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Facultatea de Inginerie

NORTH UNIVERSITY CENTRE OF BAIA MARE
Faculty of Engineering

BULETIN ŞTIINŢIFIC
AL CENTRULUI UNIVERSITAR NORD DIN BAIA MARE

SERIA D

Exploatări Miniere

Prepararea Substanţelor Minerale Utile

Metalurgie Neferoasă

Geologie şi Ingineria Mediului

Volumul XXXI Nr. 1

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ON THE DYNAMICS OF THE ROMANIAN SOIL TAXONOMY SYSTEM -IMPLICATIONS IN ENVIRONMENTAL PROTECTION ACTIVITY (I)

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Abstract:

The International Soil Decad (2015-2024) challenges us to bring to light the valuable information that soil provides about the complexity of matter organization on our planet and its ability to reflect the state of the quality of our environment.

As the fruit of intense international collaboration, FAO-UNESCO at the international level and ICPA (INCDPAPM) at national level, have developed and published over time classifications and soil maps of the Earth's globe and the Romanian soil. Currently, these fundamental elements for the circulation of scientific information in the field are constantly developed and included in the WRB of the SR data bases.

In the current economic stage, the complex works of transformation of the surface layer of the earth also require protection rules. In this context, there is also the need to preserve characteristic of soils as a benchmark against which the soils profoundly modified by anthropogenic activities can be compared, as well as the need for detailed knowledge and classification in new classification systems for these new types and subtypes of anthropogenic soils.

Key words*: environmental protection, international decade of soils, soil biodiversity*

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EFFECTS OF THE ACTIVITY OF CUPROM SA, BAIA MARE BRANCH OVER THE QUALITY OF THE ENVIROMNENT (I)

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***Abstract**: SC Cuprom SA Bucharest Branch Baia Mare is known as one of the biggest copper factory from ores from Romania, but at the same time one of the biggest polluters from the recent history of the country. Placed in the Baia Mare basin, at the outskirts of the city, the plant generated, in the past, a significant negative impact over the environmental factors, especially over the air and soil. The monitoring of the environment factors in the period of functioning and after closure revealed a high level of pollution of the emplacement. After ceasing of the activity, in 2009, the emplacement passed through a period of continuous degradation, successive demolitions of the buildings and minimum involving regarding the protection of the environmental factors and application of depollution processes. In this moment the platform of Cuprom Sa represents a tampon zone placed in the eastern part of Baia Mare, which stand in the path of development of the city in that direction due to the high level of degradation of the site, high level of pollution and lack of capitalization measures.*

***Keywords:** soil pollution, Cuprom SA, decontamination techniques*

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WOODY PLANTS VITALITY OF URBAN AREAS AND PROSPECTS OF THEIR GREENERY

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Abstract. *The problem of trees selection in urban green spaces has been reviewed. Vitality of the dominant representatives of the most spread woody plants types used in urban areas landscaping has been analyzed. The advantages of native tree species usage under exotic species in cities greenery, which has been in higher phytomeliorative ability of indigenous species, their adaptability to environmental conditions and effective use of available resources, have been found.The criteria for assessing the vitality of plants at different levels of biosystem organization have been accented; key parameters of adapted species protective processes and destructive parameters of unstable species in stressful growing conditions have been highlighted.*
The most informative indicators of woody plants life condition in urban areas have been morphologic - square, weight and linear parameters of vegetative and generative organs, necrosis, diseases and pests damages presence, the level of dechromation and crown defoliation and physiological - content and ratio of photosynthetic pigments, metabolic composition of leaves, acidity level and buffer stability of leave's internal environment.
The use of resistant to anthropogenic pollution species of Salix L. genus as effective phytoremediants of technologically-transformed ecosystems has been proposed. Sensitive to environmental contamination Populus L. and Pinus L. species have been not recommended for planting in urban areas. However, they can be used as informative bioindicators of environmental ecological condition.
Middle resistant species of Betula L., Acer L., Aesculus L., Tilia L. and Pinus L. genus have been recommended to implementation in urban ecosystems greening of recreation areas – parks and squares.
Sustainability of the trees genera analyzed in terms of anthropogenic pressure has increased in the following range: Aesculus L. → Pinus L. → Populus L. → Tilia L. → Betula L. → Acer L. → Salix L.

Keywords*: vitality, phytomelioration suitability, woody plants, urban environment, greenery.*

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INFLUENCE OF PRECIPITATION QUANTITIES ON THE STRÂMTORI-FIRIZA RAW WATER QUALITY INDICATORS

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ABSTRACT

This paper focuses on the evolution of quality indicators (pH, turbidity, oxidizability) of raw water in the Firiza-Strâmtori barrier lake, in between April 2015 – March 2016, in correlation with atmospheric precipitation quantities. pH, turbidity and oxidizability analyses were conducted in the time span of one year, tracking the evolution of these parameters in regards to the monthly quantity of atmospheric precipitations. For a comprehensive representation, the quality indicators of raw water, at the entrance and exit of the Baia Mare treatment plant, are also followed.

Keywords: *water, atmospheric precipitations, quality indicators, Firiza-Strâmtori lake*

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INVOLVING VOLUNTEERS IN PARTICIPATORY CONSERVATION OF BIODIVERSITY IN RODNA MOUNTAINS NATIONAL PARK (ROMANIA)

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Abstract

The Rodna Mountains National Park is a protected areas established in 1990 as a national park with 47.000 ha, being one of the biodiversity hot spot at Carpathian level. The Rodna Mountains National Park Administration implemented in the period 2004-2017 more than 26 projects in partnership with 35 institutions (universities, NGOs, museums, county councils, mayors, ministries, national and international agencies, administrations and custodians of protected areas etc.). The total budget accessed was 4.403.500 euros in partnership with other stakeholders through more than 15 funding sources.

Over 7.450 volunteers were involved in the Rodna Mountains National Park in various activities, with priority being the inventory, mapping and monitoring of biodiversity. Most volunteers come from the surrounding localities of the Rodna Mountains and only a small part of the countryside.

The good practice model developed and implemented by the Rodna Mountains National Park Administration is supported through various sources of funding and is a complex process whose results are appreciated at national and international level.

Key words: volunteers, national park, biodiversity conservation

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BIODIVERSITY OF WOODEN SPECIES IN RANGER DISTRIC OF TÎRGU LĂPUȘ

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***Abstract**: Ranger Distric of Tîrgu Lăpuș is a part of Maramureș Foresty Directorate within the National Foresty Directorate – Romsilva. The forest area of 11327,57 ha administrated by Tîrgu Lăpuș includes the state-owned forests located in the North of the country, the middle basin of the Lăpuș River, the Cavnic River Basin and the Someș River Basin.*

Out of the 6 production units, P.U. I-Valea Mare in terms of composition diversity, age and average wood / hectare volume of wood species since 1967 until now. In 1967 the area of Production Unit I Valea Mare was 4790.0 ha. Becouse of various modifications over the years, in 2009, the area was of 4148.6 ha. These changes are visible in terms of habitat, biodiversity and administration. The types of forest resorts and forest types, including the variety of treatments applied, have been studied in detail in order to perceive the way of life, growth and adaptation to current pedological conditions and climate change, but especially to quantify and explain the dynamics of the wood species in this area.

In conclusion, in P.U. I Valea Mare is notable for the constancy of species (beech, hornbeam and spruce), the increase and / or decrease of the share of the others (oak, resinous) and the disappearance of a species (pine). There are also some species that are found throughout this constant time frame under the share of 5% (resinous).

***Key words**: wooden species, biodiversity conservation, ranger district*

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CONSIDERATIONS REGARDING THE IMPLICATIONS OF PHILATELY IN ECOLOGICAL EDUCATION

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Abstract. *For more than 150 years postcards all over the world have three main roles: a value-added receipt for a postage payment in advance, a means of celebrating and promoting national heritage and a collection of pieces. But above all, the postage stamp is a true ambassador of human history, culture and civilization, because its form and function give it freedom of movement and the ability to transmit information all over the world. Through this paper, the authors want to open a series of presentations of what has given valuable, over time, the philately of civilization and human culture and which is reflected in philatelic collections. There are fractions of images - as far as a stamp can be - with people and places, with flowers and landscapes, animals and protected habitats, with what we want to remain alive in the memory of our descendants - as an essential component of environmental policy And sustainable development.*

Key words: *ecological education, philately, sustainable development*

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STATE INDEPENDENT ENERGY RATINGS THAT HAVE INFLUENCED THE CREATION AND ENFORCEMENT OF NATIONAL AND INTERNATIONAL LAW

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Abstract. *For more Leadership in Energy and Environmental Design (LEED) is one of the most popular green building certification programs used worldwide.[7] Developed by the non-profit U.S. Green Building Council (USGBC) it includes a set of rating systems for the design, construction, operation, and maintenance of green buildings, homes, and neighborhoods[8] that aims to help building owners and operators be environmentally responsible and use resources efficiently.*
From 1994 to 2015, LEED grew from one standard for new construction to a comprehensive system of interrelated standards covering aspects from the design and construction to the maintenance and operation of buildings. LEED also has grown from six volunteers on one committee to 119,924 staff, volunteers and professionals.[9] LEED standards have been applied to approximately 83,452 registered and certified LEED projects worldwide, covering around 13.8 billion square feet (1.28 billion square meters).[10]
Many U.S. federal agencies and states and local governments require or reward LEED certification. However, four states (Alabama, Georgia, Maine, and Mississippi) have effectively banned the use of LEED in new public buildings, preferring other industry standards that the USGBC considers too lax.[11]

Key words: *state independent legislation, LEED, One Watt, Star Rating*

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CAFFEINE ANALYSIS BY THIN-LAYER CHROMATOGRAPHY RELATED TO THE PHYSICAL-CHEMICAL PROPERTIES OF DIFFERENT VARIETIES OF COFFEE AND SURROGATES

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ABSTRACT

The aim of this study was to evaluate the physical-chemical characteristics of different types of coffee, decaffeinated and of two types of coffee substitutes based on barley and chicory. The following physical-chemical characteristics were performed: moisture, pH, content of polyphenols and qualitatively determination of caffeine, by thin-layer chromatography. The moisture of the investigated coffee and substitutes of coffee was in the range 1,5 and 3,6%. By analyzing the moisture of the coffee substitutes, we observed that coffee based on barley has the highest moisture and chicory has the lowest value. The caffeine was qualitatively determined by thin-layer chromatography. It was found that all types of the investigated samples contain caffeine excepting decaffeinated coffee. Polyphenols content of the analysed coffee samples varied in the range of 2.8-3.2 mg/g.

Keywords*: coffee analysis, coffee substitutes, polyphenols in coffee, thin-layer chromatography, coffee toxicology*

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STUDY ON EFFECTS OF DISTRUTIVE AGENTS ON THE ARTWORKS

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ABSTRACT

The paper describes a series of effects created by the impact of environmental factors on artworks in museums, as well as the way that active monitoring of these destructive agents (temperature and relative humidity) is done.

Over time, artefacts exhibited within museums are subject to a series of degradations caused by external factors (air components, humidity, temperature, sunlight, bacteria, molds or fungi etc.), which can leave a negative impact on these goods with cultural value.

The main observed negative effects are directly and intimate related to the deterioration of wood sculptures by the occurrence of cracks and the installation of different types of bacteria; the appearance of brownish-red spots on the surface of the paper and the increase in its reliability; various types of corrosion of artworks from different metals; color losses and cracks on paintings etc. The study brings to the fore the damaging effects produced on the different cultural works hosted within the County Art Museum - Art Center Baia Mare.

Key words *– destructive agents, works of art, damage effects.*

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WATER QUALITY ASSESSMENT OF THE USTUROI VALLEY ASSISTED BY THE MACROZOOBENTIC BIOINDICATORS

OANA MARE- ROŞCA[1], ROXANA POP[1], MONICA MARIAN[1], LUCIA MIHALESCU[1], ZORICA VOŞGAN[1], ILEANA GLODEAN[2]

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Abstract

The Usturoi Valley (Basin area = 11.7km2, Length = 5.5km, Average altitude = 458m) is located in the southern region of the Guai Mountains. The nature of the substrate is stony and it is generally made of gravel and sand. The riverbanks are covered with forest vegetation

The macrozoobenthic bioindicators colonize the aquatic environment substratum and they respond according to their tolerance degree to the pressures which influence water quality or aquatic habitats, thus reflecting the conditions in which they live.

Following the macrozoobenthic samples, seasonally yielded during 2016-2017 in Usturoi Valley, it was found that the dominant groups were sensitive or with medium tolerance against pollution, and they were represented by: Amphipoda (33.97%) Ephemeroptera (24.40%) and Chironomidae (20.19%), Trichoptera (10.72%), Plecoptera (3.83%), Oligochaetes(3.73%) other Diptera (2.30%) , Hirudinea (0.29%), Coleoptera, Odonata and Decapoda (0.19%). The oxygen regimen, the nutrients regimen and the saprobic index reveal good quality water in the superior sector (the first quality class), respectively moderate quality for the middle sector (the 3rd quality class)

Key words*: bioindicatori, macrozoobentos, calitatea apei bioindicators, macrozoobenthos, water quality*

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DETERMINATION OF PROPRIETIES OF RAW MATERIALS TESTING INTELLIGENT MACHINES

ELENA POP
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Abstract: *In this piece of work I managed to determine the equation of electrical conductivity of copper wire according to the sulphur, tin and nickel within the raw material. I tested the validity of this equation by comparing the results with the values resulting from the chemical analysis of the already determined wire. Thus, this equation can be used in determining the conductivity of copper wire that is going to be achieved from the raw material (copper cathodes) whose chemical structure is already known.*

Keywords: *materials, copper wire, electrical conductivity*

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