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Book of Abstracts

FOREWORD

The International Research Academy of Science and Art is the host of the forth IRASA International Scientific Conference "SCIENCE, EDUCATION, TECHNOLOGY AND INNOVATION – SETI V 2023".

The conference is multidisciplinary oriented.

Thematic fields of the SETI V 2023 conference are the following:

A. **Science, technology and innovation**
B. **Education and knowledge for the 21 century**
C. **Preservation and improvement of the environment and human health**
D. **Sustainable territorial development**
E. **National security and protection**

The **aims** of the SETI V 2023 Conference are the following:

- Improving knowledge basis for sustainable and resilient local, national, transnational and global development
- Support and harmonization of the implementation of sustainable development goals in society, economy, environment and urbanization
- Strengthening scientific, technological and innovative capacities at local, national and transnational level
- Recommendations for the improvement of education, research and security, and governance of the environmental, urban and territorial development
- Dissemination and intensification of professional communication and establishment of network for joint research, innovation and education
- Dissemination and intensification of professional communication and establishment of network for security challenges and risks in environment and society
- Experience Exchange Based on Best Practices

The results of the SETI V 2023 Conference are presented in two publications:

- The Book of Abstracts,
- The Book of Proceedings.

Belgrade, October 2023 *Editors*

Academician Prof. Vladica Ristić, PhD
Academician Prof. Marija Maksin, PhD
Academician Prof. Jelena Bošković, PhD

KEYNOTE PAPERS

THE FUTURE OF SMART AGRICULTURAL PRODUCTION THROUGH APPLIED INFORMATION TECHNOLOGIES

Jelena Bošković[1]; Vera Popović[2]; Jelena Mladenović[3]; Aleksandar Stevanović[4]; Vladica Ristić[5]; Marija Maksin[6]; Dragan Jovanov[7]

Abstract

It has known that technological opportunities are available for human beings to get out of these predicaments, solving the interconnections between food – water - energy climate nexus, and achieving agricultural transformation from traditional to digital. The aim of this review is to gain holistic solutions in a systematic view, based on water-energy-food resources to agricultural digital transformation that will play role in sustainable development. Digital agriculture combined under precision agriculture and Agriculture 4.0 are handled based on domains covering monitoring, control, prediction, and logistics. Wearable sensor technologies, real-time monitoring systems tracking whole conditions of animals in livestock, the IoT-based irrigation and fertilization systems that help enhance the efficiency of irrigation processes and minimize water and fertilizer losses in agricultural fields and greenhouses, blockchain-based electronic agriculture, and solutions based on drones and robotics that reduce herbicide and pesticide use are handled systematically.

Key words: *Agriculture, monitoring, artificial intelligence, Internet of Things (IoT).*

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PRODUCTIVITY OF NEW LINSEED GENOTYPE NS PRIMUS AND NS MARKO AND POSSIBILITY USE IN MEDICINE

Vera Popović[8]; Jelena Bošković[9]; Viliana Vasileva[10]; Savo Vučković[11]; Vesna Gantner[12]; Elizabeta Miskoska Milevska[13]; Aleksandar Stevanović[14]; Nataša Ljubičić[15]

Abstract

Linseed and linseed oil is a valuable raw material for food and medicinal purposes due to its high content of linolenic acid. *Linum usitatissimum* L. have various properties: antioxidant, immunomodulatory, anti-inflammatory, antimicrobial, antiprotozoal, insecticidal, analgesic, anti-hyperlipidemia, anti-hyperglycemic, anti-tumors and have effects on disease prevention: GI disorders, cardiovascular, urogenital and respiratory diseases. Linseed have application in drug formulations. Because of the great feature of linseed, in this study, the productivity parameters of new genotypes of oil linseed: NS Primus and NS Marko are presented. Morphological productive parameters and quality parameters of the tested linseed varieties were tested: plant height, plant weight, grain yield per plant and oil content. The experiments were carried out on the plots of the Institute of Field and Vegetable Crops in three repetitions, with the aim of testing stability and productivity. Genotype had a significant influence on the examined morpho-productive parameters. By applying the new, improved varietal production technology, we can successfully face the climate changes that are more and more present from year to year, and which certainly determine the direction of future development. The new genotypes of linseed have achieved excellent performance and are recommended for wider production both in our country and in neighboring countries primarily due to the great technological importance of linseed products.

Key words: Linseed, new genotypes, *NS Marko, NS Primus, Importance for health.*

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INTRODUCTION TO THE PHASE DIAGRAMS AND THEIR POSSIBILITIES

Yong Du[16]; Milena Zečević[17]; Aleksandar Đorđević[3]; Duško Minić[4]

Abstract

Knowledge of phase diagrams is very important today. The key point for estimating a phase diagram is the thermodynamic data set. The reason for establishing a thermodynamic data set is the future development of materials and their possible application. Examples of various diagrams A-B and A-B-C. How to read information from phase diagrams and how to obtaine correct phase diagrams. Experimental methods which are essential for description of phase diagrams.

Key words: *Various phase diagrams, A-B systems, A-B-C systems.*

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DEVELOPING COGNITIVE ABILITY IS CORRELATED WITH ACTIVE PHYSICAL TRAINING, AND HOW DOES LEARNING A FOREIGN LANGUAGE FIT INTO IT?

Slobodanka Đolić[18]; Alina-Mihaela Stoica[19]

Abstract

Research suggests that physical activity and exercise have a positive impact on cognitive ability in students, including memory, attention, and information processing. Learning a foreign language is supposed to benefit from chemical substances in the brain, such as endorphins, released while engaged in physical exercises. This is to say that the chemical process happening in the brain improves mood, reduces stress, and stimulates the growth of new brain cells. Learning a foreign language can also have a positive impact on cognitive ability. Linguistic studies have shown that bilingualism can enhance memory, attention, and problem-solving ability. Additionally, it decreases and delays the onset of dementia and Alzheimer's disease because learning a new language engages and strengthens the brain's cognitive processes, such as executive function and working memory. Physical activity is a means of stimulating brain activity in language learning, in our case, a foreign one. In conclusion, we can say that when physical activity and learning a foreign language are combined, a unique and powerful way to boost cognitive activity is created. Physical exercise can help to prime the brain for language learning by improving focus and attention, reducing stress and anxiety, and promoting mental agility. Meanwhile, learning a foreign language can act as a cognitive workout, challenging the brain to process and interpret new information from teaching materials and strengthening neural connections. This article aims to discuss the need for incorporating physical activity into language learning to become routine with numerous benefits for developing cognitive ability by helping students to enhance memory and focus attention to achieve problem-solving skills while also making an impact on promoting overall well-being and cognitive longevity in the student.

Keywords: *Cognitive ability, L2 learning skills, physical activity.*

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APPROACHES IN CROP PRODUCTION IN RESPONSE TO CLIMATE CHANGE

Viliana Vasileva[20]; Nataliya Petrovska[21]; Valentina Valkova[22]; Mima Ilchovska[23]; Emil Vasilev[24]; Ana Marjanović Jeromela[25]; Vera Popović[26]; Savo Vučković[27]

Abstract

Climate changes that have occurred recently are a serious risk for agriculture. Agriculture strongly depends on climatic conditions and, consequently, it is one of the most vulnerable sectors to the risks of global climate change. An encrease in average annual temperatures, prolonged droughts in spring and summer, increase in the concentration of CO_2 in the atmosphere strongly require adaptation of agricultural crops and their diversification under changed agroecological conditions. In addition, the human population is expected to double in the future so there will be a need to double the food production. As a result of the negative effect of climate change, yields and the quality of production from traditional crops (wheat, maize, sunflower, legumes) are decreasing. The report concern possibilities for applying different approaches as promising tools for adapting crops to changes and more easily overcoming their consequences. Intercropping system (growing two or more crop types on one field) is considered as one of the most efficient approach. In this system of cultivation, environmental resources viz. water, soil, and food resources are maximally used due to the presence of two or more types of crops, the yield obtained is higher and of better quality. This also reduces the damage caused by enemies, diseases, weeds. In a cereal–legume intercropping, the major source of nitrogen is its fixation by the legume component, thus the amount of soil nitrogen increased and enhances the nitrogen uptake in cereals. And as a final result, the economic stability of the system increased. The selection of crops should be aimed at their lower sensitivity, tolerance to adverse changes, to have such adaptability as to mitigate adverse effect. The increased concentration of CO_2 in the atmosphere leads to more intensive photosynthesis, which accelerates plant growth. A higher temperature sum also extends the growing season, but a higher temperature negatively affects growth and productivity. Raised temperatures may benefit some crops in some places but disadvantage others. Both the changes in sowing dates and the use of longer season

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cultivars are considered as management options to counteract the warming effect. Appropriate agronomic practices should be applied and adapted cultivars should be used to increase productivity beside climate change effects.

Key words: *Climate changes; inter-cropping system; appropriate agronomic practices.*

THE IMPORTANCE OF MEDICINAL PLANTS WITH ANTI-INFLAMMATORY ACTIVITIES

Marko Burić[28]

Abstract

Inflammation is caused by bacterial, viral, fungal infections and defective immune response. The use and study of medicinal plants in traditional medicine is an important for the development of new remedies. Besides various synthetic anti-inflammatory agents, herbal medicine still plays a major role to cure various health conditions. Application of various nonsteroidal anti-inflammatory drugs the pain decreases and inflammation by blocking the metabolism of arachidonic acid by isoform of cyclooxygenase enzyme, but also reducing the production of prostaglandin. The European continent is rich with many medicinal plants with anti-inflammatory activities no side effects. This study indicates the importance of medicinal plants with traditional anti-inflammatory use. In our country, the many herbs is used for the treatment of chronic inflammations of causes. Examples of herbs traditionally used to treat inflammation in Western medicine are *Matricaria chamomilla* L. and *Arnica montana* L. (Asteraceae), *Salix alba* (Salicaceae), and *Glycyrrhiza glabra* (Fabaceae). *Matricaria chamomilla* L. is used in traditional medicine to treat of diseases, including infections, neuropsychiatric, respiratory, gastrointestinal, and liver disorders, as a sedative, antispasmodic, antiseptic, and anti-inflammatory. Essential oils are composed of terpenoids, phenolic compounds, including phenolic acids, flavonoids, and coumarins. *M. chamomilla* essential oils and extracts showed antioxidant, antibacterial, antifungal, anticancer, antidiabetic, antiparasitic, anti-inflammatory, anti-depressant, anti-pyretic, anti-allergic, and analgesic activities. The willows (genus Salix), represents a valuable source of biologically active compounds among them salicin, a prodrug for salicylic acid. Willows have 322 secondary metabolites were characterized in the genus including flavonoids, phenolic glycosides, organic acids, sterols and terpenes, lignans, volatiles and fatty acids. Willows exert analgesic, anti-inflammatory, antioxidant, anticancer, cytotoxic, antidiabetic, antimicrobial, antiobesity, neuroprotective and hepatoprotective activities. *Glycyrrhiza glabra* L. (Licorice) that has been traditionally used to treat: respiratory disorders, epilepsy, paralysis, stomach ulcers, hyperdipsia, fever, sexual debility, rheumatism, skin diseases, hemorrhagic diseases, and jaundice. It is necessary to continue research with medicinal plants in order to find the most effective plants for the treatment of diseases, i.e, to evaluate the anti-inflammatory activities of this plants and to validate their use in traditional medicine.

Key words: *Medicinal plants; anti-inflammatory activities; importance for health.*

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PHYTOMEDICINE AND THE COVID-19 PANDEMIC

Dragan Jovanov[29]; Supriya Kumaravelan[30]; Jelena Bošković[31]

Abstract

The most common complication in COVID-19-affected patients appears to be acute respiratory distress syndrome. There has been varying among pharmaceutical and researcher to devise a cure. The phytotherapy or the phytomedicines have been acknowledged as effective immunity booster and potential to eliminate the viral infection. The Chinese approach toward traditional herbal medicines has already been acknowledged as antiviral and RNA synthesis inhibitors globally. The secondary metabolites of plants such as alkaloids, flavonoids, phenolic acids, and terpenoids have been the source of countless medicinal compounds. For example, well-known antimalarial chloroquine phosphate (analogue of quinine, originally extracted from the bark of cinchona tree) has broad-spectrum antiviral activities. Antiviral phytomedicines have already been used in past two coronavirus outbreaks, that is, SARS-CoV and MERS-CoV. Ethnobotany or the folklore knowledge of medicinal plants, for instance, has also played a major role in the development of new drugs for centuries. Some species such as Lycoris radiata, Artemisia annua, Lindera aggregata, Isatis indigotica, Torreya nucifera, and Houttuynia cordata have already have proven their efficacies against certain ailments. Different plant parts can be consumed as raw or be modified into decoctions and tea for maximizing their effectivity. Moreover, phytochemicals can be regarded as best source of alternative and cheaper counterparts to synthetic medicines.

Key words: *Phytochemicals, antiviral agents, immunity, medicinal plants, COVID-19.*

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TOURISM DESTINATIONS SUSTAINABILITY - PROTECTED AREAS CASE

Snežana Štetić[32]; Florin Nechita[33]; Igor Trišić[34]

Abstract

Tourism is an activity that is in a constant process of change. Tourist destinations attract or repel potential visitors due to their characteristics. A region that used to satisfy all needs for rest and recreation, today must have exceptional specifics to attract tourists. This paper discusses the segments of tourist demand according to special or specific forms of tourism. Particular emphasis is directed towards protected areas that attract an increasing number of tourists, which affects the internal development of the local community. Therefore, the importance and impact of tourism on the further preservation or devastation of these areas must be taken into account. Modern tourism develops depending on the needs and preferences of tourists. For modern tourism, the classic division into countries of tourist supply and countries of tourist demand has long been overcome. Open borders are a basic prerequisite for the development of tourist destinations. Foreign currency inflow is very important in the economies of all countries in the world. Today, a special kind of tourist demand for protected natural environment is very noticeable. The search for a "sustainable degree of interaction between nature and man; nature and tourism, as well as man and tourism" should give us an answer and a guide for planning the growth of tourism in the function of preserving the environment. That is why the authors in this paper, through research, show the interaction between the development of tourism and local tourist communities in protected areas. On this occasion, the strong and weak points of tourism development are pointed out, which influence the shaping of tourist destinations and local communities.

Key words: *Sustainable development, protected areas, tourist destination, specific forms of tourism.*

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VIOLENCE IN SCHOOLS AS AN INDIRECT THREAT TO NATIONAL SECURITY

Mirko Smoljić[35]

Abstract

Violence in schools represents an important social problem although it is often considered a local issue, it can represent an indirect threat to national security. This paper examines the connection between school violence and its potential impact on national security. Schools represent the fundamental institutions of society, they play a key role in shaping future generations and providing stability. When schools are places of violence, it can destabilize the social structure, creating the conditions for wider social problems such as crime, radicalization and social disintegration. Violence in schools, whether verbal, physical or through cyberbullying, can cause long-term psycho-social consequences for victims, including mental health problems, social isolation and increased risk of criminal behaviour. Such consequences can raise the general level of insecurity and fear in society, which can lead to the violation of the fundamental values of society and the security of the nation. In addition, schools are places where the values and norms of society are transmitted to young people. If violence is tolerated, the message is sent that violence and intimidation are acceptable ways to resolve conflict, and this can undermine social cohesion and lead to social divisions. Finally, this paper emphasizes the importance of comprehensive and effective policies and programs to prevent violence in schools. This ensures not only the safety of students, but also the long-term stability and security of society.

Key words: *Violence in schools, violence prevention policies, social disintegration, national security.*

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NORTH KOREA - SECURITY ASPECT OR INFORMATION TECHNOLOGY DEVELOPMENT

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Abstract

North Korea has been developing its military hardware for years and seems to be progressing well in developing civilian information and communication technologies. In the second decade of the twentieth century, there was little information about the economic activity of North Korea, mainly its military activity is analysed. However, the fact that North Korea ranks among the most advanced countries in information technology production is little known. This paper presents the efforts and goals of the state leadership and IT experts of North Korea to join the demanding and turbulent world market in the field of information technologies by relying primarily on their own strengths but also by using the knowledge and achievements of other countries and that, despite numerous problems, they are developing into respective producers in the IT industry. This confirms that the national environment plays a central role in the competitive success of not only companies but also the economy as a whole. According to that criterion, both entities get their places on world markets. Could this determination in development be the beginning for Serbia and its strategic determinations? North Korea's strategy was to embark on computerization without prior industrialization, which would otherwise take time and require huge investment. North Korea largely ignored the revival of industries and infrastructure. For the most part, this country has, for years, been torn between strengthening security or an accelerating industrialization supported by information and communication technologies.

Key words: *North Korea, information technology, personnel education, industrialization, security, nuclear program.*

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A
SCIENCE, TECHNOLOGY AND INNOVATION

GENETIC APPROACH AND EXPLANATION OF INTELLIGENCE

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Abstract

The brains of some people seem to be more efficient than the brains of others, but what is the neurobiological basis of human intelligence? The former focuses on identifying genes and genetic loci linked to intelligence, while the latter identifies the macroscopic structure and function of the brain to identify the brain regions involved in intelligence. How the characteristics of brain cells relate to intelligence is a mystery. However, the development of transcriptomics and cellular neuroscience of intelligence may offer a third approach and close the gap between genes for intelligence that have been identified and brain structure and function. We also go over the initial research that indicates a connection between particular brain cell populations and intelligence. Finally, we emphasize how particular genes that have been discovered produce cellular characteristics linked to intelligence and may eventually explain the structure and operation of the involved brain regions. By doing this, the way is cleared for a cellular understanding of intelligence, which will offer a conceptual framework for comprehending how the identified gene constellations support the cellular processes that underpin intelligence.

Key words: *Intelligence, temporal cortex, frontal cortex, pyramidal cells, dendrites, GWAS of gene expression, action potentials.*

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GENETIC RESOURCES AND CHARACTERISTIC OF SOME TRADITIONAL SUMMER PEAR VARIETIES IN MACEDONIA

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Abstract

The fruit characteristics of 8 traditional summer pear varieties were investigated: Carigradsko avche, Evropejsko avche, Siten Burnusus, Mustabej, Sinec, Letna kajkushka, Karamanka and Drvenjak. The largest fruits are produced by the varieties Karamanka (172.3 g) and Drvenjak (156.7 g). The pear varieties Drvenjak, Karamanka, Sinec, Carigradsko avche and Evropejsko avche has a long fruit stalk (over 3.5 cm). The largest number of healthy seeds are found in the fruit of the pear Letna kajkushka (4.4). The variety Mustabej has the firmest fruits (2235.5g/cm^2), with the highest content of soluble dry matter (14.2 %) and the lowest content of total acids (0.09 %). The fruits of the pear variety Drvenjak contain the highest value of total sugars (15.4 %). For all investigated fruit properties are found statistically significant differences between the researched varieties. The pear varieties Drvenjak and Karamanka produce the largest, high-quality fruits, with a very good to excellent taste.

Key words: *Pear, fruit characteristic, traditional, summer varieties.*

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USING NEW GROWING TECHNOLOGY AND EDUCATION TO SUCCESSFUL PRODUCTION UNDER THE CONDITIONS OF CLIMATIC CHANGES

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Abstract

Agriculture depends to the greatest extent on climatic conditions. Plant production in Montenegro has been faced with numerous challenges in recent years due to climate change. Due to climate change, sowing or harvesting is often delayed because extreme droughts or rainfall simply do not allow planned operations to be carried out in time. Extremely high temperatures have a stressful effect on plants, as a result of which yields, grain quality are drastically reduced. Often crops are exposed to very long dry periods. The construction and implementation of an irrigation system is a necessary measure, as well as agro-technical measures such as crop rotation, soil conservation treatment and use of organic mulch will reduce water losses from the soil. Thanks to climate change, the appearance of new invasive species of weeds and pests and the appearance of new plant diseases is evident. In the fight against climatic changes, the most important thing is the education of agricultural producers and the application of improved cultivation technology, because this is how abiotic stress is alleviated and satisfactory plant production is achieved. Adaptation measures and adaptation of agricultural production to climate change should be carried out systematically, taking into account all the threats the come. In order to successfully adapt to climate change, it is necessary to focus the selection on the creation of new varieties that are adaptable and stable to succeed in the new climatic conditions.

Key words: *Abiotic Stress, climatic change, irrigation, selection.*

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SIGNIFICANCE OF NEW PLANT BREEDING TECHNOLOGIES FOR SUSTAINABLE AGRICULTURE AND FOOD SECURITY

JelenaBošković[53]; Jelena Mladenović[54]; Vera Popović[55]; Aleksandar Stevanović[56]; Vladica Ristić[57]

Abstract

In the scenario of a new agriculture, breeding techniques are expected to play a significant role in order to increase the sustainability of productive processes from an environmental, economic, and social point of view. Over the past 50 years, new breeding strategies have been developed alongside the integration of various techniques, the development of in vitro techniques, and the development of molecular strategies. The use of New Breeding Techniques (NBTs) based on thorough understanding of the genome of species and varieties will enable the development of new results that overcome the constraints of conventional breeding techniques and their length while minimizing the risks of the first generation of molecular breeding tools. The use of high-throughput mutant libraries, the development of methods for fine-tuning gene regulation, strategies for breeding virus resistance, and applications of genome editing for trait improvement are all summarized here. We discuss potential applications of genome editing in domestication and synthetic biology of plants, as well as developments in delivery techniques, editing specificity, homolog directed repair, and gene drives. Our discussion of precision plant breeding's promising future in agriculture concludes with a discussion of the challenges and opportunities facing this field.

Key words: *New Breeding Techniques (NBTs), genome editing, CRISPR/Cas, precision plant breeding, trait improvement.*

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3D FOOD PRINTING: SUSTAINABLE FOOD MANUFACTURING FOR THE 21ST CENTURY

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Abstract

Three-dimensional printing (3DP) of food is a new sustainable technology increasingly preferred by researchers and industry due to its ability for personalization and novelty. It is a digitized additive manufacturing process in which an object is built up layer-by-layer from a 3D computer program with high accuracy and quality of the design. This enables the production of complex product geometries that would be difficult or impossible to achieve using conventional production methods. Currently, 3DP is being explored in the food sector in many areas, such as food customization, personalized and digitized nutrition, supply chain simplification, and expanding available food sources. However, some challenges associated with the use of 3DP limit its broader application. This is mainly related to food safety and the limited range of foods that can be printed, as this is highly dependent on their rheological and physicochemical properties. However, this technology has promising potential applications in improving food manufacturing, such as the production of innovative 3D functional foods, especially in times of global crisis similar to those currently experienced around the world. Although this technology is in line with Industry 4.0 guidelines, more research is needed prior to mass application in manufacturing, especially those related to food ingredients and formulation, safety studies and cost/technical aspects of the food printer itself.

Key words: *3D printing, functional food, industry 4.0, sustainability.*

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PROPOSAL OF MEASURES TO INCREASE THE OPERATIONAL LEVEL OF RELIABILITY OF AGRICULTURAL PTO SHAFTS

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Abstract

In order to implement a continuous process of exploitation of agricultural machinery and the safety of its operators, the paper proposes measures that can increase the reliability of agricultural cardan shafts. Based on the presented problems that limited the use of agricultural cardan shafts and defined reasons for their low service life, measures are proposed to increase the operational level of reliability of agricultural cardan shafts. These measures are primarily based on applying two technical solutions for diagnostics of the existing condition of cardan shafts, maintenance and proper use.

Key words: *PTO shafts, agricultural machines, methods, diagnostics, maintenance, exploitation.*

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MODERN ORGANIC AGRICULTURE IN ACCORDANCE WITH GLOBAL GAP STANDARD AND HACCP SYSTEM

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Abstract

Organic production is aimed at further development, not only from the aspect of environmental protection and improvement of human health, but also from the point of view of economic prosperity. The aim of this paper is to contribute to the understanding of the importance of organic production from the aspect of health safety of organic food, as well as to show the health and environmental benefits of organic production based on the Global Gap standard. The Global Gap system is a measure to ensure the quality of foodstuffs, i.e. of agricultural products from planting to factory processing, given that the goals of this system are food safety by applying the HACCP principle, using the principles of good agricultural practice, environmental protection, health and safety of employees, care for the social condition of employees, care for animals. The strictly controlled and certified method of organic production, with the application of preventive measures, results in a health-safe product of high nutritional and biological value, rich in macro and microelements that favorably affect immunity, regenerative processes and the vitality of the human organism. Research shows that organic products do not contain additives and pesticides, but contain as much as 63% more potassium, 73% more iron, 125% more calcium and 60% more zinc than products obtained by conventional production. Although it is more expensive (30-50%), consumers buy this food primarily for health reasons and better taste. Serbia has good opportunities for organic agriculture, but there is a lack of adequate state support and an organized market. Without the help of the state, this production can hardly withstand the competition of conventional, because the effects are visible only after a long series of years.

Key words: *Organic agriculture, Global Gap, HACCP system, health-safe food, environmental protection*.

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METHODS FOR MICROORGANISM DETECTION IN FOOD

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Abstract

Detection of microorganisms in food plays a crucial role in ensuring food safety. This review presents various methods for the detection of microorganisms in food. The methods encompass traditional techniques such as selective media cultivation, as well as molecular techniques like PCR and real-time PCR. Immunological methods, including ELISA, rapid tests, and FIA, are also covered. Innovative methods such as biosensors and NGS are described as well. Each of these methods has its advantages and limitations in terms of sensitivity, speed, practicality, and equipment requirements. The choice of an appropriate method depends on the specific analysis needs and laboratory resources. This review provides a concise overview of the advantages and limitations of each method, as well as their potential applications in the food industry. Understanding the different methods for microorganism detection enables rapid and reliable food analysis to identify and control potentially present pathogens. This work aims to provide useful guidelines for selecting suitable methods for microorganism detection in food to preserve public health and food safety.

Key words: *Microorganism detection, food safety, molecular techniques, immunological methods, biosensors, next-generation sequencing (NGS).*

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THE SIGNIFICANCE OF AMARANTHUS IN ORGANIC AGRICULTURE I ITS PHYTOPHARMACOLOGICAL BENEFITS

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Abstract

Extracts derived from these plants' medicinal and bioactive constituents are utilized in the production of dietary supplements, health-safe food, medicinal products, and cosmetics. Among the pseudocereals widely cultivated in organic agriculture, amaranth, buckwheat, and quinoa play pivotal roles. These pseudocereals are characterized by their substantial content of starch, protein, β-carotene, dietary fiber, minerals, vitamins, and other bioactive constituents. Of particular interest is *Amaranthus caudatus* L. (Amaranthaceae), which has garnered increasing scientific and industrial attention owing to its remarkable bioactive properties, diverse phytochemical composition, and extensive range of pharmacological actions. In contrast to wheat, rice, and oats, amaranth seeds are gluten-free and contain 30% more proteins with a well-balanced amino acid profile. Beyond its nutritional value, numerous studies have highlighted the significance of *A. caudatus* as a potential source of biologically active compounds, exhibiting anti-diabetic, anti-hyperlipidemic, anti-inflammatory, and anti-hypercholesterolemic effects, as well as antioxidant and antimicrobial activities. By incorporating amaranth into our diets, we can harness the manifold benefits of this remarkable pseudocereal, ultimately fostering health promotion and disease prevention. This work serves as a catalyst for further scientific investigations in this field, paving the way for innovative technological advancements within the realms of food, pharmaceuticals, and cosmetics that harness the potential of this extraordinary plant.

Key words: *Amaranth, organic agriculture, biological activity, phytopharmacological properties, health benefits*.

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MICROSTRUCTURAL, MECHANICAL AND ELECTRICAL PROPERTIES OF THE ALLOYS FROM TERNARY Bi-Ni-Pb AND Bi-Ni-Ge SYSTEMS

Aleksandar Đorđević[81]; Milena Zečević[82]; Duško Minić[83]

Abstract

In this study were investigated effect of chemical composition on the microstructure, hardness and electrical conductivity profiles of the Bi-Ni-Pb and Bi-Ni-Ge alloys. Microstructures of alloys have been observed out by using optical microscopy and experimental analysis of the microstructure was carried out using scanning electron microscopy (SEM). Compositions of alloys have been detected by energy dispersive spectrometry (EDS) and phases presented in microstructures by X-ray diffraction (XRD) analysis. For ternary Bi-Ni-Pb and Bi-Ni-Ge systems, extrapolated is isothermal section at 25 °C using optimized thermodynamic parameters from literature. Based on the results obranied with EDS and XRD analysis, good overall agreement between experimental and calculated values was obtained for predicted phase equilibria. Thermodynamic calculations of the isothermal sections were performed by using Pandat software. Were measured the Brinell hardness and electrical conductivity of selected alloys were measured and by using ANOVA analysis is suggested mathematical model for calculation properties for every composition of alloys.

Key words: *Isothermal section at 25 °C, mechanical and electrical properties, microstructure test, mathematical modeling.*

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ROOT FUNCTIONS

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Abstract

We obtain the concept of roots by solving algebraic equations, and therefore, we can often hear that instead of algebraic equations solutions, it is said the roots of an algebraic equation. However, if the term root is not clearly and precisely defined, or if the expanded notion of the root is used while neglecting that some important properties of the root are lost that way, mistakes may occur that still can be found in some workbooks and mathematics textbooks. This paper presents a novel and systematic approach to the study of root functions and a review of general root functions. The most frequent errors in textbook literature related to the term root are also listed.

Key words: *Algebraic equation, root, root function, general root.*

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EARTHQUAKE DYNAMICS AND DEMANDS FOR CHANGES TO LAWS RELATING TO NEW BUILDING REGULATIONS

Branko Babić[86]

Abstract

Earthquakes are a natural process of energy dissipation as the mass of the planet responds to planetary dynamics. On our planet, land masses the size of continents grind against each other as they are dragged about by the convective currents of the molten magma and it is the griding action of the adjacent intercontinental plates that cause tremors. The Earth's surface layers, will continue to float on the molten mantle for millions of years to come so tremors will always be with us and given that the African Plate is sub-ducting the Eurasian Plate, Serbia, will for all time be subject to ever stronger tremors, that will deform its surface topography. In time, the Serbian land mass will buckle to form a Himalayan type geographic relief. NASA space research probes show that earthquakes are detected on other planets in our solar system even though these plants do not have a molten core. The mechanics of planetary mass movement responding to gravitational forces and charged plasma build up formed by friction and electrical discharge are also discussed. Members of IRASA have deposited a number of Patent Applications at the Belgrade Office and elsewhere in the world, specifying ways of dissipating the energy released by the grinding plate tectonics. This knowhow, minimises the carnage of tremors and a number of Granted Patents and Copyright Applications are presented which discuss ways of dissipating energy to minimise the destruction and structural collapse during earthquakes. The continuance of tremors of the Serbian geography, demand that Laws relating to New Building Regulations be changed, to formalise requirements for all new building established on Serbian land to be earthquake proof. The demanded changes to the Law, will in generations to come, ensure that all buildings will be stable during earthquakes and the loss of life and property will be minimised during tremors.

Key words: *Earthquakes, tectonics, Serbia, Law, new construction.*

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NONLINEAR ANALYSIS OF STRUCTURES

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Abstract

This paper presents the influence of counter-plates on increasing the M-F characteristics of a semi-rigid one-sided connection of a steel beam and column with the application of numerical modeling of nonlinear analysis. The goal of this analysis is to compare the results of seven models obtained by the numerical procedure, where the influence of the change in tile dimensions by thickness and dimensions was analyzed, and for a more accurate way of determining the stiffness of the connection, an adequate experimental analysis is required, as an authoritative check of the theoretical and numerical analysis of the problem. Due to the complexity of performing the experimental method, powerful software packages, developed on the basis of finite elements, are used as the first alternative to verifying theoretical assumptions for the purpose of analyzing structures for commercial and scientific purposes. For the modeling of this connection, the software package ABAQUS version 6.11 was used, which is one of the most modern packages for simulating a wide range of engineering problems. Like other software packages, ABAQUS is based on the basis of finite elements, which allows us absolute control over the choice of the type and size of the finite element used in the analysis, as well as the method of calculation that will be carried out on the specific model.

Key words: *Nonlinear analysis, M-F characteristics, semi-rigid one-sided connection of a steel beam and column.*

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B
EDUCATION AND KNOWLEDGE FOR 21 CENTURY

ADVANTAGE AND DISADVANTAGES OF NEW EDUCATION POLICY 2020 IN INDIA

Shailja Vasudeva[90]

Abstract

Education is a system in which knowledge, values and morals share to one generation to another. It is a process of learning. There are two types of educations, one is formal education and other is informal education. Formal education is related to Universities, Schools, Academies and colleges education. One can achieve formal education from any of teaching institutes. If we talk about informal education then, informal education is related to that education which started from our home, society, workplace and media etc. We learn through informal education how to cook, how to talk, how to walk, how to speak and how to adjust. Informal education cannot provide by any educational Institute. In India we can define Indian education system in two parts. One is pre independent education system and other is post independent education system. The main objective of this paper is to discuss about the both types of education system pre independence and post-independence. And this paper will give focus about all implemented education policies in India till date. This paper will be specially give emphasis on New Education Policy 2020. This paper will also give detail description about the advantage and disadvantages of New Education Policy 2020 in India.

Key words: *India, education, education system, New Education Policy 2020, advantage and disadvantage,*

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THE FUTURE AND CHALLENGES OF CHAT GPT

Hadžib Salkić[91]; Marija Kvasina[92]; Almira Salkić[93]; Aldijana Omerović[94]

Abstract

The future of Chat GPT promises many opportunities and developments, however, there are also challenges it faces, such as the reliability of responses, the risk of incorrect information and the need for monitoring to avoid potential abuse or manipulation. Therefore, it is important to continue to develop and apply ethical guidelines and quality control in the use of Chat GPT. Challenges such as advances in quality and understanding, ethical challenges, quality control and surveillance, personalization and customization, and multimodality are presented in this paper. In addition to numerous advantages, Chat GPT also has its disadvantages and faces certain threats such as lack of control and incorrect responses, dependence on training data, potential abuse and lack of awareness of artificial intelligence.

Key words: *Chat GPT, challenges, development, shortcomings.*

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APPLICATIONS AND IMPACT OF CHAT GPT

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Abstract

ChatGPT is a very capable and flexible UI tool that provides a wide range of capabilities and applications for various industries and companies. Although it may still have some limitations, it is a valuable tool that can certainly have different applications and impacts in different areas. Examples of applications and impacts of Chat GPT presented in this paper are: user support and interaction with users, content generation, education and training, research, art projects and interactivity. The impact of Chat GPT is visible in facilitating communication and interaction with computers. It can improve user experience, provide faster and more efficient responses, and improve productivity in different areas.

Key words: *Chat GPT, applications, impact.*

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SOME CONSIDERATIONS OF DEVELOPING MULTILITERACY THROUGH FOREIGN LANGUAGE TEACHING

Lidija Beko[99]

Abstract

The intention of this paper is to offer an example of the application of multiliteracy in English language teaching for geology students. We believe that multiliteracy or/and digitalization are key to our students' ability to create and transform multiple concepts and meanings through various visual, oral, written, digital, and other forms of communication. At the Faculty of Mining and Geology, we have already piloted several models, the application of which gave good results. For the sake of clarity, in the introductory part we will refer to the contemporary need for multiliteracies among our students. In the first part of the paper, a general overview of the use of flash cards for vocabulary acquisition is given. In the second part of the paper, the use of scientific comics is explained in detail. Observing language learning in this way, it becomes clear that the most important task in foreign language teaching is the balanced exposure of the student to different forms of literacy to achieve improved results in language expression and production.

Key words: *Multiliteracy, digitalization, language teaching, geology, flash cards, scientific comics.*

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MULTILINGUALISM AND PROFESSIONAL IDENTITY

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Abstract

The actual position of foreign languages for specific purposes (LSP) at Serbian universities often shows how much university authorities do not understand the specificity and importance of knowing foreign languages which serve purposes of a variety of professions and sciences. Furthermore, multilingualism, which was present at our universities until the late 1990s, is disappearing and the orientation to "English only" is considered to be more economical and easier to organize, but it is certainly not culturally justified or wise because it impoverishes both the individual and society, and can have long-term negative consequences for our economy and culture. The aim of this paper is to present the position of LSP as a subject in the curricula of Serbian universities and the position of LSP teachers, as well as the disappearance of multilingualism. The importance of multilingualism for the development of professional identity of students and academic staff is obvious when certain number of European university mobility programs cannot be used as a result of insufficient linguistic competences. That leads to the failure to develop cooperation among various countries and institutions that have something to show and offer, which certainly impoverishes European educational space.

Key words: *Multilingualism, language for specific purposes, professional identity, European university mobility programs, Serbian universities.*

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IMPLEMENTATION OF THE CULTURE OF ESP IN ESP CLASSES: AN ANALYSIS OF THE CULTURE-ORIENTED INSTRUCTIONAL APPROACH TO STUDENTS

Nataša Lukić[101]; Jelena Vukićević-Nešić[102]; Zorana Jurinjak[103]

Abstract

Culture is an all-encompassing phenomenon that permeates various domains of human existence and is assimilated into multiple facets of human life. Comprehending culture as the fundamental basis of each and every entity facilitates a more comprehensive grasp of its broader framework, thereby illuminating its underlying connotations beyond its tangible and apparent attributes. Through the examination of the culture of a particular entity, one can gain a deeper understanding of its intricacies, discern its practical applications and inherent worth, and situate it within a specific and enhanced framework. From this perspective, this paper emphases the Culture of English for Specific Purposes, and gives its theoretical basis. The objective of this study is to examine the efficacy of a culture-oriented approach in the instruction in English for Specific Purposes (ESP) classes. To this end, the study centers on the implementation of the Culture of English for Specific Purposes and its influence on the academic accomplishments of students, with the objective of determining whether ESP students can benefit from adopting the culture of ESP. The quantitative research methodology was employed to statistically analyses numerical data for the purpose of testing the stated hypothesis.

Key words: *Culture, the culture of ESP, implementation, quantitative research, academic accomplishments of students.*

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CONSISTENCY AND PERSPECTIVES OF CULTURAL POLICY

Dženana Huseinagić[104]

Abstract

Integrating cultural, educational and scientific activities into European social values is a permanent path that will be increasingly enriched with new contents, overcoming the inherited relationships in terms of the separation of these social activities from the overall socio-economic development. One of the main agents of this transformation is the organization and functioning of the society's system, which will ensure a free and equal exchange of the results of these activities on the basis of overall material, programmatic, organizational and all other unique interests. An illustration of the constant process of democratization of cultural life as a whole, as well as the development of art, education and science within that framework, is the system of international cooperation, which arises from the essence of the globalized world. These are just some of the facts that mark the current cultural trend, which are gaining more and more momentum and impulse with the further development of society. Adopting new legal solutions based on the influence of European values would begin to confirm the essence of the modern constitution and realization of culture as a whole, primarily in terms of connecting the interests and work of all activities in society.

Key words: *Culture, art, science, democratization, European values in culture.*

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THE ROLE OF EMPLOYEE EDUCATION AND THE IMPORTANCE OF SKILLS DEVELOPMENT FOR CORPORATE SOCIAL RESPONSIBILITY

Aleksandra Kovačević[105]

Abstract

Jobs are becoming more and more complex, global, competition and the labor market have a great need for a more specialized workforce, a workforce that is constantly improving. Today's business world requires educated employees who will be able not only to upgrade science and technology, but also to set new requirements and goals. Which is why it is necessary to use the means offered by modern teaching techniques and technology. Successful companies in the world view employees as a primary development resource. The social goal of the work is for this work to be useful in practice with the aim of finding solutions for those who deal with training and education of employees. It is very important to note that the potential of a developed country depends a lot on the human resources available to the community. The goal of the realization of this work and the research itself is to determine the role of education and training of employees in the company. Determine the importance of developing skills for achieving socially responsible business. The attitudes of respondents of different ages and qualifications were compared with a positive attitude towards the application of employee training in business processes.

Key words: *Knowledge, human resources, education, efficiency, technology, society.*

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ENTREPRENEURSHIP AND EDUCATION AS KEY FACTORS FOR THE DEVELOPMENT OF INNOVATIVE CULTURE

Slobodan Milić[106]

Abstract

In this paper, the author researches the connection between entrepreneurship and education as essential factors for innovative culture development in society. Entrepreneurship is increasingly becoming the main engine of economic growth and development, while on the other hand, education has the task of preparing future entrepreneurs and innovators. Also, in addition to encouraging innovation and economic growth, entrepreneurship influences the creation of new jobs. It is of exceptional importance for developing countries, especially the ones in transition or going through a turbulent transition period. Also, in addition to encouraging innovation and economic growth, entrepreneurship affects the creation of new jobs. It is of exceptional importance for developing countries, especially the ones in transition or going through a turbulent transition period. Education should provide the fundamental knowledge and skills needed to succeed in the entrepreneurial world. A strong connection between entrepreneurship and education is crucial to creating an entrepreneurial culture that will sustain innovation, job creation, and economic progress in society.

Key words: *Entrepreneurship, education, innovation, entrepreneurial culture.*

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C
PRESERVATION AND IMPROVEMENT OF ENVIRONMENT AND HUMAN HEALTH

NATURE-BASESD SOLUTIONS AS A TOOL FOR CLIMATE RESILIANCE

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Abstract

Nature-based solutions (NbS) are strategies and sustainable approaches that utilize and work with nature to address various environmental challenges, integrating nature's benefits into decision-making processes and promoting the conservation and restoration of ecosystems. NbS could play an important role in enhancing climate resilience by leveraging the power of nature to address climate change impacts and build adaptive capacity. They offer multiple benefits for climate resilience by mitigating greenhouse gas emissions, enhancing natural resource management, conserving biodiversity, and providing adaptation strategies to climate-related risks. Examples of nature-based solutions include ecosystems restoration, sustainable agriculture practices, green infrastructure (e.g., green roofs and permeable pavements), urban parks and green spaces, natural flood control measures, and coastal ecosystem protection. By restoring and conserving ecosystems, NbS help natural ecosystems and communities better cope with and adapt to climate changing conditions, including extreme weather events, sea-level rise, and habitat loss. The purpose of this paper is to provide an overview of the use of NbS in addressing environmental challenges focusing on their application for decrease of climate-related flood and drought risks.

Key words: *Nature-based solutions, climate changes, ecosystems restorations.*

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CLIMATE CHANGE AS A RISK FACTOR IN TRAFFIC IN SERBIA

Milica Pavic[109]*; Igor Jokanovic*[110]*; Mila Svilar*[111]

Abstract

Extreme weather natural disasters, such as droughts, floods, storms, caused the impacts of climate change have global consequences that are felt around the world. Most affected are underdeveloped and developing countries, but not the most developed countries like the USA, Great Britain and China are not immune to their influence. The last few years, various sectors have suffered serious consequences of the occurrence of extreme events, causing significant economic loss, infrastructure disruptions and loss of human life. Also, the transport sector is affected by these disasters, which includes infrastructure damage, compromised security, operational disruptions and logistics. In such circumstances, the insurance of safe, quality and resistant infrastructure becomes a top priority in order to make travel safer, simpler and more reliable. The aim of this paper is to provide a comprehensive overview of the challenges Serbia faces traffic in the context of climate impacts changes, emphasizing the importance of adapting the infrastructure to future conditions.

Key words: *Climate change, traffic, challenges.*

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BIOMASS WITH THE APPLICATION OF THE NEW TECHNOLOGIES AS POTENTIAL FOR FULFILING THE GOALS OF THE GREEN AGENDA FOR SERBIA

Svetozar Krstić [112]

Abstract

The characteristics of the energy sector in Serbia are low energy efficiency (and in production and consumption), obsolescence of technology in the production sector, low level of investment, low price of electricity, low share of renewables sources of energy and irrational consumption of practically all types of energy. The core of biomass potential in Serbia lies in agricultural residue and wood biomass, a total of about 2.7 million tons (1.7 million tons in agricultural residues production and about 1 million tons in wood biomass). In addition to these two sources of biomass the rest of livestock production can be singled out from more significant sources. U the second group of biomass sources include plantations of energy plants (e.g. miscanthus, fast-growing poplar etc.), and plants that serve as raw material for biodiesel, bioethanol (rapeseed, sunflower, corn, etc.). Based on statistical data, it can be calculated that Serbia could produces so much biogas that it can replace about 20% of its natural imports of gas, and that only from animal husbandry. In addition to using the remains of agricultural production, wood waste and residue livestock production, biomass can also be obtained by growing energy plants (e.g. mischantus, fast-growing poplar, etc.), and plants that serve as raw material for biodiesel, bioethanol, etc. Unfortunately, at the moment, there are practically no energy plantations in Serbia Plants. It is necessary to encourage research into the cultivation of energy plants and the application of new technologies when using biomass. The more significant use of renewable energy is also an international obligation of Serbia, and it is clear that this sector will have to be given more attention in the future.

Key words: *Biomass, potential, green agenda, technologies, environment.*

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ORGANIC HEALTHY SAFE FOOD AND HEALTH

Marko Burić[113]; Vera Popović[114]; Jelena Bošković[115]; Ljubica Šarčević-Todosijević[116]; Bojana Petrović[117]; Aleksandar Stevanović[118]; Radmila Bojović[119]

Abstract

Organic production has a significant impact on human health, animal, food security and environmental sustainability. Pesticide exposures from conventional production may lead to important diseases, such as Parkinson's disease, diabetes, brains damage, especially in children and certain types of cancer. Epidemiological studies highlight adverse effects of certain pesticides on children's cognitive development. Use of pesticides in organic agriculture is restricted. Organic food are abundant with vitamins, antioxidants (vitamin C, polyphenols and flavonoids), minerals and dry matter content. Regular consumption of organic products (fruits and vegetables, dairy products and meat) significant reduces the risk of overweight, of pre-eclampsia in pregnancy and allergic disease. Organic meats and dairy products have a higher content of omega-3 fatty acids compared to conventional products and do not contain antibiotics. Due to the reduced amount of pesticide residues and an increased secondary plant metabolites, intake which are found in organic food, there is a reduction in health problems and a positive effect on health.

Key words: *Organic production, antioxidants; importance for health.*

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EXAMINATIONS OF TYROSINE ACTIVITY IN THE IODINE-HYDROGEN PEROXIDE OSCILLATORY MATRIX

Ana Ivanović-Šašič[120]; Jelena Maksimović[121]; Stevan Maćešić[122]; Željko Čupić[123]

Abstract

The Bray Liebhafsky (BL) reaction is the oldest known oscillating reaction that represents the catalytic decomposition of the hydrogen peroxide into oxygen and water, in the presence of iodate and hydrogen ions. Due to its extreme sensitivity to external influences (perturbations), this oscillatory reaction proved to be suitable for testing the activity of various analytes, both in closed and open reactor conditions. In this paper the impact of L-Tyrosine amino acid on the kinetics of the BL oscillatory reaction was investigated under closed reactor conditions. Numerical simulation based on proposed model of the BL oscillatory reaction to examine tyrosine activity were performed too. L-Tyrosine is an amino acid that is used as a precursor for the synthesis of the catecholamines dopamine (DA) and norepinephrine (NE). Under stressful conditions, the levels of DA and NE drop, which can compromise cognitive function. L-Tyrosine supplementation may help alleviate acute stress caused by cognitive decline by restoring catecholamine levels in the brain. It was observed that small concentration of Tyrosine generates the response of the BL matrix both experientially and numerically. The results show a great potential for the BL matrix in the analysis of L-tyrosine. Numerical simulations indicate several possible pathways of influence.

Key words: *Nonlinear dynamic, L-Tyrosine, numerical simulations*.

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APPLICATION OF MEDICINAL PLANTS IN MEDICINE AND PHARMACY

Ljubica Šarčević-Todosijević[124]; Aleksandar Stevanović[125]; Vera Popović[126]; Marija Perić[127]; Jelena Bošković[128]; Jelena Golijan Pantović[129]; Vladimir Filipović[130]; Ivana Iličković[131]

Abstract

Numerous plant medicinal and spice species have a variety of uses. In many countries, especially where there are optimal ecological conditions for plant production, they represent an important industrial raw material, as well as an export product. They are used in the food industry and in the household. However, the greatest use of plant raw materials is in medicine, pharmaceuticals (pharmaceutical preparations, medicines) and in the cosmetic industry (essential oils). Medicinal plants, according to the definition of the World Health Organization, include plant species that contain biologically active components suitable for use for therapeutic purposes or for pharmaceutical-chemical synthesis. Medicinal plants have been used for the treatment of diseases of various etiologies in traditional and official medicine since ancient times. In recent years, with the rapid development of modern analytical methods for the study of bioactive compounds in plant raw materials and bioactive products obtained from them, the application of phyto-pharmaceutical products for the prevention and treatment of many diseases has intensified. These products are effective only if used appropriately and if their pharmacological and toxicological properties are known. That is why constant quality control and standardization of herbal raw materials and medicines based on bioactive ingredients from plants is necessary.

Key words: *Medicinal plants, pharmacologically active ingredients, application.*

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THE PHENYLETHYLAMINE, DOPAMINE AND NORADRENALIN IN THE SERVICE OF HEALTH

Boro Vujašin[132]

Abstract

Love may be defined as an emergent property of an ancient cocktail of neuropeptides and neurotransmitters. Three neurotransmitters: phenylethylamine, dopamine and noradrenalin are responsible for falling in love. The combination of these three substances leads to feelings of love, excitement, bliss and happiness. Knowing that through the energy of love, we can give ourselves and others perfect health, it is appropriate to emphasize how desirable it is to exist and be a "Being of Love". The aim of the paper is to emphasize the importance of the infatuations and the Ministry of Love, which will have and has an impact on the health of every individual and the community as a whole. The work methodology is manifested in the analysis of the available documentation of The Ministry of Love and the analysis of the latest scientific findings. The results of the paper confirm that science indicates there are only two emotions, those being love and fear. Our physical genetic component changes from moment to moment, depending on our spiritual thoughts, emotions, feelings, and actions. The phenylethylamine, dopamine and noradrenalin are responsible for falling in love. The emotion of love produced by our mind and heart generates love energy that passes through our body, creating a life-giving epigenetic environment for genes and each cell individually, resulting in the biotransformation of each cell into its flawless physical and functional well-being. The heart is the place in us where we have feelings that produce 100 times stronger electric and 5000 times stronger magnetic field compared to the brain, creating waves of electric and magnetic energy that change our body and our world. On September 30th, 2022, the Ministry of Love was founded and registered on October 14th, 2022, as the first Ministry of Love on planet Earth, in Novi Sad, Republic of Serbia, currently only as an association, with the short-term goal of having the Government of the Republic of Serbia officially recognize the Ministry of Love as one of its ministries by 2028, which would serve as a model for other countries around the world. The long-term goal of the Ministry of Love is for every human being to be a member and promoter of the Ministry of Love for the sake of health, happiness, and the overall well-being and prosperity of all of us and the planet Earth as a whole. The phenylethylamine, dopamine and noradrenalin are elixirs conferring eternal youth. If there was more love there would be heaven on Earth. Knowing how important love is on planet Earth, the right to love should be highlighted in the constitution of every country, and citizens should be asked on the census whether they live in love with themselves and all around them. We are all designed and born, to learn to love ourselves, everything around us and the whole world, because that's the only way we can live a healthy, happy and long-lived life.

Key words: *Love, neurotransmitters, health, the Ministry of love.*

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RESEARCH OF RADON IN SOIL AND INDOOR RADON IN BUJANOVAČKA, VRANJSKA AND SIJARINSKA SPA

Snežana Milošević[133]; Meleq Bahtijari[134]; Fahrije Hyseni-Fejzullahu[135]

Abstract

Southern Serbia is rich with thermal spas due to geology of terrain. Underground water temperature vary from 43°C in Bujanovačka Spa up to 96°C in Vranjska and Sijarinska spa. Research on radon concentrations in this area has increased in past two decades (Žunić et al., 2014, Bossew et al., 2014). For this research were used standard alpha-track detectors for indoor radon obtained from the Department of Radiochemistry and Radioecology at Bio- Environmental- and Chemical- engineering Research and Development Center at the University of Pannonia in Veszprém (Hungary). Radon survey in Bujanovačka, Vranjska and Sijarinska spa in Southern Serbia is conducted in the aim to show possible danger of lung cancer for employees in special hospitals and inhabitants in surroundings of these spas. Twenty four detectors were exposed in summer 2021 into the soil and inside the special hospitals during the time of one month. Results show that radon concentrations are twofold to tenfold higher in soil in comparison with indoor radon concentrations: i.e. in Vranjska Spa inside "Queen Draga's bath" the lowest indoor radon concentration was measured 228 Bq/m^3, while in Sijarinska spa the highest indoor radon concentration was 1.688 Bq/m^3. Recommendations for workers and patients will be useful for future radon application in medicine and protection of human health.

Key words: *Indoor radon, spa, health protection.*

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PROTECTION OF PREGNANT WORKERS – COMPARISON BETWEEN EU STANDARDS, SERBIAN AND US LEGISLATION AND PRACTICE

Aleksandra Milošević[136]

Abstract

This seminar paper is based on the examination of the issue of protection of pregnant women at work, with particular reference to their labor rights during pregnancy and the prohibition of discrimination against them on the basis of their sex, pregnancy and family duties. In the first part of the paper, the author deals with relevant legal regulations that protect the rights of female workers during pregnancy, starting with the Constitution of the Republic of Serbia, as the highest legal act, through international regulation to domestic regulations. The second part of the paper refers to the law of the European Union that protects pregnant women from discrimination and other forms of abuse at work. Further, in order to show the protection of pregnant women from a completely different perspective, author deals with the protection of pregnant workers in the common law system. At the very end, the author gives a presentation of consideration of pregnancy of workers from the employers' angle, citing problems that the employer encounters, in connection with the implementation of relevant guarantees in practice.

Key words: *Pregnant workers, protection of workers, EU law, ILO standards, Serbian law.*

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SPECIFIC REACTIONS OF PLANTS TO ABIOTIC STRESSES WITH PHYSIOLOGICAL BIOCHEMICAL AND MOLECULAR PERSPECTIVES

Jelena Bošković[137]; Jelena Mladenović[138]; Vera Popović[139]; Vladica Ristić[140]; Aleksandar Stevanović[141]; Ljubica Šarčević-Teodosijević[142]

Abstract

Plant abiotic stress responses are vital yield restricting aspect in agriculture. Recent technology in plant biology allows research of such stress responses at a molecular scale in plants. Plants responses to abiotic stress are often considered as a complex process. Systems biology approaches allow visualizing and understanding how plant life works to overcome abiotic stress. These technologies have made noticeable contributions to the modern day improvements in our knowledge of plant biology. So, in this review, omics studies and the system biology approach towards abiotic stress tolerance in plants are highlighted. Therefore, the recent advances in biological sciences, such as transcriptomics, metabolomics, and proteomics, have assisted our understanding of the stress tolerant strategies adopted by plants, which could be further utilized to breed tolerant species.

Key words: *Abiotic stress, plants genomics, proteomics, transcriptomics, system biology.*

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ANALYSIS OF SECONDARY METABOLITES OF *TEUCRIUM MONTANUM* (LAMIACEAE) WITH SERPENTINE GEOLOGICAL BACKGROUNDS

Jelena Mladenović[143]; Jelena Bošković[144]; Vera Popović[145]; Aleksandar Stevanović[146]; Ljubica Šarčević-Todosijević[147]

Abstract

The influence of physical and chemical characteristics of the geological substrate have a significant role on the properties of the soil that is formed on a given substrate. The serpentine geological base is characterized by the presence of an increased amount of heavy metals in the soil. In serpentine soil, the amount of magnesium exceeds the amount of calcium. Such edaphic conditions of habitats impose and encourage the development of structural functional adaptations of plants serpentinophytes, which inhabit these habitats. It is represented on a limestone substrate, ultrabasic serpentines and on an acid silicate substrate. In response to adverse environmental conditions, plants produce a large number of secondary metabolites whose chemical composition depends on different environmental conditions. Therefore, the results of the research showed that the examined species has mechanisms that enable survival in stressful environmental conditions, in terms of physical and chemical characteristics of the soil.

Key words: *Teucrium montanum, variability and adaptive significance of secondary metabolites, serpentine geological substrate.*

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TAXON POACEAE - BIOLOGICAL PROPERTIES, SIGNIFICANCE AND POSSIBILITIES OF APPLICATION

Ljubica Šarčević-Todosijević[148]; Aleksandar Stevanović[149]; Snežana Đorđević[150]; Vera Popović[151]; Marija Perić[152]; Bojana Petrović[153]; Jelena Bošković[154]; Nikola Đorđević[155]

Abstract

Environmental pollution, epidemics of infectious diseases, climate change and the growing number of human populations are the main environmental challenges facing humanity in the first half of the 21st century and, according to the latest United Nations reports on the state of food security and nutrition in the world, every tenth the inhabitant of the planet is starving. Answers to these environmental challenges include reducing the emission of harmful gases and the use of fossil fuels, which lead to the greenhouse effect, as the main cause of climate change, the intensification of agricultural production, while preserving natural resources and all components of the environment, and the production of healthy and safe food. In the production of food on a planetary level, the most important are gymnosperms, representatives of the Poaceae family. *Triticum aestivum*, *Zea mays* and *Oryza sativa* are the most important species of this family, which represent a source of food for mankind. In this paper, the biological properties, importance and application possibilities of the *Poaceae* taxon are discussed.

Key words: *Poaceae family, biological properties, importance, food safety.*

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WASTE MANAGEMENT AS A SOCIOLOGICAL MODERN SOCIETY PHENOMENA

Sunčica Vještica[156]*; Nenad Stevanović*[157]

Abstract

The modern waste management concept includes procedures that ensure the least human health risk to and reduce the pressure on the environment. The preventive measures can be taken by regular monitoring and the applied measures about reducing water, air and soil pollution; negative impacts flora and fauna; environmental accident, fire or explosion; negative impacts on landscapes and natural assets of special value, noise levels and unpleasant odors. Establishing a unique waste management system requires knowledge of the entire product life cycle, the generated waste origin, as well as the elements of the process and procedures. It requires a high level of knowledge, expertise, time and resources, considering the complexity of environmental aspects, associated with the emergence of increasingly new technologies in the treatment and reuse of waste. The issue of managing new technologies is a sociological challenge today. Are we qualified enough to achieve strategic goals in this area? This work should determine the inconsistencies and legalities of modern society, which, on the one hand, consumes disposable products without limits, and on the other hand, favors and invests in the resulting technologies.

Key words: *Environment, waste, process, knowledge, sociological, procedures.*

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NETWORKING AS A TOOL FOR SUSTAINABLE WASTE MANAGEMENT IN THE ADRIATIC REGION - CIRCLABS NETWORK STUDY CASE

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Abstract

Effective waste management is essential for maintaining the ecological balance and promoting sustainability in any region. The Adriatic Region, renowned for its stunning landscapes and biodiversity, faces significant challenges in waste management due to the impact of tourism, urbanization, and industrial activities. This study explores how networking and collaboration through the Circlabs Network have contributed to sustainable waste management practices in the Adriatic Region. The Circlabs Network, a consortium of stakeholders from the public and private sectors, aims to facilitate knowledge sharing, innovation, and policy development to tackle waste management issues. This case study highlights the positive outcomes and lessons learned from the Circlabs Network's initiatives and demonstrates how networking can play a pivotal role in achieving sustainable waste management.

Key words: *Adriatic Region, networking, waste management, sustainability.*

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REUSE OF SOLID BRICK WASTE MIX IN GEOPOLYMERIZATION – A PRELIMINARY INVESTIGATION

Ivana Jelić[161]; Aleksandar Savić[162]; Tatjana Miljojčić[163]; Marija Šljivić-Ivanović[164]; Slavko Dimović[165]; Marija Janković[166]; Vojislav Stanić[167]; Dimitrije Zakić[168]; Dragi Antonijević[169]

Abstract

The applicability of solid bricks waste in geopolymerization technique was considered. Waste samples were characterized in terms of mineralogical composition by XRD prior to mechanical testing. XRD analysis showed that both brick samples contained anorthite, wollastonite, and mullite as the main components. The compressive strength investigation was carried out by screening method with three geopolymer mixtures. Geopolymer mixtures were prepared with alkaline activators; the mixtures were poured into molds and air-dried for 28 days. The compressive strength of samples was measured according to the standard SRPS EN 12390-3:2010 for cubic samples. The compressive strength values ranged from 9.8 MPa for the newer solid brick, 10.2 MPa for the older solid brick, and 10.5 MPa for the solid brick mix waste geopolymer sample. The most likely underlying reason for the higher compressive strength results of the older solid brick and the mixed sample is their mineral composition, i.e. higher proportion of aluminosilicate. However, all samples showed satisfactory compressive strengths, and it represents an excellent basis for further research.

Key words: *Reuse, recycle, compressive strength, construction.*

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WILLINGNESS OF RURAL HOUSEHOLDS IN THE MACVA DISTRICT FOR ORGANIZED COMPOSTING

Milena Milojević[170]*; Suzana Knežević*[171]

Abstract

The Mačva district is characterized by intensive agricultural production, which is accompanied by the generation of a significant amount of agricultural waste. Agricultural waste includes residues from the cultivation of field crops, residues from the cultivation of fruit crops as well as residues resulting from the cultivation of domestic animals. The absence of an organized agricultural waste management system in the Republic of Serbia, and also in the Mačva district, has a negative impact on the environment. The aim of this work was to investigate the readiness of rural households in the territory of the Mačva district for organized composting as one of the forms of sustainable management of agricultural waste. For this purpose, rural households in the territory of the municipalities of Šabac, Bogatić and Loznica were surveyed. The results of the research show that more than 80% of rural households express their willingness to join the system of organized composting of agricultural waste. The main reasons for this are economic gain, but also the awareness that the use of compost enriches the soil and improves its fertility, while reducing the need to use chemical preparations.

Key words: *Mačva district, rural households, organised composting.*

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D
SUSTAINABLE TERRITORIAL DEVELOPMENT

CREDIBILITY OF THE LEGALIZATION POLICIES OF ILLEGAL CONSTRUCTION IN SERBIA

Slavka Zeković[172]

Abstract

The paper explores causes and some effects of huge illegal construction in Serbia, as an alternative way of meeting the housing needs, as well as the credibility of the legalization policies of illegally constructed buildings (ICBs) in the socialist and post-socialist periods. The inability of these systems to provide affordable housing led to massive illegal construction (officially – 2.05 million ICBs). This paper introduces the conceptual framework of the credibility thesis of informal institutions by examining the credibility of legalization policy measures in Serbia. The analysis has identified various types and credibility of measures by legalization policies using the Credibility Scales and Intervention/CSI checklist. These findings show an extremely unsuitable mode of policies related to ICBs as the result of institutional and other contextual factors. The legal changes in the ICBs status are quite uncertain due to the resistance of interested actors and their power. Therefore, the ICBs could remain as "locked", a parallel, autonomous, and un-codified form of property rights in Serbia in the long term.

Key words: *Legalization policy, illegally constructed buildings, credibility thesis, informal institutions, CSI checklist.*

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PLANNING BELGRADE IN REVERSE: QUESTIONING STRATEGIC PLANNING IN PRACTICE

Jasmina Đokić[173]; Ljubica Slavković [174]; Ana Graovac[175]; Ksenija Radovanović [176]

Abstract

Spatial and urban planning in Serbia is designed so that the planning cycle begins with strategic plans. However, in the last decade there has been a shift in the order in the preparation and adoption of planning documentation, which has disrupted this cycle to the extent that the consistency of the steps and the hierarchy of plans are threatened, and the logic of the entire planning system is called into question. The paper analyzes this phenomenon on the example of Belgrade. The preparation of the strategic, general urban plan (GUP) of Belgrade until year 2041 is underway. However, major interventions such as the national stadium, construction at the water source and changes to the priority route of the metro, have already been adopted by detailed regulation plans. The mentioned changes are of great scope in every sense: in terms of coverage of the city territory, necessary investments, and the expected impact on the growth and functioning of the city. The goal of the research is to present a clear overview of the "dislocation" of the logical and legally established order of planning, and to record its consequences. Only on the basis of such a preliminary review, it is possible to establish a methodology for valorizing the carried out reverse planning practice, and possible mechanisms for returning it to a legally prescribed and logical sequence.

Key words: *Strategic planning, GUP, planning practice, reverse planning.*

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PLANNING AND IMPLEMENTATION OF URBAN YOUTH SPACES RESEARCH OF BULGARIAN YOUTH NETWORKS

Boryna Nozharova[177]

Abstract

Modern cities are "living" structures that have been built over decades, through principles and understandings guaranteeing livable spaces for all age groups. However, in recent years, the world has witnessed drastic changes in the way societies work, live and travel. Today, two demographic patterns are increasingly expressed in the development of urban structure: rapid urbanization and large young populations. Cities are growing in scale, but they are also getting younger. According to recent studies, a large proportion of people under the age of 30 live in urban areas, and by 2030, 60% of the global urban population is expected to be under the age of 18. The youth network in Bulgaria, created in the second half of the 20th century, has lost its original ideas for organizing and supporting young people in their free time. It is increasingly necessary to rethink open and closed spaces for young people. The research aims to trace the structural problems and challenges facing the architecture of youth centers today. To explore how cities create safe and inclusive spaces and buildings for youth.

Key words: *Youth, youth networks, youth centers, urban spaces.*

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TYPOLOGY OF MICRO APARTMENTS BASED ON THE STRUCTURE OF LIVING SPACE

Đorđe Alfirević[178]*; Sanja Simonović Alfirević* [179]

Abstract

A micro apartment is a concept of organizing living space that typically provides the basic necessities for long-term residence for one or two occupants. In general, it refers to a residential unit with a floor area ranging from 15 to 30 square meters. Micro apartments are considered to be one of the prevalent forms of sustainable housing in the future, as the concept is based on smaller living spaces and reduced consumption of energy and resources. The research is based on a deductive method and begins with the analysis of current micro apartment typologies, along with the formulation of different theoretical models. Subsequently, an analysis and comparison of characteristic examples of micro apartments are conducted to establish a clear typology. Finally, based on the typology, an evaluation is carried out, and proposals for different approaches to micro apartment design are formulated. The aim of the research is to comprehensively systematize the typological forms of micro apartments recognized in architectural practice and examine their characteristics and potential applications in urban environments. Additionally, the research aims to identify distinctive structural differences among various typological forms of micro apartments. The ultimate goal of the research is to contribute to the development of sustainable housing solutions in urban areas, with a particular emphasis on the concept of micro apartments.

Key words: *Architecture, sustainable housing, micro-apartment, typology, design.*

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ASSESSMENT OF BROWNFIELD LOCATIONS IN TEN CITIES IN SERBIA: A COMPARATIVE STUDY AND NEW IDEAS FOR IMPROVEMENT

Marina Nenković-Riznić[180]*; Sanja Simonović Alfirević*[181]

Abstract

Brownfield sites, characterized by abandoned or underutilized industrial or commercial properties, pose significant environmental, economic, and social challenges to urban areas. This paper aims to assess the prevalence and characteristics of brownfield locations in ten cities in Serbia and provide a comparative analysis of their potential for redevelopment. The undertaken research was developed for the World Bank Group and SECO project "Technical assistance: Strengthening capacities of local self-governments in Serbia towards low-carbon and resilient urban development investments", and the ten cities were chosen based on the initial survey as cities of interest to the project. Using a combination of qualitative and quantitative research methods, as well as questionnaires developed for the purpose of research data was collected on brownfield sites in Niš, Novi Sad, Kragujevac, Kraljevo, Šabac, Zrenjanin, Novi Pazar, Sombor, Užice and Leskovac. Some of the cities provided the data of brownfield sites within various databases which encompassed basic (geographical) data about the location, site histories, environmental conditions, land use restrictions, ownership status, original and potential purpose, existing infrastructure and accessibility. Future studies can build upon these findings by exploring specific redevelopment strategies tailored to the distinct challenges and opportunities presented by each city's brownfield diversity.

Key words: *Brownfield locations, redevelopment strategy, cities in Serbia.*

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ECO-INNOVATIONS AND TRANSFORMATIVE EXPERIENCES IN SUSTAINABLE NATURE-BASED TOURISM: *'PRESCRIBING NATURE'*

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Abstract:

New approaches to tourism stem from the tendency to offer a transformative experience not only to the consumer of the tourist service but to everybody engaged in creating the tourist product. Furthermore, the public health system of the world's highly developed countries includes *'Prescribing Nature'* as an important segment of modern health procedures. The paper presents the results of the research carried out within the experimental pilot project, modelled after the world health program of *'Forest Bathing'*. The research was carried out in the protected natural areas: NM 'Lipovica Forest' (Serbia), SNR 'Obedska Bara' (Serbia), NM 'Bojčin Forest' (Serbia), NP 'Biokovo' (Croatia) and Rogaška Slatina Health Resort (Slovenia) from 2016 to 2023. An innovative model of activities of the pilot project and the design of the forest wellness program with elements of relaxation techniques in nature are presented. The health effects of the pilot project were evaluated using the Short Warwick–Edinburgh Mental Well-being Scale, the Manchester Colour Wheel Test, the Likert Scale of Happiness and the Method of Active Imagination. The obtained results revealed measurable positive effects of the implemented health-recreational program on the general psychophysical and mental state of the participants.

Key words: *Sustainable tourism, health, 'Forest Bathing'.*

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PERCEPTIONS OF DEVELOPMENT OF AGRO-TOURISM ON AGRICULTURAL FARMS IN AP VOJVODINA

Radivoj Prodanović[186]; Dragan Ivanišević[187]; Tareq Kaarod[188]

Abstract

The aim of the research was to understand the role and development potential of agritourism in AP Vojvodina. The key questions are: whether agritourism can increase the income of agricultural farms and whether the additional income from tourism could stimulate the development of agriculture. The research was conducted among farmers in AP Vojvodina and farm visitors. Data were collected through a semi-structured interview and a survey questionnaire. The results indicated clear differences between farms that host tourists and those that do not. All owners of farms, which host tourists, saw the perspective of agrotourism, unlike the others. Farms, as reasons for engaging in agritourism, mentioned mainly the sale and advertising of products, and in a smaller way they emphasized the income from visitors. Those farmers who do not host tourists highlight a number of obstacles, such as: finance, administration, legislation, lack of information, safety of visitors and animals, lack of manpower, networking, knowledge and programs. They also assess the state of agritourism as bad. Open farm days play an important role in popularizing and raising awareness of agritourism. On Open Farm Days, most visitors come as families (79%) with the aim of getting to know domestic animals, the way of agricultural production and life in the countryside, taste local food and buy products. More than half of the visitors planned to leave up to 25 euros at the farm. The offered activities and hospitality were considered the most important factors in attracting visitors, while e.g. price didn't matter at all. The Covid-19 pandemic disrupted the plans of farmers, drastically reduced the number of visits by foreign tourists, but also opened up space for domestic tourists. The results revealed that the initiation of agritourism is the result of circumstances and internal motivation. Nevertheless, the awareness of farmers in AP Vojvodina about agritourism is good and most of them were thinking about offering agritourism content. There is enough potential for the development of agritourism, but it is necessary to provide greater support to programs (legislation, incentives, etc.), networking, promotions and education, and to a greater extent focus on domestic tourists.

Key words: *Agritourism, agricultural holdings, open farm days, AP Vojvodina*

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SPATIAL PLANNING OF THE HIGHWAY CORRIDORS - CHALENGES AND CHANCES FOR SUSTAINABLE TERRITORIAL DEVELOPMENT

Vladica Ristić[189]*; Marija Maksin*[190]*; Dragan Jeremić*[191]

Abstract

The aim of the research is to assess the possible contribution of the highway corridors to regional and local territorial development in its wider and immediate surroundings through the spatial planning process. The research was carried out on the example of three spatial plans for the special purpose area – the corridors for Belgrade – Niš (E-75, Corridor X), Požega – Boljare (E-763) and Niš – Merdare (E-80) highways. On these examples, the expected positive and negative impacts of the planned highways on regional development and the development of their immediate surroundings were analyzed. In the process of preparation of these spatial plans, the impacts of local stakeholders from the economic sector on the adjustment of planned solutions for corridor sections and highway facilities were analyzed. The results of the survey indicate the unevenness of the expected impacts and on measures to strengthen the positive impacts of the planned highway corridors on the development of sustainable territorial development.

Key words: *Highway corridor, spatial planning, regional and local development, impacts*.

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PLANNING CHARACTERISTICS OF INTERCITY ROADS IN URBAN AREAS AND THEIR CONNECTION WITH THE URBAN ROAD NETWORK

Mladen Lakić[192]; Igor Jokanovic [193]; Milica Pavić[194]

Abstract

The difference between intercity and urban road networks is particularly emphasized in the planning domain when it is necessary to determine the basic concepts and models of formation, and to define the surrounding contents located in the road right-of-way. Also, the means of transport and the method of operation significantly determine the characteristics and concepts of these two networks. However, the intercity and urban road networks are inseparable in terms of the formation of the transport system of the country, region, and cities, so they must have their continuity and be coordinated with each other in the realization of their function. The aim of this paper is to provide an overview of the conceptualization, alignment and shaping of intercity roads in the urbanized areas, and the way of establishing a connection with the urban road network through the transition zone while highlighting the importance from the aspect of sustainability and urban mobility.

Key words: *Roads, urban areas, urban roads, planning, arrangement.*

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CYCLE AND WALK THE (T)RAILS – TRANSFORMATIONS OF ABANDONED RAILWAYS WORLDWIDE

Peter Nikolov[195]

Abstract

All over the world there are many disused railway lines that are still waiting for their new life to begin. These facilities can be made usable again as railway cycle paths. The preliminary review of several good practices showed that railway line cycle paths are particularly attractive for tourism. These new functions create possibilities for bringing back and boosting local tourism and recreation on a new level. And they have their great potential also to be used as gradient-free, low-intersection and direct connections for everyday traffic. Because of their relatively flat terrain profile rail trails are perfect to be used and easy to follow whether one is walking or cycling. The current work aims to collect and explore examples for transformation of abandoned railways into world-class cycling and also walking trails worldwide.
This research will be the base for future study of the existing Bulgarian cases and their potential metamorphosis that can bring them again into life.

Key words: *Railway lines, abandon, new life, walk and cycle.*

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USE OF DATA WAREHOUSE IN WATER COMPANIES

Slavimir Vesić[196]

Abstract

Water utilities are the critical infrastructure of many states. They are characterized by the complexity and variety of business processes implemented and managed by various organizational units. Such a complex workflow is most often supported by several types of information systems, such as business, geographic and technical information systems. The data created in the aforementioned information systems has value but is not fully utilized. This paper analyzes and describes the possibilities that data warehouse technology can offer water companies by integrating data from all their information systems. The research used the methods of analysis, synthesis, compilation, description and case studies. The result of the work provides insight into business process improvements that can arise as a product of complex data integration. As these business processes are the core business of water companies, they can have multiple benefits and get such insights that they could not have until now through isolated observation of data from each of the previously mentioned information systems.

Key words: *Data warehouse, databases, data integration, business processes, water utilities.*

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APPLICATION OF THE MODEL OF RENT, FEES OR CHARGES IN THE VALUATION OF NATURAL CAPITAL

Božo Drašković[197]

Abstract

For the valuation of natural capital, i.e. natural resources, a reliable application of the direct market method based on the supply and demand model is required. In approaches of economic and ecological theories there is a basic mistake. The value of natural capital as natural resources is identified with the market value of goods created in the process of exploitation, extraction and processing of natural capital and its transformation into goods subject to market transactions. It is necessary to make a key distinction between the basic substance of natural capital, i.e. natural, renewable and non-renewable resources and products that are created by technological processes of their processing into goods. Final products - goods, gain value on the market based on supply and demand in conditions of perfect competition. Basic natural resources such as mineral wealth, hydrocarbons, forest, water and other resources are not found in direct market transactions, and as such do not have a directly market-indicated price. Rent is used as a surrogate price for natural, basic resources. But the value of rent is not the price of the resource itself at the same time. Rent essentially means only an indicator of the value of the right to exploit the resource, but not the price of the resource. The correlation between the amount of rent for individual natural resources and the market values of products resulting from the exploitation of resources moves in large ranges, so that they show strong flows of elasticity. Which factors affect the level of elasticity of the relationship between rent for resources and prices of final products represent a special challenge for ecological - economic science and theory. In connection with the above, a particularly current case refers to the exploitation of lithium, the economic and environmental aspects of the costs and benefits of converting a natural resource (lithium) into a final commodity - a barrier for electric cars.

Key words: *Natural resources, natural goods, rent, market values, lithium.*

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CIRCULAR ECONOMY BUSINESS MODEL - CIRCLAB ZRENJANIN STUDY CASE

Ivana Šekler[198]; Mirjana Bartula[199]; Sunčica Vještica[200]; Vladica Ristić[201]

Abstract

The global shift towards a circular economy, as a more sustainable alternative to the linear production and consumption model, has been gaining significant traction. This research deals with the successful implementation of the Circlab Zrenjanin, a circular economy business model situated in Zrenjanin, Serbia. The Circlab Zrenjanin functions as an innovative hub that advocates circular practices, resource efficiency, and waste reduction, thereby leading to various economic, environmental, and social benefits. The proposed model for CIRCLab Zrenjanin encompasses distinct phases aligned with the circular economy business model: Circular Sourcing, Re-conditioning, Access, and Resource Recovery. These phases are comprehensively elaborated as part of the CIRCLab Urban Model, offering a framework for sustainable waste management and the promotion of circular practices within the region. This case study aims to analyze the main features, strategies, and results of the circular economy business model implemented by Circlab Zrenjanin, accentuating its positive influence on the local community and beyond. By exploring the various aspects of this circular economy initiative, the study seeks to offer valuable insights into how circular practices can be effectively integrated into waste management and contribute to sustainability goals at a regional level.

Key words: *Circular economy, business model, waste management, sustainability.*

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LEGAL PERSPECTIVES ON SUSTAINABLE BUSINESS PRACTICES AND TERRITORIAL DEVELOPMENT: A COMPARATIVE STUDY

Dael Dervishi[202]

Abstract

The role of legal frameworks in fostering sustainable business practices and facilitating territorial development is crucial. This research paper explores the influence of legislation on the adoption of sustainable practices within businesses, and the subsequent impact on sustainable territorial development. Through a comparative analysis of various legal systems and their corporate sustainability laws, this paper aims to elucidate best practices and areas of reform. By proposing an integrated legal-business model that aligns profitability with sustainability, the research contributes to promoting business excellence and territorial development. Through a review of relevant case studies and legal texts, this paper provides valuable insights into the effective implementation of sustainability laws and their implications for businesses and territories. The findings provide a guide for policymakers and business leaders striving for business excellence through sustainability, thereby contributing to the discourse on sustainable territorial development. The study employed a qualitative research design, focusing on documentary analysis and case studies. An exhaustive review of existing legislation related to sustainable business practices across various jurisdictions was conducted. This allowed for the creation of a comparative matrix, analyzing the impact of different legislative frameworks on sustainable business practices. Case studies of businesses operating under these various legislative systems were reviewed to understand the real-world implementation and impact of these laws. The comparative analysis revealed significant variability in the robustness and effectiveness of different jurisdictions' sustainable business laws. Some jurisdictions had comprehensive legislation that correlated with higher levels of business sustainability and territorial development. However, others had weaker or less encompassing laws, with correspondingly lower levels of sustainability achievement. Case studies further illuminated these findings, showcasing how businesses navigated and responded to the different legislative frameworks, and the resultant impact on their sustainability practices and territorial development.

Key words: *Sustainable business practices, territorial development, legal frameworks, corporate sustainability laws, comparative analysis, business excellence.*

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SMART CITY ECOLOGY BOOST BASED ON ECO CRYPTOCURRENCY INTRODUCTION

Amit Vujić[203]

Abstract

Improving the environmental awareness of people in rural and urban areas requires the engagement of large resources by the institutions of the system. Marketing campaigns and field promotions are organized, but the results are usually unsatisfactory and have a short-term effect. Campaign effect time usually matches the campaign duration. In addition, a number of cryptocurrencies have become accepted over the past year as a means of investment by individuals, companies, banks, and the government. This paper aims to propose mechanisms for introducing an eco-crypto currency that will contribute to the permanent growth of environmental awareness and the permanent impact on the responsible behavior of the population in relation to the environment. The success of this concept can be enhanced by contributing to the creation of a socially responsible economy that will ultimately contribute to a healthier environment, environmentally responsible behavior, and promoting the importance of the community's overall well-being.

Key words: *Smart City, ecology, Block-Chain, Crypto coin, social welfare community*.

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ACHIEVING BETTER BUSINESS RESULTS BASED ON TIMELY FINANCIAL DECISIONS BY TOP MANAGEMENT

Ognjen Bakmaz[204]; Biljana Bjelica[205]; Dragana Popović[206]; Miloš Dragosavac[207]; Slobodan Popović[208]; Nikola Camović[209]

Abstract

Achieving better business results based on timely financial decisions by top management is basically based on the existence of real financial reports available to the top management of the company. Financial management and business decision-making within the business decision-making of the business decision-maker should be seen as a unity of business decision-making in order to achieve the best possible business results, but which is based on realistic reporting of the business decision-maker. The top management of the company should make business decisions on the basis of actual financial reports, in which the real operations of the company are given in a certain period of time for which those business decisions are made. Achieving better results is linked to the existence of reporting that realistically shows business operations based on timely financial decisions of top management in real-time observation and related to all economic activities in all economic sectors of the economy.

Key words: *Audit, business advantages, financial and top management.*

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USER EXPERIENCE IN THE DIGITAL ENVIRONMENT: THE BASIS FOR MAKING PURCHASE DECISIONS

Marina Guzovski [210]

Abstract

In the last couple of years, due to the COVID-19 pandemic, consumers have changed their shopping habits and purchasing behavior. They turned more to shopping through different channels of online communication. Even those consumers who had never used this type of purchase before. Providers have improved their web channels and introduced various options, all so that the consumer can make a purchase decision and purchase a particular product. Advertising methods use all the possibilities of collecting data about users and targeting ads according to the interests and preferences of consumers in order to provoke a certain reaction and stimulate the purchase process. The user experience of the web store and all the possibilities it offers ultimately affects the positive or negative outcome of the consumer's decision. Quite often, consumers reach the last step in the purchase process and give up. The paper presents and analyses the results of a survey conducted on the impact of user experience in the digital environment on consumer behavior in the purchasing process, as well as on the frequency of purchases, the types of products they most often buy and the reasons for abandoning purchases.

Key words: *Consumer behavior, digital marketing, user experience, purchase decision.*

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FINANCIAL MANAGEMENT AND APPLICATION OF AUDIT WITHIN THE FRAMEWORK OF BUSINESS DECISION-MAKING IN COMPANIES BASED ON AGRICULTURAL PRODUCTION

Biljana Bjelica[211]; Dragana Popović[212]; Miloš Dragosavac[213]; Ognjen Bakmaz[214]; Slobodan Popović[215]

Abstract

Financial management and the application of audit within business decision-making in companies that are basically related to agricultural production should be seen as a unity of decision-making aimed at achieving the best possible business results. The top management of agricultural enterprises should make business decisions based on actual financial statements. Such financial reports should be obtained by the top management of agricultural companies constantly from all parts of the agricultural company. It should be emphasized that the top management of agricultural companies receive financial reports from all other sectors and departments that are in the organizational structure of the agricultural company. It should be emphasized that in the process of establishing a system of realistic financial reporting to the top management, the introduction of a mandatory audit system into the processes of regular business is of increasing importance. The aim of the paper is to present the possible advantages in business in the organizational structure of an agricultural company with the constant introduction of auditing within the practical application of business decision-making and dealings in companies that have introduced auditing.

Key words: *Audit, business decision, financial management, agricultural production.*

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E
NATIONAL SECURITY AND PROTECTION

VIOLATION OF HUMAN AND CIVIL RIGHTS IN THE WORLD AND IN SERBIA

Dragan Bataveljić[216]

Abstract

In this paper the author is striving, before all, to present a generally accepted definition of human and civil rights, as well as their the most acceptable classification. He point to the fact that these rights are the boundaries that no country should overstep that is that they represent a defense from an absolute, irresponsible and unlimited power. Therefore, human and civil rights are guaranteed by highest general and legal acts – declarations, conventions and constitutions. In this paper, the co-authors underline the fact that law in general, particularly international law has reached the peak of its development. Yet, we are the witnesses of global violations of human and civil rights on daily basis, including the violations of the rights of non-Albanian population in Kosovo and Metohija. Indeed, the restrictions of some rights, so called "relative" rights are possible, but only in cases which are permitted by the constitution and other laws of a country. The restrictions of other, so called "absolute" rights are not allowed, such as the right to human dignity, right to physical and metal integrity, etc. The author present the examples of the obvious cases of the violations of these rights – the bombing of Federal Republic of Yugoslavia, the pandemics caused by Covid-19 virus, the genocide crimes during World War II, and others. In this paper, the author also pointed to the current situation in Bosnia and Herzegovina related to passing the law that bans the denial of genocide in Srebrenica. This represents the violation of the basic human right to freedom of thought and speech. Finally, we are living in the world of double standards applied by large powers and authorities. This also includes the double standards in relation to the current position of Serbian population in Kosovo and Metohija. To be frank, the violation of the basic rights of non-Albanian population in this south Serbian province has been taken place over decades, even a century, reaching its culmination in present days in front of the entire "democratic world".

Key words: *Human and civil rights, Republic of Serbia, Kosovo and Metohija, pandemics, genocide, NATO aggression, Bosnia and Herzegovina, constitution*.

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GLOBAL RISKS AND CONSEQUENCES

Vlado Radić[217]*; Nikola Radić*[218]

Abstract

The first years of this decade are characterized as a particularly disruptive period in the history of mankind. The return to the "new normal" after the COVID-19 pandemic was quickly interrupted by the launch of Russia's special military operation in Ukraine, leading to a series of new food and energy crises. At the beginning of 2023, the world faces a series of known and completely new risks. Current leaders and policymakers have already experienced "old" risks such as inflation, the cost-of-living crisis, trade wars, capital outflows from emerging markets, social unrest, geo-economic confrontations and the specter of nuclear war. They are reinforced by the development of a global environment of new risks, which include unsustainable debt levels, an era of low growth, low global investment and de-globalization, stagnation of human development after decades of progress, rapid and unrestricted development of dual-use technologies (civilian and military), and increasing pressures of climate change. . The next decade will be characterized by environmental and social crises, which are basically caused by geopolitical and economic trends. The cost of living crisis is ranked as the most severe global risk in the next two years. Biodiversity loss and ecosystem collapse are thought to be the fastest growing global risks in the next decade. In addition to the geo-economic confrontation and the erosion of social cohesion and social polarization, two new risks have a strong impact - the ever-present cybercrime and cyber insecurity, and large-scale migration. How the risks play out over the next two years will have ramifications for the next decade.

Key words: *Global trends, crisis, risks, challenges, consequences.*

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CORRELATION OF INTERNATIONAL CRIMINAL LAW AND THE EUROPOL IN THE FOCUS OF CURRENT SECURITY CHALLENGES

Nenad Bingulac[219]

Abstract

International criminal law represents the youngest branch of criminal law and as such it is a real link between national criminal legislation and international public law. Europol also represents a young European agency. Europol has been an EU agency since 2010. It is ultimately accountable to the Council of Ministers for Justice and Home Affairs, which includes the relevant ministers from all EU Member States. By pointing out the elements and characteristics of international criminal law, and also by pointing out the role of Europol in terms of goals, tasks, legal frameworks, subjects and types of cooperation, readers will primarily get closer to this important factor of security protection in Europe. The hypothesis of the work derives from the very title of this research. In order to better understand the aforementioned, the paper will use the methods of analysis of international legislative regulations that are important for the field of research, and also will be used the comparative and deductive method.

Key words: *International public law, international criminal law, Europol, security challenges.*

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DANGERS TO NATIONAL SECURITY FROM HYBRID THREATS

Tatjana Gerginova[220]

Abstract

In the modern world, threats come from state and non-state actors who increasingly use "soft" power mechanisms (political, economic, information) to weaken institutions, economies and societies and threaten national security. In the introductory part of the paper, the author will give some scientific definitions of the term "threats". Also, the author will analyze the terms: "asymmetric threats" and "hybrid threats". In the final part of the paper, the author states – modern threats have a complex content, therefore the need for a response to the entire society is imposed. Every modern society needs to build an effective concept for dealing with a series of challenges such as terrorism, violent extremism and radicalism, proliferation of weapons, disruption of energy supply, as well as defense against cyber and hybrid threats. Hence, every country should be able to adapt to the unpredictable, complex and changing security reality. This implies the need to build national capacities to improve resilience to these threats through a broader, more integrated and better coordination approach at the national level. The content will be created based on the analysis of foreign literature and using electronic content. In preparing the content of the paper, the author will apply the general scientific methods: the descriptive method, the normative method, the comparative method and the content analysis method as a special scientific method.

Key words: *Endangerment, asymmetric threats, hybrid threats, building national resilience.*

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ASPECTS OF COMMUNICATING CORPORATE SECURITY TOWARDS CONSUMER BEHAVIOR

Milan Brkljač[221]*; Milan Gligorijević* [222]*; Milica Simić* [223]

Abstract

Contemporary market environment dictates as necessary the safety behavior of companies towards various aspects of business, products and services, employees and last but not least consumers. Effective corporate security comprises of the process of identifying and implementing all necessary legal and security measures with aim to manage security risks in a company. Given the transparency of companies' actions, activities in the sphere of corporate security are visible to stakeholders and consumers, as a result of which they can influence consumers' decision on buying or cooperation with the observed company. This paper aims to point out the aspects of concise communication of the elements of corporate security and their impact on consumer behavior and decision-making in purchasing the company's products and services. Quality communication of the positive aspects of corporate security can lead to the creation of a strong image for one company. Thus the importance of analyzing such topics. In this paper is used the historical method as well as desk research for the analysis of the impact of corporate security on consumer behavior.

Key words: *Corporate security, consumer behavior, communications, organizational behavior, safety.*

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STUDENT DISCIPLINE AS TODAY'S SOCIAL SECURITY PROBLEM - THE ROLE OF THE EDUCATION SYSTEM IN REMOVING THIS PROBLEM

Stefan Popović[224]; Jovan Ničković[225]; Sonja Đukić Popović[226]; Vladimir Čabrić[227]; Jovan Veselinović[228]; Milan Gligorijević[229]; Dejan Đukić[230]

Abstract

Student indiscipline is one of the major problems not only of education, but also of modern society as a whole. The educational system represents the first contact of the youth with the state apparatus, and then, at the earliest age, it is the link that turns a child into a man with all social responsibilities and obligations. The work deals with identifying the key causes of student indiscipline and finding ways to prevent them. Students, teachers and parents of several primary and secondary schools of the school administrations of Belgrade and Niš played a major role in the preparation of the paper.

Key words: *Student indiscipline, national security, upbringing, education.*

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THE ORGANIZATION OF MISDEMEANOR COURTS IN GERMANY VIEWED THROUGH FORMS OF MISDEMEANOR LIABILITY

Nenad Bingulac[231]

Abstract

The German judiciary is organized when it comes to misdemeanor liability in such a way that the Municipal Courts (Amtsgericht) have jurisdiction over most minor traffic offences, such as speeding, failure to respect parking rules, driving under the influence of alcohol or drugs in minor cases, failure to obey traffic signs and Similarly. Then, the Higher Municipal Courts (Landgericht) are responsible for more serious traffic violations, such as serious violations of traffic regulations, accidents with injury or death, heavy driving under the influence of alcohol or drugs, and the like. Finally, there are the Higher Regional Courts (Oberlandesgericht) which conduct appeals proceedings, consider appeals against lower court decisions regarding traffic violations. These courts may also have jurisdiction over certain serious offenses relating to traffic. In addition to the above, it should be mentioned that minor traffic violations are handled by administrative authorities, such as police services or local governments, instead of being brought before one of the aforementioned courts. From the above, it can be seen that there are certain similarities with the domestic legislation, which will be given special attention in the paper itself. The aim of the work derives from the very title of this research. In order to better understand the aforementioned, the paper will use the methods of analysis of international legislative regulations and also will be used the comparative and deductive method.

Key words: *Misdemeanor liability, Misdemeanor Courts in Germany, Misdemeanor Courts in Serbia, international aspect of misdemeanors, court organization and jurisdiction.*

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