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AIR QUALITY EFFECTS OF ANTALYA FOREST FIRES IN TÜRKIYE

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ABSTRACT

The 2021 Turkey forest fires began on July 28, 2021, in the Manavgat district of Antalya and spread to many cities in Türkiye. As of August 12, 2021, 299 forest fires, most of which broke out in 53 provinces in the Mediterranean, Aegean, Marmara, Western Black Sea, and Southeastern Anatolia regions, had killed eight people. A significant increase compared to previous years, more than 150,000 hectares of forest and settlements had been reduced to ashes, and thousands of animals had died. The 299 forest fires, 15 of which were large, that started on July 28 were fully contained as of August 12, 2021, with the extinguishing of the fire in Köyceğiz district of Muğla. The fires were fought with 15 firefighting aircraft, 62 helicopters, 9 unmanned aerial vehicles, 1 unmanned helicopter, 850 water trucks and water tankers, 450 construction equipment, and 5,250 personnel. Many countries, including Azerbaijan, Ukraine, Russia, Spain, Croatia, Qatar, and Iran, provided personnel and vehicle support. Thousands of locals and tourists were evacuated from hundreds of villages and towns by land and sea as the fires spread to populated areas. The large-scale forest fire that broke out around Antalya is also of environmental concern. Air pollution caused by the fire, due to weather conditions, carries a risk of affecting the city centre. While Antalya's city centre's location on the Mediterranean coast benefits from reducing air pollution, the high humidity and pressure fluctuations that occur occasionally contribute to increased air pollution. According to assessments of existing air monitoring network data in Antalya during the fire period, airflow carrying combustion gases from higher elevations to the Mediterranean Sea prevented further deterioration in air quality.

Keywords: aır qualıty, Antalya, forest fıres, Turkey.

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MOLECULAR ANALYSIS REVEALED THAT THE INFECTIOUSNESS AND RESISTANCE GENES OF *ENTEROCOCCUS FAECALIS* (*PRGB, ASA1*) AND *ESCHERICHIA COLI* (*CSGA*) ISOLATED FROM EUPHRATES WATER WERE INDICATORS OF MICROBIAL CONTAMINATION

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ABSTRACT

This research sought to find methods of measuring the degree of waterborne contaminations in the Euphrates River in Hillah city through environmental DNA (eDNA) technology, using molecular methods to identify virulence and resistance genes between Escherichia coli (CsgA) and Enterococcus faecalis (prgB, asa1), as microbiological markers of contamination. Water samples were collected along 3 representative locations of the watershed along the riverbank during winter, spring, summer, and fall months, between January and November 2024. After extracting ambient DNA from the samples, specific primers were used to amplify the target genes through polymerase chain reactions (PCR). The results of the molecular work indicated increased presence of the CsgA gene in autumn and spring (11 isolates in each season) and comparatively less isolated in winter (5 isolates); which may suggest the impact of environmental conditions such as temperature and humidity, regulating gene expressions and biofilm formation. Within the Enterococcus faecalis genes, the prgB and asa1 genes were the most frequently detected in summer and fall (15 copies each season), potentially laying to the premise of higher temperatures and additional human behavior. Chi-square tests were utilized to evaluate if regional and seasonal distributions of the genes were statistically significant. The tests indicated that no significant differences were found in CsgA, (χ^2 = 5.2360, DF = 6, P = 0.8139); or in faecalis, (χ^2 = 2.9596, DF = 6, P = 0.8139). Research shows that eDNA technology is a contemporary method of water quality monitoring and can assist in detecting water contamination by bacteria, particularly in aquatic habitats where humans affect water quality. In addition, it highlights the importance of using specific genes as ecological biomarkers to monitor fecal pollution and pathogens, along with the potential of antibiotic resistance genes to transfer into aquatic environments. The study advocates for better monitoring of pollution sources and implements sustainable water resource management techniques to reduce health-associated risks of microbiological pollution.

Keywords: Environment DNA; Biomonitoring; *Enterococcus faecalis*, *E. coli*; Euphrates River Iraq; molecular identified

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ECOLOGICAL LEXICOGRAPHY AND CULTURAL LINGUISTICS: THE PRAGMATICS OF EUPHEMISM, DIALECT, AND STANDARDIZATION IN ALBANIAN BIODIVERSITY TERMINOLOGY

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ABSTRACT

This article investigates the intricate relationship between language, culture, and ecological knowledge in the construction of biodiversity terminology within the Albanian linguistic context. Drawing on a descriptive and interpretive analysis of Prof. Xhevat Lloshi's *Fjalori i Emrave të Bimëve dhe të Kafshëve, Shqip–Latinisht / Latinisht–Shqip* (2010), the study focuses on euphemistic expressions, dialectal variants, and pragmatic naming strategies that reflect both scientific understanding and deep-seated cultural norms. It argues that ecological lexicography in Albania is not merely a neutral or technical undertaking, but a culturally situated process that encodes environmental values, historical experiences, and collective identities. By examining folk taxonomies, metaphorical names, and taboo-avoidance mechanisms, the article situates Albanian biodiversity terminology within broader frameworks of environmental linguistics, biocultural diversity, and sustainable development communication. The findings highlight how culturally coded terms enhance communicative clarity, ecological awareness, and community engagement in conservation efforts. The study concludes that integrating local linguistic practices into education, lexicography, and biodiversity planning can strengthen both environmental stewardship and linguistic resilience—particularly when aligned with global standards such as ISO 704 and the UN Sustainable Development Goal 15 (*Life on Land*).

Keywords: biodiversity, flora, fauna; latin terminology, ecological terminology.

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THE TRADE BALANCE AND ITS IMPACT ON ALBANIA'S ECONOMIC GROWTH DURING THE TRANSITION PERIOD

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ABSTRACT

The trade balance is a crucial indicator that significantly influences a country's economic growth. The 2008 financial crisis revealed that many European countries had underestimated the importance of the trade balance. As a result, it was primarily the state sector in Europe that suffered from the crisis, unlike the United States, where the private financial sector was more heavily affected. In this context, the present paper focuses on analyzing the trade balance indicator. The aim is to examine the state of Albania's trade balance and its influence on economic growth during the transition period. To achieve this, the paper is structured around the following objectives: a) To present and analyze theoretical perspectives on the trade balance, particularly in the context of economic growth, b) To assess the trade balance situation in Albania during the transition periodic) To analyze the impact of the trade balance on economic growth using econometric methods, d) To provide policy recommendations for the Albanian government. The analysis utilizes data from relevant institutions and employs both graphical representation and econometric techniques, specifically using the EViews software. The primary data analyzed include Albania's trade balance and GDP over the period 1996–2021.

Keywords: Trade Balance, Economic Growth, Export, Import, Linear Regression Equation.

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SUPPORTING NATURAL ECOSYSTEMS: THE ROLE OF INTEGRATING STUDENT ENVIRONMENTAL VOLUNTEERING AND BUSINESS CORPORATIONS

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ABSTRACT

Global environmental issues call for the mobilization of all available resources, including student volunteering. The study analyzes the role of student environmental volunteering as a critical factor in solving environmental problems and identifies mechanisms for its reinforcement through business partnerships. The research methodology included a survey of experts from environmental organizations, business structures, and universities (n = 45); focus groups with student volunteers (n = 48); a correlation analysis of the effectiveness of projects; and the assessment of expert consistency with Kendall's coefficient of concordance. The experts were selected based on the criteria of experience in intersectoral interaction, the presence of environmental programs, and work with students. The results revealed the predominance of altruistic motivations among students, with experts from different sectors assessing the role of academic requirements and career prospects differently. Strategic partnerships received the highest effectiveness ratings from all expert groups. Correlation analysis revealed strong positive links between corporate support and project performance indicators. The main barriers to student participation were the lack of time, information, and transport accessibility. The findings confirm the need to integrate student environmental volunteering into strategic business plans to achieve sustainable conservation results and form support ecosystems that unite the efforts of environmental organizations, businesses, and educational institutions.

Keywords: corporate social responsibility, environmental protection, sustainable development, youth initiatives.

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EFFECTS OF HEAT TREATMENT ON THE BENDING RESISTANCE OF *FAGUS SYLVATICA* R AND *PINUS SYLVESTRIS* L, AN ENVIRONMENTALLY FRIENDLY TECHNOLOGY: A CASE STUDY

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ABSTRACT

This study investigates the effect of thermal treatment on the bending strength of European beech (*Fagus sylvatica* R) and Scots pine (*Pinus sylvestris* L). Specimens were thermally modified at 160°C and 200°C for 2 hours in an oxygen-limited environment. Bending strength was assessed according to EN 408 standards to determine changes in the Modulus of Rupture (MOR). The results showed a significant reduction in MOR at 200°C, particularly in pine, while moderate treatment at 160°C preserved or slightly improved mechanical performance in both species. A two-way ANOVA was conducted to analyze the influence of wood species and treatment temperature, revealing statistically significant effects for both factors and their interaction. Tukey's HSD post hoc test further confirmed meaningful differences between groups. These findings suggest that thermal treatment parameters can be optimized to enhance biological durability and dimensional stability while minimizing the loss of structural performance. The study highlights the importance of selecting appropriate regimes, especially when mechanical integrity is required alongside improved material stability.

Keywords: heat treatment, mass loss, bending strength, beech, pine.

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TAX INCENTIVES AND GREEN INVESTMENTS: COUNTRIES' CAPABILITIES TO ACHIEVE THE PRINCIPLES OF SUSTAINABLE DEVELOPMENT

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ABSTRACT

In the modern context of socio-economic development in many countries worldwide, enhancing the effectiveness of tax incentives for transitioning economic sectors to a green economy has become an urgent agenda item for achieving sustainable development principles. The purpose of this paper is to analyze the specifics of designing tax incentives for green investments within the framework of national development strategies to achieve the principles of sustainable development. The study employed qualitative methods for collecting information and working with large databases of economic data, enhancing the quality and reliability of the results. As a result of the conducted study, the main types of tax incentives for green investments were systematized. The application of tax incentives for green investments in various economic sectors is uneven: some sectors are prioritized, while others have lower priority. According to the authors, it is necessary to develop universal tax incentives to increase the attractiveness of green investments, the effectiveness of which directly depends on the degree of decarbonization in economic sectors, thereby contributing to the achievement of sustainable development principles.

Keywords: environmental, social, and governance projects, green investments, ecology, green financing, tax benefits.

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INTERSECTING CRISES OF GROUNDWATER DEPLETION, ENERGY USE, AND FOOD SECURITY IN AGRICULTURAL SECTOR IN WESTERN UTTAR PRADESH, INDIA

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ABSTRACT

In India groundwater depletion has become a serious issue as it is the largest consumer of groundwater in the world. After the Green Revolution in the agriculture sector in 1960s, irrigation has been a major reason for groundwater extraction in western Uttar Pradesh, India. The root of this phenomenon is the cultivation of water-intensive cash crops and subsidised energy consumption to enhance production, resulting in complex interdependency. Water-energy-food (WEF) nexus approach has been applied in this study. Primary data were collected in Western Uttar Pradesh from farmers and other stakeholders. The study reflects the paradoxes faced by Indian agricultural practices in the region. The core objective and hypotheses of the study are to examine interlinkages between groundwater depletion, cropping pattern, and power subsidies in western Uttar Pradesh through the WEF nexus approach. The obtained results indicate that most agricultural production in this region relies on groundwater, mainly for sugarcane, wheat, and paddy. Overuse of water has resulted in an increase of tube wells and electricity usage. This study is also relevant with reference to Sustainable Development Goals (SDGs) number 2 (improved nutrition and promote sustainable agriculture), number 7 (affordable and clean energy), and number 12 (responsible consumption and production).

Keywords: food security, groundwater exploitation, irrigation governance, power utility, sustainable development, sustainable development goals, water-energy-food nexus.

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ECO-CREATIVE SPACES AS TOOLS FOR ECOLOGICAL RESTORATION AND SUSTAINABLE TOURISM DEVELOPMENT

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ABSTRACT

This study examines the role of eco-creative spaces in promoting ecological sustainability, fostering environmental education, and enhancing domestic tourism through regenerative practices. By integrating ecological restoration with creative tourism, these spaces mitigate urban degradation, rehabilitate abandoned sites, and reduce the environmental footprint of tourism. Through a qualitative analysis of regional case studies (Belgorod Region, Russia), we demonstrate how eco-creative spaces combine waste reduction, green volunteering, and biodiversity conservation with cultural programming to align tourism with sustainable development goals. Study findings reveal that such spaces not only revitalize degraded urban and rural ecosystems but also serve as hubs for environmental awareness, particularly among youth. The study argues for the broader adoption of eco-creative models in tourism planning to balance economic growth with ecological resilience, offering a replicable framework for regions pursuing sustainability.

Keywords: sustainable tourism, ecological restoration, urban regeneration, environmental education, biodiversity conservation.

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GREEN BONDS AS A FINANCIAL MECHANISM FOR ECOLOGICAL RESTORATION AND BIODIVERSITY CONSERVATION: PATHWAYS TO SUSTAINABLE DEVELOPMENT

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ABSTRACT

The escalating degradation of global ecosystems—driven by climate change, biodiversity loss, and land-use alterations—demands innovative financial instruments to support ecological restoration and sustainable development. Green bonds, particularly sovereign green bonds, have emerged as a critical tool for mobilizing capital toward projects that align with planetary boundaries and life sciences imperatives, such as habitat preservation, renewable energy, and sustainable agriculture. This study examines the role of sovereign green bonds in financing ecologically transformative projects, leveraging a mixed-methods approach combining literature analysis, case studies, and expert surveys (N=48). Results highlight four key drivers of sovereign green bond issuance: (1) capital mobilization for biodiversity-positive projects, (2) development of green financial markets, (3) investor demand for eco-centric portfolios, and (4) reputational benefits tied to ecological stewardship. The paper identifies gaps in current green bond frameworks, emphasizing the need for standardized metrics to evaluate ecological outcomes (e.g., species recovery, carbon sequestration). By integrating financial mechanisms with life sciences priorities, sovereign green bonds can bridge funding gaps for large-scale conservation and climate adaptation, advancing the UN Sustainable Development Goals (SDGs) linked to terrestrial and aquatic ecosystems (SDGs 14, 15). The study underscores the urgency of aligning financial markets with ecological thresholds to mitigate anthropogenic pressures on biosphere integrity.

Keywords: green bonds, biodiversity finance, ecological restoration, sustainable development, climate resilience, SDGs.

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COMPARATIVE ANALYSIS OF THE ESSENTIAL OIL COMPOSITION OF *ACHILLEA MILLEFOLIUM* L, FROM FOUR REGIONS OF ALBANIA

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ABSTRACT

Achillea millefolium L., widely referred to as yarrow, is a frequently utilized medicinal plant that is renowned for its multifaceted therapeutic properties, which are predominantly ascribed to its essential oil composition. The aim of this study was to analyze the chemical profiles of essential oils extracted from *A. millefolium* collected from four distinct regions of Albania: Kolonja (Derimar), Korça (Mali i Thate), Pogradeci (Mali i Valamares) and Kruja (Qafe Shtama). The essential oils were obtained via hydro distillation, and their composition was subsequently analyzed using gas chromatography-flame ionization detection (GC-FID) analysis. Eighteen major compounds were identified across all samples, representing more than 90% of the total oil content in each region. The constituents included borneol (4.01–21.15%), cineole (10.72–20.8%), azulenes (10.72-21.28%), and camphene (2.85–7.65%). Kruja exhibited the highest total concentration of identified compounds at 98.23%, with particularly high levels of para-cymene (13.68%) and limonene (11.26%). In contrast, Kolonja had a profile characterized by elevated levels of borneol (19.93%) and azulene (18.76%). Monoterpenes such as alpha-pinene, beta-pinene, and alpha-terpineol, although present at lower concentrations, were consistently detected across all samples. Alpha-pinene ranged from 1.75% in Kolonja to 4.87% in Pogradeci, while beta-pinene varied from a low of 2.96% in Kruja to a high of 11.70% in Korça. Alpha-terpineol was present at concentrations ranging from 1.26% in Kruja to 3.21% in Korça. These results highlight the influence of geographic and potentially climatic factors on the phytochemical composition of *A. millefolium* L. essential oils in Albania. Understanding these regional differences is important for optimizing the medicinal use of the plant, guiding standardization efforts, and informing local agricultural and pharmacological applications.

Keywords: *Achillea millefolium***,** essential oils, hydro distillation, chemical composition, Albania.

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SYNTHESIS OF ACTIVATED CARBON POWDER PREPARED FROM THE EGGPLANT AS AN ADSORBENT FOR THE REMOVAL CONGO RED FROM AQUEOUS SOLUTION

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ABSTRACT

This work used eggplant as a precursor for preparing activated carbon through chemical activation by H_3PO_4. Using batch adsorption experiments, eggplant activated carbon was investigated for removing Congo red (CR) dye. The synthesized AC samples were evaluated as adsorbents for the elimination of a synthetic aqueous solution of the Congo red (CR) dye. Using scanning electron microscopy (SEM) in combination with energy dispersive X-ray (EDX) spectroscopy and physisorption measurements, the physical characteristics, morphology, elemental analysis, and specific surface area (BET) of the activated carbon (AC) were all described and assessed. When the starting CR dye concentration was 90 mg/L, pH was 4, the adsorbent dose was 0.2 g/L, and the equilibrium contact period was 120 minutes, the highest ACEP removal efficiency of CR was 98.95%. The adsorption data fit better with the Freundlich (R^2 = 0.96) isotherm model than the Langmuir (R^2 = 0.93) model and express the multilayer adsorption on heterogeneous surfaces. The maximum adsorption capacity was 72.44 mg/g. The kinetics data were fitted well to the pseudo-second-order model (R^2 = 0.99). The study results showed that eggplant activated carbon adsorbed CR effectively and could be used as a low-cost potential bio adsorbent for the removal of anionic dyes in wastewater treatment.

Keywords: Adsorption, Congo Red, Eggplant, Activated carbon, isotherm, kinetic.

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EVALUATION OF WHEAT CULTIVARS AND FERTILIZATION STRATEGIES FOR SUSTAINABLE BAKING PRODUCTION IN KOSOVO

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ABSTRACT

Sustainable wheat production is essential for food security and environmental conservation in Kosovo's baking industry. This study investigated the agronomic performance and grain quality of three wheat cultivars (Andalusia, Adelaide, Antille) under different diammonium phosphate (DAP) fertilization regimes (50%, 100%, 150% of recommended rates) across two distinct agroecological zones (Cërkulez and Gusar). Using a two-factorial randomized complete block design with three replications, we measured phenological development, yield components, and grain quality parameters. Results demonstrated significant ($p<0.05$) cultivar × fertilization interactions, with Antille showing superior yield (5.2 t/ha) and protein content (13.0%) at 100% DAP, while Adelaide exhibited better nitrogen use efficiency at lower fertilization levels. The 100% DAP application (200-230 kg/ha) optimized both yield and grain quality without excessive nutrient input. These findings provide evidence-based recommendations for sustainable wheat production in Kosovo, balancing productivity with environmental considerations for the baking industry.

Keywords: Triticum aestivum, phosphorus fertilization, cultivar selection, grain quality, sustainable intensification.

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TOWARDS A SMART AND SUSTAINABLE FOREST FUTURE: AN AI-DRIVEN NATIONAL FOREST MONITORING SYSTEM FOR ALBANIA

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ABSTRACT

This study proposes the structure of a National Forest Monitoring System based on Artificial Intelligence and the integration of data from multiple sources. The proposed system relies on the integration of modern technologies, including satellite imagery, unmanned aerial vehicles, ecological acoustic sensors, Geographic Information Systems, Artificial Intelligence, and neural networks, to enable real-time and dynamic monitoring of forests. These technologies will facilitate the early detection of forest fires, track deforestation trends, identify illegal activities, and promote sustainable forest management. The study is based on an extensive review of some of the best global practices and technical literature. The study describes a modular architecture of the proposed system, assesses implementation challenges including financing and data resource management, and provides concrete recommendations for phased implementation. Additionally, the paper presents ways to engage stakeholders, particularly local communities, and aligns the National Forest Monitoring System with the Sustainable Development Goals, REDD+ requirements, and contemporary standards.

Keywords: Artificial Intelligence, forest, monitoring system, spectral analysis, predictive analytics.

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Abstract
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INTEGRATING CREATIVE INDUSTRIES INTO NATIONAL SUSTAINABILITY AGENDAS: A POLICY AND STRATEGIC PLANNING FRAMEWORK

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ABSTRACT

Creative industries (CIs) are increasingly recognized not only for their economic value but also for their potential to contribute to sustainable development goals. However, the strategic policy mechanisms to harness CIs specifically for sustainability outcomes, particularly in transitioning economies like Russia, remain understudied. This research seeks to address this gap. This study employs a systematic literature review and comparative policy analysis to synthesize international and Russian approaches to CI development. Through a critical analysis of statistical trends and policy documents, and by developing a novel conceptual framework, we identify the key strategic elements necessary to align the CI sector with socio-ecological objectives. Our findings highlight a significant opportunity for CIs to drive sustainability through their inherent ecological (e.g., nature conservation, promoting resource-light services), social (e.g., community cohesion, cultural preservation), and economic functions. We identify critical gaps in Russia's current conceptual and strategic framework for CIs. In response, the paper proposes a structured hierarchy for a national CI development strategy (encompassing vision, policies, programs, and projects) explicitly designed to integrate sustainability principles. Furthermore, we emphasize the foundational role of educational system reform in building necessary human capital. The study concludes that a strategically supported CI sector can be a powerful catalyst for sustainable, place-based development. The proposed framework offers a actionable roadmap for policymakers to unlock the multiplicative potential of CIs, moving beyond purely economic metrics to foster a more resilient and sustainable future. This research has significant implications for other economies seeking to leverage their cultural and creative capital for sustainability.

Keywords: creative industries, economic development, support, strategy, element, territory.

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A USER-CENTRIC FRAMEWORK FOR ASSESSING LAND PUBLIC TRANSPORT SERVICE QUALITY: A FOUNDATION FOR INTEGRATING SUSTAINABILITY METRICS

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ABSTRACT

Comprehensive assessment frameworks are critical for transitioning towards sustainable urban mobility, yet existing models often fail to integrate user-perceived service quality with environmental performance. This study aims to develop and validate a holistic Level of Service (LOS) model for land public transport that prioritizes the passenger experience, creating a foundational framework for future ecological integration. We propose a novel two-block assessment model (Movement and Accessibility) comprising 12 weighted indicators—including journey duration, stop accessibility, information availability, and vehicle occupancy—derived from sociological surveys and calibrated against urban design standards. The model was tested on multiple routes in Moscow, Russia, and its outputs were validated against established methodologies (HCM, TCQSM) and direct user evaluations. Results demonstrate a strong correlation between the proposed model and user perceptions, confirming its efficacy in capturing the holistic passenger experience where traditional carrier-focused models fall short. While the current model focuses on service quality, its structured, weighted design provides a direct pathway for incorporating environmental metrics—such as emissions per passenger-km—into a unified sustainability score. This work provides transport planners and policymakers with a robust tool for evaluating and improving public transport systems, explicitly designed to be expanded upon to meet the integrated social and environmental goals of sustainable urban development.

Keywords: sustainable urban mobility, accessibility, vehicle emission standards, smart city, eco-mobility.

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THE IMPACT OF HYPERTENSION ON LIPID PROFILE, FASTING BLOOD GLUCOSE, SERUM ELECTROLYTES, ALBUMIN, UREA AND CREATININE AMONG SUDANESE HYPERTENSIVE PATIENTS AT KASSALA CITY, SUDAN

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ABSTRACT

The aim of the research: This study examines the lipid profile, glucose status, renal function, and electrolyte concentration in order to thoroughly evaluate the metabolic problems of Sudanese hypertension patients. Methods: In Kassala city, a case-control study was carried out between May and September of 2024. Following their assent, a total of 100 participants—50 hypertension patients and 50 healthy controls—were included based on the inclusion and exclusion criteria. Structured questionnaires were used to gather data, and SPSS version 22 was used for analysis. The appropriate authorities granted their ethical clearance. Following the implementation of all quality control procedures, blood samples were obtained and biochemical parameters were evaluated using automated chemistry analyzers. Results: LDL (106.85 ± 32.46 vs. 45.90 ± 21.72, $p < 0.001$), triglycerides (90.86 ± 38.51 vs. 111.94 ± 15.81, $p = 0.001$), and fasting blood glucose (130.94 ± 80.54 vs. 91.40 ± 11.36, $p = 0.001$) were all considerably higher in hypertensive patients. Hypertensive patients had lower HDL values (36.20 ± 8.18 vs. 73.66 ± 9.93, $p < 0.001$). Patients with hypertension had substantially higher sodium levels (144.73 ± 4.44 vs. 135.88 ± 5.60, $p < 0.001$). Significant alterations in albumin levels were linked to a longer duration of hypertension (>15 years) ($p = 0.01$). Serum sodium showed a positive connection with LDL and a significant negative correlation with both triglycerides and HDL ($p < 0.05$). Serum creatinine and LDL showed a negative, significant connection (r -0.198, p 0.048). HDL and fasting blood glucose had a negative connection, while LDL and albumin had a positive correlation ($p < 0.05$). There was a substantial positive connection ($p < 0.05$) between the length of the clinical condition and both albumin and sodium. Conclusion: Significant changes in sodium levels, metabolic indicators, and lipid profiles are linked to hypertension, highlighting its complex effects on metabolic and cardiovascular health. In order to address these risk factors, targeted public health initiatives are essential.

Keywords: Hypertension, Dyslipidemia, sodium, potassium, Cardiovascular Risk, Metabolic Health, renal function, hyperglycemia.

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ASSOCIATION OF miRNA-21 EXPRESSION WITH INF-γ, TGF-α, AND PANCA LEVELS IN ULCERATIVE COLITIS PATIENTS

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ABSTRACT

Ulcerative colitis (UC) is a chronic, relapsing inflammatory disorder of the colon, primarily characterized by immune dysregulation and persistent mucosal inflammation. A wide range of molecular and immunological biomarkers have been implicated in the initiation, activity, and progression of the disease. Among these, microRNA-21 (miRNA-21) has gained particular attention as a key post-transcriptional regulator of gene expression, with critical roles in modulating immune responses and inflammatory signaling pathways. Concurrently, cytokines such as Interferon-gamma (INF-γ) and Transforming Growth Factor-alpha (TGF-α), along with autoantibodies including perinuclear Anti-Neutrophil Cytoplasmic Antibodies (pANCA), have been recognized as essential contributors to the inflammatory microenvironment in UC. The present study was designed to investigate the association between miRNA-21 expression and the levels of INF-γ, TGF-α, and pANCA in patients with UC, with the aim of evaluating their potential as prognostic biomarkers for disease activity and progression.

Keywords: Ulcerative Colitis, miRNA-21, INF-γ, TGF-α, pANCA, qRT-PCR, ELISA, Biomarkers, Immune Dysregulation, IBD.

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SYNTHESIZED FLAVONOID DERIVATIVE ATTENUATING CHLORPYRIFOS-INDUCED TOXICITY IN RATS

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ABSTRACT

Pesticide exposure, particularly to chlorpyrifos, has been linked to increased oxidative stress owing to the overproduction of reactive oxygen species (ROS), which adversely affects both humans and animals. This study aimed to synthesize a flavonoid derivative (C1) and evaluate its potential for mitigating chlorpyrifos-induced toxicity in male rats. Design/methodology/approach A total of 28 Sprague Dawley rats were randomly divided into four groups (seven rats per group): Group I (control) received maize oil, Group II received C1, Group III was exposed to chlorpyrifos, and Group IV received both C1 and chlorpyrifos for two weeks. Also, the predicted ADME properties were carried out using the SwissADME website. The TBARS analysis showed increased levels of oxidative stress markers in chlorpyrifos-exposed rats. Administering C1 alone improved biochemical parameters and reduced lipid peroxidation. Notably, rats pretreated with C1 before chlorpyrifos exposure exhibited substantial reductions in oxidative stress markers compared to the chlorpyrifos-only group. Additionally, total plasma protein, albumin, urea, acetylcholinesterase activity, and antioxidant enzymes, including superoxide dismutase, glutathione S-transferase, catalase, and glutathione, were significantly reduced in the chlorpyrifos-exposed group. Conversely, cholesterol, low-density lipoprotein cholesterol, and triglyceride levels increased, whereas high-density lipoprotein cholesterol levels declined, indicating metabolic disturbances. The predicted ADME analysis predicted good bioavailability, stability, and low toxicity of C1. Originality value: The novel compound C1 exhibits good antioxidant properties that help to neutralize free radicals and protect against chlorpyrifos-induced renal and hepatic damage, making it an attractive therapeutic agent.

Keywords: Chlorpyrifos, synthesized flavonoid derivative, oxidative stress, TBARS.

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EDUCATIONAL MANAGEMENT STRATEGIES FOR PROMOTING ECOSYSTEM LITERACY IN PRIMARY SCHOOLS IN VIETNAM

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ABSTRACT

The urgency of environmental challenges has highlighted the need to cultivate ecosystem literacy from an early age, particularly through primary education. This study explores educational management strategies that support the promotion of ecosystem literacy in Vietnamese primary schools. A mixed methods design was applied during the 2023 to 2024 academic year across seven schools in urban, peri urban, and rural areas of Hanoi. Quantitative data from structured surveys (N = 248) were analyzed using descriptive statistics, t tests, and one way ANOVA, while qualitative data from semi structured interviews and parent focus groups were thematically coded. Findings indicate that strong leadership, teacher collaboration, and active parental engagement significantly enhance the implementation of ecosystem literacy initiatives. However, disparities in training, resources, and stakeholder participation hinder consistent implementation, particularly in rural settings. The study underscores the need for systemic, equity focused management approaches to strengthen ecosystem literacy programs and offers practical recommendations for policy and practice in sustainable education.

Keywords: Ecosystem literacy; educational management; instructional leadership; stakeholder engagement; primary education; Vietnam; sustainable education.

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THE WEAKENING OF PROTECTED AREAS: AN ANALYSIS OF ENFORCEMENT GAPS AND ECOLOGICAL RISKS IN RUSSIA

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ABSTRACT

Protected areas are cornerstones of global conservation and sustainable development strategies. Their effectiveness, however, depends not just on designation but on robust enforcement against violations. Using Russia as a case study, this paper identifies a critical gap between the formal establishment of protected areas and the practical mechanisms available to protect them. A significant change in 2014 stripped many territories, including nationally important resorts, of their status as "specially protected natural territories". This research assesses different categories of protected territories, including nature reserves, national parks, and most notably, resort regions. The analysis is grounded in a detailed case study of the Caucasus Mineralnye Vody (CMW) resort region. The analysis reveals several critical shortcomings: ecologically valuable areas like resorts left without adequate protection; non-standardized terminology and competing norms; inconsistent sentencing guidelines (e.g., for "significant damage") undermine the deterrent effect; practical issues, such as the lack of clearly registered boundaries for protected zones, further cripple enforcement. The case of CMW demonstrates how these failures directly enable environmental degradation, overdevelopment, and the depletion of natural healing resources. It is argued that the current framework is insufficient to ensure the ecological integrity of Russia's protected areas. The paper concludes by proposing specific steps to close these enforcement gaps. The findings have broader implications for the global discussion on the governance of protected areas, highlighting that without clear and enforceable liability, even the most ambitious conservation designations risk becoming "paper parks," failing their core sustainable development objectives.

Keywords: protected areas, environmental issues, sustainable development, conservation policy, Russia, Caucasus Mineralnye Vody.

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EVALUATING THE IMPACT OF PHYSICAL ACTIVITY INTERVENTION PROGRAMS ON PHYSICAL ACTIVITY LEVELS AND MOTOR SKILL DEVELOPMENT IN PRESCHOOL CHILDREN: A LITERATURE REVIEW

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ABSTRACT

Background: The preschool years represent a critical period for promoting physical activity (PA) and developing fundamental motor skills (FMS). Aim: The primary objective of this review is to evaluate whether PA interventions enhance engagement in physical activity and support gross and fine motor development in children aged 3 to 6 years. It also explores gender differences in program responsiveness, identifies the most effective program designs, examines the optimal age for intervention, and considers the potential for long-term lifestyle benefits. Methods: A systematic literature review was conducted using three academic databases: Google Scholar, PubMed, and Scopus. The search included studies published between 2005 and 2024. Inclusion criteria required peer-reviewed, intervention-based studies with pre- and post-measures, targeting children aged 3–6, and published in English. Results:Most interventions reported significant improvements in gross motor skills. Several programs also achieved moderate short-term increases in PA levels. Interventions that combined structured activities with guided play, frequent sessions (2–5 times per week), and educator involvement were most effective. Limited evidence suggested gender-based differences, with boys often excelling in object-control skills and girls in balance and locomotion. Children aged 4 to 5 years showed the greatest responsiveness to intervention. Although few studies included long-term follow-up, those that did, found positive associations between early motor proficiency and later PA engagement and health outcomes. Conclusion: PA intervention programs in early childhood are generally effective in promoting motor skill development and increasing PA participation. Success is strongly influenced by program structure, frequency, and developmental appropriateness.

Keywords: Physical activity, preschool children, motor skill, intervention programs, gross motor skills.

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THE STUDY OF NATURAL REGENERATION IN THE BEECH FOREST STANDS, IN WHICH ARE APPLIED SHELTER-WOOD CUTTINGS DIFFERENT DENSITIES DURING THE PERIOD 2010-2020 AND THE DETERMINATION OF SILVICULTURAL MEASURES

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ABSTRACT

This study aims to assess the state of forest stand regeneration in old-growth beech forest areas treated with shelter-wood cutting 2010-20 in the territory of the Republic of Albania and determine the necessity of intervention with silvicultural measures, to restore the ecological and biological balance in the forest stands with an integrated approach such as "*Forest Landscape Restoration* (FLR)". FLR is today defined as a process that aims to restore ecological functionality and enhance human well-being in forest areas that have been deforested/degraded by human intervention. Natural regeneration of forest stands is one of the main measures within the framework of the FLR integrative concept. The object of the assessment will be the forest areas used within the framework of long-term exploitation contracts. The National Forest Agency reports on 10 long-term exploitation contracts concluded between forest exploitation subjects and 4 municipalities. Beech stands in Librazhdi (LB), Elbasani (EL), Korça (KO) and Gramshi (GR) forests were selected for this research. The degree of real coverage will be evaluated in relation to the necessary degree of coverage to ensure the continuity of the forest stand. On the basis of the degree of cover and the condition of the natural regeneration, the types of silvicultural interventions will be determined. The authors investigate the structural characteristics, regeneration processes and survival of a young generation of common beech (*F. sylvatica* L.) based on measurements (2023-2025). This paper sought to answer whether or not shelter-wood cutting system was successful in our study area by evaluating the effect of shelter-wood cutting in 2015 and 2024, in stand structure (tree DBH and basal area, crown diameter, tree height) and regeneration density. Since the exploited areas are virgin forests, in this study we will also give our opinion on whether these interventions have been reasonable in terms of European objectives for the preservation of virgin beech forests, as well as in the rehabilitation of coniferous forests in the Mediterranean area, especially silver fir.

Key words: virgin or old-growth forests, shelter-wood cutting, *Fagus sylvatica* L., regeneration, semi-natural forestry.

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SEASONAL TEMPERATURE AND ACUTE GASTROENTERITIS IN VLORA, ALBANIA

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ABSTRACT

Acute gastroenteritis [AG] of infectious origin is a significant global public health concern. Seasonal diarrhea remains particularly prevalent during the summer months. This study aims to assess the seasonal distribution of gastrointestinal infections and their correlation with temperature, to inform prevention strategies, minimize health risks, and improve disease management. We conducted a retrospective analysis of 17 years (2007–2023) of weekly syndromic surveillance data from the ALERT system in Vlora, Albania. Weekly data (52 weeks/year) were analyzed to identify seasonal trends and associations with ambient temperature. Spearman correlation, ANOVA, and linear regression models were applied. Results revealed a clear seasonal distribution, with a significant increase in diarrhea cases in the third quarter (July–September), corresponding with peak temperatures. The correlation between temperature and diarrhea incidence was moderate-to-strong (r=0.69), and regression analysis showed that temperature explained 73.4% of the variance in cases. Warmer periods facilitated pathogen proliferation and increased dehydration risk, contributing to seasonal peaks. Compared to the quarterly mean, diarrhea cases rose by 40% in Q3, while Q1 exhibited a 54% decline. Projections indicate a gradual rise in incidence through 2027, particularly during Q3. This study confirms that high ambient temperatures are a primary determinant of seasonal gastroenteritis outbreaks in Vlora, with projected increases in cases especially in Q3. With projected increases in incidence, preventive measures and strengthened preparedness are urgently needed. Targeted measures - such as enhanced monitoring of drinking and recreational water quality, reinforcement of food safety standards, and seasonal health education campaigns for both residents and tourists - are essential to mitigate summer peaks.

Keywords: Acute gastroenteritis, seasonal diarrhea, temperature correlation, public health, Vlora.

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ASSESSMENT OF MARINE LITTER ALONG THE TOURIST COASTLINE OF VELIPOJA AND SHËNGJIN, ALBANIA, WITH EMPHASIS ON PLASTIC POLLUTION

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ABSTRACT

The aim of this study is to assess the quantity and distribution of marine litter, with a particular focus on plastic litter, along the coastal zones of Velipoja and Shëngjin, Albania, areas that have experienced a significant increase in tourist flows in recent years. Sampling of marine litter was carried out following careful field observation and monitoring. Marine litter sampling took place during April and May 2025, prior to the start of the tourist season. The density of marine litter was calculated as the number of items per square meter (items/m^2), while the Clean Coast Index (CCI) was determined using a constant value of K = 20. According to the Clean Coast Index (CCI), the studied beaches exhibited varying levels of cleanliness: central section of the Velipoja coast was classified as moderately clean (CCI = 9.0), peripheral section of the Velipoja coast was also moderately clean (CCI = 6.6), while Shëngjin coast was classified as clean (CCI = 2.4). Cigarette butts were the most common type of litter across all three sites, representing a major source of plastic pollution. On the central section of the Velipoja coast, they accounted for 56.63% of total marine litter, a phenomenon closely linked to the high influx of tourists in this area. Plastics comprised an average of 90.01% of total marine litter, with the highest proportion observed in the peripheral section of the Velipoja coast (92.03%) and the lowest in Shëngjin coast (86.09%). Effective monitoring and management of marine litter by competent authorities and local stakeholders are of particular importance in reducing of marine litter in northern Adriatic coastline of Albania.

Keywords: marine litter, plastic pollution, tourist coastline, Clean Coast Index (CCI).

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THE BLUE FLAG PROGRAM AS A TOOL FOR SUSTAINABLE COASTAL MANAGEMENT

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ABSTRACT

Coastal areas are essential sources of economic power. Excessive and improper use disrupts the natural structure of coastal zones, potentially leading to irreversible impacts. This case hinders the proper utilization of these areas. Many of these impacts are environmental, influencing the economic outputs of coastal regions. Since coasts are significant for tourism, they must comply with eco-label criteria and incorporate standards that support sustainable beach management to ensure sustainable tourism, thereby increasing their attractiveness. In this regard, the Blue Flag program plays an effective role in ensuring the sustainability of coastal management planning. The Blue Flag initiative aims to achieve the highest standards in coastal and beach management through comprehensive and multidisciplinary parameters. It incorporates criteria aligned with the philosophy of an eco-label integrated into environmental management systems. Accordingly, this study examines the extent to which the criteria of the Blue Flag program align with environmental management mechanisms, the principles of integrated coastal zone management, and the United Nations (UN) Sustainable Development Goals.

Keywords: Blue Flag, coastal area management, environmental management systems, sustainable development

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THE EFFECTS OF MICROBIAL WATER POLLUTION OF LAKE OHRID ON HUMAN HEALTH IN THE POGRADEC REGION

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ABSTRACT

Since 2019, the Albanian part of Lake Ohrid has been included in the UNESCO World Heritage List as a mixed natural and cultural site. Lake Ohrid is one of the most valuable aquatic resources in Albania, both economically and in terms of tourism. Currently, the lake is classified as an oligotrophic ecosystem; however, it faces a growing risk of eutrophication due to various anthropogenic pressures. These include unregulated fishing practices, habitat destruction, introduction of invasive species, decline in endemic species, degradation of reed zones, erosion, and inadequate enforcement of environmental laws. The aim of this study was to investigate the correlation between potential pathogenic microorganisms in lake water and waterborne diseases—a topic of significant relevance—while also highlighting the broader implications that water quality has for the economy, tourism, and public health. The research was conducted at four sampling stations around the Albanian shoreline of Lake Ohrid, specifically in the areas of Pogradec and Tushemisht, over the period 2022–2023. These sites are among the most frequently used recreational bathing zones by both locals and tourists during the summer months. A particular focus of this research is the novel approach of directly linking microbial water quality indicators to potential health risks, especially in recreational waters, to better inform preventive strategies. Findings indicate suboptimal microbial water quality in some bathing areas of Lake Ohrid, particularly around Pogradec. This raises concerns regarding possible health implications, especially during peak tourist season when exposure increases significantly. Based on the results, the study emphasizes the urgent need for improved sanitary monitoring and the implementation of effective preventive measures to protect water quality and reduce public health risks.

Keywords: Fecal coliforms, lake Ohrid, fecal streptococci, surface waters, public health, waterborne pathogens

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APPLICATION OF FUZZY LOGIC FOR THE DIAGNOSIS OF DIABETES

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ABSTRACT

Diabetes mellitus is a chronic metabolic disease that causes high blood sugar levels. Fuzzy logic offers a potential solution to diabetes diagnostic precision. Treatment involves the administration of insulin injections to regulate blood glucose levels, lifestyle modifications such as diet and exercise, as well as the use of antidiabetic medications. This research aims to develop and evaluate a fuzzy logic model for diabetes diagnosis, focusing on its potential to enhance accurate and timely detection, unlike traditional threshold-based techniques. This study uses fuzzy logic to predict the likelihood of diabetes mellitus. The study involved 32 participants aged 24-93, with health history data such as age, glucose, serum insulin, BMI, and family history of diabetes disease. Fuzzy logic was utilized to predict the level of diabetes in patients. The fuzzy logic approach is used to determine whether input variables like age, BMI, glucose, serum insulin, and diabetes pedigree function, can predict the output variable of diabetes value. The results show that 72% of patients have moderate diabetes, and 28% of patients have very high diabetes. This research effectively developed a fuzzy logic model to predict diabetes mellitus levels in patients. The constructed model is applicable to a wide range of individuals. The developed model offers potential for future enhancements and updates. Additionally, the system can help medical professionals.

Key words: diabetes mellitus, fuzzy logic toolbox, membership function, prediction model

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IMPLICATIONS FOR SUSTAINABLE BUILDING DESIGN: A COMPUTATIONAL ANALYSIS OF AIRFLOW INTERACTIONS IN FIRE SAFETY SYSTEMS

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ABSTRACT

The design of smoke control systems is a critical component of sustainable building development, directly impacting life safety—a core tenet of social sustainability. Pressurization systems for elevator shafts and adjacent fire-safe zones (FSZ) are essential for ensuring tenable conditions during evacuation. However, these systems are often designed in isolation, neglecting their aerodynamic interdependence. This oversight can lead to two unsustainable outcomes: (1) dangerously inadequate pressure differentials that fail to prevent smoke ingress, jeopardizing occupant safety, or (2) excessively over-designed systems that consume unnecessary energy, conflicting with environmental goals. This study employs a methodological computational analysis to quantify the mutual influence of these coupled pressurization systems in high-rise buildings. Using parametric modeling aligned with building codes (SP 7.13130.2013), pressure regimes and air flow rates analyzed for two common architectural layouts: with and without a physically enclosed FSZ. Our results demonstrate that a failure to account for this coupling can lead to pressure differentials exceeding 150 Pa on evacuation doors, hindering escape, or falling below the safe minimum of 20 Pa. Furthermore, the calculated air flow requirements differ by an order of magnitude between the two layouts, with significant implications for fan energy consumption. It is concluded that integrated modeling of these systems is not merely a technical detail but a prerequisite for achieving truly sustainable and resilient buildings, ensuring both occupant safety and energy efficiency. This research provides a framework for designers to optimize these critical systems concurrently.

Keywords: sovereign education, nature-oriented thinking, legitimacy of power, environmental-legal worldview, environmental-legal consciousness, legal securitization.

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THE ROLE OF TECHNOLOGY AND SUSTAINABILITY IN PROMOTING INNOVATION FOR THE MANAGEMENT OF THE TOURISM BUSINESS ECOSYSTEM IN ALBANIA

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ABSTRACT

Tourism in Albania presents significant potential for economic development, especially in the context of globalization and the growing focus on sustainability and digital technology. This article analyzes the impact of technology and sustainable practices on fostering innovation for the effective management of the tourism business ecosystem in Albania. Based on two structured questionnaires—one for businesses and one for tourists—the study explores the relationship between the capacities of the private sector and tourists' perceptions regarding service quality, infrastructure, technology, and sustainability. The results show that tourism businesses in Albania face structural and financial challenges, where the lack of long-term support, insufficient documentation for grant applications, and limited access to financing from international organizations are key factors hindering development. However, the increasing use of technologies such as mobile applications, virtual reality (VR), and augmented reality (AR), as well as the inclusion of local communities in tourism activities, are positive indicators of innovative transformation and sustainability. On the other hand, tourists highly value the country's natural beauty and hospitality, but also emphasize the need for greater digitalization, centralized information, and a more sustainable approach to nature. Comparisons with European Union countries reveal that Albania still has progress to make, but also possesses a significant opportunity to develop a sustainable, innovative, and digitalized tourism model. The article concludes with practical recommendations for policymakers and market stakeholders on how to improve the investment climate, accelerate digitalization, and strengthen the managerial.

Keywords: Technology, Sustainability, Innovation, Tourism Ecosystem, Businesses in Albania, Management, Start-ups, Financing.

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DOSIMETRIC VERIFICATION USING PLASTIC PLATES

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ABSTRACT

This study investigates the dosimetric verification of treatment planning system (TPS) calculations using a plastic phantom composed of RW3 slabs. The phantom was scanned with a CT simulator, and treatment plans with different field sizes and gantry orientations were created in the TPS. Dose calculations were performed using both the Collapsed Cone (CC) and Monte Carlo (MC) algorithms. Measurements were carried out with a calibrated Farmer-type ionization chamber connected to an IBA Dose 1 electrometer, with corrections applied for temperature, pressure, and recombination. The comparison between measured and calculated doses showed deviations within 2.2% for CC and 1.8% for MC, well inside the clinical acceptance criterion of 3%. These results confirm the suitability of RW3 slab phantoms for independent dosimetric verification and support the accuracy of both CC and MC algorithms in routine clinical quality assurance.

Keywords: Dosimetry, Plastic phantom (RW3), Ionization chamber (Farmer), Monte Carlo, Collapsed Cone, Treatment Planning System, Quality Assurance.

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ESTIMATION OF SEDIMENT VOLUMES TRAPPED BY CHECK DAMS, PUKA REGION, ALBANIA

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ABSTRACT

Soil erosion is a real problem in different areas of Albania. construction of check dams is considered as one of the measures to reduce the transport of the sediments and to control the erosion phenomena. In this study, we evaluated the volume of trapped sediments by 7 check dams constructed in 2024 in the Korthpule area, Puke region, Albania, using the Trapezoid method. The results showed that all check dams trapped 16.074 m^3 of sediment, with volumes varying between 0.963 m^3 and 3.446 m^3. Two check dams with the highest volume of trapped sediment were also evaluated with the section method with regard to compare the results between them. The comparison showed that Trapezoid method overestimated the volume of trapped sediment for both check dams, respectively 0.458 m^3 for check dam P8/M1 and 0.161 m^3 for check dam P8/M2. Considering these results, it can be stated that more investigations of the trapped sediment are necessary in order to evaluate the effect of check dams in restoration projects in the studied area and not only.

Keywords: Erosion, check dam, Topographic survey, Trapezoid method, trapped sediment.

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APPLICATION OF FENTON'S REAGENT FOR EFFECTIVE DEGRADATION OF EOSIN DYE: INFLUENCE OF OPERATIONAL PARAMETERS, ENVIRONMENTAL APPLICATIONS AND KINETIC MODELING

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ABSTRACT

This study explores the removal of Eosin dye from aqueous solutions through an advanced oxidation process based on Fenton's reagent. The influence of key operational parameters, including ferrous ion concentration, solution pH, initial dye concentration, and hydrogen peroxide dosage, was systematically investigated to optimise the degradation process. Experimental results demonstrated that increasing Fe^{2+} concentration enhanced degradation efficiency due to the accelerated generation of hydroxyl radicals. Meanwhile, pH played a critical role, with maximum performance achieved at a pH of 3. Under optimal operating conditions (15 ppm Fe^{2+}, 40 ppm H_2O_2, and an initial dye concentration of 50 ppm), the system achieved complete dye degradation with a removal efficiency of 92%. The results indicated that as the H_2O_2 concentration increased from 20 to 50 ppm, the dye removal efficiency rose from 44.52% to 92.44%, reaching a maximum at 40 ppm, and then slightly decreased to 79.08% at 50 ppm. Consequently, 40 ppm of H_2O_2 was considered the optimal concentration for Eosin dye degradation .Comparison of the regression coefficients (R^2) revealed that the first-order kinetic model provided the best fit, with $R^2 = 0.9943$, which is significantly higher than those obtained for the zero-order ($R^2 = 0.843$) and second-order ($R^2 = 0.862$) models. Kinetic analysis revealed that the degradation followed a first-order reaction model, confirming the applicability of the Fenton mechanism to this system. Collectively, these findings establish the Fenton process as a highly effective and practical method for the treatment of dye-contaminated wastewater, underscoring its potential for industrial wastewater management

Key word: fenton process, practical method, treatment, dye-contaminated, wastewater, industrial wastewater management.

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SUSTAINABLE COMMUNITY DEVELOPMENT AND ETHICS IN TOURISM: CASE STUDIES FROM DURRËS, VELIPOJA, AND VLORA, ALBANIA

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ABSTRACT

Tourism is a powerful economic engine, especially in developing countries like Albania, where natural beauty, cultural heritage, and geographic position offer competitive advantages. However, the expansion of the tourism industry often presents ethical challenges that remain overlooked in public discourse and policy planning. This paper explores the ethical implications of tourism in three major coastal regions in Albania—Durrës, Velipoja, and Vlora—focusing on issues of community participation, environmental justice, and equitable distribution of benefits. Using a mixed-methods approach, the study combines field research, structured questionnaires with 150 local residents, policy analysis, and participatory observation to assess the degree to which tourism development aligns with ethical principles. The research reveals that while tourism has generated short-term economic gains, it has also contributed to environmental degradation, social exclusion, and limited community agency in local decision-making. Participation levels remain low across all three regions, and perceptions of unfair benefit distribution are widespread. The study proposes a normative framework for ethical tourism governance, which centers on inclusion, transparency, and sustainability. The findings aim to inform both national tourism strategy and local governance models in Albania and serve as a model for ethical tourism in similar transitional contexts. The paper contributes to the academic discourse on tourism ethics and sustainability while offering actionable policy recommendations.

Keywords: tourism ethics, sustainable tourism, community participation, environmental justice, Albania, coastal regions, Durrës, Velipoja, Vlora.

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ENVIRONMENTAL TOXICOLOGY AND HEALTH IMPLICATIONS OF BODYBUILDING SUPPLEMENTS: A POST-PANDEMIC PSYCHO-SOCIAL PERSPECTIVE ON QUALITY OF LIFE

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ABSTRACT

Background: The COVID-19 pandemic reshaped global health priorities, heightening awareness of preventive care and physical fitness while fostering excessive supplement use. Bodybuilding supplements, particularly high-protein and multi-ingredient products, are widely marketed for performance enhancement, yet carry risks of organ toxicity, psychological harm and environmental impact. *Objective:* This article explores the intersection between health consciousness, bodybuilding supplement use, and quality of life (QoL), highlighting biomedical risks, environmental toxicological concerns, psychosocial drivers, and the need for regulatory oversight through a real-world clinical case. *Methods:* A narrative review was conducted using PubMed, Scopus, and Web of Science, synthesizing biomedical and psychological evidence on supplement toxicity and QoL. Findings are illustrated through a clinical case of supplement-induced hepatotoxicity and nephrotoxicity, supported by medical records, laboratory data, imaging, and follow-up assessments. *Results:* A 37-year-old male with excessive protein and stimulant supplement intake presented with jaundice, elevated liver enzymes, and impaired renal function. Supplement discontinuation and supportive therapy led to full recovery within six months. Literature analysis demonstrates that excessive protein and unregulated supplements may trigger acute or chronic organ injury, while social pressures and fitness culture promote misuse. In addition, the excessive demand for supplements, along with their overproduction and disposal, raises concerns in environmental toxicology, particularly regarding soil and water contamination. *Conclusion:* Bodybuilding supplements act as a double-edged sword: offering temporary benefits but imposing biomedical, psychological, and ecological costs. A biopsychosocial and environmental framework is required, integrating healthcare, regulatory oversight, and environmental education to safeguard both individual well-being and ecosystem health.

Keywords: Bodybuilding supplements, environmental toxicology, quality of life, biopsychosocial perspective, environmental education.

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SEROPREVALENCE OF *THEILERIA EQUI* IN HORSES FROM TIARET, ALGERIA

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ABSTRACT

Equine theileriosis is a tick-borne disease caused by one of the agents responsible of equine piroplasmosis *Theileria equi,* which affect various species of equids such as; horses, donkeys, zebras and mules, leading to significant economic losses in the equine industry. In order to obtain an initial understanding of prevalence of the disease in Tiaret area, a representative sample of 184 asymptomatic horses serum was analysed using *T. equi* Antibody test kit (VMRD®, Inc, Pullman, WA, USA), and potential risk factors were identified. The seroprevalence for *T. equi* was 54.11 % with a 95% confidence interval CI (44.41%- 58.85%). Univariate and multiple logistic regression models were employed to evaluate the relationship between the risk factors and the various outcomes. The risk factors found to be associated with *T. equi* seropositivity were age and parasitic load. The blood smears were negative for *T. equi* since the subjects studied were asymptomatic during sampling period. Four tick species were identified as following: *Hyalomma marginatum* (46.30%), *Hyalomma excavatum* (22.84%), *Rhipicephalus bursa* (19.75%), *Rhipicephalus sanguineus* (11.11%) respectively. This recent work represents the first report on the status of the serological prevalence of *T. equi* in Tiaret region, Algeria.

Keywords: *Theileria equi,* cELISA, horse, tick, Algeria.

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SOME HEALTH ISSUES FROM THE PERIPHERAL BLOOD ELEMENTS OF YOUNG ATHLETES IN THE QUIET PHASE: A HEMATOLOGICAL AND ENVIRONMENTAL APPROACH

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ABSTRACT

Complete blood count is a valuable analysis that can provide important information regarding the clinical and subclinical status of a patient. Influenced by place of residence, environmental conditions, different abnormalities can be detected through complete blood count either in patient suffering clinically and healthy individuals practicing various sports in different sports environments. In this study we performed and analyzed complete blood count in twenty-five young athletes which were about to undergo an intensive programmed physical activity. The aim was to detect any abnormality which could be presented prior to the physical activity. Results shows a largely coherent and physiologically plausible CBC profile. The absence of dominant out-of-range patterns, reasonable clustering in pairwise relationships, and an NLR distribution without pronounced pathological skew collectively point toward stability in hematologic and inflammatory axes. However, studies with a higher caseload, longer persistence and integrated clinical approach are mandatory to confirm results obtained.

Key words: Athletes, Hematology, Peripheral Blood, Analyses, Environment.

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NEW ISATIN-THIAZOLIDINONE HYBRIDS TARGETING MELANOMA: RATIONAL DESIGN, SYNTHESIS, AND MOLECULAR DOCKING SUPPORTED BY PHARMACOKINETIC AND TOXICOLOGICAL PREDICTIONS

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ABSTRACT

Melanoma is a highly aggressive skin malignancy associated with BRAF mutations and EGFR dysregulation, leading to poor prognosis and therapeutic resistance. The aim of this study was to design, synthesize, and characterize new isatin-thiazolidinone hybrids. Their drug-likeness was evaluated through comprehensive *in silico* studies, which predicted good oral bioavailability and safe toxicological profiles. Furthermore, molecular docking against key oncogenic targets (BRAF V600E and EGFR) to elucidate potential mechanisms of action, revealing strong binding affinities and supportive interactions within the active sites. The synthesized hybrids were successfully characterized, and their structures elucidated using FT-IR spectroscopy, melting point determination, and TLC analysis. The results indicate that these isatin-thiazolidinone hybrids are promising antineoplastic candidates with dual kinase-inhibitory activities (BRAF/EGFR inhibitors) targeting melanoma.

Keywords: Melanoma, isatin-thiazolidinone hybrids, BRAF/EGFR inhibitors, *in silico* ADMET, molecular docking.

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INTEGRATED COASTAL ENVIRONMENTAL MANAGEMENT THROUGH WASTE UTILIZATION AND MANGROVE REVEGETATION FOR ABRASION MITIGATION: A CASE STUDY OF KARAWANG REGENCY, WEST JAVA PROVINCE

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ABSTRACT

Global climate change has emerged as a significant threat to coastal regions, with one of its most visible consequences being severe shoreline abrasion. In Karawang Regency, West Java, this issue has become increasingly alarming as the coastline continues to retreat by several meters, placing large areas of land at risk and disrupting the lives of coastal communities. This study aims to implement and assess an integrated approach to coastal environmental management, focusing on the use of discarded tire waste in combination with mangrove revegetation as a method to reduce abrasion. The research applies a mixed-method approach that combines quantitative data, such as measurements of shoreline abrasion, sediment accumulation, and tidal flooding, with qualitative insights gathered through interviews and direct field observations. This methodological design allows for a comprehensive analysis of both the physical impacts of the intervention and the social outcomes related to community involvement and empowerment. The use of used tires as materials for wave breakers, wave dampers, and sediment traps has proven to be more effective and cost-efficient than traditional coastal defense structures. These tire-based installations have not only reduced wave energy and minimized erosion but have also encouraged sedimentation in previously eroded areas. As a result, coastal progradation has occurred in several locations, with the shoreline advancing by several meters. This has led to a measurable expansion of the buffer zone protecting nearby settlements, improving the long-term resilience of these communities. When combined with mangrove restoration efforts, the tire-based structures contributed to a sustainable bioengineering solution that supports both ecological and social objectives. The integration of technology and natural vegetation helped stabilize the coastal environment, restore degraded ecosystems, and promote biodiversity. In addition, the initiative became a model for community engagement, encouraging local participation in environmental conservation. This innovation has been formally recognized through the issuance of a national patent in Indonesia, highlighting its potential as a replicable solution for other vulnerable coastal areas.

Keywords: Abrasion Mitigation, Integrated Coastal Management, Mangrove Revegetation, Karawang Regency, Waste Utilization.

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TEACHING MEDICAL ENGLISH TO STUDENTS OF HIGHER EDUCATION INSTITUTIONS IN ALBANIA: CHALLENGES ENCOUNTERED AND EDUCATIONAL STRATEGIES

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ABSTRACT

Medical English is part of English as a Foreign Language widely taught in universities specialized in Medicine and medical related sciences, as a separate branch of English for Specific Purposes. While Albanian universities are suffering from a decrease in the numbers of students, specialists of medical related sciences are in high demand all over Europe, this resulting in private universities expand their study programs attracting a lot of students to meet the needs of the healthcare system. Studies show that the healthcare system is the one with the highest prevalence of brain drain. Although English is the lingua franca and is widely taught as a compulsory subject across universities, German language teaching – learning is being widespread specifically to this category of healthcare professionals who study hard in order to meet the needs of the labour market in Germany. The fact that medical students excel is advantageous for both lecturers and students, thus helping the instructors be more efficient in their teaching and achieve promising results. Curriculum designs so far have been outlined and planned by the faculties, however there has been no clear-cut division between English for Specific Purposes (ESP) and Content Language Integrated Learning (CLIL) in these courses.

Keywords: medicine, ESP, CLIL, brain drain.

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CONGENITAL RUBELLA SYNDROME IN THE 21ST CENTURY: A SYSTEMATIC REVIEW

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ABSTRACT

Congenital rubella syndrome (CRS) is a classic viral teratogenic infection due to maternal rubella infection during pregnancy, resulting in fetal infection and damage, causing a wide range of birth defects. Rubella virus continues to be a public health problem in many developing countries, including Ethiopia, where the rubella vaccination coverage is very low. CRS poses a formidable public health problem in the low/medium incidence areas of Ethiopia. National rubella vaccination strategy/schedule has not yet been implemented despite the introduction of measles vaccination in 1984, and continuous requests have been made to introduce rubella vaccination. The introduction of measles vaccines in 1963 worldwide and extensive surveillance of the disease associated with massive vaccination program in many countries led to immediate widespread observations of CRS cases linked to virus transmission through measles vaccine. The rubella epidemic that occur in Cameroon, Bangladesh, and Yemen with documented CRS cases has rekindled inquiries on CRS prevalence and vaccination programs among national and international stakeholders. These epidemiological investigations have also rekindled the look for rubella importation, expensive rubella laboratory kit purchases, and rubella vaccine introduction in countries like Ethiopia where rubella has never been documented. National rubella vaccine has been initiated many times, yet still lacks global, national and regional rubella surveillance policy despite the widespread global attention CRS has gained in the 21st century.

Key words: Congenital rubella syndrome (CRS), viral teratogenic, infection, Rubella virus.

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ASSESSMENT OF POPULATION STRUCTURE AND BEHAVIOR OF *PSEUDOCHAZARA TISIPHONE* BROWN, [1981] (*LEPIDOPTERA NYMPHALIDAE*) USING THE MARK-RELEASE-RECAPTURE (MRR) METHOD: A CASE STUDY IN SOUTHEASTERN ALBANIA

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ABSTRACT

The Mark-Release-Recapture (MRR) method is used today as one of the most useful approaches for obtaining demographic information on animals, including insects. The Mark-Release-Recapture (MRR) method is important because it allows us to collect data without affecting the biological cycle of the animals (insects in the study). In 2024, MRR was to assess the population structure and behavior of Pseudochazara tisiphone Brown, [1981] (Lepidoptera: Nymphalidae), a species listed as Vulnerable (VU) in Albania's national Red List. The study was conducted in Bredhi i Drenovës National Park (Korçë, Albania), an ecologically significant habitat in southeastern Albania. Over two intermittent weeks during the period from 7 to 31 July, 164 individuals were marked 88 females (53.7%) and 76 males (46.3%). A total of 17 individuals (10.4%) were recaptured, with females comprising a larger proportion of recaptures (64.7%) compared to males (35.3%). These results provide a snapshot of the species' local population structure and suggest potential sex-based differences in behavior or spatial use, warranting further investigation.

Keywords: Pseudochasara tisiphone, Mark-Release-Recapture, Lepidoptera, Albania, insect conservation.

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MEASURING NATURAL RADIOACTIVITY IN SOIL SAMPLES FROM AL-ZUBAIR DISTRICT IN BASRA USING SODIUM IODIDE (NAI) AND ASSESSING THE ASSOCIATED HEALTH RISKS

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ABSTRACT

This study aimed to evaluate the natural radioactivity levels of soil samples collected from the Al-Zubair district in Basra, Iraq by using sodium iodide detectors (NaI). The goal is to understand what (if any) health problems are associated with such radiation levels. The specific activity of 238U varied from (12.9±0.85)–(30.9±1) Bq/kg, with an average value of (25.72±3.57) Bq/kg. The activity levels of 232Th ranged from (6.4±0.4) to (30.6±0.1) Bq/kg, with a mean value of (20.29±1.91) Bq/kg The activity by 40K exhibits in the range of (42.5±1.3) to (338.2±3.6) Bq/kg and an average of (179.93±23.925) Bq/kg, respectively Furthermore, values of calculated radiological parameters, i.e., Raeq, Hex Hin Iγ and Iα are found within the safe limit for environmental purposes. The outcomes indicate that the naturally radioactive levels in Al-Zubair soils are generally low and do not pose significant potential health risks. Nonetheless, long-term monitoring is recommended, especially in high-isotope-concentration areas, to protect public health.

Keywords: Natural radioactivity, (NaI) Detectors, Al-Zubair district, Soil, Health risks.

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ECOSYSTEM DYNAMICS OF TURBULOGENESIS: ABIOGENESIS IN THE TURBULENT PROTOATMOSPHERE

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ABSTRACT

Turbulogenesis is postulated and interpreted as a new mechanism of primary abiogenesis occurring under previously unconsidered conditions: turbulogenesis in turbulent near-surface flows of the protoatmosphere. Turbulogenesis (or turbiogenesis) is understood as abiogenesis actualized in stochastically localized zones with a high probability of organic structure synthesis resulting from turbulent, vortical, and interference processes in Earth's primordial atmosphere. From an ecological perspective, these zones may be interpreted as dynamic proto-ecosystems — transient yet structured environments capable of energy exchange, compartmentalization, and emergent order. Thus, turbiogenesis represents an atmospheric model of primary ecosystem genesis preceding biological evolution. On the basis of formalization and modeling via the wave equation, phase interference, and the Monte Carlo method, under certain combinations of temperature, electric field, light intensity, and turbulent energy, localized resonant amplification of the probability of chemical synthesis arises. Analysis of spatiotemporal simulations revealed rare but stable probability peaks, eoloforms, which can be interpreted as potential precursors of prelife. Statistical analysis confirmed that these peaks are significant and nonrandom. The overall probability of turbulogenesis under the given conditions was approximately 0.25%, with an optimal combination of parameters and conditions. Turbulogenesis represents a multifactorial, nonlinear, and phase-resonant model capable of complementing existing views on abiogenesis.

Keywords: ecosystem dynamics; turbulogenesis; turbiogenesis; abiogenesis; atmospheric ecology; nonlinear self-organization; proto-ecosystems; emergent order; turbulence modeling.

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CMT VERSUS CONDUCTIMETER: DIAGNOSTIC ACCURACY FOR BOVINE MASTITIS IN ALGERIAN DAIRY HERDS

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ABSTRACT

Mastitis is one of the most significant diseases in dairy cattle farming. This work focuses on detecting subclinical mastitis in dairy cows by comparing two diagnostic methods*:* The Dramininski® test (MD 4x4 Q2 milk electrical conductivity test) and the CMT (Californian Mastitis Test) as a confirmation test. The study was conducted in the Tiaret region between November 2023 and May 2024, involving 62 dairy cows from four different farms. After discarding the first streams of milk, both tests were performed according to the manufacturer's instructions. The results showed an overall prevalence of mastitis of 39.1%, 56.6% according to the CMT and the Dramininski® test respectively. The prevalence varied with age: 50.0% in 2-year-olds, 56.5% in 3-year-olds, 83.3% in 4- to 5-year-olds, 60.0% in 6-year-olds, and 75% in 7- to 8-year-olds. Depending on the breed, the prevalence was 61.5% for Montbéliard cows, 100% for Friesians, 75.0% for Crossbreeds, 50% for Fleckviehs, 71.9% for Prim'Holsteins, and 60.0% for Normans. Regarding the coat, the prevalence was 58.3% for Pie Rouge cows and 73.7% for Pie Noirs. Milk samples from affected quarters yielded 18 strains of *Staphylococcus aureus* and 2 strains of *Escherichia coli* Our experiment demonstrated that the conductimeter's efficiency was comparable to the CMT. These results highlight the importance of early detection and effective management of mastitis to improve the health and productivity of dairy herds.

Key words: mastitis; CMT; Conductivity; prevalence; microbiology

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PHARMACOLOGICAL POTENTIAL OF BIOACTIVE COMPOUNDS IN ORIGANUM SPECIES

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ABSTRACT

Origanum species and particularly *Origanum vulgare* and its subspecies, are well known medicinal and aromatic plants belonging to the *Lamiaceae* family. In the Mediterranean they are traditionally recognized for their culinary and medicinal uses. Recent studies have underlined remarkable pharmacological potential of *Origanum* species, mainly attributed to their rich content of bioactive compounds such as carvacrol, thymol, rosmarinic acid, salvianolic acids, and flavonoids. These compounds are proven to have high antioxidant, antimicrobial, anti-inflammatory, antifungal, analgesic, antidiabetic, anticoagulant, and anticancer activities. Recently, essential oils of *Origanum vulgare* are widely used for their strong activity against free radicals and the benefits on lipids metabolism. These properties are mainly dedicated to the significant amounts of different lipid molecules, found in different *Origanum* species as well as to the considerable content of terpenes. The most used part of the plant is the top flowering part of the plant, which is rich in these components. The aqueous and alcoholic extracts of the plant are tested and have shown very good efficacy against bacteria, fungi and yeasts. The pharmacological effectiveness varies between subspecies, extraction method, and the chemical composition/profile of the plant, which is closely shaped by different ecological variables, particularly climatic conditions and soil characteristics, in the geographical area where the plant is grown and collected.

Key words: Origanum species, Origanum vulgare, Laminaceae, Medicinal plants, Bioactive compounds, Essential oils, Pharmacological potential.