta-Sperchios) transform faults comprising a big folded segment with the same tectono-stratigraphic units in Albania, Greece, Kosovo and in FYROM, while the Hellenides can be put into the segment of Aegean Arc, south of Sperchios Transform fault up to the border with Taurides. The Pliocene

differentiation of Hellenides from Albanides is the direct result of oceanic lithosphere of the Ionian Sea entering the trench south of Kephallonia while continental lithosphere continued to be subducted north of the trench. The Shkodër-Peja transform fault represents an active transverse strike-slip fault zone shifting the Mirdita Zone towards south-west and offsetting the orogenic thrust front at Drini Bay near Lezha. The NNW-SSE direction of the Albanides to the south of Shkodër-Peja transversal immediately deviates to the WNW direction of the Dinarides, north of this transversal. The different arrangement of the tectono-stratigraphic units which were established on either side of the Shkodër-Peja transform fault are as follows: Sazani-Paxos, Ionian, Kruja-Gavrovo, Krasta-Pindos, Mirdita-Subpelagonian, Korabi-Pelagonian and Vardari-Axios zones in the south, and the Kruja-Dalmatian, Cukali-Budva, Albanian Alps-Karst/Prekarst, Vermoshi-Bosnian, Gashi-Durmitor, Dinaric ophiolite belt and Drina Ivanjica – Peja zones in the north. The Sperchios (Kremata-Spechios) transform fault is a present-day active fault zone cutting across the orogenic fabric. The opening of the Sperchios Basin graben together with Kremasta fault system accommodates the transcurrent movements of the North Anatolian fault on the east with those of the Cephalonia transform on the west as a “bridge of failure”. The different arrangement of the tectono-stratigraphic units which were established on either side of the Sperchios transform fault are as follows: the Paxos-Sazani, Ionian, Gavrovo-Kruja, Pindos-Krasta, Subpelagonian-Mirdita, Pelagonian-Korabi and Vardari-Axios zones in the north, and east of Ionian zone, the Gavrovo-Tripolitza, Pindos-Olonos, Parnassos, Beotian, Subpelagonian and Pelagonian units in the south. The Pindos-Olonos, Parnassos and Beotian zones of Hellenides are equivalent with the Cukali-Budva, Albanian Alps-Karst/Prekarst and Vermoshi-Bosnian zones of Dinarides. The main geological features have been described in details for the tectono-stratigraphic units of Albanides. Mirdita Zone represents a super-structure zone resulted from a basin graben-like architecture. The continental rifting during the Early-Middle Triassic time was associated and followed with continental break-ups of the Vardari and the Mirdita basins during the Late Anisian time and the oceanic spreading in Vardar and Mirdita basins from the Ladinian to the Middle Jurassic time. The three main models plotted in the graphs provide information about the generation place of the Mirdita ophiolites and the way and time of oceanic basin closing. The generation place of the Mirdita ophiolites is supposed to be the Mirdita graben megastructure in southwest of Korabi-Pelagonian microblock and northeast of Hajmeli (Koziakas) platform. The compressional deformation stages and tectonic style of Mirdita oceanic basin closure are characterized by interoceanic and marginal bidivergent paleoemplacement during Middle Jurassic until beginning of Late Jurassic time. The southern half of Korabi-Pelagonian mikroblock during the Triassic and Jurassic times was developed under platform condition (Pelagonian platform), while the northern half have been in basin condition (Korabi Basin: Muhurr-Çaje-Malësi e Korabit - Kastoria and Kollovozi-Sharri-Flambouro units).

Keywords: Albanides setting, Shkodër-Peja and Sperchios (Kremasta-Sperchios) transform faults, Tectono-stratigraphic units, Alpine geological evolution

THE IMPACT OF HYDROPOWER WATERS TO THE SHORES' LANDSLIDE

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ABSTRACT

Slope stability has been investigated and landslide monitored for the assessment of emergency situation in Albania and the results are here reported. Mountainous relief and geological structure are the sources for instable slopes and landslide development. The following landslides might occur in Albania based on the geological formations and landslide body mass: i) instable slopes and intensive landslides developed in weathered bedrocks and in overburden beds at the lakeshores of hydropower plants, ii) instable slopes and intensive landslides developed in Oligocene flysch formation, Neogene's molasses, and in loose Quaternary deposits and, iii) downfalls in the weathered rocks. Development of new landslides or re-activation of the old ones is mainly due to human activities. Civil engineering works of the last decade and a disequibrated ecologic system due to deforestation etc. are the source for landslide development. The slipping bodies of some landslides have very big volume, more than 40 million cubic meters. The biggest ones, observed at lakeshores near hydropower plants are of great geological hazard. In order to define adequate prevention measures and to manage disasters, accurate measurements would be crucial. Multidisciplinary integrated engineering geophysical-geological-geodesic methods involving inevitably innovative technologies have been periodically included in the survey system for slope stability investigation and landslide monitoring. *In-situ* multidisciplinary geophysical-geological-geodesic investigation and monitoring have been carried out in the following three stages: i) surface integrated geological-geophysical survey and installation of geodesic markers, ii) drilling of shallow boreholes and, iii) *in-situ* monitoring of landslide. Setting up two observatory stations for multidisciplinary monitoring of the two aforementioned landslides involving current technology is an ongoing project.

Keywords: Slope stability, landslide, geophysical investigation

WENLOCK GRAPTOLITE BIOZONES OF THE MUHURR-CAJE UNIT (KORABI ZONE), AND THEIR CORRELATION WITH THE STANDARD GRAPTOLITE BIOZONES

Pandeli PASHKO

ABSTRACT

Data on the on moderately rich Wenlock graptolite fauna of the black-dark argillaceous-siliceous or gray-green tuffitic shales of Muhurr Black Shale have been recently revised. Consequently, a more complete biozonal scheme could be obtained. The graptolite rhabdosomes exhibit deformation and fragmentation due to cleavage. 28 graptolite species, where *Cyrtograptus* prevails, have been identified. The latter along with *Monograptidae* and *Retiolitidae* make the basis for biostratigraphical biozonation. The *Monoclimacis*, and *Pristiograptus* are frequent. In addition, certain selected species are here illustrated. Information about seven assemblage graptolite biozones is

here reported. The first, lower-most Sheinwoodian *murchisoni* biozone precedes the *antennularius*, *belophorus* and *perneri* biozones. The Homerian biozone starts with *lundgreni-testis* and consists of *nassa* and *ludensis* Biozones. The Llandovery/Wenlock boundary has been identified between Telychian *lapworthi-grandis* and Sheinwoodian *murchisoni* biozones. The Wenlock/Ludlow boundary could be met in an interval with mixed graptolite assemblages of the latest Homerian *ludensis* and the lowest Gorstian *nilssoni* Biozones.

Keywords: Wenlock, graptolite biozones, Muhurr-Caje Unit, Korabi Zone

GLN27GLU POLYMORPHISM OF BETA-2 ADRENERGIC RECEPTOR (*ADRB2*) GENE IN CYSTIC FIBROSIS ALBANIAN PATIENTS

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ABSTRACT

Cystic fibrosis (CF), a common genetic disease in the Caucasian population, is caused by mutations in the cystic fibrosis transport regulator (CFTR) gene. This gene encodes for CFTR protein, which serves as a chloride channel in epithelial cells. Recent studies emphasize the role of Arg16Gly and Gln27Glu polymorphisms of *ADRB2* gene in the pathogenesis of CF and bronchodilator response. The present study aims to evaluate Gln27Glu polymorphism of *ADRB2* gene in Albanian CF patients, compared to healthy Albanian population group. In addition, we aim to investigate possible relationships of *ADRB2* genotypes with clinical markers. We genotyped 66 CF Albanian patients, all identified previously as delta F508 homozygote, for Gln27Glu polymorphisms using allele specific polymerase chain reaction. Genotypes and Gln27Glu allele frequencies found in this group were quite similar with those found in the control healthy group. Gln27 allele was more frequent (65%) compared to Glu27 allele (35%). Our data of Gln27Glu polymorphism in Albanian CF patients are the first data in our population and could be used for further investigations of relationships with clinical markers and therapy in our CF patients.

Keywords: — β_2 adrenergic receptor (*ADRB2*), cystic fibrosis, modifier gene, Gln27Glu polymorphism

**ENHANCING E-GOVERNMENT PUBLIC SERVICE ONTOLOGY
SCHEMA WITH GIS REFERENCE TO SUPPORT ADMINISTRATIVE
SERVICES PROVIDED BY THE LOCAL GOVERNMENT IN
ALBANIA**

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ABSTRACT

Nowday's government is moving from non-electronic services to a new public service schema known as demand-driven or personalized e-services. We define a formal model for a Public Service on the basis of the semantic web, to anticipate the need to match supply and demand for public services. The Administrative-Territorial Reform of 2015 enhanced administrative, professional, and technical efficiency to deliver modern and qualitative services for citizens. Most of them follow a similar activity-based path, where a considered number of activities are done by non-electronic methods, and considered completely different from each-other. The schema here reported addresses the key concepts and relations needed to coordinate the activities necessary for integrated public services. The proposed ontology was based on a complex processes involving citizens and a wide literature and studies. We propose ontology for Public Services, as an extensive version, using GIS reference, in order to support public administrative services of the local government.

Keywords: public service, local government, GIS, e-government, ontology.