

РЕЗЮМЕТА НА НАУЧНИТЕ ТРУДОВЕ СЛЕД ПРЕДХОДНАТА ХАБИЛИТАЦИЯ

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Dineva S.B. 2019. Registered Amendments in the Structure of *Betula Pendula* Roth Leaf Blades as Adaptation to Polluted Environment, eJournal of Applied Forest Ecology (eJAFE), Vol., No. (201) 72920-26. Available online at www.ejafe.com ISSN: 2347-4009/2019, Vol 7, №2, 20-26, (IF - 0,742; Google scholar; ISA).

Abstract: Screening and evaluating tolerance of trees to soil and air pollution is a leading task, especially nowadays, when environmental pollution reached its limits. The diminishing of air pollution and climate alterations are the crucial duties for the humanity. Trees utilization for remediation and revitalization of contaminated locations as filtering system or as bio-accumulators are well known and recognized good and proper practice that alleviate the harmful impact of pollution and offer the best monitoring system. Trees are also bio-indicators toward different types of pollution. In the urban conditions trees enhance aesthetic view, reduce noise and dangerous pollutants, moderate temperature and wind, and protect homes. In that study assessment of *Betula pendula* Roth tolerance in relation to industrial pollution have been made, using for the conducted research the leaf blades alterations. In the result the conclusion is that silver birch showed plasticity and tolerance towards industrial pollution and can be successfully applied as a species for building green belts around polluted locations, or for afforestation of unfavourable environmental areas, and in a design of urban forest

Keywords: *Betula pendula*, air pollution, leaf blades, urban forest

Dineva S. B. 2019. Deposition of calcium oxalate crystals and tolerance of deciduous trees to pollution. eJournal of Applied Forest Ecology (eJAFE), Vol.7, No.1 (2019) 8-13. Available online at www.ejafe.com ISSN: 2347-4009 (IF - 0,742; Google scholar; ISA).

Abstract: Plants are frequently utilized as biological indicators for the extent of air pollution. They are organisms which are sensitive to pollutants in the air and many studies are focused on morphological, physiological, and histochemical effect of air pollutants on plants. Various experiments have been conducted to explain the interaction of plants and those pollutants. Deciduous tree plant species growing naturally in Bulgaria, such as *Acer campestre* L. (field maple), *A. tataricum* L. (tatarian maple), and four cultivated: *A. negundo* L. (box elder), *A. saccharinum* L. (silver sycamore), *Morus alba* L. (white mulberry), and *Platanus acerifolia* Willd. (London plane) have been investigated. There were found increasing the formation of Ca-oxalate crystals in the lamellae of *Morus alba* L. under polluted air conditions or scattering of them in different way in *Acer negundo* L. The most pronounced depositions of different types of calcium crystals were observed in the most resistant to pollution and dry environment species *Morus alba* L. Further investigations are needed to specify the relation between biomineralization and specific environmental conditions.

Keywords: Calcium oxalate crystals, deciduous trees, pollution.

Mariyana Lyubenova, **Snejana Dineva***, Kristiana Cala, Branislav Dinich, Silvena Boteva **2019.** Ecotoxicity of Purified Industrial Waste Water. Environment and Ecology Research 7(4): 208-219, 2019 <http://www.hrpub.org> DOI: 10.13189/eer.2019.070402.

Abstract: Purified industrial waste water (PIWW) has been evaluated for probable toxicity using test-systems with *Pseudorasbora parva* (topmouth gudgeon) and *Lepidium sativum* L (garden cress). The acute toxicity of PIWW was calculated according to mortality of *Pseudorasbora parva* in dilutions 1, 5, 10, 25, 50, 100 and 200 times, and distillate water (DW) was used as a control. The LC₅₀ has been calculated after 96 h of treatment and it was at approximately 8x (7.69) times dilution of PIWW. The toxic effect of PIWW with and without copper ions, added as CuSO₄ have been measured using *Lepidium sativum* L. The comparison of the toxic effects of the same concentrations of copper in PIWW and DW, mixed and non-mixed contamination has been evaluated. It was found that Cu⁺² has inhibitory effects on the root's and stem's growth of *Lepidium sativum* L seeds, and that effect appears in concentrations over 2 mg/l Cu⁺². The 50% inhibition of root's growth in DW was EC₅₀=7.26 mg/l of copper ions, while for PIWW that concentration was EC₅₀=17.23 mg/l Cu⁺². The calculated EC₅₀ for stem's growing in DW was 54.57 mg/l Cu⁺² and 72.07 mg/l Cu⁺² in PIWW. The observed EC₅₀ differences in DW and PIWW perhaps are due to the formation of ligand compounds among copper cations and other impurities in the waste water and hence as consequences the reducing of free Cu⁺² or their bioavailability, hereafter reduce copper toxicity. It was registered that PIWW diminished growth inhibitory effect of copper ions on *Lepidium sativum* L seeds lessening its amount by involving free Cu⁺² in complexes with other waste products.

Keywords: LC₅₀, EC₅₀, Copper Ions, Purified Industrial Waste Water, *Lepidium sativum* L., *Pseudorasbora parva*

Dineva Snejana 2019. Review Paper: Nitrate Content in a Human Daily Intake. JOJ Horti Arboric. ISSN: 2641-8215 2019. 2(4): 555595. (Google Scholar; J-Gate; Index Copernicus International; Genamics; OAJI – Open Academic Journals Index; Academic Scientific Journals -Cite factor; DOAJ – Directory of open access journals; CrossRef).

Abstract: There is no doubt that the quality of food closely related to human health. That is why in that field are applying much effort to educate young, inform people, produce and sell high-quality food. The most usual contaminant of food is the high nitrate content in vegetables, water or cured meat. Nitrates and nitrites enter the food chain through the polluted environment from intensive agriculture or from the food industry where are used as food additives. Despite all measures to produce and sell high-quality food, human daily intake still can contain a high number of nitrates or nitrites that can cause undesirable health problems.

Keywords: Food safety; Human health; Nitrates

Dineva S.B. 2019. Evaluation of nitrate content in food products from commercial chains in BG, Innovation and entrepreneurship, ISSN 1314-9253 2019, Vol 7, № 3, 129 -137. (Scientific Indexing Services (SIS); Open Academic Journals Index (OAJI); The European Reference Index for the Humanities (ERIH) to NSD).

Abstract: The evaluation of food quality is the crucial question and concern for all governments. Rules and monitoring the food in the food chain is adopted in all countries. There are no doubt that the food closely connected to the human health. One of the most common contaminants are nitrates and nitrites, which have and positive not only negative influence. In this paper are represented the results of the evaluation of the content of NO³⁻ in different products in food chain market in BG. A higher amount of NO³⁻ up to 900 mg/kg was found in fresh potatoes, with an average of 645 mg/kg. The highest nitrate levels recorded for strawberries were up to 300 mg/kg, with an average of 148 mg/kg. For bananas, an average of 95 mg/kg and for shortgrain cucumbers 38 mg/kg. For other vegetables, the NO³⁻ values were within the allowable range. For apricots, kiwi, lemons, limeti <30 mg/kg.

Key words: nitrates, food products, fresh potatoes

Динева С. 2019. Оценяване на нитратното съдържание в хранителни продукти от търговските вериги в БГ. Иновации и Предприемачество, ISSN 1314-9253 2019, т.7, № 3, 129 -137.

Резюме: Оценката на качеството на храните е ключов въпрос и загриженост за всички правителства. Правила и наблюдение на храните в хранителната верига са приети във всички страни. Няма съмнение, че храната е тясно свързана с човешкото здраве. Един от най-често срещаните замърсители са нитрати и нитрити, които имат положително не само отрицателно влияние. В статията са представени резултати от оценка съдържанието на NO_3^- в различни продукти на пазара на хранителни вериги в България. Открито е по-голямо количество NO_3^- до 900 mg/kg в пресни картофи, със средна стойност 645 mg/kg. Завишени нива на нитрати са отчетени за ягодите до 300 mg/kg, със средна стойност 148mg/kg. За другите зеленчуци стойностите на NO_3^- са в рамките на допустимите граници. За кайсии, киви, лимони, лимети < 30 mg/kg.

Ключови думи: нитрати, хранителни продукти, пресни картофи

Snejana Dineva, Zlatin Zlatev **2019**. Urban environmental quality assessment by shape and spectral indices of mulberry leaves. ARTTE Vol. 7, No. 3, 2019 ISSN 1314-8788 (print), ISSN 1314-8796 (online), doi: 10.15547/artte.2019.03.004. 184-205.

Abstract: In this paper, an analysis of the potential use of the surface and geometric characteristics of mulberry leaves as parameters for environmental quality assessment is made. Methods have been used to reduce the amount of data of latent variables, linear and kernel variants of principal components. It has been found that a kernel variant of the principal components, combined with nonlinear separating functions of discriminant analysis and a method of support vector machines, are an appropriate methods for distinguishing the degree of air pollution from the mulberry leaf data. The results obtained could be used as preliminary baseline data for future evaluations and studies related to remote monitoring of urban air quality.

Keywords: Environmental quality, passive biomonitoring, mulberry leaves, principal components, latent variables, discriminant analysis, support vector machines, spectral indices, shape indices

Nedeva V., Dineva S., Ducheveva Z. **2019**. Students in blended learning by flipped classroom approach. Information Technologies and Learning Tools, ISSN: 2076-8184. 2019, Vol 72, №4, 204-213. (DOAJ; Russian Science Citation Index, Google Scholar, IndexCopernicus, ULRICHSWEB™, WorldCat).

Abstract: The article presents the Flipped Classroom approach and its application at the Faculty of Techniques and Technologies (FTT) - Yambol, based on the training in the subjects "Programming and Use of Computers", "Food Contaminants", and "Object-Oriented Programming" in the 2016- 2018 academic years. For the students, the problem is to filter some sources that are not reliable. In the new digital age, the lecturers expect them to be creative and to prepare their assignment using new approaches. When students follow their lecturers' instructions concerning the literature and resources their projects tend to be more successful. This is one of the issues we encounter in preparing students for their classes. The second problem that we want to solve is the presentation of information using the "pouring in the bank" approach, where students are offered lectures and tutorials without being able actively to participate in the learning process. The students are trained to acquire knowledge without placing and solving problems and looking for new solutions. The article goals are to analyze the approach that we apply to the students' training to stimulate their activity in learning the material and filling the gaps in their knowledge. The first part of the article reviews the theory and the application of the Flipped Classroom approach by other authors in different subject areas. We present different taxonomic models and qualities that they build for the student's learning process. The following part analyses the application of the approach in the mentioned fields of study for students of Bachelor's and Master's degrees. In the article, we present steps for Flipped classrooms. We discuss also the key elements of The Flipped classroom and the benefits and limitations of using it. In conclusion, the article outlines the results achieved and the prospects for enhancing the engagement of the students in learning.

Keywords: E-learning; Flipped classroom approach; education strategy; university education.

Dineva Snejana 2019. Monitoring of nitrate content in potatoes from Bulgarian market. International Conference on Technics, Technologies and Education ICTTE 2019. October 16-18, 2019, Yambol, Bulgaria. Proceedings of ICTTE 2019 ISSN 1314-9474. 1-5.

Abstract: The potatoes are common food for people of all ages and very often are used in Bulgarian kitchen as a main component of core dishes and also separately under different types of salad. The aim of this article is to give information about the nitrate content in potatoes from the commercial chain in Bulgaria. The monitoring have been conducted during June, July and August. The measurements of NO_3^- ions were carried out with a Greentest appliance, Model ECO 5. The samples from the conducted monitoring were with higher NO_3^- content for the fresh potatoes that have been accepted and recommended from EU as healthy one. The highest content of NO_3^- in fresh potatoes were 645 mg/kg measured for June, 340 mg/kg for August, and 500 mg/kg for fresh potato produces from BG measured in August, at the accepted safety level 250 mg/kg. The red potatoes were with average 287 mg/kg nitrate levels. The amount of nitrates are not eliminated during cooking processes, so that results are warning that the food from the commercial chain can be not enough healthy, especially for infants.

Keywords: nitrates, food safety, potatoes

Dineva Snejana 2019. The importance of visualization in e-learning courses. The 14th International Conference on Virtual Learning (ICVL) 2019. University of Bucharest, Faculty of Mathematics and Informatics. 177-182. (WoS, Thomson Reuters).

Abstract: Good E-courses always should contain visuals. All types of visuals are important and help researchers and learners to achieve their goals. Applying visualizations to tough topics benefits both teachers and students, helping them to cope with difficult new matter, as well as leading to profounder understanding. If we support students by implementing visual learning materials their performance are risen. The results of our practices on different subjects demonstrated that students achieved better performance on exams, when visuals methods are used during learning process.

Keywords: E-courses; E-Learning; Visualization

Dineva Snejana, V. Nedeva, Z. Ducheveva 2019. Digital Generation and Visualization in E-Learning. The 14th International Conference on Virtual Learning (ICVL) 2019. University of Bucharest, Faculty of Mathematics and Informatics. 183-189. (WoS, Thomson Reuters).

Abstract: In the new ages we are faced with the internet or digital generation that are a digital native grown up and acquires innovative and adequate methods to be put in practice for working and training them. The paper is based on the training in the subjects "Programming and Use of Computers", "Food Contaminants", "Microbiology", "Biochemistry" and "Ecology", for students of Bachelor's and Master's degree in the period from 2016 to 2018 school years. The age analyses reveal that students undergoing FTT training are mainly from Y and Z generation. The report analyzes the effectiveness and the opportunity of unlimited on-line visual resources to educate well our generation and the putting into practice of those approaches in Faculty of Technics and Technology – Yambol. There is no doubt that the e-courses give opening a study subject to be presented in depth, logically and thought-provoking way. Many studies showed that new generation students prefer blend learning instead of traditional one, and that they don't like reading of books, instead of that they favor a learning in active manner combining all types of possible information resources applying in their activity. Most of all of course they like chat, video games or movies, as well as any kind of visualization. Therefore applying visualizations to tough topics ever benefits both teachers and students to attain deep understanding and to manage with the novel information. If we support students by implementing video manuals and they watch it before lessons or exercises, they came to the schoolroom with better confident that already have some training. The results of our practice and investigation displayed that students achieved better performance on exams when visuals methods drawing their attention are used during learning process,

and that they are more motivated to attend lectures, like discussions, as well as actively to cooperate with the lecturers

Keywords: Digital Generation; E-Learning; Visualization; Python Tutor; Programming

Nedeva V., **Dineva Snejana 2019**. Improve critical thinking skills for students of FTT – Yambol. The 14th International Conference on Virtual Learning (ICVL) 2019. University of Bucharest, Faculty of Mathematics and Informatics. 201-207. (WoS, Thomson Reuters).

Abstract Critical thinking is an important skill, especially in the digital century, when a huge amount of information bomb the young, every day, through the web net. The aim of the paper is to describe and introduce the main qualities of critical thinking. We present also how the abilities of well-developed VLE help for the successful growth of students. The good practices that we use to boost critical thinking are discussed. We try to develop critical thinking and logical reasoning skills. These are our main goals in teaching programming. Programming is a complex process where the programmer very often uses most of their time to planning the individual pieces that will come together to make the system works. In the paper, we analyze different strategies that we apply to improve critical thinking: training strategies; strategies for ongoing knowledge testing; evaluation strategies. Each of these aims to develop critical thinking along with mastering programming languages. Implemented strategies in programming training produce positive results, allowing students to grow professionally.

Keywords: e-learning, critical thinking, good practices

Dineva Snejana 2019. New technologies and teaching ecology. The 14th International Conference on Virtual Learning (ICVL) 2019. University of Bucharest, Faculty of Mathematics and Informatics. 224-228. (WoS, Thomson Reuters).

Abstract: The free web-based resources are tremendously helpful in our new digital decades to teachers and students for developing and reaching good quality education in almost all possible spheres of knowledge. One of the most important missions of any research organization is to spread a knowledge. The research organizations and new technologies offers great possibilities to improve the quality of teaching by open educational channels and implementing supportive interactive materials and activities in classroom.

Keywords: e-learning, ecology education, supportive interactive materials

Dineva Snejana 2019. Nitrate content in fruits and vegetables from commercial chains in Bulgaria. Applied Researches in Technics, Technologies and Education (ARTTE) Vol. 7, No. 2, 2019 ISSN 1314-8788 (print), ISSN 1314-8796 (online), doi: 10.15547/artte.2019.02.009. 144-148.

Abstract: The aim of this monitoring is to evaluate the nitrate content in vegetables and fruits from the commercial chain in Bulgaria. The vegetables were purchased from the food chains in June and July. The measurements of NO_3^- ions were carried out with a Greentest appliance, Model ECO 5. Four samples from the conducted monitoring were with higher NO_3^- amount that is allowed for trade and accepted as healthy (potato, radish, and strawberries). The content of NO_3^- in fresh potato were 645 mg/kg at the accepted safety level 250 mg/kg. The level of nitrates also was higher in the both samples of radish 3700 mg/kg and 2934 mg/kg at accepted level as safety for consumption 1500 mg/kg. This small survey suggests that on the market in the country are still in the trade food products with not enough good quality.

Keywords: nitrates, food safety, vegetables, fruits

Dineva S.B. 2018. Nowadays education and long-life learning. The 13th International Conference on Virtual Learning. University of Bucharest and "1 December 1918" University of Alba Iulia. ISSN 1844 – 8933. p. 190-196. (WoS; Thomson Reuters).

Abstract: The article reviews the importance of long-life learning nowadays and the new semantic e-learning environment created during last years to support the requirements of that conditions. The education in 21st century is a long-life learning education with commitment of formal, non-formal and informal learning supported by New Learning Environments. The e-Academia framework has been adopted and created with real and virtual members of organizations, applications for communication and collaboration, e-Learning and directory services. The aim of article is to describe the changes of education system in the last decades forced by the innovations of technology and their implementation in the life. The characteristics of the New Learning Environments are analyzed and the concept of long-life learning.

Keywords: long-life learning, new learning environments, intelligent network

Dineva S.B. 2018. Teacher's feedback using Moodle and blend learning. The 13th International Conference on Virtual Learning. ISSN 1844 – 8933. p. 87-91. (WoS; Thomson Reuters).

Abstract: This report based on our experience and collected data explain the useful teacher's feedback, which are received from implementing blend learning through creating on line e-training course, multimedia e-books, self-assessment tests and etc., on Moodle online learning management system. The sites of e-learning of Microbiology, Chemistry, Ecology and Biochemistry were among the first developed and used for full and part time study in blend learning. The obtained feedback that has been registered is proper and entire information about student process of learning; higher quality of acquire knowledges; better and low cost support for student training; adequate students assessment and efficacy in applying e-test for exam.

Keywords: web learning resources, Moodle, blend learning, student assessment, teachers feedback

Dineva Snejana, Nedeva Veselina, Zlatoeli Ducheва 2018. Improving the quality of study assessment. The 13th International Conference on Virtual Learning. ISSN 1844 – 8933. p. 106-111. (WoS; Thomson Reuters).

Abstract: This article concern the problem with accurate evaluation of students and the possibility to improve the quality of assessment tests and learning process itself. The assessment is a part of study and many researchers agree that well-designed and inventive assessment can boost the active learning process. There are enough evidences that motivation of students to study is toughly affected by assessment so improving the quality of assessment tests in virtual learning environment is an urgent and important task nowadays.

Keywords: student assessment, formative, summative and diagnostic assessment, quality of assessment

Nedeva V., Dineva S.B. 2018. How student collaboration influence on student success. The 13th International Conference on Virtual Learning. University of Bucharest and "1 December 1918" University of Alba Iulia. ISSN 1844 – 8933. p.130-135. (WoS; Thomson Reuters).

Abstract: This report regarded student success in higher education that is with high importance and one of the main concern for all institutes. It reviews how student success can be enhanced using collaboration tools in VLE and the methods that are used. The base types of collaboration are described too. The features of effective learning environment that result to higher student success are discussed. The report analyzes the experience of Faculty of Technique and Technology - Yambol from Thracian University according to the EU DigComp 2.1 framework and the competences that the students should acquire for communication and collaboration.

Keywords: students collaboration, student success, effective learning environment

Dineva Snejana, Nedeva Veselina 2018. E-learning and equal access to quality education. The 13th International Conference on Virtual Learning ICVL 2018. ISSN 1844 – 8933. p. 528-533. (WoS; Thomson Reuters).

Abstract: The article discusses the opportunity of e-learning to provide equal access to high quality education. Based on scientific publications and our observations the review of possibilities offered by the distance education to those willing to study have been made; the reasons to impose distance in front of traditional training also; and the Moodle's advantages as a platform for the development of e-learning. The conclusions are that e-learning has a great potentiality for acquiring high quality education under different forms of training. The one of positive side of e-learning is that it allows applying DL and can be recognized as a tool for equal access to education. The DL allows to be realized in practice the right for anyone to be educated. The existed barriers to learning in DL can be overcome in future.

Keywords: Moodle, e- learning, blend learning, equal access to education

Nedeva V., **Dineva S.B.** 2018. Understanding and Supporting student's collaboration and communication in blended learning. The 13th International Conference on Virtual Learning. University of Bucharest and "1 December 1918" University of Alba Iulia. ISSN 1844 – 8933. p.99-105. (WoS; Thomson Reuters).

Abstract: The report discusses the subject of student's collaboration, communication and blended learning. The purpose of the report is to describe the extent of skills that students need to acquire in the field of collaboration and communication in blended learning and the use of Moodle virtual learning environment. For this purpose, the following questions are presented and analysed in Materials and Methods: Communication and collaboration as part of Digital communication; Benefits of Collaboration Software; What is mean to be Collaborative. In the Discussion and Results section are analysed Moodle activities for the development of Communication and collaboration skills in blended learning and Moodle's Plugins to create an environment for communication and cooperation. Conclusions are drawn on the application of the various blended learning tools and the learning outcomes that can be achieved.

Keywords: Collaboration and communication, blended learning, Moodle, Moodle plugins.

Dineva Snejana Boycheva 2017. Leaf blade structure of *Morus alba* L. and resistance to industrial pollution. J Appl For Ecol (eJAFE), 5:1–8. (Global IF:0.742; Google scholar; ISA). <https://doi.org/10.5281/zenodo.2574836>;

Abstract: Trees can absorb toxicants and mitigate air pollution. *Morus alba* L. (Mulberry) is a well-recognized tree species that has high ecological plasticity and endurance toward adverse environmental conditions. The structure of *Morus alba* L. leaf blades has been investigated in order to reveal its remarkable resistance performance toward industrially contaminated environment. Field observations showed that laminae of *Morus alba* L. were in good state and well-developed, without significant decrease of leaf blade surfaces, and with no chlorosis and necrosis, till the end of vegetation period. Anatomical measurements registered greater leaf thickness of laminae from trees of polluted region. Under the industrial pollution the cuticle layer of adaxial surface increased, while from the abaxial side it decreased. In the adaxial surface epidermis have been detected idioblasts that perhaps strengthen the lamina surfaces and prevent from direct injury from air toxicants. The mesophyll structure of *Morus alba* L. expressed xeromorphic adaptation without noticeable air spaces in the spongy parenchyma naturally, and the spongy parenchyma seemed almost like palisade tissue, represented from palisade-like cells.

Key words: *Morus alba*, industrial pollution, leaf blade structure.

Olsen J.E, **Dineva S.B.** 2017. Effects of Chronic Ionizing Radiation and Interactions with Other Environmental and Climatic Factors on Plant Growth and Development. eJournal of Applied Forest Ecology (eJAFE), Vol.5, No.1 (2017) 31– 53. Available online at www.ejafe.com ISSN: 2347-4009 (Global IF: 0.742; Google scholar; ISA).

Abstract: Plants are the main supportive human being system. Under insistent exposure to mutagens, such as low ionizing doses radiation, enhance level UV-B radiation, chemicals, heat, drought, and cold, they are enforced either to adapt or to die. Ordinarily it is accepted that the living organisms under the influence of environmental stress factors, always acquire adaptive responses, but the available data still stay controversial. The effects of chronic exposure on living organisms and populations still stay insufficiently explored, and denote a much needed field of research. The aim of a review is to summarize published data for consequences of chronic ionizing radiation on plant growth and development. Epigenetic and genetic alterations were registered in plants arising under combined influence of different environmental stress conditions. Nevertheless, there are still not enough information for the combined effects of ionizing radiation, enhance level UV-B radiation, which are already registered as results from climatic changes and so expected to have important role in the future on plants populations. The increased pollution of the environment is out of the doubt, but the knowledge about mechanisms and the range of plants to adapt is still insufficient.

Keywords: Low ionizing doses radiation, UV-B radiation, combined effects, plant populations.

Dineva S.B. 2017. The Tolerance of Some *Acer* species to Air Contamination. eJournal of Applied Forest Ecology (eJAFE), Vol.5, No.1 (2017) 1-7. Available online at www.ejafe.com ISSN: 2347-4009 (Global IF: 0.742; Google scholar; ISA).

Abstract: The *Aceraceae* are broadly used tree species due to their resistance to dryness, gas emissions or erosion conditions. Some species from *Aceraceae* have been evaluated for their tolerance to industrially contaminated environment: *Acer campestre* L. (Hedge Maple); *Acer tataricum* L. (Tatarian maple); *Acer saccharinum* L. (Silver maple), and *Acer negundo* (Box elder). All observed species were well adapted and tolerate that type of environmental contamination, but from the observed parameters their resistance in decreased order is: *Acer tataricum* > *Acer campestre* > *Acer saccharinum* > *Acer negundo*.

Key words: *Aceraceae*, tolerance, air contamination

Dineva S.B. 2017. Structural Modification Induced by Air Pollutants in *Acer campestre* (L.) Leaves. Analele Științifice ale Universității „Al. I. Cuza” Iași s. II a. Biologie vegetală, 2017, 63, 1-2: 13-23. ISSN: 1223-6578, E-ISSN: 2247-2711 (IC Value 2012 - 5.40; EBSCO).

Abstract: The study estimated modification in morphology and structure of *Acer campestre* L. leaf blades under two diverse levels of industrial air contamination. The samples have been collected from the same trees growing on the identical place but in two separated with long time periods: 1990, 1991 – first period and 2004 – second; that are characterized with great difference of pollutant levels, especially for SO₂ at least twice in amount through heavy polluted period. The structure and developing of winter buds and leaves lamina have been monitored through severe contamination to reveal any adaptation responses. Increasing of palisade tissue and decreasing of spongy parenchyma have been detected, during high levels of industrial contamination, but not in the period with relatively low pollution levels, that correlated with increasing the palisade ratio. Augmented palisade ratio stated for an adaptive response of tolerant plants toward the stress factor.

Keywords: leaf blade, industrial pollution, polluted air, sulphur dioxide, *Acer campestre*.

Nedeva V., **Dineva S. 2017.** The Benefits of Combining Social Media and e-learning for Training Improving in FTT Yambol. The 12th International Conference on Virtual Learning (ICVL-2017). **Edited by:** Vlada, M; Albeanu, G; Adascalitei, A; Popovici, M. **Book Series:** Proceedings of the International Conference on Virtual learning. ISSN 1844 – 8933. OCT 28, 2017. 158-164. (WoS; Thomson Reuters).

Abstract: In recent years, social media have become more and more popular in both business and education. Their use has a number of advantages that students are familiar with and apply on a daily basis. The report examines the most commonly used social media and the opportunities for their

application in education. The purpose of the report is to present the way in which some of the most popular social media combine with e-learning conducted at the Faculty of Techniques and Technology (FTT) in Yambol. The advantages and disadvantages of using them are analyzed, and conclusions on results and prospects were made.

Keywords: social media; e-learning;

Key Words Plus: SOFTWARE; FACEBOOK; SUPPORT

Dineva S.B. 2017. Antimicrobial Resistance and New EU Action Plan. Innovation and entrepreneurship, ISSN 1314-9253 Volume V, number 4, 2017. 231-235. (Scientific Indexing Services (SIS); Open Academic Journals Index (OAJI); European Reference Index for the Humanities (ERIH) to NSD).

Abstract: Antimicrobial resistance (AMR) is a serious health problem. Worldwide, around 700,000 people die per year from antibiotic resistant infections. The World Bank has warned that, by 2050, drug-resistant infections could cause global economic damage on a par with the 2008 financial crisis. By 2050 AMR has the potential to become a more common cause of death than cancer.

Key words: Antimicrobial resistance (AMR), New action EU plan

Dineva S.B. 2017. Assessing the Adaptability of *Acer saccharinum* L. to industrially contaminated environment according to its leaf blade structure. International Journal of Forestry and Wood Science (IJFWS) (ISSN: 2167-0465) Vol. 3(2), pp. 010-026, Accepted 29 July 17. (Under review by Thomson ISI for inclusion in SCI-E. Google Scholar; J-Gate; Index Copernicus International; Genamics; OAJI – Open Academic Journals Index; Academic Scientific Journals -Cite factor; DOAJ – Directory of open access journals).

Abstract: Assessing the adaptable capability of tree plants to air and soil pollution is an important task, because of nowadays increasing technogenic pollution and global warming trend of climate change. Plants are well known with their ability to absorb, filtrate, localized air contaminations, and mitigate the adverse effect of pollution. The goal of study is to estimate the adaptability of *Acer saccharinum* L. to industrial air pollution through observation of the leaf blade structure modifications. Under conditions of industrial air contamination has been registered reduction of lamina surfaces. The leaf blade structure of *Acer saccharinum* L. is characterized with high coefficient of palisadness naturally (65%). In conditions of industrial pollution silver maple developed thicker cutin ($p < 0.05$), smaller epidermal cells ($p < 0.05$) and expanded photosynthetic mesophyll tissue ($p < 0.0001$), which strengthen the capacity of plant to overcome the adverse conditions. The high coefficient of palisadness, the preserved thickness of cuticle, accompanied with the adapt alterations of mesophyll; provide a reason to classify silver maple as species with high pliability and as a tolerant to environmental stress. *Acer saccharinum* L. is a suitable for building green belts around areas with adverse emissions and for urban forestry.

Key words: leave blade structure, industrial pollution, polluted air, *Acer saccharinum* L. morphological and anatomical alterations

Динева С. Б. 2016. Основни замърсители на хранителни суровини и продукти. on line: ISBN 978-954-9999-99-0. с. 157.

Качеството на храната е приоритетен и основен въпрос за специалистите от хранителната индустрия. Достъпната информация, за видовете замърсители на хранителните суровини и продукти, начините на тяхното постъпване в хранителните вериги, здравословния риск за потребителите и възможните методи за превенция, е един от начините да се обезпечи качествена суровина и продукция в сектора на хранителната индустрия. През последните години се засили контрола, прие се споразумения, актуализираха се норми и действащи закони, които регулират спазването на приетите стандарти и обезпечават безопасна храната за потребление. Приложиха се методи за намаляване замърсяването на околната среда и постъпването на нежелани токсични вещества в диетата. Заболяванията на черен дроб, жлъчка и чревен тракт, сърдечно-съдовите,

диабет и канцер са свързани предимно с режима на хранене и качеството на хранителните продукти. Според националния план „Храни и хранене“ 2005 - 2010 г., здравето не е единствено отсъствие на болест, а включва физическо, умствено и социално благополучие, за което ключова роля играе качеството на храната. Ето защо, все повече внимание се обръща на наличието на достъпна информация за замърсяване на хранителните продукти и на подготовка на специалисти в тази област.

Snejana Dineva, Kremena Andreeva 2015. Healthy Risk of Dioxins in Food. Applied Researches in Technics, Technologies and Education, ARTTE, ISSN 1314-8788 (print), ISSN 1314-8796 (online), doi: 10.15547/artte.2015.01.013. V.3. N1., pp.101-103.

Abstract: The term “dioxin” refers to a broad family around 419 types of dioxin-related compounds have been identified but only about 30 of these are considered to have significant toxicity, with TCDD being the most toxic. Dioxins and related chemical compounds are toxic industrial pollutants which are persistent in the environment, and bioaccumulate through the food chain, particularly in the fat tissue of animals and humans. In the food produce the contaminant levels shall be kept as low as possible following good practices and the maximum levels must be set in order to protect public health. Dioxins are a by-product of chemical processes, not produced intentionally, but with high negative impacts to human health and environment. The article makes revision and summarizes the last statements on dioxin residues in the food, strategies for reducing, legislations and healthy risk assessments mostly with educational purpose.

Keywords: food safety, dioxin, dioxin-related compounds, healthy risk assessments.

Dineva, S. 2015. Safeness of Consuming Irradiated Food. Applied Researches in Technics. Technologies and Education. ARTTE Vol. 3, No. 1, 2015 ISSN 1314-8788 (print), ISSN 1314-8796 (online), doi: 10.15547/artte.2015.01.012, 93-100. (ERIH Plus).

Abstract: The food laws aim a defence of human life and health as well as the environment. A general EU principle for food safety policy is the integrated approach from “farm to fork”. Treatment of food with ionizing energy is applied in many countries for improvement of food hygiene, reduction of spoilage and shelf-life extension of produce. Nevertheless, there has been reported an evidence for neurological dysfunction caused by irradiated diet in some animal species. Till now this observations are with unclear explanation. Also it is known that such kind of food treatment reduce the nutrition value of the foodstuff. Hence there is a knowledge gap, more information and more investigations are needed as well as applying the accepted rule that consumers should have the right to apply their own free choice to consume either irradiated or non-irradiated food. This article has an educational purpose, to highlight “the pros and coins” of that food treatment, and the existed laws for regulation.

Keywords: food irradiation, food safety, radiolytic products, radiation dose.

Snejana Dineva, Veselina Nedeva 2015. Expanding Web and Innovation Skills for 21st Century. The 10th International Conference on Virtual Learning ICVL 2015. The 10th International Conference on Virtual Learning ICVL 2015. ISSN: 1844-8933 – ISI Proceedings, accessed via Web of Science, since year 2006. University of Bucharest and West University of Timisoara. 62-67. (WoS; Thomson Reuters).

Abstract: Gathering the opinion of educators, education experts and executives collective vision for learning known as the Framework for 21st Century Learning has been constructed. According to this Framework, students must master innovative skills and expertise novel knowledge in order to succeed in comprehensive and competitive workenvironments and life that becomes more and more complex each new day. An emphasis is made on creativity, critical thinking, communication and collaboration mentioned as essential to adapt students to the future. In that article, we try to figure out how

developing the Web content and technology innovations influenced onquality of learning process and help students acquiring the needed skills.

Keywords: Web4.0, quality of education, Framework for 21st Century Learning

Veselina Nedeva, **Snejana Dineva 2015**. Intelligent e-Learning with New Web Technologies. The 10th International Conference on Virtual Learning ICVL 2015. The 10th International Conference on Virtual Learning ICVL 2015. ISSN: 1844-8933 – ISI Proceedings, accessed via Web of Science, since year 2006. University of Bucharest and West University of Timisoara. 2015/10/31 68-74. (WoS; Thomson Reuters).

Abstract: Technology innovations with Web 4.0 influence on the quality of student learning and performance in blended learning. Development of the Web technology extends the capabilities of the recent e-learning. The report analyses the changes that occur in e-learning in accordance with the evolution of the World Wide Web. Web 3.0, Web 4.0 and trends in Web 5.0 to outline the new features of e-learning. Artificial Intelligence with Big Data, Linked Data, Cloud Computing, Data Driven science put different emphasis on e-learning. 'The Semantic Web will connect all the Web's data and information much more closely, enabling contextually based search and research. The Internet of Things will let Web-connected machines of all kinds communicate with each other and with us, creating a rich flow of data about their location and status.

Keywords: Intelligent e-learning, e-learning characteristics, technology innovations, Web 3.0, Web 4.0, Web 5.0

Lyubenova Mariyana, Roumen Nedkov, Nadejda Georgieva, **Snejana Dineva 2014**. Space Models of Oak Vegetation Dynamics in Protected Zone, Bulgaria. IJAR. ISSN 2320-5407 Volume:4, Issue: 7, July 2014, p.23-30. (IF=2.1652; IJAR has got Impact factor of 6.118 and highest Index Copernicus value of 56.43.

Abstract: The information for spatial and temporal variation in the distribution of forest ecosystems is essential for determining tendencies in alteration of the forest area size and structure under the conditions of climate changes and existing management of the forest. The paper presents spatial models of xerothermic oak ecosystems distribution in SCI "Zapadna Stara Planina i Predbalkan" in 1977, 1992 and 2007, as a result of the conducted simulation on the base of the studied forest vegetation reflective characteristics. The modification of occupied areas by altitude, exposure, slope, soil type and bedrocks has been analyzed. The climatic fluctuations are characterized by deviations of de Marton index. The ecological status of communities is determined by calculating of state vector and the output factors having the greatest weight to the established state are obtained. The comparative spatial analysis of ecological status presented in the paper and the dynamics of the forest vegetation is the result from the application of a combined investigation method – processing of satellites, aerial photo (orthophoto), GPS and overground data in the using of aerospace technologies and modeling in GIS environment. The created spatial models can be used in the monitoring of the forest ecosystems, for conservation of the forest flora and vegetation, for sustainable management of the forest areas, as well as and for investigation of xerothermic oak forest vegetation in other regions and protected zones.

Keywords: *Quercus frainetto-cerris* ecosystem, space dist

[Динева С. Б. 2014](#). Биохимия, ISDN 978-954-338-104-3. стр.288.

Предговор

Биохимията е наука за химичния състав, свойства, обмяна на веществата и енергията в живите организми. Изучава химичните процеси в микроорганизми, растения, насекоми, риби, птици, бозайници и човек. Биохимията изучава животът на молекулно ниво, т.е. наука за химичните основи на живота. Всички биологични процеси - основи на живота, са химични трансформации. Животът обхваща свойствата на репликация, катализа и променливост, свойства характерни за почти всички живи организми.

Много са постиженията в областта на биохимията, с които биохимиците могат да се гордеят:

- Изучен е химичният състав на клетките и тъканите в човешкия организъм.;
- Изучени са структурите на субклетъчните органели и са изяснени техните функции.;
- Изучена е ролята и функциите на разнообразни биологични мембрани.;
- Изяснени са важни механизми на регулация на молекулно, клетъчно и организмово ниво.;
- Установена е структурата на главните съединения, които се срещат в него и са изяснени техните функции.;
- Изяснени са функциите на нуклеиновите киселини и белтъците – ролята на ДНК за съхраняване и предаване на наследствената информация; на информационна РНК, която детерминира аминокиселинната последователност в белтъци.;
- Първоначално формулираната —централна догма: ДНК → РНК → белтък (закон на Франсис Крик) бе допълнена и разширена с възможността за обратна транскрипция, напр. във вируса, предизвикващ синдром на придобита имунна недостатъчност (СПИН).
- Развитието на рекомбинантната ДНК технология оказва изключително голямо влияние във всички медико-биологични науки, и хранителни технологии.
- Изучени са и класифицирани голям брой биокатализатори: с белтъчна природа (ензими).;
- Открити са биокатализатори, спадащи към РНК (рибозими).;
- Установени са метаболитните пътища за разграждане и синтеза на нискомолекулни и високомолекулни биологично важни съединения.;
- Изяснен е механизмът на биологичното окисление и окислително фосфорилиране.;
- Изяснени са биохимичните основи и механизъм за развитие на голям брой заболявания.

През 21 век главното засега и с изключителна важност постижение е предсрочното завършване на проекта за човешкия геном, който към 15.04.03 е изучен 99,99%. Идентифицирането на гените върху всички хромозоми предлага на учените по цял свят неоченими възможности да подобряват здравето на хората и да побеждават болестите. Знанието за гените ще позволи да разбираме как те повлияват развитието на болестите, ще помогне на изследователите да асоциират дадени гени с определени болести и ще улесни създаването на нови лекарства.

Главни проблеми за решаване остават изясняване биохимичните основи на развитието, клетъчната диференциация и мозъчните функции. Това предполага по-детайлно изучаване на механизмите на генната регулация, т.е. защо и как еукариотните гени се включват и изключват по време на развитието и диференциацията, а също и как нормални клетки се превръщат в ракови.

Очаква се задълбочаване на познанията в областта на клетъчното деление и растеж, съзнание и памет, механизми на клетъчна секреция и др.

Теоретичните цели на биохимията са да изучи на молекулно равнище състава, структурата и функциите на клетъчните компоненти, химичните реакции и процеси, протичащи в клетките и тяхната регулация. Тя въвежда студента в света на многобройните природни биологични превръщания, тяхната взаимна обусловеност и роля в хранителните процеси и човешкия организъм. Формира у студентите познания за строежа на биохимичните субстрати, механизма на биохимичните процеси и значението им. Създава базисни лабораторни умения и възможности за тяхното приложение в практиката.

Знанията по биохимия са полезни не само на професионалистите, но и за всеки обикновен човек. Все по-голямо внимание се отдава на превантивната медицина – например чрез оптимално хранене да се осигури правилен растеж, предпазване от атеросклероза, предпазване от рак, предпазване от остеопороза и пр.

Svetoslav Atanasov, Veselina Nedeva, **Snejana Dineva 2014**. How to Motivate Students Learning Instead of Cheating On a Test, The 9th International Conference on Virtual Learning ICVL 2014, ISSN-1844-8933, University of Bucharest and "Transilvania" University of Brasov; 10/2014, DOI: 10.13140/2.1.2039.0409 (Web of Science- WoS; Thomson Reuters).

Abstract: The quality of education is a crucial aim. Technology impacts so many areas of modern life. There are streaming too many information from everywhere, plenty of information. Technology

provides a bounty of tools for learning and in the same way of cheating on a exam. The ability to improve quality of education is the main goal to any institution, formal or informal organization for education. In that article we will spoke about the methods that are often use for cheating on e-tests, how we try to prevent that way of practice and what is important teachers to do in order to reduce bad manner of cheating among students.

Key words: quality of education, distance education, e-learning

Veselina Nedeva, **Snejana Dineva**, Svetoslav Atanasov **2014**. Effective e-learning course with web conferencing. Пета национална конференция по електронно обучение във висшите училища. Русе. 4:152-158.

Abstract: High quality of education is a main goal of any institution, formal or informal organization for education. The ability to improve quality of education by sharing audio, video, any combination of media, or lessons and in that way to expand the level of acquired knowledge is explored by many organizations and can be obtained using web-conferencing systems. Web-conferencing is a system that performs live meetings between participants from different locations over the Internet and in that way expand communication, sharing of knowledge and experience.

Key words: education, distance education, e-learning, web-conferencing systems

Dineva Snejana, Krastev Krasimir, Yorgova Radostina **2013**. Conditions That Can Advance the Learning Effectiveness. The 8th International Conference on Virtual Learning ICVL 2013. University of Bucharest, Faculty of Psychology and Educational Sciences. 115-122. (WoS; Thomson Reuters).

Abstract: Educators must be prepared for a technology-rich future and keep up with change by adopting effective approaches that permeate lessons with appropriate technologies. Students view teaching with the use of new technics and e-learning materials as more attractive and think that the adequate equipment in computer rooms of dormitories will improve their self-preparation and the efficiency of learning.

Key words: Web-based learning, e-learning, computers, educational technology, quality of education, learning effectiveness

Veselina Nedeva, **Snejana Dineva** **2013**. Design and development of efficient e-learning courses. The 8th International Conference on Virtual Learning ICVL 2013. University of Bucharest, Faculty of Psychology and Educational Sciences. p. 108-114. (WoS; Thomson Reuters).

Abstract: The following article presents the stages of the designing and development of e-learning courses and their content. The factors, influencing the efficiency of the e-learning courses in the process of their development, are also shown. The good practices in the developmental process for efficient e-courses are presented, and are supported with examples driven form the authors's own experience. Keyword: e-learning, design course, development course, efficient e-course.

Key words: e-learning, e-courses, design of e-courses, efficient e-course.

Krastev K., R. Yorgova, **S. Dineva** **2013**. Acceptance of New Learning and Teaching Methods by Students. The 8th International Conference on Virtual Learning ICVL 2013. University of Bucharest, Faculty of Psychology and Educational Sciences. pp.102-107.

Abstract: With the utilization of new teaching and learning methods new forms of learning emerged. In Faculty "Technics and Technology" – Yambol, Trakia University – St. Zagora, VLE has been created and applied, using Moodle platform. The opinion of students from extramural training program has been investigated about quality of education based on the new applied methods of teaching. Students positively accepted new technics and tools of teaching and study without effect of their own skills of working with computers and new technology.

Key words: Web-based learning, e-learning, quality of education, e-learning technolog

Pehlivanova M., Zl. Ducheва, **Snejana Dineva 2013**. Increasing the quality of student's training through strategy of collaborative learning. ARTTE Vol. 1, No. 3-4, 2013 ISSN 1314-8788 (print), ISSN 1314-8796 (online).209-217.

Abstract: Development of modern communication technologies and their application in all areas of life, the dynamics of the demand for skilled workers requires a new philosophy and approach to teaching and learning to develop flexible, mobile, adaptable personalities with critical thinking with a flair for innovation, skills team work, making informed decisions and more. The report makes comparative analysis of traditional learning and training and contemporary learning strategies. The study is a continuation of many years of work on the problems of e-and blended learning and their importance for improving the quality of education and competitiveness of professionals prepared at the Faculty. There are analyzed opinions of students about learning strategies and their work in small groups. The cooperative and collaborative learning methods on forming groups, evaluation of activity process and the final product, the difficulty of the tasks for independent work are discussed in the paper.

Keywords: collaborative learning, cooperative learning, learning in small groups, traditional learning.

Dineva Snejana, Veselina Nedeva 2013. How Technology Influence Student Attendance and Success. The 8th International Conference on Virtual Learning ICVL 2013. University of Bucharest, Faculty of Psychology and Educational Sciences. 123-127. (WoS; Thomson Reuters).

Abstract: The educational process supported by information and communication technology (ICT) changed the traditional education. Technology is used to create more meaningful and attractive assignments. The report analyzed the influence of available Web-based e-learning materials on students' interest, motivation, lessons attendance and exam success. Power Point presentation technology can engage students by making lectures more interactive and allows lectures to keep track of whether students understand the material.

Key words: Web-based learning, e-learning, lessons attendance, exam success

Zlatoeli Ducheва, Margarita Pehlivanova, **Snejana Dineva 2013**. Possibilities for students to evaluate and improve electronic courses (Students opinion). The 8th International Conference on Virtual Learning ICVL 2013. University of Bucharest, Faculty of Psychology and Educational Sciences, ISSN 1844 – 8933. p. 135-141. (WoS; Thomson Reuters).

Abstract: The report based on the conducted survey that inspected the students' opportunity to interact with educators in order to assess the e-training material and courses to achieve higher quality and learning effectiveness. The activity of students in collaboration with the tutor and the positive attitude to subject is the key for successful acquiring of knowledge and effective learning process. Students accepted new technology interactive tools as good approach for training and have positive outlook to blended learning. The chance to take into accounts their opinion and collaborate with teacher makes them more responsible and effective learners.

Key words: evaluation, quality and efficiency of e-courses, blended learning

Zlatoeli Ducheва, Margarita Pehlivanova, **Snejana Dineva, 2013**. Opportunities for students to evaluate the electronic courses (According to the teacher). The 8th International Conference on Virtual Learning ICVL 2013. University of Bucharest, Faculty of Psychology and Educational Sciences, ISSN 1844 – 8933. p. 128-134. (WoS; Реферирана в Thomson Reuters).

Abstract: The report examine the students' opportunity to evaluate the e- training courses in order to increase their quality and efficiency. Review has been made based on various author sources that indicate the types and stages for fulfillment of assessment and the feedback from students and the

formation of a culture for evaluation. Strategies for overcome the confrontation to the evaluation of e-courses by students have been studied through planning, collaboration, creativity, respect and personal responsibility.

Key words: evaluation, quality and efficiency of e-courses

Krasimir Krastev, Radostina Yorgova, **Snejana Dineva** 2013. Choice, computer knowledge and the usefulness of e-learning materials. ARTTE Vol. 1, No. 1, 2013 ISSN 1314-8788 (print), ISSN 1314-8796 (online), 51-56. (ERIH Plus).

Abstract: The wide range of technologies involving in the education methodology significantly improved the quality of teaching and learning. The quality of education has the important role and it is one of the main goals of any country and government. With the utilization of new teaching and learning methods new forms of learning emerged, varying from computer based learning, blended learning, online learning, web-based learning, e-learning etc. The virtual learning environment has been created using Moodle software platform and has been applied in Faculty of Techniques and Technology of Yambol, University of St. Zagora. The web-based course of Chemistry has been developed and applied during 2011-2012 year. The paper represents the results from the statistical analysis on some questions of conducted inquiry, using Likert classification, into acceptance and assessment of the web-based course of Chemistry and the e-learning test system from the students.

Key words: Web-based learning, e-learning, Likert classification, blended learning.

Lyubenova M., **S. Dineva**, N. Georgieva, T. Georgieva, I. Karadjova, P. Parvanova 2012. Ecotoxicology Assessment Model Of Culture Plant - Soil Complex Treated With Waste Water., J. "Biotechnology & Biotechnological Equipment", (B&BE) (ISSN: 1310-2818), Biotechnol. & Biotechnol. Eq. 2012, 26(2), 2883-2893. DOI: 10.5504/BBEQ.2011.0158 (IF=0.622, IF=0.291).

Abstract: The industrial environmental "hot spots" create significant ecological hazards for terrestrial and aquatic ecosystems. Guidelines and legislation often refer to the total amount of contamination without estimating the complex relationship between the environmental factors and the toxicant. In cases of suspicion for adverse effect on the environment bio-assessment can be used as a tool to detect the presence of hazardous chemicals. Bioassays with vascular plants are considered to be universal tools of identifying the combined effects of pollutants in ecotoxicology. The purpose of this article was to evaluate the toxicological effect of plant-soil complex treated with waste water from Radomir Metal Industries, Bulgaria. The conclusion is that the sewage from the metallurgical plant Radomir Metal is used properly for irrigation of arable land. The question can be which kind of plants are suitable to be cultivated there. The effluent seems toxic for the aquatic systems and has a slight negative impact on the soil breathing and germination of treated plants. Nevertheless, in the bioassay for all examined plants a stimulating effect on the weight of roots and stems was registered under the treatment with soil extract.

Keywords: ecotoxicology, soil pollution, soil respiration, energy of germination, germination, early development, culture plant

Mariana I. Lyubenova, **Snejana B. Dineva**, Irina B. Karadjova 2012. Ecotoxicology Assessment of Waste Water Emitted From Radomir Metal Industries (Bulgaria). ECOLOGIA BALKANICA. Online ISSN: 1313-9940. Print ISSN: 1314-0213 Vol. 4, Issue 2, 2012. 51-60. (WoS; Scopus; ICv2015=84.21; IBI Factor 2014-2015: 3,46; DOAJ, CABI Abstracts; EBSCO; Elsevier; SIS).

Abstract: The purpose of this article is to evaluate the toxicological effect of wastewater emitted from „Radomir Metal Industries". It has been registered that the range of 50% mortality (LC₅₀) of great water flea (*Daphnia magna* St.) is limited between 75% and 80% effluent. The data mortality rate-effluent dilution for *Pseudorasbora parva* well correlated with linear regression, R²=0.86. LC₅₀ is reported from exposure to raw sewage (100%). Results indicate that even when individual concentrations of toxic

metals are within the permissible limits the effluent remains toxic for the hydrobiota perhaps due to the combine effect of the contaminants.

Keywords: ecotoxicology, heavy metals, effluent, *D. magna* St., *P. parva* Temminck & Schlegels

Nedeva V. I., S. B. Dineva 2012. Blended Learning and Applying New Tools and Services of E-Learning Support. Computer Technology and Application. ISSN: 1934-7332(Print); 1934-7340(Online). 3 (2012) 471-476. (WoS)

Abstract: The strengths and weaknesses of different online technologies and learning methods have been examined by combining the blended learning program with practical work on institutional e-learning projects. There are differences between the traditional e-learning system and the new E-Learning 2.0 training. At present time, the new technologies provided by Web 2.0 better correspond to the needs of both students and teaching staff. The new Web 2.0 allows the "promoting of individual creativity", together with the "use of collective intelligence". A comparison of the two development stages of the e-learning tools has been completed and the advantages of E-Learning 2.0 are shown. The main components of Web 2.0 are provided and the use of wiki as an up-to-date collaboration tool for on-line teamwork is shown.

Key words: E-Learning 1.0, E-Learning 2.0, blended learning, Web 2.0 applications, wiki activities.

Dineva S. , Nedeva V. 2012. Cloud Computing and High Education. The 7th International Conference on Virtual Learning ICVL 2012. University of Bucharest and "Transylvania" University of Brasov. 171-176. (WoS; Thomson Reuters).

Abstract: The quality of education is the policy and main goal of any country and government. The cloud computing solve many problems and open many opportunities to the education establishments. The offered by cloud providers multimedia interactive lessons holds great promise for improving the quality of education by the ability to illustrate ideas with visual, audio, text, or any combination of media and in that way to improve the level of aquired knowledge.

Key words: cloud computing, education, distance education, e-learning

Nedeva V., S. Dineva 2012. New learning innovations with Web 4.0. Proceedings of the 7th International Conference on Virtual Learning (ICVL), Bucharest, Romania. pp. 316-321. (WoS; Thomson Reuters).

Abstract: The report analyzes the evolution of Web technology and the role of innovation in education. These technologies are applicable both in distance learning, e-learning and m-learning. It has been created a summary of the various stages in the development of technologies of web 1.0 to web 4.0. Emphasis is made on the following basic characteristics of Web 4.0 - Intelligent agents, Mobile technologies and Cloud computing and services.

Key words: Web-based learning, e-learning, m-learning, intelligent agent, mobile technologies, cloud computing and services

Ducheva Z., S. Dineva, M. Pehlivanova 2012. Evaluation of Certain Aspects of Electronic and Blended Learning (Teachers Opinion). Proceedings of the 7th International Conference on Virtual Learning (ICVL2012). University of Bucharest and "Transylvania" University of Brasov. pp. 177-182. (WoS; Thomson Reuters).

Abstract: In this paper, we investigated the opinion of university professors according to e-learning and blended learning opportunities. All respondents agreed that e-based courses are more attractive to students and convinient to the use of lecturers. Regardless of the age, the younger group and the group of 50-60 years believe that they have good technical selfpreparation in the use of interactive learning tools. Most respondents use blended learning, which combines the advantages of traditional and

modern teaching technologies and improve the quality of education. Some of the problems that arise are related to financial incentives for professors to introduce e-learning.

Key words: e-learning, blended learning

Krastev Kr. Yorgova R. , **Dineva S. 2012.** Analyzing Factors That Made E-Learning Successful. Proceedings of the 7th International Conference on Virtual Learning (ICVL2012). University of Bucharest and "Transilvania" University of Brasov. pp. 183-189. (WoS; Thomson Reuters).

Abstract: The virtual learning environment has been created using Moodle software platform and has been applied in Faculty of Engineering and Technology of Yambol. The paper presents the results from conducted statistical analysis examining the impact of different individual factors that make e-learning attractive and desirable for the learners. Using Likert classification, students of extramural training system classified individual factors that determine positive or negative perception of e-learning from them. The results show a consistency and correlation to the factors that determine overall perception negatively or positively.

Key words: Web-based learning, e-learning, critical success factors

Dineva Snejana, Vanya Stoykova 2011. Improving the quality of ODL-process and reducing drop off of the students through applying interactive devices. Научни трудове на русенския университет - 2011, том 50, серия 3.2 , 129-132.

Abstract: Virtual learning becomes an important task for academic institutions. In Technical College of Yambol the virtual learning environment (VLE) has been created using Moodle software platform and has been introduced into the practice. Multimedia courses have been created in different disciplines. Using interactive whiteboards and possibilities teachers to record their instruction and post the material for review by students at a later time is a good opportunity to overcome the main student's problems and reducing the rate of drop off as well as improving the quality of ODL-process by creating interactive ODL-modules.

Key words: ODL process, virtual learning environment, interactive whiteboards.

Vanya Stoykova, **Snejana Dineva**, Krasimira Georgieva **2011.** Requirements to teachers for using interactive whiteboards in creating training modules for ODL-process. Научни трудове на русенския университет - 2011, том 50, серия 3.2 , 123-128.

Abstract: A virtual learning environment has been created using Moodle software platform and has been applied in Technical College of Yambol. Multimedia courses have been created as well. In our paper we give the assessments of the requirements for the teachers regarding implementation of high quality open and distance learning process. Using interactive whiteboards and possibilities for the teachers to record their instruction and post the material on-line is a good opportunity for realizing ODL-process. The paper presents possibilities for using interactive whiteboards as an educational tool and their application into the practice. The experience and perspectives of their use in educational process at the Technical College of Yambol is shown.

Key words: ODL process, virtual learning environment, interactive whiteboards, requirements to teachers.

Dineva, S., Z. Ducheveva, 2011. Positiveness of Web-based site for General and Inorganic Chemistry in Blended Learning, The 6th International Conference on Virtual Learning ICVL 2011, University of Bucharest and "Babeş-Bolyai" University of Cluj-Napoca, Romania, 2011, pp. 211-218. (WoS; Thomson Reuters).

Abstract: The virtual learning environment (VLE) in the Technical College of Yambol has been created using Moodle software platform and has been applied. In order to improve the quality of student

training, this year start a project "Introducing Interactive Teaching Methods in Inorganic Chemistry and Investigation the Effect on the Quality of Knowledge". The project has the aim: to create e-learning data base of General and Inorganic Chemistry; to apply new interactive devices during lecture activities; innovative possibilities for self preparation of students as well as new assessments of acquire knowledge of students. The inspection of the opinion of students enrolled in e-learning supported courses, in the TC – Yambol, showed that 80% of students support the idea of blended learning supported by Webbased e-learning materials, they found e-learning more interesting. Approximately 80% of students gave positive answer about the e-quizzes for self preparation, followed by 70% for video materials and the same range of 70% for lecture presentations. We expect that through the creation of new approaches for teaching and self preparation will give novel possibilities to improve the quality of education furthered in the College.

Keywords: e-learning environment, blended learning, multimedia courses, self preparation, quality of education

Nedeva Veselina, [Dineva Snejana](#) 2011. Blended Learning and Applying New Tools and Services of E-learning Support The 6th International Conference on Virtual Learning ICVL 2011. C3VIP:"Consistency-Competence-Clarity-Vision-Innovation-Performance". University of Bucharest and "Babeş-Bolyai" University of Cluj-Napoca, 218-223. (accessed via Web of Science; Реферирана в Thomson Reuters)

Abstract: Due to combining the blended learning program with practical work on institutional e-learning projects, strengths and weaknesses of different online technologies and learning methods have been examined. There are differences between traditional e-learning system and E-Learning 2.0 training, which appear in the recent time, responsive to the needs of learners, technologically supported by Web 2.0 applications. Wherein the principles of "promoting individual creativity", together with the principle of "use of collective intelligence" are most often applied. As a further strategy we planed to enlarge the capacity of blended learning process by applying on-line activities and training methods supported by E-Learning 2.0 tools. Introducing also new subjects to out data-base and expansion of the data-base by creation the new compulsory disciplines courses. Creation of social network and community inside of College as well as applying wiki – activities will play more attention to furthered work.

Keywords: E-Learning 1.0, E-Learning 2.0, blended learning, Web 2.0 applications, wiki – activities

Margarita Pehlivanova, [Snejana Dineva](#), Zlatoeli Duchevea 2011. Innovative Potential of Social Networks in Blended Learning. The 6th International Conference on Virtual Learning ICVL 2011, University of Bucharest and "Babeş-Bolyai" University of Cluj-Napoca, Romania, 2011, pp. 167-171. (WoS; Thomson Reuters).

Abstract: Foundation of e-learning environment was created in the Technical College of Yambol. The virtual learning environment (VLE) has been created using Moodle software platform and has been applied. The multimedia courses have been created in different disciplines. In order to improve the offered e-learning system, we carry out survey on the end of each year. The participants are students – one part of them attended full-time regular education; other - extramural form of education. The inspection of the opinion of students enrolled in e-learning supported courses, in the TC – Yambol, showed that 90% of students support the idea of using forums, where they can share problems, news, discussions, give assessments, ideas, literature and etc. More than 80% of students gave positive answer about the stimulus to cooperate in learning groups and to identify themselves through that group. Creation of social network and community inside of College will give new possibilities to improve the quality of furthered work in blended learning.

Keywords: e-learning environment, blended learning, E-Learning 1.0, E-Learning 2.0, social network

[Dineva Snejana](#), Stoikova Vania 2011. Application of Interactive Devices and Virtual lab in Chemistry Learning. The 6th International Conference on Virtual Learning ICVL 2011. C3VIP:"Consistency-

Competence-Clarity-Vision-Innovation-Performance". University of Bucharest and "Babeş-Bolyai" University of Cluj-Нароса, 261-267. (WoS; Реферирана в Thomson Reuters)

Abstract: This paper presents an educational project ("Introducing Interactive Teaching Methods in Inorganic Chemistry and Investigation the Effect on the Quality of Knowledge") of blended learning in the studies of "Food Technology" in Technical College of Yambol. The blended learning model is established and supported by e-learning on-line materials. The multimedia courses, lessons and e-quizzes have been created. Moodle platform is used for the management of on-line educational process. We propose the innovative devices that can be apply in Chemistry lessons and by integrated audio – video tools, specific programs and interactive whiteboards, virtual labs to create simulations of chemistry experiments and solving different problems.

Keywords: blended learning, high education, e-learning environment, whiteboards, Virtual Chemistry Lab

Dineva, Snejana 2010. A study on Students' views on Blended Learning Environment Usage. Annals of Spiru Haret University, Mathematics-Informatics Series, 23-30. http://anale-mi.spiruharet.ro/upload/full_2010_s_a4.pdf

Abstract: The purpose of the article is to present the opinion of our students that have been enrolled in the web-based course on Ecology during their traditional face-to-face education. The analyses of the data had reflected students learning and satisfaction especially on the usage of the online materials and workshop components of blended mode of learning. The results show that students prefer integrated combination of face-to-face traditional with web based online teaching and learning activities.

Keywords: e-learning, blended learning, self-preparation, online education, web-supported e-learning

Pehlivanova M., Zlatoeli Ducheва, **Snejana Dineva 2010.** Assessment of Blended Learning Education – Students' Opinion. The 5th International Conference on Virtual Learning ICVL 2010. VIRTUAL ENVIRONMENTS FOR EDUCATION AND RESEARCH, C3VIP: "Consistency-Competence-Clarity-Vision-Innovation-Performance", University of Bucharest and University of Medicine and Pharmacy Tirgu-Mures, 72-78. (WoS; Реферирана в Thomson Reuters)

Abstract: In the activities of College part of professors used elements of classical training classroom learning programs, a Computer-aided Learning and Web-based training in MOODLE. Part of the main topics, subjects, seminars and other exercises are conducted in classic mode. Some of educational disciplines are fully developed in the form of e-courses, which contain the majority of the components for work in MOODLE-environment. Computer-aided learning is used as a supplement to traditional ways of students training. It makes it possible to provide guidance in implementation of curricula and to conduct of certain exercises. This type of training is carried out under-equipped computer labs in the college, but also on a personal computer at home with common software. The aim of our investigation was to compare the preferences of the students and to estimate student's opinion about the blended learning ant traditional learning – positive and negative sites of e-learning. The results show that students appreciated integrated combination of face-to-face traditional with web based online teaching and learning activities.

Keywords: e-learning, blended learning, virtual learning environment

Snejana Dineva, Veselina Nedeva 2010. Accepted Strategy for the Further Development of Blended E-Learning: Tk-Yambol Case Study. The 5th International Conference on Virtual Learning ICVL 2010. VIRTUAL ENVIRONMENTS FOR EDUCATION AND RESEARCH, C3VIP: "Consistency-Competence-Clarity-Vision-Innovation-Performance", University of Bucharest and University of Medicine and Pharmacy Tirgu-Mures. 79-84. (WoS; Thomson Reuters).

Abstract The e-learning and multimedia presentations allow tremendous visualization in the field of study as well as unlimited access to the training materials at any possible time. Many investigations showed that the performance of e-learning system improved the quality of the acquire knowledge. Virtual learning becomes an important topic for academic institutions and for researchers. In our investigation we gave the assessments of the current stage of development the VLEs in our institution as well as further strategy for successful expansion and introducing the distance learning.

Keywords: e-learning, quality of the education, e-learning based lessons and quizzes

Nedeva V., Emilia Dimova, **Snejana Dineva 2010**. Overcome Disadvantages of E-Learning for Training English as Foreign Language. The 5th International Conference on Virtual Learning ICVL 2010. VIRTUAL ENVIRONMENTS FOR EDUCATION AND RESEARCH, C3VIP: "Consistency-Competence-Clarity-Vision-Innovation-Performance", University of Bucharest and University of Medicine and Pharmacy Tirgu-Mures, 275-281.

Abstract: The report presents the advantages of e-learning forms and the use of multimedia programs and products in the "English as foreign language" education, when compared to the traditional education. An already established and running virtual learning environment – namely eDuTK (<http://tk.uni-sz.bg/edutk/>), based on the MOODLE software, is being used in Technical College – Yambol. There is description of implementation of MOODLE for foreign language training. Analyze of advantages and disadvantages of multimedia product in e-learning education are developed. General disadvantages of e-learning on the base of other author publications are explored. The possibilities to overcoming of e-learning disadvantages by MOODLE activities, Hot Potatoes and other multimedia resources in the practices of Technical College – Yambol in the paper have been presented.

Keywords: e-learning, English language training, digital technologies, advantages and disadvantages of e-learning

Margarita Pehlivanova, Zlatoeli Ducheveva, **Snejana Dineva 2009**. Advantages of the Web-Based Training for the Increasing Quality of Preparation and Self-Preparation of Students from the Specialty "Food Technology". The 4th International Conference on Virtual Learning "Virtual Learning - Virtual reality, October 30-November 1 2009. Iassy. Romania. p.239-246. (WoS; Thomson Reuters).

Abstract: The report represents the results of implementation e-learning based lessons and quizzes in the education of students in Technical College of Yambol, Bulgaria. The e-learning is a way to use networking technologies that allow to access the training materials at any possible time, permit interacting with the training environment in convenient for the user time, that lead to improving self motivation and the effectiveness of acquiring knowledge's. The area of e-learning study in Technical College of Yambol included courses in Informatics, Programming languages, Information technology, Common and General Chemistry, Biochemistry, Microbiology, Ecology. The results of our investigation show that the performance of e-learning system is the reason for improving the effectiveness of the education, as well as improving the motivation among students and teachers have been registered.

Keywords: e-learning, effectiveness of the education, motivation

Dineva S., V. Nedeva 2009. Development interactive courses of education in Microbiology based on e-learning system applying in Technical College - Yambol, The 4th International Conference on Virtual Learning "Virtual Learning - Virtual reality, October 30-November 1 2009. Iassy. Romania. p.231-239. (WoS; Thomson Reuters).

Abstract: The purpose of the article is to represent the results of the development interactive courses of education in Microbiology based on virtual learning environment. The virtual learning environment has been created using Moodle software platform and has been implemented in many different disciplines in Technical College of Yambol. The advantages of this way of education is the unlimited access of the training materials in convenient of the learner time, as well as the interactive method of

acquiring the knowledge's in form of test or by creation of multimedia presentations. The performance of virtual study environment allows improving the efficiency of the learning.

Keywords: e-learning, Moodle, course organization, lessons, quiz, new feature in Moodle

Любенова М., Динева С. 2007. Тест за мутации с *Arabidopsis thaliana* (L.) Heynh. стр.215-223. В. кн.: Любенова М., Калчев Р. 2007 г. Екотоксикология. Малък практикум. София, 2007. ISBN:978-954-91730-6-2. Издателство и печат: АН-ДИ, София. стр.312.

В Екотоксикологията се изследват и анализират ефектите от влиянието на токсичните компоненти в околната среда (главно с антропогенен произход) върху биологичните системи от различен ранг - организми, индивиди, популации, съобщества и екосистеми. Това изисква както наличие на знания относно физичните, химичните и биологичните свойства на токсикантите, така и относно структурата и функционирането на всички компоненти на природната среда. Във връзка с това екотоксикологията е комплексна, надграждаща дисциплина за всички специалисти, занимаващи се с опазването на околната среда.

В практикума се разглежда използването на различни видове биотестове и биомаркери за изследване на токсичното влияние на токсикантите върху индивидите и популациите и върху биоценозите и екосистемите, което е свързано с провеждането на биоиндикационни и биомониторингови изследвания, предхождащи набелязването на мерки за опазване. Разгледани са и различните подходи за екосистемна диагностика.

Днес над $60 \cdot 10^3$ антропогенни химични съединения се използват широко в човешката практика. Хиляди нови синтетични химикали се регистрират всяка година. Във връзка с това в много страни законодателството изисква задължителното провеждане както на токсикологични, така и на екотоксикологични тестове на тези химикали. Мащабите на възможните екологични последици върху околната среда и биосферата изискват бързи и точни оценки на токсикологичните ефекти и усъвършенстване на тестовите и моделните обекти. Практическото значение на екотоксикологията за съществуването и функционирането на макробиологичните системи в природата е огромно и непрекъснато нараства.

Получените знания в практическия курс по екотоксикология са част от необходимата фундаментална и приложна база при подготовката на специалисти по екология, опазване на природната и околната среда. В предложения малък практикум основно са включени провежданите лабораторни занятия по дисциплината Екотоксикология, включена в учебния план за магистри по опазване на околната среда и магистри по екохимия в Биологическия и Химическия факултет на Софийския университет "Св. Климент Охридски", може да бъде полезен също на студентите от специалност Екология и екотоксикология в УНСС и на всички студенти, изучаващи екология и екотоксикология. Той може да бъде полезен от всички специалисти, занимаващи се с опазване на околната среда в научен или практически аспект - от специализираните екотоксикологични лаборатории в Центъра по Опазване на Общественото здраве, в Изпълнителната Агенция по Околна Среда, от Министерство на Околната среда и водите и неговите регионални структури (Регионалната инспекция по околната среда и водите), от Басейновите дирекции, от Министерство на земеделието и горите и неговите регионални структури, от Националното управление на горите и неговите регионални структури (Районното управление на горите и др.), както и от други структури и учреждения, провеждащи мониторингови изследвания.

Dineva S.B. 2006. Development of the leaf blades of *Acer platanoides* L. in industrially contaminated environment. *Dendrobiology*. 55, 25-32. (IF= 1.164; Indexed in: Science Citation Index Expanded – Clarivate Analytics; Web of Science - Clarivate Analytics; Journal Citation Reports/Science Editions – Clarivate Analytics; SCOPUS – Elsevier; EBSCOhost - Electronic Journals Service; CABI full text - Database; DOAJ - Directory of Open Access Journals; Biblioteka Nauki - Polish Scientific Library; Google Scholar).

Abstract: Leaf blades of Norway maple (*Acer platanoides* L.), growing in heavily polluted industrial area have been studied for anatomical changes developed under the influence of the industrial contamination (with SO₂, NxOx, Pb, As). The aim of the examination was to reveal the dynamics in the development of leaf blades and to trace the impact of the contaminated air on the leaf structure of Norway maple. The conducted study registered acceleration of the vegetative growth of the leaf blades that is manifested through approximately two weeks earlier appearance of leaves on the tree, faster linear growth and strengthened the xeromorphic traits in the leaf structure of the tree plants from the contaminated region. The observed changes are regarded as adaptation of the plant to the polluted environment, ie as tolerance.

Additional key words: Norway maple, leave blades, industrially contaminated air, sulphur dioxide

Dineva S. 2005. Leaf blade structure and the tolerance of *Acer negundo* L. (Box elder) to the polluted environment. Dendrobiology ISSN: 1641-1307. 2005. Vol. 53. 11 – 16. (IF=0.26) (IF= 1.164; Indexed in: Science Citation Index Expanded – Clarivate Analytics; Web of Science - Clarivate Analytics; Journal Citation Reports/Science Editions – Clarivate Analytics; SCOPUS – Elsevier; EBSCOhost - Electronic Journals Service; CABI full text - Database; DOAJ - Directory of Open Access Journals; Biblioteka Nauki - Polish Scientific Library; Google Scholar).

Abstract: Polluted air is a stress factor that contributes to the decline of urban trees. Air pollution may cause short-term (acute) damage, which is immediately visible and long-term (chronic) damage, which can lead to gradual tree decline. Long-term damage may predispose trees to other disorders. The impact of technogenic factors on the leaf's anatomical structure of *Acer negundo* L. (Box elder) was studied. The thickness of the upper cuticle is increased when compared to those from an ecologically pure area. A change in the rate of mesophyll tissue is due to the enlargement of the palisade parenchyma. The thickness of lower epidermal cells is decreased. All changes of the leaf blade structure are significant and are in direction of increasing the xerophyte characteristics of the leaves. Box elder is native to much of temperate North America. This is a tree of lowlands and wet hardwood forests. As such, we can assume that the registered changes are adaptive responses of the tree to the contaminated environment and that the tree can be considered to be relatively tolerant.

Additional key words: polluted air, sulphur dioxide, anatomical structure

Dineva S.B. 2004. Comparative studies of the leaf morphology and structure of white ash *Fraxinus americana* L. and London plane tree *Platanus acerifolia* Willd growing in polluted area. Dendrobiology 52, 3-8. (IF= 1.164; Indexed in: Science Citation Index Expanded – Clarivate Analytics; Web of Science - Clarivate Analytics; Journal Citation Reports/Science Editions – Clarivate Analytics; SCOPUS – Elsevier; EBSCOhost - Electronic Journals Service; CABI full text - Database; DOAJ - Directory of Open Access Journals; Biblioteka Nauki - Polish Scientific Library; Google Scholar).

Abstract: The leaf blades of white ash *Fraxinus americana* L. and London plane tree *Platanus acerifolia* Willd. growing in heavy polluted industrial areas were studied for morphological and anatomical changes developed under the influence of industrial contamination. The aim of the investigation was to determine and compare the influences of air polluted with SO₂, NxOx, Pb, As, Zn, Cu etc. on the morphology and the structure of the leaves of these deciduous trees. Both species are tolerant to environmental changes but with different environmental characteristics and tolerances and they are widely used for planting. Under polluted conditions, the trees strengthened the anatomic xeromorphic characteristics of their leaf structures, which gave them the opportunity to mitigate the stressful conditions of the environment. The observed responses are regarded as adaptive and compensative to the adverse effects of air pollution.

Key words: air pollution, morphology, anatomy of leaf, *Fraxinus americana* L., *Platanus acerifolia* Willd.

Dineva S.B. 2018. Deciduous tree species under polluted air environment and leaf blade modifications. In book: Trees under polluted environment, Dineva S., M. Lyubenova, J. Olsen 2018. www.lap-publishing.com; LAP LAMBERT Academic Publishing; 978-620-2-07811-5. 2018/1/11. pp.176.

Blurb/Shorttext:

The resistance of plants to air pollution, ie their ability to grow and thrive in a polluted atmosphere is current science problem having great practical application. Studies of tree species in terms of industrial pollution are interesting, important and with practical significance. Persistent to pollution trees are used to create green filters, enabling the localization of gaseous pollutants. Optimization of industrial environments through the creation of green filters is achieved by careful plants selection. Hence, anatomo-morphological, physiological, biochemistry and other depth studies are needed for more efficient use of tree species and enhance of industrial environments.

Deciduous tree species under polluted air environment and leaf blade modifications

Abstract: The air pollutants such as gaseous, aerosols and dust effect directly and indirectly on plants leaves with or without visible damages. The leaf is a part of the plant that first and most obviously exhibit visible symptoms of injury and that can serve as bioindicator for tolerance of the species. Nevertheless, even without visible injures, biochemical, physiological and cellular changes can take place to mitigate stress and the ample used of the plant internal resources. Typically under ambient air pollution tree plants adapt through leaf blade modifications. Evaluation of leaf alterations in plants exposed to air pollution is an important task for biological monitoring and mitigation strategies. The aim of study is to evaluate leaf blade morphology and structure amendments under industrial air pollution for deciduous trees most applied in urban planting: *Acer campestre* L, *Acer negundo* L, *Acer saccharinum* L, *Acer tataricum* L, *Acer negundo* L., *Fraxinus americana* L, *Morus alba* L, *Platanus acerifolia* Willd.

Key words: *Acer campestre* L, *Acer negundo* L, *Acer saccharinum* L, *Acer tataricum* L, *Acer negundo* L., *Fraxinus americana* L, *Morus alba* L, *Platanus acerifolia* Willd., leave blades, polluted environment

Динева С. Б. 2005. Изследване анатомо-морфологичните показатели при широколистни дървесни видове развиващи се в промишлено замърсена среда и оценяване на тяхната толерантност. Ямбол. 2005. ISBN 954-9999-38-6. (2005). 137с.

Монографията включва резултати от научен проект 2004 година на тема: „Изследване развитието на листни петури на широколистни дървесни видове, развиващи се в промишлено замърсена среда и оценяване на пасивната толерантност”, възложен и финансиран от Технически Колеж – Ямбол, към Тракийски Университет – Стара Загора.

Монографията е предназначена за ученици и студенти от ВУЗ изучаващи Екология и Опазване на Околната Среда, специалисти лесовъди и еколози, работещи върху проблема за опазване на околната среда.

Изказвам лични благодарности на д-р Лилия Дражева и доц. д-р Красимира Узунова – Зам. Декан по Учебната работа в Биологически Факултет, СУ – София за оказаното съдействие в процеса на изследване.

ВЪВЕДЕНИЕ

Антропогенното замърсяване на околната среда се съпровожда от редица негативни последствия за флората и фауната. Промисленото замърсяване е предпоставка за появата на кисели дъждове, за промяна реакцията на реките, езерата, водоемите, почвата, както и за нарушаване на екологичното равновесие. Според някои автори, един от основните фактори за деклайн на горите е серният диоксид (Jozafacink W. *et al.*, 1982; Hinrichsen, 1983; Thiel, 1985). При това се счита, че степента на поразяване, причинена от серните емисии е по-голяма от регистрираната, защото уврежданията се проявяват по-късно във времето (Hinrichsen, 1983; Thiel, 1985). Неблагоприятният ефект на серния диоксид се засилва от азотните окиси, фотохимичните

оксиданти (озона) и тежките метали, поради наличието на т.нар. синергичен ефект (Glatzel, 1983; Traca, 1985; Thiel, 1985).

В равновесие с околните концентрации на въглероден диоксид природната дъждовна вода има приблизително $pH = 5,6$. Постъпилите в атмосферата серни и нитрогенни окисни емисии взаимодействат с атмосферната влага, както и с наличните промишлени токсиканти и формират кисели соли. Според някои автори (Likeus *et al.*, 1972) валежите в някои области на Земята имат средно годишно $pH = 4,4$, а при индивидуални валежи pH достига до 2,1. Тази увеличена киселинност на валежите, вследствие на окисляването и хидратирането на сярата и азота от промишлени източници, има увреждащи ефекти върху листната маса (Thomas, 1951; Кулагин, 1965; Jonson & Sundberg, 1972; Wood & Bormann, 1974; Ferenbaugh, 1976; Shriner, 1976; Evans *et al.*, 1977; 1978; Илькун, 1978; Kummer, 1983). При наличие на силен вятър емисиите от серен диоксид могат да бъдат пренесени на големи разстояния. Например от един до три дни серния диоксид може да достигне до места, намиращи се на 200 до 500 км разстояние от източника на замърсяване (Kowalkowski *et al.*, 1983). Единственият естествен път на отстраняване на серният диоксид, може да бъде наличието на горски масив (Lorenz, 1985).

Устойчивостта на растенията към замърсяването на въздуха, т.е. способността им да растат и да се развиват в условията на замърсена атмосфера е актуален за науката проблем, имащ голямо практическо приложение. Изследванията на дървесни видове в условията на промишлено замърсяване са интересни и с важно практическо значение. Устойчиви на замърсяване дървесни видове се използват за създаване на зелени филтри, способстващи локализирането на газообразните замърсители. В качеството си на биологични акумулатори, те обезвреждат токсичните емисии (Чернышева, 1981). Оптимизацията на промишлените среди посредством създаването на зелени филтри се осъществява чрез щателен подбор на растенията. Анатоомо-морфологични, физиолого-биохимични и други задълбочени изследвания са необходими за по-ефективното използване на дървесните видове и за оптимизация на промишлените среди.

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