

Vol. 11 (4): 671-678 (2021)

EVALUATION OF AIR QUALITY IN KONYA CITY CENTER AFTER THE NEW CORONA-19 OUTPUT AND WITH ITS CAUTION

Sukru DURSUN^{1*}

^{1*}*Konya Technical University, Environmental Engineering Department, Konya, Turkey;*

*Corresponding Author Sukru DURSUN, e-mail: sdursun@ktun.edu.tr;

Received May 2021; Accepted June 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.401>

ABSTRACT

As in the changing conditions throughout the world, urbanization in Turkey, energy supply and the use of energy resources create significant effects on a global scale, and as a result, air pollution is an important environmental problem. It is known that the factors that cause air pollution have significant effects on human and environmental health. In order to reduce these effects, improving air quality is important all over the world. Scientists and relevant authorities are working on monitoring the values of pollutants to find solutions to air quality problems, to follow an effective path or to determine a strategy. It is also important to measure air pollutants and monitor the quality, and to determine the causes and sources of pollution. It is very important to spread or model the analysis processes over a wider area. It is possible to reach these parameter limits with the measures to be taken to improve the air quality parameters. In recent years, new stations have been established in addition to 4 air quality measurement stations in the center of Konya, and the daily average data obtained from these are evaluated in this study. It has been observed that some local factors are also effective, as all parameters change depending on seasonal conditions. In general, it is understood from the results of studies that the air quality decreases and the size of pollution increases in cold winter seasons. It is necessary to reduce the pollution values, to control the pollutant rate arising from the activities of industrial enterprises, to reduce the use of fossil fuels, to encourage urban public transportation, to protect nature, and to make legal arrangements in human activities that reduce air quality. The studies to be carried out for this purpose should be started by the relevant authorities in order to reduce the factors causing pollution and to protect the air quality. It should be the duty of humanity to take measures to protect the life of all living things, especially human health.

Keywords: Konya, Air Quality, PM, COVID 19, outbreak

Vol. 11 (4): 679-684 (2021)

DOES THE WASTEWATER PRODUCED BY THE WATER STEAM DISTILLATION OF ROSE OIL FROM *ROSA ALBA* L. AND *ROSA DAMASCENA* MILL. HAVE GENOTOXIC POTENTIAL?

Svetla Gateva^{1*}, Gabriele Jovtchev¹, Tsveta Angelova¹, Ana Dobрева², Milka Mileva³

^{1*}*Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 2 Gagarin Str., Sofia 1113, Bulgaria;*

²*Institute for Roses and Aromatic Plants, 49 Osvobojudenie Blvd, Kazanlak 6100, Bulgaria;*

³*The Stephan Angeloff Institute of Microbiology, Bulgarian Academy of Sciences, 26 Acad. G. Bonchev Str., Sofia 1113, Bulgaria;*

*Corresponding Author Svetla Gateva, e-mail: spetkova2002@yahoo.co.uk;

Received May 2021; Accepted June 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.402>

ABSTRACT

Bulgaria is known as one of the main producers of high quality rose oil from *Rosa damascena* Mill. and *Rosa alba* L., which are valued on the world market for fragrances with the rating "Royal Class". Wastewater is one of the wastes discarded in the environment as result of water steam distillation applied in rose oil production. There are scarce data whether this waste harms the soil or it can be recovered, and whether this waste could be utilized further. To address these questions, this study investigated the potential cytotoxic/genotoxic effect of wastewater produced by water steam distillation of oil from *R. alba*, and *R. damascena*. Five concentrations (from 3 to 20%) of wastewater of both roses applied for 1h and 4 hours were tested for genotoxicity by chromosome aberration assay in two test-systems, barley and lymphocyte cultures. Cytotoxicity was determined by mitotic index. Both wastewaters showed not high, but statistically significant genotoxic activity at the concentrations applied, as lymphocytes had higher sensitivity than barley cells. Clear dose-dependence was detected in lymphocytes treated with *R. alba* L. wastewater, whereas close values of aberrations for all concentrations was observed in barley. Genotoxic effect of prolonged treatment was lower than that of 1 h in both test-systems. Wastewater of *R. damascena* Mill. induced slightly higher genotoxicity compared with that of *R. alba* L. No concentration dependence was obtained in both test-systems neither for short-time treatment, nor for the longer 4h period. Our data suggest that the wastewaters produced by the water steam distillation of oil from both roses are promising for further use in practice.

Keywords: wastewater, *R. alba* L. and *R. damascena* Mill., genotoxicity, test-systems

Vol. 11 (4): 685-692 (2021)

ENVIRONMENT ISSUES AND FEEDING MECHANISM FOR WILD PIGS AND WILD PORK PROCESSING DURING EVFTA IN ASIAN COUNTRIES

Leng Thi Lan¹, Dinh Tran Ngoc Huy^{2*}, Bui Thi Thom¹, Nguyen Thi Hang³

¹Thai Nguyen University of Agriculture and Forestry, Vietnam;

²Banking University HCMC, Ho Chi Minh city Vietnam, International University of Japan, Japan;

³Thai Nguyen University, University of Information and Communication Technology, Vietnam;

*Corresponding Author Dinh Tran Ngoc Huy, e-mail: dtnhuy.2010@gmail.com; lengthilan@tuaf.edu.vn;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.403>

ABSTRACT

In case of Northern region of Vietnam, many provinces and cities such as Thai Nguyen that have much and enough conditions for feeding wild pigs in Thai Nguyen ecological environment. Feeding wild pigs and managing wild pork meat quality is meaningful in Vietnam, esp. In Thai Nguyen province as pork products can offer variety of tastes due to food processing and suitable for Vietnamese tastes and can export to the world widely. We might note that wild pigs prefer to live in herds, from 5-10 pigs and live in mixed forests. To meet demand from global markets including US and Europe, we need better solutions for feeding wild pigs and enhance quality of wild pork meat. From wild pork meat, people can offer delicious food via pork processing as suggested in the paper. Last but not least, we propose protein and energy mechanism for wild pigs feeding in case study of Vietnam. On conclusion, it's stated that, In Thailand and China, wild boars have also been domesticated and crossed with native pigs to become livestock in the breeding system for 12-18 years. Purebred Thai wild pork has many advantages over Vietnamese wild boar such as high resistance, less care, self-fertilization without human intervention, simple housing, low cost. livestock production is low but the output is stable. With the development of society, the demand for wild pork meat and pure local pigs are being preferred. Therefore, farmers are gradually taming farming in the direction of concentration but still keeping their wild behavior.

Key words: feeding, protein and energy, pig farming, wild pork and pigs, Vietnam.

Vol. 11 (4): 693-698 (2021)

EVALUATION OF POLLENS AS AEROALLERGEN IN SHKODRA DISTRICT, ALBANIA

Mirela Lika (Çekani)^{1*}

^{1*}University of Tirana, Department of Biology, Tirana, Albania;

*Corresponding Author Mirela Lika (Çekani), e-mail: mirela.rika@fshn.edu.al;

Received May 2021; Accepted June 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.404>

ABSTRACT

In this study, aerogenic allergies caused by aeroallergens, mainly pollen, were evaluated. Information about aeroallergens, their structure, or composition and impact on allergies was initially analyzed. Also, based on the literature and studies that have been conducted, the mechanisms of development of allergic reactions and their effects on the human body have been evaluated. Since pollens are one of the main causes of allergies and promote the manifestation of various reactions and symptoms. Specifically, this work consisted of the morphological study of pollens of allergic plants in the area of Shkodra and several people affected by pollen allergies were studied. Statistical data processing was also performed by 100 allergic patients, studying the families of the most common allergic plants in the area, and the association of these pollens with allergies in humans, as well as distributions with the most affected age group and sex, as well as the most common diagnosis that these patients present. The working methodology consisted in the collection and determination of trees and pollen, the cause of various allergies, according to clearly defined methodologies. The results have been expected, for the association of pollens with the occurrence of allergies, mainly of the respiratory tract in humans.

Keywords: aeroallergen, allergy, pollen, bacteria, fungi, mechanism of allergy, early-stage reactions, late-stage reactions, chemical mediator, allergen

IMPLEMENTATION OF INTEGRATED SOLID WASTE MANAGEMENT IN TURKEY BASED ON CIRCULAR ECONOMY

Oylum Gökkurt Baki*

**Sinop University, Engineering and Architecture Faculty, Environmental Engineering Department,
57000, Sinop, Turkey;*

*Corresponding Author Oylum Gökkurt Baki, e-mail: ogbaki@sinop.edu.tr;

Received May 2021; Accepted June 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.405>

ABSTRACT

Solid waste still remains an urban problem in many places in Turkey. One of the most important principles of waste management strategy recently in Turkey, prevention of waste generation at source and/or waste minimization. In the legal regulations in Turkey, waste minimization, reuse of wastes, recycling materials and energy are handled as priority. These principles, which are also included in our legislation, actually support circular economy (CE) practices. At the same time, integrated solid waste management (ISWM) adopts a principle based on the 3R approach (reduce, reuse and recycle) aiming to optimize solid waste management for all waste generating sectors and all stakeholders. In the circular economy, the principles of "reduce, reuse, recycle (reduce, reuse, recycle-3R)" is 3R principles are absolutely valid. It aims to design wastes so that they can be included in the system and maximize resource recovery. The aim of the study is to reveal the strategy of waste management in Turkey and to indicate the point where the studies have reached in the circular economy (CE) approach. In addition, to emphasize the importance and necessity of applications of circular economy approach in solid waste management. In that the circular economy is an important approach both to tackle environmental problems and to encourage sustainable production and consumption.

Keywords: circular economy, life cycle assessment, integrated solid waste management, 3R approach, principles, Turkey.

THERMODYNAMIC EVALUATION OF ORGANIC RANKINE CYCLE CONFIGURATIONS TO INCREASE ENERGY AND EXERGY EFFICIENCY OF BIOGAS COGENERATION POWER PLANT

Ahmet Serhan Hergul¹, Muharrem Eyidogan¹, Yusuf Cay², Fatma Canka Kilic^{1*}

¹*Kocaeli University, Technology Faculty, Department of Energy Systems Engineering, Umuttepe Campus, 41001, Kocaeli, Turkey;*

²*Sakarya University of Applied Sciences, Technology Faculty, Mechanical Engineering Department, Esentepe Campus, Serdivan, Sakarya, Turkey;*

*Corresponding Author Fatma Canka Kilic, e-mail: fatmacanka@hotmail.com;

Received May 2021; Accepted June 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.406>

ABSTRACT

Organic Rankine Cycle (ORC) is widely used in electricity generation from low temperature waste heat sources. This study introduces the analysis of the biogas cogeneration plant run by internal combustion engines of different power scales. Taking into consideration the variable exhaust temperatures of the engines of the biogas plant operating at asymmetric power and the thermal capacities of the high temperature and low temperature circuits, analyzes and optimizations were realized by considering different fluids and boundary conditions for different cycle types at variable temperatures. To increase the overall efficiency of the plant and to recover the thermal energy thrown into the atmosphere, different fluids in different cycle types have been examined. To designate the working conditions of the proposed system, the energy production and internal consumption data of a working biogas power plant were investigated. Calculations were executed by taking consideration of the long-term recorded gas production data and the corresponding electrical power, electrical efficiency values, thermal production, waste feeding and preheating needs, and environmental conditions. The effects of different cycles on the total energy and exergy efficiencies of the plant were analyzed.

Keywords: Organic Rankine Cycle (ORC), a biogas power plant, energy, exergy efficiency, waste heat recovery.

Vol. 11 (4): 715-724 (2021)

AIR QUALITY OF O₃ AND NO₂ TIMELINE CHANGES IN KONYA CITY CENTER

Huseyin Toros¹, Hysen Mankolli², Sukru Dursun^{3*}

¹ITU, Faculty of Aeronautics and Astronautics, Maslak, Istanbul, Turkey;

²Expert in Ecology, Plainfield, Illinois, USA;

^{3*}Konya Technical Un, Engineering and Natural Science Faculty, Konya, Turkey;

*Corresponding Author Sukru Dursun, e-mail: sdursun@ktun.edu.tr;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.407>

ABSTRACT

In cases that air quality will change the living health or environmental quality, the composition of the air should not change or the substances that are dangerous to be in the air that not be present in the atmosphere. Air pollution, which is a result of urbanization and fuel use brought about by different life styles, can cause a dangerous impact area on a global scale as well as in Turkey. Air pollution has a significant impact on human health, so the issue of air quality is of great importance all over the world. The management of the parameters related to the outdoor air quality is carried out in accordance with the Air Quality Assessment and Management Regulation. A country's or region's success in improving and protecting the air quality, local and national air pollution problems, and the support of citizens who are well informed and informed about the developments in pollution reduction are needed. For the investigation of air pollution in Konya, NO₂ and O₃ parameters have been evaluated. The stations are statistically analysed according to the measurement results made in the required periods. As a result of this, it is aimed to study on the continuously measured parameters and their effects, what the necessary measures should be in order to reduce the effect and what the applications could be by evaluating and graphing the data. In this study, the effect of temporal NO₂ and O₃ changes on air quality was evaluated.

Keywords: Environment, Temporal change, Air quality, NO₂, O₃.

Vol. 11 (4): 725-730 (2021)

SOME MEDICINAL - AROMATIC PLANTS SOLD IN HERBALISTS OF ORDU PROVINCE IN TURKEY AND THEIR USAGE

Asiye KARAEVLI¹, Ayse Gul SARIKAYA^{2*}

¹Bartın University, Faculty of Forestry, Bursa, Turkey;

^{2*}Bursa Technical University, Faculty of Forestry, Bartın, Turkey;

*Corresponding Author Ayse Gul SARIKAYA, e-mail: aysegul.sarikaya@btu.edu.tr;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.408>

ABSTRACT

In this study, 17 herbalists from the center and some districts (Korgan-Kumru-Fatsa-Unye) of Ordu province were interviewed in order to determine the medicinal and aromatic plants sold in herbalists in Ordu province and their usage areas. As result of the interviews, it was determined that 35 taxa belonging to 19 families and they have 20 different usage areas. Families with the most used species were Lamiaceae (20%), Apiaceae (11%), Rosaceae (8%) and Fabaceae (8%). Using parts of this taxa are leaf (37%), seed (17%), flower (17%), fruit (14%), root (5%), shell (3%) and the stem (3%). It has been determined that taxa are consumed as brewing (52%), raw (20%), powder (15%), oil (9%) molasses (2%) and boiling (2%). The species mostly sold in the herbalist shops were distinguished as Ginger (*Zingiber ofinale* R.), Turmeric (*Curcuma longa* L.), Chili pepper (*Capsicum annum* L.), Black pepper (*Piper nigrum* L.), Mint (*Mentha piperita* L.) and Thyme (*Tymus* spp.). Medicinal and aromatic plants are mostly used as flu, cold, upper respiratory tract ailments, slimming-edema remover, spice, strengthening the immune system and relieving intestinal disorders.

Keywords: Ordu, herbalist, medicinal aromatic plants, Turkey.

Vol. 11 (4): 731-736 (2021)

GEOSYSTEMS TRANSFORMATION IN THE NORTHERN PART OF BAIKAL NATURAL TERRITORY (*study and mapping*)

Tatyana Konovalova¹², Alexander Sizykh^{3*}

¹V.B. Sochava Institute of Geography, Siberian Branch of Russian Academy of Sciences, Irkutsk, 664033, Russia;

²Irkutsk State University, 664033 Irkutsk, 126 Ulan-Batorskay str., Russia;

^{3*}Siberian Institute of Plant Physiology and Biochemistry of RAS SB, 664033 Irkutsk, 132 Lermontova str., Russia;

*Corresponding Author Alexander Sizykh, e-mail: alexander.sizykh@gmail.com;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.409>

ABSTRACT

We present the result of the study of geosystems transformation in hard-to-reach northern areas of Baikal Natural Territory. It is stated that geosystems transformation is determined in many aspects by changes in matter and energy links in the geosystems resulting from the effect of Baikal Rift Zone. There are considerable contrasts in geosystems situated at different tectonic sites of the territory, a strong character of their links, the relation to a definite rocks composition, to the areas of past and modern glaciations. We consider basic methods of mapping of geosystems transformations. The mapping supposes solution of three main tasks, which are traditionally determined as identification, systematization and interpretation of the geosystems. They consist of the following steps: determination of diagnostic features of the geosystems; time and space synthesis in the whole taking into account regional and typological specifics, structural-dynamic and evolutionary transformations; provision of the possibility to form ideas on the trends of geosystems transformation by names and classification positions. Each typological unit of geosystems has different taxonomic identification and reflects different physical-geographic features of a region and diverse geographic relations resulting from external functional properties of a geographic environment structure coordinating the peculiarities of their transformation on the base of macrogeographic regularities.

Key words: geosystem, mapping, transformation mechanisms, landscape boundaries.

Vol. 11 (4): 737-742 (2021)

PREVALENCE AND CHARACTERIZATION OF *STAPHYLOCOCCUS AUREUS* FROM MARKET MILK

Khushboo Sahito¹, Aijaz Hussain Soomro¹, Tahseen Fatima Miano^{1*},
Raja Ghazanfar Ali Sahito²

¹Sindh Agriculture University, Institute of Food Sciences and Technology, Tando Jam, Pakistan;

²University of Cologne, Institute of Neurophysiology, Germany;

*Corresponding Author Tahseen Fatima Miano, e-mail: tahseenfm@yahoo.com;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.410>

ABSTRACT

This study designed to check the prevalence and to characterize *Staphylococcus aureus* isolates from market milk. The total number of 20 marketed milk samples were randomly collected from different locations of Hyderabad district of Sindh, Pakistan. The *S. aureus* were isolated on Mannitol Salt agar, among the presumptive *S.aureus* isolates an overall 15 milk samples observed contaminated with *S. aureus* showing a prevalence rate of 75%. For genotypic characterization, DNA extracted from the isolates and all the isolates identified by species, specific primers targeting 16S rRNA that showed 750bp PCR amplified product. Antibiogram profile showed susceptibilities of the isolates against five antibiotics using the Kirby-Bauer disc diffusion method. The antibiotic ciprofloxacin showed higher susceptibility rate followed by norfloxacin, tetracycline, oxytetracycline and ampicillin.

Keywords: Microbes, toxins, antibiotics, contamination, milk.

Vol. 11 (4): 743-752 (2021)

THE PARTICIPATION OF PEOPLE IN DEVELOPING AGRICULTURE VALUE CHAIN OF WILD PORK AND WILD PIGS IN THE NORTH OF VIETNAM

Bui Thi Thom¹, Dinh Tran Ngoc Huy^{2*}, Nguyen Thi Hoa³, Bui Thi Suu⁴

¹Thai Nguyen University of Agriculture and Forestry, Vietnam;

^{2*}Banking University HCMC, Ho Chi Minh city Vietnam - International University of Japan, Japan;

³Thu Dau Mot University, Binh Duong, Vietnam;

⁴Tay Bac University, Quyet Tam Ward, Son LA city, Son La Province, Vietnam;

*Corresponding Author Dinh Tran Ngoc Huy, e-mail: dtnhuy.2010@gmail.com;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.411>

ABSTRACT

Authors perform this research to study on constructing value chain of wild pork and wild pigs in the northern region of Vietnam. Thuy, N.T (2021) presented the analysis results show that factors including: income, natural conditions, loan capital, market have a great impact on the level of people's participation. Since then, the article has suggested some solutions to improve people's participation in agricultural value chain development of wild pigs and wild pork. Thom, BT., & Huy, D.T.N (2021) stated Feeding wild pigs and managing wild pork meat quality is meaningful in Vietnam, esp. In Thai Nguyen province as pork products can offer variety of tastes due to food processing and suitable for Vietnamese tastes and can export to the world widely. Feeding wild board in different environment also affect quality of wild pork meat, for example in US, Brazil or In Vietnam. It is in the study we will make comparison to wild pork meat in China and Thailand and suggest to enhance vale chain linkage of wild pork and wild pigs to enhance exporting markets. Last but not least, better value chain linkage can be enhanced through reducing transaction costs from wild pig farming to factories and producing wild pork meat following European standards or GlobalGAP or VIETGAP.

Key words: wild pork, wild pigs, agriculture value chain, linkage, Vietnam, northern region

IMPACT OF GREEN ECONOMY IN SUSTAINABLE DEVELOPMENT

Alvina Gucaj^{1*}, Flora Merko², Alba Ramallari²

^{1*}Office manager, Protik Innovation Center, Tirana, Albania;

²Aleksander Moisiu University, Department of Economics, Durrës, Albania;

*Corresponding Author Alvina Gucaj, e-mail: cokualvi@gmail.com; floramerko@yahoo.it;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.412>

ABSTRACT

The economy is closely related to nature and the environment is absorbed to productive factors. In economic growth, the environment is considered an exogenous economic factor, while in development economics, the environment is considered an economic resource and an integral part of economic development. It "produces" welfare for the population and thanks to related activities, can also produce economic benefits and wealth. Theories of economic growth in the past were based on the fact that to secure the needs of future generations it was necessary to provide them with a heterogeneous part of natural/artificial capital not less than the current one. Development theories now consider the loss of natural capital as irreplaceable by man-made capital. Developed countries' enterprises are oriented towards a green economy, developing countries consider, natural resources, a source for economic growth. Based on these conditions, it is important to analyze the environmental factor in Albania to understand whether the environment it is considered an endogenous factor for the economic development of the country or whether it is a primary source for economic growth. To carry out this work, the methodology used will be based on empirical analysis, to explore the influence that natural resources have had on the economic growth of the country and the evolution of the economy over the last 30 years. The expected results of this paper are: natural resources are considered a primary factor for economic growth while in contrast pollution, catastrophic natural events such as floods, frosts, or drought are increasingly damaging the country's economy.

Keywords: Green Economy, Sustainable Development, Natural Resources, Empirical Analyze.

FOOD WASTE MANAGEMENT STRATEGIES IN FOOD SUPPLY CHAIN

Aijaz Hussain Soomro¹, Nida Shaikh¹, Tahseen Fatima Miano^{1*}, Asadullah Marri¹,
Shahzor Gul Khaskheli¹, Dileep Kumar¹

¹*Sindh Agriculture University, Institute of Food Sciences and Technology, Tandojam 70060, Sindh, Pakistan;*

*Corresponding Author Tahseen Fatima Miano, e-mail: tahseenfm@yahoo.com;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.413>

ABSTRACT

The increasing food waste is considerably gaining attention to food growers, processors, scientists and consumers to explore the ways that can alleviate the risks of food waste. The objective of this study is to discover effective food waste management strategies to improve existing food waste management approaches in food production areas. According to the Food and Agriculture Organization (FAO) revealed that one third of all food produced is wasted every year, worldwide owing to insufficient production, processing, and storage tactics. This frequent and persistent food waste is not merely generating food security issues but also creating economic problems, impacts on profitability in food supply chain, loss of food waste management cost and hunger. Therefore, securing the food from waste from various stages of food processing throughout the food supply chain is important for understanding. This review paper focused on the key factors in food supply chain to food waste and food waste preventing strategies regarding existing sustainable food waste utilization approaches.

Keywords: Food waste, sustainability, food supply chain, waste management.

Vol. 11 (4): 767-776 (2021)

INVESTIGATION OF EXPECTATIONS FOR THE AGRICULTURAL PRODUCTION AND FOOD PRODUCTION SECTOR AFFECT OF THE COVID-19 VIRUS PANDEMIC AND MEASURES

Sukru Dursun¹, Lyudmyla Symochko^{2,3*}

¹Konya Technical University, Faculty of Engineering, Konya, Turkey;

²Faculty of Biology, Uzhhorod National University, Voloshyna Str.32, Uzhhorod, Ukraine;

^{3*}Institute of Agroecology and Environmental Management NAAS, Metrologichna Str., 12, Kyiv, 03143, Ukraine;

*Corresponding Author Lyudmyla Symochko, e-mail: lyudmilassem@gmail.com;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.414>

ABSTRACT

The importance of food requirement for the worldwide country is geared towards China COVID-19 pandemic for the agricultural activity and food production in the world with its seasonal fluctuation of foods available used in domestic food and general products. Initial preparations of the current dispositions, which will also be made food preparations, along with its cultivation in small-producer countries in Asia, then Afrikaans, South America. With its current continuation, it will be designed in a near future as comprehensive, especially in low-income countries in general. It can be predicted that the social and economic damage that can be thought of worldwide can be a very serious effect. It's definitely the case-by-case scenario in the workforce in the fresh fruit and vegetable and animal sectors with the global total revenue completed every day in large chunks of the world and with the design limiting placement. The ongoing pandemic and the person coming from a country selection in the production sector in the country, on the other hand, require the correct health status of the scanner to be taken into account. While the pandemic is occurring in the use by adapting without being collected, it turns out that not being grown, making it economical will not be completed. This study is planned to be evaluated both in terms of health and in terms of economy, by examining and examining what came with the emergence of the pandemic.

Keywords: COVID-19, agricultural production, pandemic, food industry, economy, environment.

PLANT STRUCTURAL POPULATION AND DYNAMICS OF DEGRADED ECOSYSTEMS IN SOUTHERN BENOUE OF NORTH CAMEROON

Aboubakar Seibou^{1*}, Tchobsala¹, Bring², Haiwa Gilbert³, Sofalné Clement⁴

^{1*}University of Maroua, Faculty of Sciences, Department of Biological Sciences, PO 814 Maroua, Cameroon;

²University of Ngaoundere, Faculty of Arts, Letters and Human Sciences, Department of Geography, PO 454 Ngaoundere, Cameroon;

³University of Maroua, National Advanced School of Engineering of Maroua, Department of Environmental Sciences, Cameroon;

⁴ABIOTeT, PO 127 Maroua, Cameroon;

*Corresponding author Aboubakar Seibou, e-mail: aboubakarseibou@yahoo.fr;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.415>

ABSTRACT

The study of the structure and dynamics of vegetation was carried out in the ecosystems of southern Benoue in northern Cameroon. The general objective of this work is to characterize the structure of the vegetation and to assess the degradation of the ecosystems. The inventory methods chosen include biodiversity survey techniques commonly used in ecological studies. A total of 36 100 m x 100 m quadrat plots were established in four plant formation: reserve, forest gallery, field and anthropized savanna to take dendrometric parameters such as size, diameter at breast height of all woody species. Landsat satellite images were processed and analyzed between 1989 and 2019 using Google Earth and GIS software, QGIS 10.12.1. The vegetation presents a physiognomy of open forest with a diametral L-shaped structure reflecting the dominance of individuals of small DBH and a vertical "U" structure reversed from sites and plant formations reflecting a low representation of juvenile and adult individuals. As for the diachronic study by remote sensing, it emerges from the variations of land use elements an increase in field (by 29%, 10% and 20%), of the grassy savannah (by 2%, 14% and 8 %) and buildings and bare soil (by 5%, 8% and 2%) and a decrease in shrub savannah (by -31%, -23% and -14%), in wooded savannah (by -2%) , -5% and -12%) and gallery forest (-4%, -5% and -4%) respectively for Garoua 3, Lagdo and Ngong. Overall, our zone is marked by an accentuated state of degradation of the vegetation with a current state of cover of the grassy savanna of 38%, of the field of 28%, of the shrub savannah of 16%, of the wooded savanna and the frame and bare floors of 7% each, the forest gallery of 5% and the open water of 4%. These results open up better prospects for the development of planning and development mechanisms of this area not yet deeply explored for the bases of a good management strategy.

Keys words: plant population, dynamics, ecosystem, Benoue, Cameroon

Vol. 11 (4): 791-796 (2021)

DETECTION OF *CRYPTOSPORIDIUM* SPP. IN CALVES THROUGH NESTED PCR AND KINYOUN'S ACID-FAST METHODS IN İĞDIR, TURKEY

Fatma ERTAŞ^{1*}, Adnan AYAN²

¹*Iğdir University, Tuzluca Vocational School, Department of Medical Services and Techniques Iğdir, Turkey;*

²*Van Yüzüncü Yıl University, Faculty of Veterinary Medicine, Department of Genetics, Van, Turkey;*

*Corresponding Author Fatma ERTAŞ:e-mail: fatma.ertas@igdir.edu.tr;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.416>

ABSTRACT

The present study was conducted to determine the prevalence of cryptosporidiosis by using Kinyoun's acid-fast and Nested PCR methods in 0-01 month aged calves in İğdir Province, Turkey. A total of 100 calves were used in this study. The calves belonging to the İğdir Provincial Directorate of Agriculture and Forestry, were diagnosed to have diarrhea on the basis of their clinical and anamnesis. In the microscopic examinations of 100 samples, 34 (34%) *Cryptosporidium* spp. were detected in Kinyoun's acid-fast whereas in the Nested PCR method it was found 38 (38%). Accordingly, attention was drawn to the necessity of complying with protective measures due to its zoonotic importance.

Keywords: *Cryptosporidium* spp., Calf diarrhea, Nested PCR, Turkey.

Vol. 11 (4): 797-802 (2021)

GEOGRAPHIC INFORMATION SYSTEM IN EPIDEMIOLOGICAL STUDY: CANCERS OF THE RESPIRATORY SYSTEM KONYA

Hatice Canan GUNGOR^{1*}, Gülgün ÖZKAN²

^{1*}*Necmettin Erbakan University, Meram Vocational School, Department of Civil Defense and Firefighting, Konya, Turkey;*

²*Konya Technical University Faculty of Engineering sand Natural Sciences Map Engineering, Konya, Turkey;*

*Corresponding Author Hatice Canan GUNGOR, e-mail: cgungor@erbakan.edu.tr; gozkan@ktun.edu.tr;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.417>

ABSTRACT

In this study, Konya province was chosen as the location with its 31 district border. Among the environmental factors of soil-water-air pollution, which is epidemiologically accepted as one of the causes of respiratory system cancer, soil pollution was evaluated and its relationship with the disease was investigated. The relationship between space and disease was analyzed on thematic maps created with Geographic Information Systems (GIS) software. GIS is an advanced technology that enables to match information with space, to visualize and keep information up to date. Soil pollution is defined by the Nickel values found in the soil. Disease data were obtained from the address data of the patients who were included in the respiratory system (Lung, Larynx, Nasopharynx) of cancer patients diagnosed between 2005 and 2009, obtained from the Konya Provincial Health Directorate. Of the 1302 cases registered in 31 districts, 84.18% were male cancer cases and 15.82% were female cancer cases. When the average age is examined, it is understood that the disease often progresses between the ages of 60-69. In the western and southwestern parts of the province, it was observed that respiratory system cancers overlapped with high pollution points. In this study, the effect of the living area on respiratory system cancers was confirmed, and the importance of improving regional characteristics was emphasized.

Keywords: GIS, Epidemiology, Respiratory Cancers, Soil Pollution, Environment and Disease.

Vol. 11 (4): 803-814 (2021)

OCCURRENCE OF HEAVY METALS IN BÜYÜK MENDERES RIVER BASIN, TURKEY

Ebru Çokay^{1*}, Serkan Eker¹, Ilgi Karapınar¹, Erhan Şener²

^{1*}*Dokuz Eylül University, Department of Environmental Engineering, Tinaztepe Campus,
35160 Buca-İzmir, Turkey;*

^{2*}*Suleyman Demirel University, Department of Geological Engineering, 32260 Çünür-Isparta, Turkey;*

*Corresponding Author Ebru Çokay, e--mail: ebru.cokay@deu.edu.tr;

Received June 2021; Accepted July 2021; Published August 2021;

DOI: <https://doi.org/10.31407/ijeess11.418>

ABSTRACT

The Büyük Menderes River, the one of the most important rivers in the Aegean side of Turkey serves as a resource for various water uses. Therefore, environmental quality of the Büyük Menderes River basin is a critic issue due to great pressure from a diverse range of humans and their activities. Heavy metals are one of the most known priority or special pollutants in aquatic ecosystem. The free metal ion is the most toxic form to aquatic life. Thus, determining the total concentration of a heavy metal in a water sample provides relative information about its toxicity. The European Union (EU) declared that metals as one of the most significant pollutants to be controlled and monitored in water bodies based on Water Framework Directive (WFD) that focuses on providing sustainable management of river, lake, transition, ground and coastal waters. The main objective of WFD is to achieve “good ecological and chemical status” to protect human health, water supply, natural ecosystems, and biodiversity. In this work, the detected heavy metal concentrations of 19 metals at 15 lakes, 2 transition, 4 coastal and 26 river-sampling stations of Büyük Menderes River Basin (BMRB) were monitored for a year according to EQS values. Monthly and annual average concentrations of heavy metals were evaluated, and the results were presented with environmental quality standards namely Annual Allowable Concentration (AA-EQS) and Maximum Allowable Concentration (MAC-EQS).

Keywords: Büyük Menderes River, Environmental Quality Standards, Metal Pollution, Water Framework Directive.

Vol. 11 (4): 815-818 (2021)

**PLANT COMMUNITIES OF ENVIRONMENTAL CONTACT AS
INDICATORS OF DIRECTION OF THE VEGETATION FORMATION
(*some theoretical aspects*)**

Alexander Sizykh^{1*}, Tatyana Konovalova²³

^{1*}*Siberian Institute of Plant Physiology and Biochemistry SB RAS, Irkutsk, 664033, Russia;*

²*V.B. Sochava Institute of Geography, SB RAS, Irkutsk, 664033, Russia;*

³*Irkutsk State University, Irkutsk, 664033, Russia;*

*Corresponding Author Alexander Sizykh, e-mail: alexander.sizykh@gmail.com;

Received July 2021; Accepted August 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.419>

ABSTRACT

To study of the vegetation communities of the environments transition environment zones were showing the present tendency forming of the vegetation for different areas with different of physic-geographical and ecological conditions of territories at all. These communities can be the regional models for indication of the present processes, the past and future changes in the structure of the vegetation in different ecological conditions. It's shown that ecotones and plant communities, reflection the paragenese (object) in the vegetation structure are indication of the structural and dynamic features of the vegetation cover organization at all. There has the classification value and characterized the between zonal, between altitudinal zonality and interzonal differences of the vegetation community's structure of the big regions. The ecotones and paragenese in vegetation structure at the research region is reflection of the physical-geographical conditions of the plant communities formation for the concrete period of time.

Keywords: plant communities, indicators, ecotones, paragenese.

Vol. 11 (4): 819-830 (2021)

EFFICIENCY OF WINTER WHEAT FERTILIZATION SYSTEMS IN THE STEPPE ZONE OF SOUTHERN UKRAINE

Svitlana Burykina¹, Anna Kryvenko^{1*}, Ruslan Solomonov¹,
Galina Kapustina¹, Antonina Drobitko²

¹*Odesa State Agricultural Research Station of NAAN, Ukraine;*

²*Mykolaiv National Agrarian University, Ukraine;*

*Corresponding Author Anna Kryvenko, e-mail: kryvenko35@ukr.net;

Received July 2021; Accepted August 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.420>

ABSTRACT

The results of the fifth and sixth rotations (2007–2020) of a long-term stationary experiment to study the effectiveness of various mineral fertilizer systems for growing winter wheat in the field crop rotation are summarized. The stationary experiment was established in 1971 on the southern low-humus heavy loam chernozem on forests. The natural and climatic zone is the Steppe; the agro-soil province is the dry Black Sea Steppe. Alternation of crops in the field crop rotation: black pair – winter wheat – winter rapeseed – winter wheat – sidereal pair – winter wheat – winter wheat. The weighted average indicators of fertilizer efficiency in winter wheat crops were determined: N₆₀P₃₀₋₆₀K₃₀₋₆₀ – yield gave increase of 1,52 t/ha; energy efficiency coefficient was of 3,63; net profit was of 0,98 \$/ha; N₁₂₀P₃₀₋₆₀K₃₀₋₆₀ – yield gave increase of 2,04 t/ha; energy efficiency coefficient was of 2,41; net profit was of 0,79 \$/ha; N₁₈₀P₃₀₋₆₀K₃₀₋₆₀ – yield gave increase of 2,22 t/ha; energy efficiency coefficient was of 2,09; net profit was of 0,69 \$/ha. For the zone of the Black Sea Steppe of Ukraine, the parameters of the payback of a unit of the active substance of mineral fertilizers are determined by the increments of the protein content in winter wheat grain, which on average amount to (mg/kg a. s.): 202 NPK kg/ha and the ratio N:P:K = 2,5:1:1 – 10,68, N₆₀ – 28,20, N₁₂₀ – 28,20 and N₁₈₀ – 21,48. It is shown that the systematic use of a complete mineral fertilizer with a total rate of 202 NPK kg/ha and a ratio of N:P:K = 2,5:1:1 for black and sidereal pairs provides winter wheat grain with a protein content of 14,18%; winter rapeseed – 13,21% and 12,40% – for a stubble precursor. It is noted that at high and very high level of availability of available phosphorus and potassium in the southern chernozem, which was created in a stationary experiment during the years preceding the presented period (37 years), the maximum protein content in wheat grain is noted when N₁₈₀ is applied: for black pairs – 14,84%, for sidereal – 15,25%, for winter rapeseed – 14,38% and for stubble predecessor – 13,86%.

Keywords: winter wheat, mineral fertilizers, precursor, crop rotation, agrotechnical efficiency, economic and energy efficiency, net income.

Vol. 11 (4): 831-836 (2021)

THE IMPACT OF AGROCHEMICAL LOADING ON NUTRITIVE REGIME OF GRAY FOREST SOIL DURING FIELD CROP ROTATION

Olena Litvinova¹, Stanislav Dehodiuk², Dmytro Litvinov^{1*}, Lyudmyla Symochko³,
Yaroslava Zhukova⁴, Anzhela Kyrylchuk⁴

¹*National University of life and environmental sciences of Ukraine, Ukraine;*

²*NSC «Institute of Agriculture NAAS, Ukraine;*

³*Uzhhorod National University, Uzhhorod, Ukraine;*

⁴*State Institution «Soils Protection Institute of Ukraine», Ukraine;*

*Corresponding Author Dmytro Litvinov, e-mail: litvinovdv2018@ukr.net;

Received July 2021; Accepted August 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.421>

ABSTRACT

This paper presents the results of studies on how mineral and organic fertilizers influence agrochemical indicators of gray forest coarse light loam soil. It was found that when applying the organo-mineral fertilizer systems (N₆₀P₆₀K₆₈ with 12 tons of manure per 1 ha of arable land) there was a tendency of increase of humus reserves to 35,1 t/ha per one treatment against the control of 28,1 t/ha. The application of 12 t/ha of manure in crop rotation under the organic fertilizer system contributed to the most intensive accumulation of humus reserves in the tilth top soil (0-20 cm) – 36,5 t/ha, with the soil solution acidity pH = 5,2. Over a five-year period, the average amount of hydrolyzable nitrogen in the experiment increased by 17-50%, mobile phosphorus compounds rose by 50-75 %, mobile potassium compounds increased by 27-50 % compared with the control of 44,1, 150 and 90,8 mg/kg of soil respectively. The highest level of fertility was provided by the application of N₆₀P₆₀K₆₈ with 12 tons of manure per 1 ha of crop rotation area, while the movement of nutrients took place within the root layer with no significant migration processes observed.

Key words: humus content, nitrogen, phosphorus, potassium, soil fertility, fertilizer system.

Vol. 11 (4): 837-844 (2021)

THE STUDY AND MAPPING OF THE GEOSYSTEMS TRANSFORMATION (*Methodological and Methodic Aspects*)

Tatyana Konovalova¹², Alexander Sizykh^{3*}

¹Irkutsk State University, 664033, Irkutsk, 126 Ulan-Batorskay str., Russia;

²V. B. Sochava Institute of Geography SB RAS, 664033, 1 Ulan-Batorskay str., Irkutsk, Russia;

^{3*}Siberian Institute of Plant Physiology and Biochemistry SB RAS, 664033, 132 Lermontova str., Irkutsk, Russia;

*Corresponding Author Alexander Sizykh, e-mail: alexander.sizykh@gmail.com;

Received June 2021; Accepted July 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.422>

ABSTRACT

Mapping of geosystems attracts attention as a concise way to organize a significant amount of geographical information. Initially, the development of theoretical provisions and the compilation of geosystem maps were based on geobotanical principles and methods of integrating facies according to structural and structural-dynamic indicators. At the present stage, the task of mapping geosystems is largely determined by the need for predictive studies of their natural and anthropogenic transformations. The relevance of the development of geosystem mapping in the direction described here is determined by the need to create medium-scale maps of the transformation of geosystems, which are characterized by significant spatial and temporal scales, heterogeneous genesis, various stages of development. The creation of such maps requires the synthesis of time and space in a single whole, the comparison of the current state of the geosystem with the natural rhythms and laws of the development of the natural environment. The mapping methodology is based on the modern idea of the transformation of geosystems and the further development of the theory of geosystems by V. B. Sochava, includes techniques for displaying patterns of development and transformation of geosystem structures. Maps of the transformation of geosystems are a theoretical model of reality, synthesize information about the transformative dynamics and evolution of geosystems, the direction of their rearrangements, both in natural and anthropogenic conditions. The article presents a scheme of transformation of geosystems and methods of its mapping.

Key words: geosystem, structure, evolutionary and dynamic transformations, transformation factors, map legend.

Vol. 11 (4): 845-856 (2021)

THE MODEL OF REGIONAL DEVELOPMENT OF AGRARIAN SCIENCE IN UKRAINE: THE RELATIONSHIP BETWEEN A CENTENARY PAST AND TODAY

Nataliia Kovalenko^{1*}, Olha Hloba²

^{1*}*Institute of History of Agrarian Science, Education and Technique of NSAL NAAS, Ukraine;*
²*Hryhorii Skovoroda University in Pereiaslav, Ukraine;*

*Corresponding Author Nataliia Kovalenko, e-mail: BoikoNP@ukr.net;

Received June 2021; Accepted July 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.423>

ABSTRACT

The article highlights a centenary evolution of the organization of the regional principle of agricultural research as one of the types of scientific support, whose role in modern conditions of formation and development of the national system of agrarian science, as well as the search for ways of its integration, becomes particularly importance. In the early 1920s Ukrainian, Western European and American agrarian scientists discovered the effectiveness of scientifically justified agricultural production taking into account soil and climatic conditions. At that time, it became an impetus to the application of the regional principle as the main way of organization of scientific support of Ukrainian agriculture in the new economic conditions. For the development of agrarian science, the organizational model of sectoral research according to the American type was used, as the most effective world example of research work organization, where the main role was played by regional research stations. For the effective organization of scientific support, in their structure there were departments for various scientific fields: field farming, horticulture, gardening, breeding, agrochemistry, entomology, phytopathology, agricultural meteorology, animal husbandry and agricultural economics, which later developed into special research institutes. In modern conditions to the regional principle in Ukraine powerful specialized National Research Centers have been formed, which have improved and expanded the sectoral research work in different soil and climatic conditions of the country: Southern, Central and Northern Steppe; insufficient, unstable and sufficient humidified of the Forest-Steppe; Polissya. At the beginning of the 21st century, Ukrainian scientists developed innovative technologies in various areas of specialization, processed the strategy of computerization of the agrarian sector, introduced economic and mathematical modeling for different levels of management of agricultural production processes and created regional information databases. Ukrainian scientists are now intensively cooperation with their foreign colleagues to develop and implement joint research programs, hold international congresses and symposia and establish international sectoral scientific organizations. It is important to solve large-scale problems, the main of which are the sustainable development of agroecosystems, ecologization and biologization of agrarian production, conservation and improvement of soil fertility and biodiversity, as well as production of ecological friendly products.

Key words: regional development, regional research stations, agrarian science, innovative technologies, computer modeling, areas of specialization, ecologization and biologization, production of ecological friendly products.

Vol. 11 (4): 857-866 (2021)

ZINC DEFICIENCY IN SOILS OF UKRAINE: POSSIBLE CAUSES AND REGULATORY MECHANISMS

Natalia Makarenko¹, Valeria Bondar^{1*}, Volodymyr Makarenko², Lyudmyla Symochko^{3,4}

¹National University of Life and Environmental Sciences of Ukraine, H. Oborony Str., 15, 03041 Kyiv, Ukraine;

²Kyiv Taras Shevchenko National University of Kyiv, Volodymyrska Street, 64/13, 01601, Kyiv, Ukraine;

³Uzhhorod National University, Voloshyna Street. 32, 88000, Uzhhorod, Ukraine;

⁴Institute of Agroecology and Environmental Management, Metrologichna Str. 12, 03143, Kyiv, Ukraine;

*Corresponding Author Valeria Bondar, e-mail: lera_bond@email.ua;

Received June 2021; Accepted July 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.424>

ABSTRACT

In the context of global pollution, zinc is generally considered a heavy metal that can harm human health and other living organisms. However, it is known that zinc is a necessary micronutrient that is involved in many important metabolic processes. In a coronavirus pandemic, the positive role of zinc in controlling COVID is important. Zinc is one of the priority micronutrients that are deficient for most regions of the planet and its deficiency can lead to serious diseases and Ukraine is no exception. It is established that zinc is in short supply for most regions of Ukraine and products that are part of the diet of Ukrainians do not contain enough of it and do not provide the daily physiological needs of people. One of the reasons for such an unsatisfactory situation may be the insufficient amount of zinc in the soils of Ukraine, or the low level of its mobility. It is shown that Zn was characterized by a low level of transition from soil to crop production - the average transition coefficient ranged from 0.10. The reason for this phenomenon could be the low content of zinc in the soils of Ukraine. The grouping of soils of Ukraine by the potential ability to provide plants with a sufficient amount of Zn, taking into account the physiological needs of man was carried out. Using Zn transition coefficients in the soil-plant system and potential mobility of the element in soils of different soil-climatic zones of Ukraine, the division into groups was made: very low potential ≤ 21 mg Zn kg⁻¹, low potential from 22 to 48 mg Zn kg⁻¹, average potential from 49 to 77 mg Zn kg⁻¹, high potential ≥ 78 mg Zn kg⁻¹. According to the division, an assessment was made and it was found that the population of most of Ukraine cannot get enough zinc naturally through food of plant and, accordingly, animal origin. It is shown that one of the effective mechanisms of regulation of zinc inflow into the soil and increase of its mobility is the system of fertilization of agricultural plants. The analysis of traditional fertilizers of Ukraine and phosphorites from deposits of Ukraine is presented. It was found that the highest content of Zn was in phosphorites - it ranged from 7.8 to 14.2 mg kg⁻¹. It is shown that, depending on the peculiarities of the technology of growing crops, the soil can be annually introduced from 200 to 20.000 and more mg kg⁻¹ of Zn. It is proved that it is possible to increase the content of zinc in soils by applying agrochemicals, first of all, phosphorus fertilizers, and to increase its mobility and transition to plants - by introduction of technological operations of cultivation of crops, especially in conditions of low level of natural mobility Zn (south and east of Ukraine).

Key words: Zinc, Micronutrient, Deficiency, Soil, Agricultural plants.

Vol. 11 (4): 867-872 (2021)

EFFECT OF THE SEASON AND THE STAGE OF LACTATION ON THE PHYSICO-CHEMICAL PROPERTIES OF HOLSTEIN'S COW MILK IN TIARET, ALGERIA

Amina Belkhemas^{1*}, Abdellatif Niar¹, Bouabdellah Benallou², Mohamed Benahmed¹

¹*Nature and Life Sciences Faculty, University of Tiaret (14000), Algeria;*

²*Farm Animal Reproduction Laboratory, Veterinary Institute, University of Tiaret (14000), Algeria;*

*Corresponding author Amina Belkhemas, e-mail: amina.belkhemas@univ-tiaret.dz;

Received June 2021; Accepted July 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.425>

ABSTRACT

The current study aimed to determine the effect of season and lactation stages on certain physico-chemical parameters in Holstein crossbred cows in Tiaret city (Algerian west high lands). A total of 245 milk samples from 45 cows were analyzed by lactoscan SP in two seasons (spring and winter), and from different stage of lactation (early, mid and late). The results showed that all the chemical constituents were higher in the spring and lower in winter, with no significant difference. However, the season had a significant influence on milk conductivity ($p < 0.05$). On the other hand, Fat was the only component that was highly significantly affected by the lactation stage ($p < 0.001$). Further, there was an increase in protein, fat, SNF, and conductivity values during the progress of lactation, unlike the values of lactose and density that decrease when the lactation stage progresses.

Key words: Holstein cows, season, stage of lactation, physico-chemical parameters

Vol. 11 (4): 873-880 (2021)

EVALUATION OF THE AIR POLLUTION IMPACT OF HEAVY GOODS, DIESEL DRIVEN VEHICLES, ALONG THE A1 HIGHWAY IN NORTH MACEDONIA

Nikola Manev^{1*}, Dame Dimitrovski², Elenior Nikolov¹, Drage Petreski¹,
Zoran Markov², Viktor Iliev²

^{1*}Military academy "General Mihailo Apostolski", Skopje, Vasko Karangeleski, bb, North Macedonia;

²Faculty of Mechanical Engineering, Skopje, Karposh II, bb, North Macedonia;

*Corresponding Author Nikola Manev, e-mail: manev.nikola@yahoo.com;

Received July 2021; Accepted August 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.426>

ABSTRACT

Road traffic is a major source of air pollution due to emissions of a range of pollutants but most notably CO, NO_x, NMVOC and particulate matter (PM) emissions, which have a strong association between their concentration and respiratory system diseases. Diesel engines have the highest emission rates of these pollutants as they dominate heavy-duty applications due to their greater fuel efficiency, power output and ability to haul bigger loads. This also means higher quantities of non-exhaust emissions per vehicle, as the load distribution, and the size of the vehicle, factor in the quantity of brake and tire wear emissions. This implies that the presence of exhaust pollutants and non-exhaust PM and their impact to the environment has been exacerbated by the presence of heavy goods vehicles (HGVs). Multiple reports on North Macedonia's air pollution management claim that national emissions inventories report all key sources of pollution but need to strengthen inputs for the transport sector as there is a need to validate the consistency of transport data used in the inventory and further capture context-specific features of important local emission sources. In this context, since the average emissions of HGVs vary significantly as a result of the different mission profiles, payloads, mileage and vehicle age of an HGV, this paper defines a typical HGV model for North Macedonia and then provides an analysis and an estimate on the emissions footprint of the HGVs transiting the Macedonian A1 highway, thereby gathering a significant part of the aforementioned specific data on transport in the country.

Key words: HGVs, diesel, air pollution, impact, emissions, evaluation

Vol. 11 (4): 881-886 (2021)

REGULATORY FRAMEWORK ANALYSIS FOR THE BROILER BY-PRODUCTS TREATMENT IN UKRAINE AND THE EU

Olga Tertychna¹, Galyna Ryabukha^{2*}, Valeriy Pinchuk¹, Olga Kichigina¹, Inna Horodynska¹

^{1*}*Institute of Agroecology and Environmental Management NAAS, Metrologichna Str., 12, Kyiv, 03143, Ukraine;*

^{2*}*Chernihiv Polytechnic National University, Shevchenka Str.,95, Chernihiv, 14035, Ukraine;*

*Corresponding author Galyna Ryabukha, e-mail address: g.ryabukha@gmail.com;

Received July 2021; Accepted August 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.427>

ABSTRACT

The paper considers the features of the regulatory framework for the treatment of broiler production by-products of in Ukraine and the EU. The main legal act in the field of handling by-products of broiler production in Ukraine is the Law of Ukraine "On by-products of animal origin, not intended for human consumption." As regards the EU Member States, there is also a special Regulation - Regulation (EC) № 1069/2009 of the European Parliament and of the Council of 21 October 2009 laying down rules of treatment for animal by-products and derived products not intended for human consumption and repealing Regulation (EC) № 1774/2002 (Regulation on animal by-products). The paper analyzes the relevant regulations and establishes how the three categories of animal by-products relate to each other, considers the treatment of animal by-products of all three categories of animal by-products.

Key words: broiler production by-products, Law of Ukraine, EU Directive, by-products categories, by-products treatment, by-products use, by-products utilization.

Vol. 11 (4): 887-894 (2021)

EFFECT OF GESTATIONAL STATE ON THE METABOLISM OF COWS IN THE REGION OF TIARET, ALGERIA

Berrani Abdelkader^{1*}, Meliani Samia¹, Bourabeh Akila²

¹*University of Tiaret, Nature and Life Sciences Faculty, Animal Hygiene
and Pathology Laboratory, (14000), Algeria;*

²*University of Tiaret, Veterinary Sciences Institute, (14000), Algeria;*

*Corresponding Author Berrani Abdelkader, e-mail : kadibiovet@gmail.com;

Received July 2021; Accepted August 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.428>

ABSTRACT

The aim of this study was to determine the influence of gestational state on certain biochemical parameters in Holstein crossbred cows reared in the region of Tiaret, Algeria. One hundred cows, during the year 2020-2021, aged from one year to ten years in different physiological stages were used. The animals belong to different farms in Tiaret located in the north-west of Algeria. The physiological state of the cows had a significant influence ($p < 0,05$) on cholesterol, triglycerides, urea, total protein, albumin, calcium and phosphorus. We found that changes in concentrations and phenomena of metabolic adaptations and regulations were installed, in particular in the transition stage (gestation-lactation) and that the transition period is a major stressor on the cows studied. The results of this study could serve as reference values for this cows in the region of Tiaret, Algerian and other regions or countries with similar climatic and nutritional conditions.

Key words : cows, pregnant, postpartum, lactation, biochemical parameters.

AGROECOLOGICAL ASSESSMENT OF GREEN MANURES GROWN FROM WINTER GRAIN HARVEST LOST IN THE CONDITIONS OF THE RIGHT-BANK FOREST-STEPPE OF UKRAINE

Razanov Serhiy^{1*}, Ovcharuk Vitaliy², Krasnyak Olena³, Bakhmat Mykola⁴, Bakhmat Oleg⁵

^{1,2,3}Vinnytsia National Agrarian University, 3, Soniachna Str., 21008, Vinnytsia, Ukraine;

^{4,5}State Agrarian and Engineering University, 13, Shevchenko Str., 32316, Kamianets-Podilskyi, Ukraine;

*Corresponding Author Razanov Serhiy, e-mail: razanovsergej65@gmail.com;

Received July 2021; Accepted August 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.429>

ABSTRACT

To increase soil fertility and reduce their pollution by various harmful substances, including heavy metals, to replace chemical fertilizers, which are a source of these toxicants the main task for nowadays. The content of nitrogen, macro- and microelements in the vegetative mass grown from lost (from 5% to 8%) grain during the harvest of winter wheat, winter barley, winter rape and winter peas was studied. It was found that the yield of vegetative mass grown from grain lost during harvesting is 4500 kg ha⁻¹ – winter wheat, 3700 kg ha⁻¹ – winter barley, 11500 kg ha⁻¹ – winter rape and 6200 kg ha⁻¹ – winter peas. The concentration of phosphorus, potassium, calcium, magnesium and sodium in the vegetative mass of these greens was respectively in the range of 0.65 g kg⁻¹ – 1.25 g kg⁻¹; 3.1 g kg⁻¹ – 4.8 g kg⁻¹; 1.01 g kg⁻¹ – 3.1 g kg⁻¹; 0.21 g kg⁻¹ – 0.75 g kg⁻¹; and 0.18 g kg⁻¹ – 0.52 g kg⁻¹. While the concentration of lead, cadmium, copper, zinc, manganese and cobalt in the vegetative mass of green manures grown from grain harvested during the harvest of winter wheat, winter barley, winter rape and winter peas was 0.02 mg kg⁻¹ – 0.024 mg kg⁻¹, 0.0015 mg kg⁻¹ – 0.0024 mg kg⁻¹, 44 mg kg⁻¹ – 48 mg kg⁻¹, 0.45 mg kg⁻¹ – 0.8 mg kg⁻¹, 3.2 mg kg⁻¹ – 7.8 mg kg⁻¹, 4.3 mg kg⁻¹ – 7.3 mg kg⁻¹ and 0.017 mg kg⁻¹ – 0.22 mg kg⁻¹. The nitrogen content in the vegetative mass of green manures obtained from 1 ha ranged from 21600 to 52100 g. The use of these green manures in crop production has a higher environmental efficiency of fertilizers due to low concentrations of lead, cadmium, zinc and copper compared to mineral fertilizers. The coefficient of accumulation in the vegetative mass of green manures was from 0.016 to 0.019 for lead, from 0.0053 to 0.0085 for cadmium, from 0.2 to 0.27 for zinc and from 0.59 to 0.78 for manganese.

Key words: Green manure, Winter wheat, Winter barley, Winter rape, Winter peas, Yield, Nitrogen, Macronutrients, Microelements, Grain.

TOBACCO CONSUMPTION AND ITS EFFECT ON EATING BEHAVIOR AMONG BIOLOGY STUDENTS

Djamila MEZOUAR^{1,2,*}, Asmaa HAMMOU¹, Bahia TAYBI¹, Amine DJILALI¹

^{1*}University of Tiaret, Faculty of Natural and Life Sciences, Department of Natural and Life Sciences, BP P 78
Zaâroua 14000, Tiaret, Algeria;

^{2*}Abu Bekr Belkaid University of Tlemcen, Laboratory of Physiology, Pathophysiology and Biochemistry of
Nutrition, Department of Biology, Faculty of Natural and Life Sciences,
Earth and Universe Sciences, 13000, Algeria;

*Corresponding Author Mezouar Djamila, e-mail: djamila.mezouar@univ-tiaret.dz;

Received July 2021; Accepted August 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.430>

ABSTRACT

Objectives. This study aimed to estimate the prevalence of tobacco consumption, the eating behavior and the socio-economic status among biology students at the Faculty of Natural and Life sciences, University of Tiaret, Algeria during 2019-2020 academic year. **Methods.** A cross-sectional, anonymous questionnaire-based study of 152 students selected randomly was conducted. **Results.** The Overall smoking prevalence among participated students was 40.46%. About 55% of male tobacco users smoke 14 cigarettes daily. Most girls smoke occasionally. The majority of males started smoking at the age of 16. The largest portion of students depended on one or both parents for their income. In terms of diet, students consumed largely foods rich in sugar. In addition, most smokers want to quit because it is dangerous for health. From our survey, it was noted that 73.58% of consumer and 53.82% of non-consumer take the breakfast every day. **Conclusion.** We must intensify efforts to prevent students from starting smoking by raising awareness of its health risks.

Key words: Tobacco consumption, eating behavior, socio-economic status, Biology students.

Vol. 11 (4): 911-918 (2021)

CONFIDENTIALITY AND PRIVACY IN ALBANIAN HEALTHCARE

Andia Meksi¹, Enkelejda Shkurti^{2*}, Bardhyl Çipi²

¹National Institute of Public Health, Tirana, Albania;

^{2*}University of Medicine, Tirana, Albania, Faculty of Medicine, Tirana, Albania;

*Corresponding Author Enkelejda Shkurti, e-mail: enkeleda.shkurti@umed.edu.al;

Received July 2021; Accepted August 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.431>

ABSTRACT

In modern times, Confidentiality and Privacy principles are reflected in all international and national legislations. Since the formulation of these principles in the Hippocratic Oath and until their emergence in international ethical documents, such as the Oath of Geneva, Confidentiality and Privacy will constantly be the cornerstone of good medical practice. In this paper the authors have summarized some concepts of medical Confidentiality and Privacy, their roles in respecting and protecting the interest of patients and the interest of society that the medical profession can best serve the protection of people's health. Later some historical, ethical, juridical information on them are given as an extension of Medical Deontology in response to new developments in medicine. In the last part of the paper the authors have reflected the situation of Medical Confidentiality and Privacy in Albania and their role to improve the practice of medicine in the current situation of Albania.

Keywords: Confidentiality, privacy, Albania healthcare.

Vol. 11 (4): 919-926 (2021)

BREAST CANCER, KNOWLEDGE AND INFORMATION OF PATIENTS PRESENTED IN PRIMARY CARE, THE ROLE OF NURSING STAFF IN EARLY DIAGNOSIS

Zamira Imeraj^{1*}, Rudina Pirushi¹, Denisa Veseli (Bego)¹, Ilir Arifaj

^{1}University of Medicine, Faculty of Medical Technical Sciences, Tirana, Albania;*

Corresponding Author Zamira Imeraj, e-mail: Zamira_08@live.com;

Received July 2021; Accepted August 2021; Published September 2021;

DOI: <https://doi.org/10.31407/ijeess11.432>

ABSTRACT

Purpose: The purpose of the study is to assess the knowledge of female patients who presented to the primary care service about breast cancer, knowledge about the disease including its etiology, pathology, diagnosis and early prevention. The role of nursing staff as informants, facilitators and facilitators for early diagnosis in breast cancer prevention. **Method:** The study was conducted in the Tirana primary service, during the period September 2018 - February 2019. The data collection tool was a self-administered questionnaire completed by 250 women who presented to the polyclinics of Tirana. The questionnaire is divided into three sections. Section A: included the socio-demographic characteristics of the participating women. Section B: assessed the family history, what knowledge and information these women had about breast cancer and who they think are the risk factors for breast cancer. Section C: researched the knowledge of these women about breast cancer prevention, self-examination, mammography and periodic checkups also collected data on the role of polyclinic nurses and the assistance they provided for early breast cancer screening. **Conclusions:** For the early diagnosis of breast cancer, the nursing staff in primary health care plays an important role in informing and providing appropriate data to the female population about self-examination and other procedures to detect and prevent breast cancer in a timely manner. Also informing the population through health promotion, brochures and media information regarding the early detection of cancer so that its treatment can become more successful.

Keywords: breast cancer, early diagnosis, prevention, informing, nursing role.

Vol. 11 (4): 927-930 (2021)

EFFECTIVENESS OF GROWING SORGHUM IN THE ALTAI TERRITORY

Sergey Ivanovich Kapustin^{1,2}, Alexander Borisovich Volodin¹, Andrey Sergeevich Kapustin^{3*},
Olga Ivanovna Vlasova², Inna Anatolievna Donets²

¹North Caucasus Federal Agrarian Research Centre, Nikonov str. 49, Mikhailovsk,
Stavropol region, 356241, Russia;

²Stavropol State Agrarian University, 12 Zootechnicheskoy Ln, Stavropol, 355017, Russia;

^{3*}North Caucasus Federal University, Pushkin str. 1, Stavropol, 355017, Russia.

*Corresponding Author Andrey Sergeevich Kapustin, e-mail: hpplus@bk.ru;

Received August 2021; Accepted September 2021; Published October 2021;

DOI: <https://doi.org/10.31407/ijeess11.433>

ABSTRACT

Increasing the cultivation area of the most valuable crops, replacing unproductive varieties and hybrids with more productive ones is a significant reserve for strengthening the forage base and improving its quality. Despite the fact that the varieties and hybrids of sorghum of “North Caucasus Federal Agricultural Research Centre” breeding, which were studied in 2019-2020 in the Altai Territory, were inferior to local standards in terms of the duration of the growing season and seed yield, they significantly exceeded them in plant height, yield of green and dry matter, the content of digestible protein in 1 forage unit and metabolic energy. The average two-year rates indicate that the most significant plant height was found in the hybrid of sweet sorghum Yarik (240.5 cm) and the new sorghum-sudangrass hybrid Gvardeets (247 cm). The highest yield of green and dry matter were obtained from hybrids of sweet sorghum Yarik (43.0 t/ha and 12.8 t/ha, respectively), Silosnoe 88 (43.6 t/ha and 12.4 t/ha), variety Larets (43.4 t/ha and 12.7 t/ha), undergoing state variety testing Tandem (42.9 t/ha and 12.0 t/ha), as well as the new sorghum-sudangrass hybrid Gvardeets (40.3 t/ha and 11.1 t/ha). The standard Duplet provided 25.7 t/ha of green and 8.5 t/ha of dry matter during the experimental years. In comparison with the standard, these hybrids and varieties exceeded in the content of digestible protein in 1 kg of dry feed by 13-26 g, carotene by 13.9-115.9 g, forage units by 0.01-0.02.

Key words: sweet sorghum, sorghum-sudangrass hybrid, environmental testing, yield, green matter, dry matter.

Vol. 11 (4): 931-938 (2021)

MONITORING OF THE SEASONAL DEVELOPMENT OF IPID BARK BEETLE (*IPS ACUMINATUS*) IN SCOTS PINE STANDS BY REMOTE SENSING

Tetiana Kuchma¹, Iryna Shvydenko¹, Mariya Vysochanska¹, Oleg Yaremko², Liudmyla Raichuk^{1*},
Lyudmyla Symochko³, Mykola Kuchma¹, Yulia Havryluk⁴

^{1*}*Institute of Agroecology and Environmental Management of NAAS, 12 Metrologichna str., 03143 Kyiv, Ukraine;*

²*Ternopil Oblast Department of Forestry and Hunting, 5a Bagataya Str., 46008 Ternopil, Ukraine;*

³*Uzhhorod National University, 14 Universitetskaya Str., 88000 Uzhhorod, Ukraine;*

⁴*Luhansk Taras Shevchenko National University, 1 Gogol Square, 92703 Starobilsk, Ukraine;*

*Corresponding Author Liudmyla Raichuk, e-mail: edelvice@ukr.net;

Received August 2021; Accepted September 2021; Published October 2021;

DOI: <https://doi.org/10.31407/ijeess11.434>

ABSTRACT

The research aimed to estimate the intensity of the impact of some environmental factors on the seasonal development of apical bark beetle (*Ips acuminatus*) in Scots pine (*Pinus sylvestris*) stands in the conditions of Ukrainian Polissya, as well as to evaluate the extent and dynamics of infestation of forest ecosystems. According to the results of the classification of the obtained satellite images, the dynamics of the area and number of tree mortality foci of *P. sylvestris* per quadrant was determined, which enabled us to create appropriate maps by the area of infestation and its propagation rate. In 2018, there was an intensive increase in the area affected by apical bark beetles compared to 2017. Whereas in 2019 the expansion of the affected areas compared to the previous 2018 slowed down significantly. Approximation of experimental data revealed the presence of a logarithmically normal distribution for the infestation area, and, consequently, the size of the pest population. The Principal Component Analysis revealed that in the studied area the most important factor influencing the population dynamics of ipid bark beetle and, accordingly, the intensity of its invasion, were weather and climatic conditions. Characteristics of the stand had little effect. It was established that favourable climatic conditions led to the fact that in the territory of Ukrainian Polissya *I. acuminatus* develops in more than two generations per year, and also slightly changed the attack strategy, namely the rate of damage and selectivity. An assumption on the further forming of favourable conditions for the proliferation of *I. acuminatus*, the emergence of new, not previously characteristic of the pest features of seasonal development and, consequently, the insect invasion on stands of *P. sylvestris* was made.

Keywords: *Ips acuminatus*, *Pinus sylvestris*, populations, tree mortality, environmental factors, remote sensing, Polissya of Ukraine, climate change.

PHYSICO-CHEMICAL CHARACTERIZATION OF *MENTHA PULEGIUM L.* ESSENTIAL OILS FROM THE TIARET REGION

Djamila Mezouar^{1,2,*}, Ali Bensaad¹, Abedelsalem Benzarrouk¹, Rahma Affane¹,
Houria Rebhi¹, Torkia Berrezoug¹

¹*Department of Natural and Life Sciences, Faculty of Natural and Life Sciences,
University of Tiaret 14000, Algeria;

²*Laboratory of Physiology, Pathophysiology and Biochemistry of Nutrition, Department of Biology, Faculty of
Natural and Life Sciences, Earth and Universe Sciences, Abu Bekr Belkaid University of Tlemcen 13000, Algeria;

*Corresponding Author Mezouar Djamila: e-mail: djamila.mezouar@univ-tiaret.dz;

Received August 2021; Accepted September 2021; Published October 2021;

DOI: <https://doi.org/10.31407/ijeess11.435>

ABSTRACT

Objectives. The objective of our study aimed to extract and determine some physicochemical characteristics of *Mentha pulegium L.* essential oil. **Materials and methods.** The samples of *Mentha pulegium L.* were collected in May 2021 in the region of Tiaret and identified by a botanist at the Faculty of Natural and Life Sciences, University of Tiaret. The leaves of *Mentha pulegium L.* were washed, sorted and dried in the open air at room temperature (about 23-27 °C) for two weeks, then they were crushed in a mortar. After that, the leaves obtained were stored in sealed glass containers protected from light and moisture. The extraction of *Mentha pulegium L.* essential was realized by hydrodistillation technique. **Results.** Our results showed that the extraction yield is equal to 0.18%. The study of the physicochemical parameters indicated that the pH is equal to 5.22. Regarding the acid number, we noted a value equal to 0.28. Whereas, the refractive index was equal to 1.332. **Conclusion.** These parameters are used to determine the quality of *Mentha pulegium L.* essential oil. According to our results, we can say that the essential oil in our study is of intermediate physicochemical quality.

Key words: *Mentha pulegium L.*, hydrodistillation, essential oils, physicochemical characteristics, Tiaret.

Vol. 11 (4): 943-948 (2021)

INFLUENCE OF ENVIRONMENTAL FACTORS IN THE COMPOSITION OF ESSENTIAL OILS CONTENT OF *JUNIPERUS COMMUNIS* L. BERRIES, IN SOUTHEAST PART OF ALBANIA

Arlinda Agastra^{1*}, Belul Gixhari², Najada Kadiasi¹, Alban Ibraliu^{1*}

¹Agricultural University of Tirana, Department of Agronomic Sciences, Tirana, Albania;

²Albanian Gene Bank, Agricultural University of Tirana, Tirana, Albania;

*Corresponding Author Alban Ibraliu, e-mail: albanibraliu@ubt.edu.al; arlinda.agastra@gmail.com;

Received August 2021; Accepted September 2021; Published October 2021;

DOI: <https://doi.org/10.31407/ijeess11.436>

ABSTRACT

Juniperus communis L. is a widely spread scrub throughout the territory of Albania. Berries export plays an important role in the economic aspect of the population of Albania. Juniper fruits were collected from five wild population in the South region of Albania: Voskopoje, Erseke, Leskovik, Miras with the aim of investigating the effect of environmental factors and soil composition elements on the chemical composition and the natural variation of the essential oils between. The Juniper berries are collected at them same natural sites for two years (2017-2018) dried in the shade at room temperature and the essential oil was obtained by hydrodistillation in a Clevenger apparatus for 4 h at a distillation rate of 3 mL.min⁻¹. The essential oil components were identified by GC-FID and GC/MC analysis. The EO yield differed depending on the population origin and ranged between 1.5-3 % on the first year based on the dry weight (v/w, based on the dry weight) and during the second year the essential oils content varied at a range 1.6-2.8 %. The principal components of the *Juniperus communis* L. berries essential oils were α -pinene, myrcene, β -pinene, sabinene, limonene, terpinene-4-ol, belonging mainly to monoterpenes class. The dominant component was α -pinene present in all the samples taken in consideration. Referred to the statistical analyses held in this study we assumed that in populations of *Juniperus communis* L. the environmental factors have a significant affect in the quantity, quality and composition of the essential oils concluding that soil types and specific elements like PH and humus content had had effected on chemical constitutions of essential oil in the investigated populations. According to the results and to the composition of EO in juniper berries in southeast part of Albania we can assign that it belongs to α -pinene chemotype.

Keywords: Albania, *Juniperus communis*, essential oils, soil composition

Vol. 11 (4): 949-958 (2021)

EFFECT OF SALT STRESS ON IONIC ACCUMULATION AND BIOCHEMICAL BEHAVIOR OF CHICKPEA (*CICER ARIETINUM* L.)

Koulali F^{1*}, Sehari M¹, Kouadria M¹, Hassani A¹

^{1*}University Ibn Khaldoun of Tiarret, Algeria, Faculty of Natural and Life Sciences, Laboratory of Agrobiotechnology and Nutrition in dry areas, Algeria;

*Corresponding Author Fatiha Koulali, e-mail: fatihacom2007@yahoo.fr;

Received August 2021; Accepted September 2021; Published October 2021;

DOI: <https://doi.org/10.31407/ijeess11.437>

ABSTRACT

Salt stress affects plants' metabolism negatively. It causes a reduction in the osmotic potential and ionic toxicity through significant accumulation of Na⁺ in tissues. Also, it leads to a nutritional imbalance. In response to these effects, plants synthesize organic compounds called osmolytes with osmoprotective action such as proline and soluble sugars. They are important in osmotic adjustment to limit water loss and to maintain cell turgor, which motivates the development of metabolic processes in plants. Accordingly, one of the most sensitive plants to salinity is chickpeas, widely consumed by humans. The aim of this work is to identify some biochemical and mineral criteria involved in the tolerance of six chickpea genotypes subjected to high concentrations of NaCl (0, 50, 75, 100mM). The obtained results showed the salinity had a depressive effect on the rate of proteins and on soluble sugars (2.50 mg.g⁻¹ Fresh Mater FM) except for the Collection 28 genotype (4.707 mg.g⁻¹FM), Ghab4 (3.912 mg.g⁻¹FM), and Belkhadem (3.949 mg.g⁻¹FM) which recorded a remarkable increase during severe stress. However, studied genotypes showed a significant accumulation of proline in leaves, around 125 mg.g⁻¹FM observed at 100 mM NaCl and an average of 55 mg.g⁻¹FM in the control. On the other hand, for the mineral balance, the genotypes were the "includer" type because they show a significant accumulation of Na⁺ in leaves (18 mg.100g⁻¹Dry Matter DM on average at 100 mM NaCl compared to the control, which displays an average of 7 mg.100g⁻¹DM). Whereas the K⁺ decreases (50 mg.100g⁻¹DM) but with a higher rate than the Na⁺ regardless the applied dose of NaCl.

Keywords: Osmotic stress, soluble sugars, proline, proteins, chickpeas, minerals