SIXTH INTERNATIONAL SCIENTIFIC CONFERENCE

JUNE 5 th – WORLD ENVIRONMENT DAY

THE BOOK OF ABSTRACTS

18 - 19 June, 2018, Bihać, Bosnia and Herzegovina

University of Bihać

Biotechnical Faculty

Year 5 ♦ No. 5 ♦2018.

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Ph.D. Husein Vilić, Dean
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M..Sc. Toromanović Merima

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JUNE 5 th – WORLD ENVIRONMENT DAY

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Bihać, June 2018. Organization committee

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CONDITIONS FOR USE OF MEDICINAL HERBS AND ITS PREPARATIONS IN THE TERRITORY OF THE KNIN CITY

Boris Dorbić[1], Marija Lizatović[1], Ivna Podrug[1], Emilija Friganović[1]

[1] University of Applied Sciences „Marko Marulić“ in Knin, Department of agriculture karst
Petra Krešimira IV. 30, 22 300 Knin, Croatia

bdorbic@veleknin.hr
boris.dorbic@gmail.com

Keywords: Medicinal herbs, preparations, use, attitudes, Knin.

ABSTRACT:

The oldest records of folk medicine have been found in the Sumer area, which describe in detail 1,000 herbs and various herbal remedies. So far, around 500 medicinal herbs have been used in Croatian areas since ancient times. There are also over 65 types of teas and over 85 pharmaceutical and cosmetic products with healing properties. Medicinal herbs are herbs that are considered as exotic and folk medicine, and contain biologically active substances that can be used for therapeutic and / or pharmaceutical purposes. It is used for cosmetic products and as raw materials for the food and pharmaceutical industry. The most exported herbs from Croatia today are : imortelle, sage, malva, gentiana, peppermint, tilia etc. The most common products of medicinal herbs are: teas, tinctures, syrups, cosmetic products, etc. Survey on the use of medicinal herbs and its products in the area of Knin in the second half of 2017 there were certain cognitions. For example, more people think that human nutrition should be complemented by healing herbs and their products. The most informations about the use of medicinal herbs respondents search online. The most popular herbal preparation is tea. Half of the respondents occasionally make strong alcoholic drinks with healing herbs. Internet shopping is not popular, as evidenced by the fact that 85% of respondents have almost never ordered medicines online. Respondents believe that Knin citizens have limited knowledge of the use of herbs. Medicinal herbal preparations are most used for various colds and viruses etc. The obtained results can be preliminary state of the effects, and improvements can be made by permanent education of the population in this area as well as local / state strengthening improvement of collecting and breeding medicinal herbs and processing plants on the mentioned area.

THE INFLUENCE OF DIFFERENT FERTILIZATION SYSTEMS ON THE YIELD OF THE BEETROOT

Husnija Kudic[1], Mirsad Icanovic[2], Vildana Jogic[2], Azra Beciraj[2], Enez Selimbegovic[2]

[1]Federal Ministry of Agriculture, Water Management and Forestry, Marka Marulica str. no. 2, 71000 Sarajevo,
[2]Faculty of Biotechnical Sciences in Bihac, L. Marjanovića bb, 77000, Bihac

husnija.kudic@bih.net.ba

Keywords: beetroot, fertilization, yield, fertilization system, yield components

ABSTRACT:

Activities carried out in agricultural production can, to some extent, cause pollution of the environment. Excessive application of various chemicals, pesticides, mineral fertilizers and some agrotechnical actions can contribute to pollution of air, soil and groundwater, which can adversely affect human health. With this experiment the influence of different fertilization systems on the yield of the beetroot were examined (Beta vulgaris L. var.conditiva Alef). Research was carried out with various fertilization systems: mineral fertilization (1000 kg / ha NPK 7:20:30 and 300 kg / ha KAN in two applications), reduced mineral fertilization (500 kg / ha NPK 7:20:30 and 150 kg / ha of KAN in one application) and organic fertilization (5 t / ha of composted chicken manure). The aim of this paper is to investigate the influence of different fertilization systems on the yield and yield components (plant length with the root, root diameter) of the beetroot. The research was set up in open, in randomized block design and with four repetitions. Although the climatic conditions in the year of the survey were rather unfavorable (dry), the yield was within the normal boundaries (25-40 t / ha). After the completion of the research, it can be concluded that there is no statistically significant difference between organic fertilization (26 t / ha) and reduced mineral fertilization (28 t / ha), while it statistically significantly varies from the beetroot yield in the full mineral fertilization (35 t / ha). As a recommendation for further production we recommend reduced mineral fertilization, the achieved results justify the invested funds and the possible negative impact on the environment is minimal.

NITRATES DIRECTIVE 91/676/EEZ IN AGRICULTURAL PRODUCTION ON THE TUZLA CANTON AREA

Glavić Midhat[1], Amir Zenunović[2], Nermin Ramić[2], Amir Hasić[2]

[1] FARMA II USAID/Sweden
[2] Poljoprivredni zavod Tuzla

midhat.glavic@farmabih.ba

Keywords: nitric directive, manure, fertilizer, water pollution, air pollution

ABSTRACT:

Intensive use of fertilizers, use and uncontrolled release of manure generated on farms, and changes in land use are the main factors of progressive increase nitrata and nitrate and nitrite levels in the waters of Europe in the last 30 years. Huge amount of pollution comes from large cattle, swine, and beasts farms. The consequences are increased eutrophication of rivers, lakes and sea, as well as reducing the quality of surface and underground waters, and thus the drinking water to levels harmful to human health and animals.

Separate Directive entitled "Council Directive no. 91/676/ECC of 12 December 1991. in connection with the protection of waters from pollution caused by nitrates from agricultural sources, "The European Union is limited by nitric pollution that originates from agricultural pollutants. This is one of the first in which the EU regulations governing the problem of protection of the environment in agricultural production, and which had resulted in significant changes in agriculture.

All the land the EU are obliged to abide by these nitric directives. At the close surrounding region (Croatia and Serbia) have already taken some steps in the application of nitric directives.

In Bosnia and Herzegovina still has no activities related to Nitrates directive. However with the construction of new farms, and increasing presence in the field of Agriculture, some measures that are related to Nitratna directives already apply. General state of the application of fertilizers and manure, especially on the territory of Bosnia and Herzegovina in very poor condition. Agricultural producers need to learn how to compost in agriculture do not throw away but are applied.

In working with the basic characteristics given the situation on the Tuzla Canton area in the manure application, facilities for storage and keeping manure.

FACILITATING GREEN CARE IMPROVEMENTS IN VITICULTURE

Melita Sternad Lemut[1], Lorena Butinar[1], Paolo Sivilotti[1], Adesida Rowland[1], Urban Česnik[2], Urška Vrhovšek[3]

1) University of Nova Gorica, Wine Research Centre, Lanthieri Mansion, Glavni trg 8, SI-5271 Vipava
2) University of Nova Gorica, School for Environmental Sciences, Lanthieri Mansion, Glavni trg 8, SI-5271 Vipava
3) Research and Innovation Centre, Edmund Mach Foundation, Food Quality and Nutrition Department, Metabolomic Unit, Via E.Mach 1, 38010 S.Michele all'Adige, Italy

melita.sternad.lemut@ung.si

Keywords: sustainable viticulture, *Botrytis cinerea*, yeasts, biocontrol, canopy microclimate manipulation, metabolomics, grapevine metabolites.

ABSTRACT:

The growing demand of consumers for environment-friendly and safe food products forced many winemakers to restrict the application of synthetic fungicides to earlier season, trying to reduce the risk of residues being detected in wines. Main risk for infection by B. cinerea, however, occurs later in season. To support an improvement in whole-season B. cinerea green care, the potential of yeasts as biocontrol agent was studied. Selected yeasts were tested for their antifungal activities. Furthermore a field experiment in Pinot noir and Pinot gris vineyards was designed to study different combinations of optimized canopy microclimate manipulation techniques and PBA application. In experimental conditions, PBA's ability to maintain appropriate population density for disease prevention was observed. Grape quality and quantity parameters were monitored. Microvinifications were performed and the wines were chemically evaluated. Analytical approach of metabolomics was applied to upgrade the understanding of induced changes in plant metabolism.

Based on yeasts testing results, biocontrol yeast P. guilliermondii ZIM 624 was selected and after its application to the vineyard, we were able to detect its suitable density on grapes until harvest, but it was not detected in wines. In case of early defoliation for both varieties the trend towards smaller grape compactness were confirmed together with lower cluster weight and yield, which can eliminate the need for later cluster thinning (reduce costs). Among grape basic quality parameters, optimized techniques had positive effect primarily on sugar content and color, but unexpectedly, in the treatments with biocontrol yeasts, higher acidity was detected in P. gris grapes. Significant effects of canopy microclimate manipulation on many observed

metabolites were detected. Also PBP introduction indicated some effects on grapevine biosynthetic behavior but the differences in content of these metabolites compared to control were no longer detected in wines with exception of mainly some flavonols, stilbenes and flavan-3-ols.

Acknowledgement: The research was financed by ***ARRS – Agencija za raziskovalno dejavnost Republike Slovenije*** *- Postdoc Research Project* ***Z4-7189****: Facilitating green care in viticulture by means of metabolomic-based front line conception / Utiranje poti zeleni zaščiti vinograda s pomočjo naprednega metabolomskega pristopa.*

THE INFLUENCE OF ADDING HELJDE IN THE GRAPE WHEAT HANDLE ON PHYSICAL PROPERTIES

Amir Hasić[1], Amir Zenunović[2], Refik Šahinović[3], Husein Vilić[3], Sanel Hodžić[2], Emir Mujić[3]

[1.]Poljoprivredni zavod, Tuzla
[2.]Ministarstvo poljoprivrede, vodoprivrede i šumarstva TK
[3]Univrzitet u Bihaću, Biotehnički fakultet.

sahinovic.r@gmail.com

Keywords: eggs, buckwheat, quality, physical properties

ABSTRACT:

The subject of the research is the study of the influence of different buckwheat relationships in concentrated nutrients on the physical properties of egg-bearing eggs, which are fed with concentrated nutrients, with a different share of buckwheat in the meal. Investigations were carried out in four groups of nosebleeds: control and three experimental. The review groups are formed with regard to the different share of buckwheat in concentrated foods. Within the first experimental group food was used with 10% relative share of buckwheat, within the second group with 20% relative share of buckwheat and within the third group with 30% relative share of buckwheat, while standard concentrated food was used in the control group of the coke carrier.

The results of the research concerning the possibility of adding buckwheat in concentrated nutrients, in the feeding of noseboard, in order to improve the quality of eggs, play a major role. A special value is the study of the optimal percentage of buckwheat in the nutrient from the aspect of improving the quali- tutetic properties of eggs. On the basis of the conducted research, it can be concluded that buckwheat in the meal of coca carriers has positive effects on the quality of the eggs, in terms of the tracked physical characteristics.

SPECIFICATIONS OF SHEEP REPRODUCTION

Šahinović Refik[1], Hasić Amir[2], Vilić Husein[1], Mujić Emir[1], Zenunović Amir[3]

[1]Univerzitet u Bihaću, Biotehnički fakultet
[2]Poljoprivredni zavod, Tuzla
[3]Ministarstvo poljoprivrede, vodoprivrede i šumarstva, TK.

sahinovic.r@gmail.com

Keywords: sheep, reproduction, methods

ABSTRACT:

Sheep are a seasonally active animal, that is, their full activity is related to the length of the daytime photoperiod (daylight light day), and begins when the daily period is shorter. In our conditions, this is the period of September and October. Due to this fact, sheep are classified into a "short day" animal group. This period is called the season of full activity.Because of this fact, lambs are sheep once a year, making the reproductive efficiency of sheep low. In theory, it is possible that lambs are twice or at least three times in two years. To achieve this, a range of biotechnological methods are applied, among which they are most effective: hormonal, photodiode length regulation method, ram effect, enhanced diet method, artificial insemination and embritransfer.The estrus cycle in sheeps lasts somewhat shorter than other species of domestic animals, and lasts on average for 17 days.Gravidity in sheeps lasts between 145 and 150 days. Sheep lambing generally runs smoothly, but whenever possible, lambs must be monitored and, if necessary, help sheep in lambing.

IMPLICATION OF CERTAIN REPRODUCTIVE ABNORMALITIES ON THE INSEMINATION INDEX IN DAIRY COWS

Emir Mujić [1*], Husein Vilić [1], Nermin Pračić [1], Jelena Nikitović [2], Đorđe Savić [2], Amir Hasić [3]

[1] University of Bihać, Biotechnical Faculty, Luke Marjanovića bb, 77 000 Bihać
[2] University of Banja Luka, Faculty of Agriculture, Bulevar vojvode Petra Bojovića 1A, 78 000 Banja Luka
[3] University of Tuzla, Faculty of Technology, Univerzitetska 8, 75 000 Tuzla

emir.mujic@unbi.ba

Keywords: dairy cows, reproductive efficiency, reproductive abnormalities, insemination index

ABSTRACT:

Application of contemporary scientific achievements requires contemporary reproduction organisation, which in practical sense have a direct effect on reproductive potential in dairy cows. Consequently, main purpose of this paper, in the context of identification of potential breeding difficulties, was to explore the influence of certain reproductive abnormalities on the insemination index in dairy cows. Practical research has been carried out in Holstein-Friesian breed of dairy cows in the area of Cazin municipality. Planned observational activities included 351 cows, divided in two groups: A/ without reproductive abnormalities, control (n=215) and B/ with reproductive abnormalities, experimental (n=136). Animals in experimental group were sorted in accordance with their reproductive abnormalities (anoestrus and cyst, reproductive tract infections, lagging placenta, heavy calving) and their insemination index was monitored as specified reproductive parameter. Selection of the trial for statistical analysis of data was made on the basis of normal distribution of the obtained results. The statistical significance of the difference among obtained values was tested with the ANOVA methods and with help of Student's „t" test. Results of the research imply the serious influence of reproductive abnormalities on the insemination index that has proved to be the highest in the group of reproductive abnormalities whose causes are genital tract infections (2,31). The values of this parameter in other subgroups of the experimental group were slightly lower in comparison to the group of cows with genital tract infections and ranged from 2,21 in the group of strain calving, to 2,28 in the group with the retention of placenta.

SIGNIFICANCE OF FOREST CULTIVARS IN THE AREA OF PROTECTED LANDSCAPE „KONJUH“

Noćajević Sead [1*]; Ovčina Jasmina [2]; Iširović Emir[1] ;Musić Admir[2]; Salkić Besim [1]

University of Tuzla[1]
CISP (COMITATO INTERNAZIONALE PRE LO SVILUPPO DEI POPOLI)[2]

sead.n_63@hotmail.com

Keywords: forest fruit trees, Protected landscape "Konjuh", phytocoenological images, distribution.

ABSTRACT:

The area of the Protected landscape "Konjuh" is located mostly in the forests covered by the parts of the municipalities Banovici, Kladanj and Zivinice. During the vegetation season in 2015 and 2016, several phytocoenological images of forest fruit trees in the Protected Landscape "Konjuh" were made. The aim of the paper is to see the distribution of forest fruit trees in the forest ecosystems of the mentioned area, with an emphasis on the functional significance for the living world of the area. The fruit trees, like the noble leaves of the forest, are wild cherry, Vrapcharka (Prunus avium L.), wild pear (Pyrus communis L.), wild apples (Malus sylvestris Mill.), Breccia (Torminalis clusii M.Roem.), Sorbus aria L. and others Wild cherry, Vrapcharka (Prunus avium L.) is the most famous forest fruit grower, occurs as a single tree or in smaller groups (Nocajevic, 2009). In forest ecosystems fruit trees are an important place. The functional benefit of forest fruit trees is special in the time of flowering, when "decorate" the forest and its edges, provide a rich bee pasture, and in the autumn some and earlier (wild cherry) bring fruits feeding many members of forest fauna (Oreskovic et al. 2006). Forest fruit trees are also important for humans, with nutritive, dietary, pharmacological and bioenergetic balance.

EFFECT OF WEATHER CONDITIONS TO OATS YIELD (*Avena sativa* L.) IN HILLY AND MOUNTAINOUS AREAS

Borislav Petković[1], Ilija Komljenović[2], Vojo Radić[2]

[1]Centar for the Development and Improvement of the Village, Banja Luka, Bosnia and Herzegovina
[2]Faculty of Agriculture, University of Banjaluka, Bulevar Vojvode Petra Bojovica 1A 78000 Banjaluka, Republic of Srpska, Bosnia and Herzegovina

borislav.p1980@gmail.com

Keywords: Oats, yield, year, growing conditions.

ABSTRACT:

In the structure of sowing, oat is one of the most common spring crops in hilly and mountainous area of the Republic of Srpska. The aim of this researches was to examine productivity and determine the effect of weather conditions on the yield of oats on the mountain Manjača. During the four-year period (2011-2014) at the location of Manjača, variability of oats yield of the variety Flemingsregent was examined. The weather conditions drastically varied over the period of the research. The first year was characterised by the lack of rainfalls and dry periods, while the fourth year was characteristic by high and above average amount of rainfalls for the city of Banja Luka. The highest yield of kernel of 3.55 t/ha was recorded in the first year, while in the fourth year the yield was 1.82 t/ha, which was the lowest yield recorded during the research. The low yield of 1.82 t/ha in the fourth year was to the greatest extent the consequence of high amount of rainfalls, first of all in the stages of maturing and harvesting. Rainfalls caused lodging of crops, punching weed flora on the parts of the parcel where the main crop laid (primarily ambrosia – dominant late weeds on the mountain Manjača), delay and aggravation of the process of harvesting, as well as aggravation of drying and storing of the crop. The weather conditions in the first and the second year of our researches can be considered favourable for the production of oats on Manjača. The weather conditions typical for the fourth year (2014) of our researches were extremely unfavourable for the production of oaths on the location the researches were conducted. In order to achieve higher yields of oaths at the location of our researches, it would be necessary to do the sowing of the crops as early as possible in order to avoid negative effects of drought and late weeds (primarily ambrosia), which cannot be controlled in the later stage of the main crop development as the weeds may grow to the height of the main crop if the growth of oats is weak. In order to reduce the effect of high amounts of rainfalls in the time of ripening when the crops is in the stage for combine harvesting, the harvesting should be done in the shortest possible time.

VARIABILITY OF MAIZE YIELD SILAGE (*Zea mays* L.) IN THE MOUNTAINOUS AREA PF THE BANJA LUKA REGION

Borislav Petković[1], Ilija Komljenović[2], Vojo Radić[2]

[1]Centar for the Development and Improvement of the Village, Banja Luka, Bosnia and Herzegovina
[2]Faculty of Agriculture, University of Banjaluka, Bulevar Vojvode Petra Bojovica 1A 78000 Banjaluka, Republic of Srpska, Bosnia and Herzegovina

borislav.p1980@gmail.com

Keywords: maize, silage, yield, rainfalls.

ABSTRACT:

Production of forages, first of all for the winter period, represents the basis for animal production profitability. By using silage during the entire year in the feeding of ruminants, in particular dairy cows, we provide a good meal with minimum variations in nutritious material. The silage of a complete maize plant is mostly used in our tradition. In the five vegetation seasons (2009-2013), the effect of the age factor to the yield of the silage of hybrid maize from FAO group 400 was researched. The experiment was held on the mountainous area of the city of Banja Luka above 500 m asl. The sowing was performed to a depth of 6-8 cm, with 70 cm spacing between rows. The lowest silage yield of 9.28 t/ha was recorded in 2011, which was characterised by an extreme lack of shortfalls and higher monthly mean temperature compared to perennial average. The highest yield of silage of 20.38 t/ha was recorded in 2010. Rather high yield of silage for the researched areas achieved in the second year was the result of sufficient rainfalls during the entire vegetation period. The aim of this research was to determine the productivity of the yield of the hybrid maize silage from the FAO group 400 during five vegetation seasons in the mountainous area on acid soil. The production of the silage maize was in high correlation with the amount of rainfalls. To achieve higher yields of silage, calcification of the soil should be made and the irrigation system should be provided.

BIOAVAILABILITY OF LEAD AND CADMIUM FROM SOIL SOLUTION TO PLANT ROOT

Husejin Keran, Jasmin Suljagić, Indira Šestan, Melisa Ahmetović, Amra Odobašić

University of Tuzla, Faculty of Technology, Univerzitetska 8, 75 000 Tuzla

husejin.keran©untz.ba

Keywords: lead, cadmium, bioavaibility

ABSTRACT:

Bioavailability of lead and cadmium, means, if plant, eg. its' root has available big concentration of ions of those metal. However, different soil factors of soil, such as pH, organic matte content, as well as clay content, as main factors which influence bioavailability of those metals. The various plants has different affinity against those metals, and it is important to chose plants when bioavailability is considered.

In this work, the influence of pH and the organic matter content are considered to intake of heavy metals to plant, and results have showed that lower pH values than 6, considerably influence bioavailability. However, a high content of organic matter has also a positive influence on bioavailability because, it binds ions of lead and cadmium and they are not available to plant roots.

ANTIMICROBAL ACTIVITY OF PLANT EXTRACTS FROM GENUS ALLIUM

[1]Džaferović Aida, [1]Bakrač Azra, [1]Džafić Subha, [1]Jogić Vildana, [2]Nikitović Jelena, [3]Amir Hasić, [4]Miloš Rodić

[1]Biotehnical faculty, University of Bihać, Luke Marjanovića bb. Bihać,
[2]Agricultural faculty, University of Banja Luka, Bulevar vojvode Petra Bojovića 1A, Banja Luka
[3]Technical faculty, University of Tuzla, Univerzitetska 8, Tuzla
[4]Veterinary institute in Bihać, Omera Novljanina bb, Bihać

aida.dzaferovic@unbi.ba, azrabakrac@unbi.ba
subhadzafic@unbi.ba, vildana.jogicd@unbi.ba

Keywords: ***Allium ursinum, Allium sativum, Allium cepa,*** **Antimocrobal activity,** ***Salmonella spp.***

ABSTRACT:

It is known that plant extracts possess antimicrobial activity against a wide variety of bacteria. Therefore, the subject of this study was to investigate the antimicrobial potential of methanol extracts of plants from the genus Allium. Herbal extracts of ramsons - Allium ursinum, garlic - Allium sativum and red onion - Allium cepa were used as samples. The antimicrobial effect of methanolic extracts of these plants was studied using a disc dilution method. In this way, he tried to inhibit the growth of all bacteria and Salmonella sp. isolated from the regular food control sample, which is part of the monitoring of the health safety of finished products before placing them on the market.

The results of the methanolic extracts showed a visible zone of inhibition on the nutrient surface for the total number of microorganisms (Plate Count Agar) in which the bacterial growth was prevented. The extracts showed significant antimicrobial activity ,going from 15,24 to 27,91 mm. The Allium sativum extract had the most expressed inhibition zone of 27,91 mm, followed by Allium ursinum (21,13 mm), and the lowest antimicrobial activity showed the Allium cepa extract, the bacterial growth inhibitory zone was 15,24 mm, which is significant lower than the other two tested extracts.

Antimicrobial activity of investigated extracts showed significantly lower values to Salmonella spp. Allium ursinum showed an inhibition zone with a diameter of 14,73 mm, and Allium sativum showed an approximate value of 14,11 mm, while extracts of Allium cepa did not show any antimicrobial activity on Salmonella spp.

RADIATION SYNTHESIS AND SWELLING BEHAVIOR OF STARCH BASED THREE COMPONENT HYDROGELS AS SOIL CONDITIONER

Mohamed, Mohamady Ghobashy[1*], H. Abd El-Wahab[2], Norhan Nady[3,4], A. M. Naser[2], Farag Abdelhai[2], Basem Kh. El-Damhougy[2], Fatima Muhamedagić[5]

[1]Radiation Research of Polymer department, National Center for Radiation Research and Technology (NCRRT), Atomic Energy Authority, P. O. Box. 29, Nasr City, Cairo, Egypt, [2]Department of Chemistry, Faculty of Science, Al- Azhar University, P.O. Box 11754, Nasr City, Cairo, Egypt, [3]Polymeric Material Research Department, Advanced Technology and New Materials Research Institute (ATNMRI), New Boarg El-Arab City 21934, Alexandria, Egypt, [4]Chemical and Petrochemicals Department, Egypt-Japan University of Science and Technology (E-JUST), New Boarg El-Arab City, Alexandria, Egypt, [5]University of Bihać, Biotechnical Faculty, Ul. Luke Marjanovića bb 77000 Bihać.

*Corresponding author: M.M.Ghobashy Email: mohamed.ghobashy@eaea.org.eg; mohamed_ghobashy@yahoo.com; Tel.: +20222727413; Fax: +20222749298
fatima.muhamedagic@gmail.com

Keywords: Radiation synthesis; polymerization; hydrogel; sunflower; soil conditioner

ABSTRACT:

This article addresses the progress in radiation synthesis of starch-based hydrogels to use as soil conditioner. The hydrogels samples have been prepared in weight ratios 25:75, 50:50 and 75:25 (wt:wt) for three components of starch (St), acrylamide (Am) and Polyvinylpyrrolidone (PVP), individually. The nine hydrogels samples prepared through a facile approach in an aqueous medium by exposed to gamma radiation at dose of 30 kGy. The effect of preparation conditions of the obtained INP hydrogels of PVP/St, PAAm/St and PAAm/PVP such as starch content on the swelling behavior and absorbing water from moisture soil has been investigated. The structure and the morphology of the superabsorbent PVP/St, PAAm/St and PVP/PAAm IPN hydrogels were characterized using Fourier transform infrared spectroscopy technique (FTIR), scanning electron microscope (SEM) and x-ray diffraction (XRD).

The results indicate that the water absorption capacity of hydrogels decreased with an increased starch content. This is attributing to the occurrence of intermolecular H bonds of all hydrogels samples increased with increased (St) content as performed by FTIR. Three soil conditioners PVP/St, PAAm/St and PVP/PAAm INP hydrogels with ratio (75/25) were selected to evaluate the effectiveness on water holding capacity (WHC) in heavy metals and alkaline soil pH > 9 for plating sunflower (Helianthus annuus). All treatments were irrigated weekly. The effectiveness of the soil conditioner in the following order: PVP/PAAm > control > PVP/St > PAAm/St.

ENERGY EFFICIENCY

MEASURES FOR INCREASING THE ENERGY EFFICIENCY OF BUILDINGS IN THE AREA OF BOSNIA AND HERZEGOVINA

Merima Gadara

Univerzitet "Džemal Bijedić", Mašinski fakultet, Mostar

merima.maslo@unmo.ba

Keywords: energy efficiency, energy, building sector

ABSTRACT:

A building sector over the last decade has enormous potential for energy savings, and thus for improving energy efficiency.
The average annual heat energy consumption in most of the existing facilities in Bosnia and Herzegovina is significantly higher, and up to 3 times than in new buildings.
Residential buildings built during the seventies and eighties of the last century are characterized by enormous final energy consumption and increased heat energy consumption.
Such buildings are large energy consumers and do not meet at all the modern tendencies to reduce energy consumption in them, in order to achieve greater comfort, a more comfortable and healthy stay, environmental protection and reduce climate changing.
This paper presents the basic measures to improve energy efficiency that will reduce the energy needs of designing, building and using new ones as well as reconstructing existing buildings.

ANALYSIS AND SIMULATION OF MULTIPLE-EFFECT EVAPORATION SYSTEM IN ORDER TO REDUCE HOT UTILLITY CONSUMPTION

Ervin Karić[1], Nesib Mustafić[1]

[1] Department of Chemical Engineering, Faculty of Technology, University of Tuzla, 75000 Tuzla, Bosnia and Herzegovina

ervin.karic@untz.ba

Keywords: hot utillity, multiple-effect evaporation system, binary system, analysis, simulation.

ABSTRACT:

Hot utilities consumption is a major problem in the process industry. Evaporation process requires a consumption of a large amount of energy, so it is necessary to look for the different possibillities for minimizing energy consumption by analyzing the mentioned processes and their process parameters. One of the ways to reduce hot utillities consumption in evaporaton systems is to use the generated secundary steam from the previous evaporator in the next evaporator. In this paper, a comparison of the hot utillitiy consumption with and without using generated secundary steam is presented. Mass and energy balance of multiple-effect evaporation system was presented. A binary system $Na_2CO_3 \cdot H_2O$ was used to illustrate the analysis and simulation of the multiple-effect evaporation system. The proposed matematical model was developed in Microsoft Excel with VBA (Visual Basic for Applications) and GAMS (General Algebraic Modeling System). The results showed that the hot utillitiy consumption was significantly decreased when the generated secondary steam is used as a hot utillity for the next evaporator. Reducing the hot utillity consumption reduces the fuel consumption for the production hot utillity, which has the effect of reducing the emission of the flue gases into the environment. The developed model can be applied for any binary system with the input of physico-chemical properties of the analyzed binary system.

INFLUENCE OF HYDRO POWER PLANTS ON THE ENVIRONMENT AND PROCEDURE OF THEIR EXECUTION IN BOSNIA AND HERZEGOVINA

Nedim Hurem, Emir Bajramović

Univerzitet u Bihaću, Tehnički fakultet Bihać, Dr Irfana Ljubijankića bb

nedim_hurem@hotmail.com
emir.bajramovic@unbi.ba

Keywords: hydroenergy, environment, accumulation, water, concession, possibility

ABSTRACT:

The aim of this paper is to present possiblity of Bosnia and Herzegovina which is in renewable sources of energy in terms of production electrical energy from rivers. This paper shows division of hydroelectric power plants according to amount of electricity produced (big and small), division by way of using water (flow and accumulation). The main point is on procedure which must be done, local and cantonal governments licences and permissions in procedure of awarding concession, usually lasting for 30 years. Also, the conditions were presented which should be met when it comes to influence on environment and conditions which work contractor should fill up during the execution of the works.

SMALL HYDROPOWER PLANTS AS RENEWABLE ENERGY SOURCES

Vera Nikolić

University of Belgrade**,** Faculty of Biology, Studentski trg 16, 11000 Belgrade

vera@bio.bg.ac.rs

Keywords: renewable energy sources, small hydropower plants, Serbia

ABSTRACT:

The Serbian energy sector is characterized by low energy efficiency (both in production and in demand), obsolete technologies in energy production, lack of investment, subsidized energy prices and irrational consumption together with significant (negative) environmental impacts. In such a situation, Serbia is obliged to produce 27% of electricity from renewable sources by 2020. The most controversy is caused by the construction of small hydropower plants, because among all other renewable sources it has the most negative environmental impact, primarily on biodiversity, which causes numerous protests by citizens, but also the reactions of the scientific and professional public. The renewable character of hydropower and the absence of smoke and ash from it does not mean that it is environmentally acceptable by itself. Nowaday, the negative consequences of the construction of hydroelectric power plants and the diversion of water flows are scientifically investigated and well known. There are three main problems related to SHP in Serbia: insufficient information to the public, non-implementation of laws and by-laws and inadequate quality of the Environmental Impact Assessment Studies.

ENVIRONMENT, NUTRITION AND HEALTH

DETERMINATION OF PHYSICAL-CHEMICAL PROPERTIES AND STABILITY OF ORANGE JUICE AT ROOM TEMPERATURE

Amra Bratovčić[1], Amra Odobašić[1], Indira Šestan[1], Emina Tucić[1], Adisa Hasanbašić[1], Edita Šarić[2]

[1]University of Tuzla, Faculty of Technology, Univerzitetska 8, 75000 Tuzla,
[2]Federal Institute for Agriculture Sarajevo, Butmirska cesta 40, Ilidža

amra.bratovcic@untz.ba

Keywords: orange juice, viscosity, pH, conductivity, water activity, stability

ABSTRACT:

In the paper we have determined the main physical-chemical parameters (viscosity, pH, conductivity, refractive index and water activity) in three different type of the orange juice samples. The first sample was natural squeezed orange juice with the pulp, the second one was natural squeezed orange juice centrifuged (with the removed pulp) and the third one was purchased. The experimental results showed considerably higher conductivity in naturally squeezed orange juice than in purchased and pH stability was maintaned almost constant. Viscosity changed faster in a sqeezed orange juice, while in the purchased one was almost constant. The squeezed orange juice is healthier without additives and without any added artificial sugar and contain more electrolites in line with conductivity results.

TRANSLOCATION OF Pb IN THE SYSTEM TOBACCO-SMOKE CONDENSATE FOR HERZEGOVINIAN TOBACCO TYPES

Leto A.[1], Hasanbegović J.[1],Hadžiabulić S.[1],Temim E[1].

[1]Agromediterranean faculty Džemal Bijedić University of Mostar, Univerzitetski kampus, Sjeverni logor bb

alma.leto@unmo.ba

Keywords: **content, lead, tobacco, smoke condensate, variety**

ABSTRACT:

Herzegovinian tobacco varieties include three varieties: Ravnjak, Veliki Hercegovac and Veliki Hercegovac 32. They are known as Herzegovinian varieties, since they may be grown in Herzegovina exclusively, and their characteristics and quality depend on agro ecological conditions which are different from those in Herzegovina area. The content of heavy metals in tobacco, lead which was the subject of this research as well, and its transition into smoke condensate has large ecological as well as health significance, especially because these elements enter the organism through tobacco consummation accumulate inside without possibility to be thrown out through digestive tract, which is a case with the other plants. The aim of this research was examination of Pb content in the middle, actually the most quality and the most representable harvests of all varieties of Herzegovinian tobacco (Ravnjak, VH i VH32) in what quantity this element translocate into smoke condensate, which is especially important for the population of humans recognized by World Health Organization as passive smokers. Since such research has never been done on Herzegovinian tobaccos, the results were compared with the results on Virginia and Berelej varieties cultivated in B&H as well and which have relevant data in domestic and foreign literature, though there is no previous research in B&H similar research has been done in the world. The results indicated that Pb quantity in smoke condensate stays within the range that is usual for this element.

HYGIENE CORRECTNESS OF WATER SUPPLY OF MUNICIPALITY OF SANSKI MOST

Huska Jukić, Asmir Aldžić , Aldin Pašagić, Aldina Aldžić –Baltić

Fakultet zdravstvenih studija, Bihać

asmiraldzic@hotmail.com

Keywords: physico-chemical indicators, microbiological indicators, water supply

ABSTRACT:

This paper presents the results of testing the hygienic correctness of the municipal water supply in Sanski Most in 2015 and 2016.
The following physico-chemical indicators were examined: humidity, pH value, consumption of KMnO4, ammonia, nitrates, nitrites, chlorides and iron, and microbiological indicators: Escherichia coli, Coliform bacteria, Enterococci and Clostridium perfrigens. The results of the study showed that water from the city watercourse meets the conditions prescribed by the Regulation, while the water from the local waterworks is problematic because there is no possibility of improving its quality in the rainy periods.

EFFECTS OF ADDING ACACIA HONEY TO FERMENTATION AND PROPERTIES OF YOGURT FROM SOY DRINKS

Almira Džafica[1], Emina Gradinović[1], Sajdin Smajić[1], Una Piralić[1], Arabella Musić[1], Mirveta Mulalić[1], Edina Mesić[1], Erna Egrlić[1], Mehmed Duraković[1]

[1]University of Bihać, Biotechnical Faculty, 77 000 Bihać, Bosnia and Herzegovina

edina.sertovic@gmail.com

Keywords: fermented milk, soybean beverage, acacia honey, sensory properties, acceptability

SUMMARY:

Fermented dairy products are obtained by fermentation of milk using appropriate microorganisms. High nutritional value, therapeutic properties, probiotic and prebiotic use contribute to a steady increase in the consumption of fermented dairy products. The aim of this scientific paper was to examine the impact of the addition of acacia honey on the speed of fermentation, sensory, physico-chemical and rheological properties, as well as the acceptability of the probiotic beverage. Since honey has a very rich chemical composition and contains all nutrients necessary for growth and development of the organism, a positive effect on fermentation speed as well as sensory properties is assumed.The honey was added to the samples at concentrations of 4.5, 5.5 and 7.0%, and a sample was used as a control without the addition of honey. Sample inoculation was performed by probiotic monoculture Lactobacillus acidophillus La 5. Fermentation of the dairy drinks was carried out at 42° C for 8 to 9 hours depending on the sample type. The produced samples are cooled and stored in a refrigerator at 4 °C. Sensory properties of fermented beverages were evaluated by a panel of 11 sensory analysts by scoring method. Sensory, physico-chemical and rheological characteristics were measured after fermentation on 1, 7, 14 and 21 days, while the evaluation of acceptability was carried out the first day after fermentation. The addition of acacia honey showed a positive effect on fermentation speed, sensory, physico-chemical and rheological properties as well as on the acceptability of probiotic soybean beverage.

HOW TO INFORM THE CONSUMER ON PACKED FOOD?

Benjamin Muhamedbegović[1], Nermin Pračić[2,] Emir Mujić[2]

[1] University of Tuzla, Faculty of Technology, Univerzitetska 8, 75 000 Tuzla, BiH
[2] University of Bihać, Biotechnical Faculty, Luke Marjanovića bb, 77000 Bihać, BiH

benjamin.muhamedbegovic@untz.ba

Keywords: nutritiondeclaration, consumer, food, packaging

ABSTRACT:

Contemporary consumers need for proper, balanced or moderate nutrition, which involves consuming optimal amounts of nutrients through meals, specific information about the nutrient content of packaged foods offered to them on the market. Consumers, through nutritional declarations on packaging, can compare products by the content of fats, added sugar or salt, and make easier choose of healthier foods for the desired type of diet. This is especially important for consumers with allergies and intolerances to some food ingredients.

Packaged food producers are legally obligated to provide a spectre of accurate, understandable, useful and complete information on food, as well as the packaging itself as an integral part of the food product. In doing so, they must take into account that a wealth of information does not cause "information overload" of consumers that, at the place of purchase, because of time pressure can be counterproductive.

THE MOST COMMON LIFESTYLE RISK FACTORS RELATED TO CHRONIC NON-COMMUNICABLE DISEASES AMONG THE UNA-SANA CANTON POPULATION

Hasanbegović Elma, Hašić Majda, Duraković Adnan, Buljubašić Meliha, Duranović Semra, Kahrić Adna, Veladžić Musa

Biotechnical Faculty, University of Bihać

vildana.btf@gmail.com

Keywords: risk factors, chronic diseases, eating habits, lifestyle

ABSTRACT:

Nowadays chronic diseases or lifestyle diseases are one of the biggest health problems in developed and developing countries. They are of long duration and generally slow progression, ending with rapid death - non-infective and non-transferable. We are talking about cardiovascular system diseases, diabetes, cancers, osteoporosis, stroke, Alzheimer's disease, chronic respiratory diseases etc. Modern fast lifestyle, urbanization, stress, environmental pollutants exposure and, the most important – bad habits, are the factors we can blame for creating a perfect ground for mentioned diseases. Some of these risk factors can be avoided, others – not. The aim of this research is to determine the risk factors related to chronic non-communicable diseases (that can be prevented) development among the Una-Sana Canton population, considering gender and place of residence. 250 people aged between 18 and 55 participated and this research paper offers the analysis of their physical activity, how much time they spend sitting, including sitting in front of all types of screens and also analysis of their eating habits.

THE RIGHT TO CLEAN DRINKING WATER IN THE CONTEXT OF HUMAN RIGHTS AND THE SITUATION IN OUR REGION

Jasmina Cepić

Public Health Institute of Una-Sana Canton

cepic.jasmina@gmail.com

Keywords: Human Rights, Water Supply, Sewage, Civic Initiative, Public Good

ABSTRACT:

United Nations General Assembly declared 2010. that an access to clean water and sanitation was a global right. Some European countries have launched initiatives to enter the right to clean drinking water into a constitution on equal terms which would prevent the privatization of water as a public good, and prevent possible abandonment of management of water stations in the public interest to the concessionaires. Unfortunately, under the influence of liberal capitalism the German Bundestag did not include the right to clean water on the list of basic human rights. By the end of 2013 the first European citizens' initiative: Right2Water was submitted to the European Commission. The European Commission already adopted a Communication in response to the initiative "Water and Sanitation are Human Rights! Water is a public good, not commodity!" in March of 2014. The result of action in connection with the initiative is the seventh action program for the protection of the environment which seeks to provide a high standard of safe drinking water by 2020. 62% of citizens of Una-Sana Canton and 60% of citizens of the Federation of Bosnia and Herzegovina have a connection to the public water supply system. 25% of citizens of Una-Sana Canton and 57, 5% of citizens of the Federation of Bosnia and Herzegovina have sewage. The possibility of contamination of drinking water sources through the soil and surface water is always present due to inadequate treatment of solid and liquid waste materials and uncontrolled use of agricultural agents. The Constitution of Bosnia and Herzegovina does not treat the right to clean drinking water with single of its Articles. However, Annex I of the Bosnia and Herzegovina Constitution contains the list of additional agreements which should be applied, and among them there is Article 12 of the International Covenant on Economic, Social and Cultural Rights (1966) which treats the right to mental and physical health by improving all aspects of environmental hygiene. Unfortunately, water reduction in the capital of the Federation of Bosnia and Herzegovina, the unwillingness of

communities to cope with the problem of floods that happened in 2014, the lack of safe drinking water despite large reserves and poor coverage of the city's sewage system suggest that water and wastewater are not being treated as a human right, and in a burst of liberal capitalism there is a real danger that the water will be increasingly treated as a commodity rather than a public good.

EATING HABITS AND LIFESTYLE OF UNA-SANA CANTON POPULATION

Bajraktarević Imran, Seferović Elvedina, Bešić Nedžada, Mujezinović Nejra, Grahović Abdulah, Džaferagić Ajla

Biotechnical Faculty, University of Bihać

vildana.btf@gmail.com

Keywords: eating habits, lifestyle, nutritional status

ABSTRACT:

Proper nutrition means healthy intake of all necessary nutrients in adequate amounts; varied; age and physical and mental constitution appropriate; working and intellectual efforts appropriate; climate and working environment appropriate; in a good balance to maintain optimum health. Unfortunately, nowadays people live fast. That means that they choose more often premade meals from the frozen aisle or they take food from well-known fast food chains. There is less time for food preparation, indulging in good meal, and chatty lunch or dinner time with family.

The aim of this research is to determine how eating habits and lifestyle influence the Una-Sana Canton population nutritional status, considering gender and place of residence. In addition to the description of the social status of 250 examinees from Una-Sana Canton municipalities, this research paper offers the analysis of eating habits (number of meals, fast food intake, liquids, coffee, alcohol, cigarettes, canned food, sweets, snacks) and their relation to nutritional status. The research involved survey participation through customized survey.

THE TECHNOLOGY OF PRODUCTION OF JELLY IN MONTENEGRO

Odalović Aleksandar, Tiganj Eldar

Biotechnical Faculty, Podgorica

odalovica@t-com.me

Keywords: jelly, technological process, sugar, pectin, citric acid, color, aroma

ABSTRACT:

The paper presents the results of testing the production of jelly from oranges, lemons, strawberries and green apples containing 60-65% sugar, water, agar-agar, citric acid (E330), flavor and color.

Research was carried out in the period from 2013 to 2014 in the fruit processing plant "Tref" Petnjica - Montenegro. The tests included acquaintance with the line for the production of jelly, where the finished product after completion of the production process can be kept for 12 months. It was found that the solid jelly pack is made in aluminum and cellophane foils or cartons, and the jelly consistency is packaged in glass, hermetically sealed packaging.

During the process of production of jelly, a quality order of technological operations has been established, which includes control of the finished product with the methods of modern standards HACCP and ISO 9000 and ISO 14000.

Extremely high level of quality of finished products, contributes to the expansion of product range of this company from year to year, as well as a flexible price that enables the mentioned products to be found on the Montenegrin market and the regional market.

Analyzing jelly of oranges, lemons, strawberries, strawberries and green apples, the orange-tasting jelly was best shown.

HYGIENE CORRECTNESS OF WATER SUPPLY OF MUNICIPALITY OF BOSANSKA KRUPA

Huska Jukić, Asmir Aldžić, Melisa Okić, Melita Okić, Aldina Aldžić –Baltić

Fakultet zdravstvenih studija, Bihać

asmiraldzic@hotmail.com

Keywords: Bosanska Krupa, water supply, physico-chemical indicators, microbiological indicators

ABSTRACT:

This paper summarizes the results found in testing the hygiene of water supply located in the Bosanska Krupa municipality. The following physicochemical indicators were examined: color, odor, taste, residual chlorine, haze, pH value, electrical conductivity, chlorides, consumption KMnO4, ammonia, nitrates, nitrites and iron, and microbiological indicators: Escherichia coli, Coliform bacteria, Enterococcus and Clostridium perfrigens. The results correlate to the months of October 2015, December 2016, August and November 2017.

EFFECTS OF ADDING POLLEN GRAINS TO FERMENTATION AND PROPERTIES OF YOGURT FROM SOY DRINKS

Una Piralić[1], Almira Džafica[1], Emina Gradinović[1], Sajdin Smajić[1], Arabella Musić[1], Mirveta Mulalić[1], Edina Mesić[1], Erna Egrlić[1], Mehmed Duraković[1]

[1]University of Bihać, Biotechnical Faculty, 77 000 Bihać, BiH

edina.sertovic@gmail.com

Keywords: pollen, fermented milk, soybean beverage, sensory properties, acceptability

SUMMARY:

Fermented dairy products are an important group of functional foods. A large number of studies have shown their beneficial effect on human health. The aim of this scientific paper was to examine the influence of the addition of pollen to the fermentation speed of the probiotic soybean beverage and to the sensory, chemical and rheological properties. Considering that the pollen has a very rich chemical composition and contains all the nutrients necessary for the growth and development of the organism, a positive influence on fermentation speed was assumed. The pollen was added at concentrations of 0.3, 0.6 and 0.9% to the soybean beverages and a sample was used as a control without the addition of pollen grains. Sample inoculation was performed by probiotic monoculture Lactobacillus acidophillus La 5. The fermentation of dairy beverages was performed at 42° C for 8 to 9 hours depending on the sample type. The produced probiotic yogurt samples are chilled and stored in the refrigerator. Sensory evaluation of probiotic dairy drinks with pollen was performed by a panel of 11 evaluators. The evaluation was performed by a system of 20 weighted points. Measurements of physico-chemical and rheological characteristics were carried out after fermentation on 1, 7, 14 and 21 days. The addition of pollen seeds showed a positive effect on rheological properties but did not have a beneficial effect on sensory properties. Also, by increasing the concentration of the added pollen, no change in physical-chemical properties was observed.

OVERVIEW OF EDIBLE PLANT SPECIES CONTAINING CYANOGLYCOSIDES WITH A SPECIAL FOCUS ON AMYGDALIN

Halid Makić[1], Adijana Jaganjac-Mehadžić[2], Kemal Salkić[2], Azra Bakrač[1], Subha Džafić[1], Samira Dedić[1]

[1]Univerzitet u Bihaću, Biotehnički fakultet, Luke Marjanovića bb,
[2]Poljoprivredni zavod Unsko sanskog kantona, Omera Novljanina br. 4

adijana.jaganjac@gmail.com

Keywords: cyanoglycosides, amygdalin, toxicity, concentration

ABSTRACT:

The aim of the paper is to show the level of cyanoglycoside content with a special focus on amygdalin in plant species commonly consumed in our region, which in their composition have this compound. Cyanoglycoside concentration in plant material varies and depends on genetic and environmental factors, location, season and type of soil. Cyanoglycosides are natural plant toxins present in more than 2650 plants and are in fact nontoxic if they are intact. Mechanical processing of plant material, food processing or consumption results in damage of plant structure and coupling with the corresponding β-glucosidase enzyme, which differentiates it to sugar and cyanohydrin. Cyanohydrin is rapidly degraded to HCN and an aldehyde or ketone. Exposure to cyanide from unintentional or deliberate use of cyanogenic glycoside can result in damage to the central nervous system. Toxicity is associated with the ability to hydrolyze spontaneously or in the presence of the enzyme. Based on this, the toxicological grade of cyanogenic glycosides is estimated in terms of the amount of free cyanide produced after hydrolysis. Proper processing of plant material during the process of food processing can substantially affect the reduction of cyanide content to acceptable concentrations. Consideration of the level of cyanogenic glycoside in specific plant foods, the health implications of cyanogenic plants consumption and the efficient processing procedure are important data with the aim of reducing the risk of cyanide suppression.

RAPID AND SENSITIVE DETERMINATION OF ChE ACTIVITY IN BLOOD PLASMA

Andrej Jerkič, Tjaša Birsa, Mojca Žorž, Dorota Korte, Martina Bergant Marušič, Mladen Franko

University of Nova Gorica, Laboratory for Environmental and Life Sciences,
Vipavska 13, POB 301, SI-5001 Nova Gorica, Slovenia

mladen.franko@ung.si

ABSTRACT:

Cholinesterases (acetylcholinesterase - AChE), butyrylcholinesterase - BuChE) are known to be irreversibly inhibited by organophosphorus (OP) and carbamate compounds[1], which are widely used as pesticides in agriculture. Consequently, these chemicals are frequently present in water and crops, and through the food chain in general population. The physiological function of AChE and BuChE is the hydrolysis of neurotransmitter acetylcholine to terminate the transmission of nerve pulse between axon and muscle neurons. OPs and carbamates inhibit AChE and BuChE by irreversible binding to the enzyme's active site. Consequently, enzymes are not able to hydrolyze acetylcholine, which leads to overstimulation and disability to terminate the transmission of nerve pulses. Measuring the cholinesterase (ChE) activity can be used as indication of OP or carbamate poisoning[2]. According to latest findings, ChE activity is also suggested to be related to neurodegenerative disseases which can be treated by appropriate ChE inhibitors[3].

In this work measurements of ChE activity were performed by flow injection analysis with thermal lens spectrometric detection (FIA-TLS)[4]. Blood plasma samples were dilluted 100-times prior analysis and after addition of Ellman's reagent (5,5' Dithiobis(2-nitrobenzoic acid); DTNB), they were injected into the FIA carrier flow which contained enzyme substrate (acetylthiocholine). The products of enzymatic hydrolysis of the substrate are acetic acid and thiocholine, which reacts further with DTNB to form yellow-colored 5-thio-2-nitrobenzoate (TNB^-). TNB^- was detected by TLS after excitation with a 25 mW laser beam from a Kr-ion laser (413 nm). The generated thermal lens was sensed by defocusing of a probe beam from a He-Ne laser (2 mW, 630 nm).

The achieved LODs of FIA-TLS for AChE or BuChE were 0.1 mU/mL, what is over 3 times lower than in case of UV-vis spectrophotometry. The linearity range was from LODs to 70 mU/mL. To validate the reliability of the method, total ChE (AChE + BuChE) activities in 14 blood plasma samples were determined based on calibration with AChE. The ChE activities were in the range 2100 mU/mL to 15000 mU/mL, with an average value of 4500 mU/mL and

median of 3000 mU/mL. This agrees well with the activities reported in literature (2044 to 17968 mU/mL) and the activities determined by UV-Vis spectrophotometry (2000 – 15700 mU/mL).

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THE USE OF SPICES IN THE PRODUCTION OF TRADITIONAL FRESH CHEESE

Suzana Jahić[1], Lamija Makić[1], Aida Džaferović[1]

[1]Biotechical faculty, University of Bihać, Luke Marjanovića bb 77 000 Bihać

suzanajahic2002@gmail.com

Keywords: traditional fresh cheese, basil, thyme

ABSTRACT:

The cheese is defined as a fermented or unfermented product obtained after milk, skimmed milk or partially skimmed milk, cream, jellies or combination of said raw materials and whey germination (with the addition of sylvatic or some other substitute enzyme enrichment). As a highly-appreciated food product, cheese is a concentrated source of high-biological protein values and is therefore recommended for its daily consumption to almost every person regardless of age. In addition to protein, cheeses are also a good source of vitamins soluble in fats (A, D, E, K) and water-soluble vitamins (Vitamin B groups: B1, B2, B6, B9 and B12), but also mineral substances, especially calcium, phosphorus and magnesium.Traditional cheeses have created self-help in a given area as a result of a long-standing development of a certain technology (recipe) of production that has been passed from the knee to the knee. In this work, experimental production of traditional fresh cheese was carried out with the addition of spices, basil and thyme. For the purposes of research, cheese samples were prepared with the addition of the mentioned spices in concentrations of 0.50% and 0.25%. The results of chemical analysis of cheese samples have shown that, according to consistency, the examined samples are classified as semi-soft / soft cheeses; the lowest water content was 79.51% in the sample with the addition of 0.25% thymus and the highest water content was 81.59% in the sample with the addition of 0.25% basil. According to the amount of fat in the dry substance, the cheese can be classified into semi-rich cheeses having a fat content of 25-45%. According to results of sensory evaluation, the highest overall score (the maximum number of possible points 20.00) achieved the cheese with the addition of 0.25% thymus – 19.80 points, then follows the cheese with the addition of 0.25% basil – 19.70 points, and the lower grades were achieved the cheeses with the addition of 0.50% basil – 18.90 and 0.50% thymus – 18.00 points.

FOOD TRACEABILITY

Huska Jukić, Anela Borić, Asmir Aldžić

Fakultet zdravstvenih studija, Bihać

asmiraldzic@hotmail.com

Keywords: food safety, follow up system, quality nutritonal products.

ABSTRACT:

In the past 20 years the population all over the world has shown concern about the safety of the food we eat.The presnce of various diseases in animals that can be transmitted of humans or chemicals found in animal food and human food can endager the quality and safety of nutritisnal products. Follow up system is a system that contains risk managment tools. The follow up system gives food businesses or state authorities possibility to with draw products from the supply drain which are identified as unsafe for people who consum it. The follow up system is the most important in food safety policy. The food monitoring system that includes steps from food production to distribution, all in ordes to identify and eliminate the risks and protect the health of the population is know as the follow up system.

CHARACTERIZATION OF OIL FROM RASPBERRY AND BLACKBERRY SEEDS

Senad Krivdić[1], Staniša Latinović[1], Nataša Ivković[1], Mirjana Milošević[1], Ivan Samelak[2], Goran Vučić[1], Ladislav Vasilišin[1], Zoran Kukrić[1]

[1]Faculty of Technology, University of Banja Luka, Vojvode Stepe Stepanovića 73, 78 000 Banja Luka
[2]Faculty of Natural Sciences and Mathematics, University of Banja Luka, Mladena Stojanovića 2, 78 000 Banja Luka

goran.vucic@tf.unibl.org

Keywords: physical-chemical properties, oil, raspberries, blackberries

ABSTRACT:

In this paper, physical and chemical characterization of oil from raspberry and blackberry seeds was done, after production of juice, juice and wine, respectively. The amount of seeds extracted from pomace was from 20 to 22%. By the cold shredding of seeds, oil was obtained in amount of 10% relative to the mass of seeds.
In the analyzed samples, oil density, refractive index, acid number, peroxide number, saponification number and iodine number were determined. The biological value of the oil was determined by the content of total phenols, flavonoids, flavonols and flavan-3 and the antioxidant potential was determined by DPPH and ABTS test.

QUALITY OF FINELY CHOPPED BOILED SAUSAGES ON THE MARKET OF BANJA LUKA CITY

Dušanka Marković[1], Danica Savanović[1], Ladislav Vasilišin[1], Goran Vučić[1]

[1] Faculty of Technology, University of Banja Luka, Vojvode Stepe Stepanovića 73, 78 000 Banja Luka

goran.vucic@tf.unibl.org

Keywords: quality, meat products, boiled sausages

ABSTRACT:

*Quality of meat products primarily depends of the quality of raw materials, additives and spices added in order to improve organoleptic and other product properties, then from the selection of technological processes of processing and preservation as well as the quality of packaging materials for finished products that must provide protection without any change in the product . Sausages, as meat products, represent the largest group of meat products with several hundred species and thousands of commercial names. These are the products obtained by filling natural or artificial wrap. The aim of this article is to ascertain whether there are significant differences in the products declared as finely chopped sausages. Twelve products from different manufacturers that declared themselves the same product were tested. The chemical and physical-chemical properties of the product were investigated. Content of total fat, water content as well as the amount of nitrite, then color, hardness (texture) and pH of the product were tested. After the chemical and physical-chemical analyzes carried out, it was concluded that there are: significant differences in the total fat content (from 0.99 to 18.92%), the amount of nitrite (from 11.66mg/kg to 84.97mg/kg) as well as the values color parameter L *, fewer differences exist for other quality parameters, but are not significant as the previous one.*

BIOAVAILABILITY OF HEAVY METALS IN CEREALS FROM BUŽIM AREA

[1]E. Pehlić, [1]A. Aldžić-Baltić, [1]M. Žapčević, [2]A. Šapčanin, [3]H. Nanić, [4]K. Salkić

[1] Faculty of Health Studies, University of Bihac, Bosnia and Herzegovina
[2] Faculty of Pharmacy, University of Sarajevo, Bosnia and Herzegovina
[3] Biotehnical Faculty, University of Bihac, Bosnia and Herzegovina
[4] Agricultural Institute of the Una-Sana Canton, Bosnia and Herzegovina

minelazapcevic@gmail.com

Keywords: bioavailability, heavy metals, cereals

ABSTRACT:

Heavy metals are elements that can cause many adverse effects on human health due to their coherence with contamination and potentially toxic effects. Cereals are considered a rich plant source of carbohydrate, proteins, vitamins and minerals. However, cereals are also rich with phytate, which can decrease the bioavailability of critical nutrients and heavy metals.

The aim of this study was to determine bioavailability of heavy metals in analysed samples of cereals. Eight samples of cereals were collected from two different locality of Buzim area and analysed on microelements iron (Fe), cobalt (Co), cooper (Cu) and chrom (Cr), and heavy metals lead (Pb), cadmium (Cd) and arsenic (As). Before analysis on the Atomic absorption spectrophotometre (AAS), the samples were prepared by wet digestion in the Milestone S.r.l microwave oven. - START D. After digestion, the samples were analyzed using the AAS SHIMADZU series AA - 6800.

The concentrations of heavy metals, except cobalt, in the analyzed samples were within the limits of the maximum permissible concentration values for the specified metals as prescribed by the Ordinance on maximum permitted levels for certain contaminants in foodstuffs for Bosnia and Herzegovina and the EU Regulation (EC No. 1881/2006).

Concentration of cobalt in most analyzed samples slightly exceeded the maximum permitted value prescribed by WHO. As integral part of vitamin B12, presence of cobalt in grains and cereal products is desirable.

Concentrations of toxic heavy metals are in reference values, so consummation of these grains is not a threat to the human health.

HOW TO REACT TO THE NECESSITY OF A SUSTAINABLE ANIMAL PRODUCTION? THE ECOLAMB PROJECT

Peric Tanja[1], Bergant Martina[1], De Marco Ario[1], Makorič Petra[1], Ogun Sinan[2]

[1]Laboratory for Environmental and Life Sciences, Univerza v Novi Gorici, Nova Gorica, Slovenia
[2]RR Research AR-GE Tarim Ltd Sti, Istanbul, Turkey

tanja.peric@ung.si

Keywords: Sustainability, animal production, lamb, welfare, quality, meat, EcoLamb

ABSTRACT:

EcoLamb assesses the sustainability of diverse European sheep production systems focusing on the ecological footprint, animal welfare aspects and nutrition value of lamb meat. The outcomes of these assessments will be used to understand the potential future barriers that limit the innovative capacity and development of the sector and the opportunities that may provide a future market niche against competitive products from other global markets. Farm solutions that incorporate consumer expectations for animal welfare and meat quality will enhance the competitiveness of Europe's lamb meat sector. The project engages trans-national research and industry stakeholders from 6 countries made up of Germany, Italy, Portugal, Slovenia, Spain and Turkey to analyse on 20 case study farms resource-efficient, competitive and low-carbon lamb production models. Direct linkage between animal welfare, meat quality and pharmaceutical use will also be determined using innovative Precision Farming techniques. The project will produce a tool-box of recommendations for productive sheep farm management, supply chain and marketing on how to improve the acceptability of lamb meat by consumers. Thus, the multidisciplinary approach and the multi-actor involvement of the EU sheep sector will assist in re-designing critical aspects to increase society acceptance and the place of lamb meat in future diets and the outcomes of the project will be used by stakeholders to promote changes in farm management, marketing and processing of meat from sheep. Additionally, results will be used by farm consultants, farmer groups and policy officers to re-design consulting approaches and plan new initiatives to make all aspects of the European sheep industry more sustainable.

WASTE MANAGEMENT

FOOD PROCESSING WASTES AS POTENTIAL SOURCE OF BIOLOGICALLY ACTIVE COMPOUNDS

Branka Mozetič Vodopivec

Wine Research Center, University of Nova Gorica, Glavni trg 8, 5271 Vipava, Slovenia

branka.mozetic@ung.si

Keywords: food processing wastes, wine, olive oil, extraction methods, polypehnols

ABSTRACT:

During fruit processing the beverage and wine industry needs to dispose between 25% and 35% of the starting raw materials mass known as the fruit pomace. In the case of olive oil production is that ratio even higher. Unfortunately, some parts of the pomace in the fruit processing industry still go to landfill, causing environmental pollution and huge losses of valuable materials that can potentially be exploited for their contents of a great variety of natural additives and many health-promoting ingredients (e.g., phenolic compounds, vitamins, carotenoids, dietary fiber). Therefore, valorization of wastes and by-products from fruit processing addresses two issues, the use of waste and by-products and second, a societal health, which is highly contributing to a sustainable food chain from an environmental and economical point of view. Evaluation and efficient management of waste from food production represents is also one of the main objectives of the European Union (EU) actions against food waste and towards sustainable development. The Waste Framework Directive emphasizes the importance of prevention of waste generation and exploitation of waste by its use and recycling.

Fruit processing wastes are already known as valuable source of plant phenols, health-promoting components with antioxidant and antimicrobial properties which could replace different synthetic compounds, providing food production and processing more sustainable and also consumer safe. These compounds can be used also as natural therapeutic agents. We are also facing growing interest of consumers towards functional foods that provide beneficial effects to humans in terms of health promotion and disease risk reduction. Type and quantity of phenolic compounds in wastes of fruit processing depends on chemical/physical extraction techniques, fruit sort and cultivar and also food processing technology which is more or less efficient in transfer of phenols from original fruits to product and wastes. Grape and apple pomace were already described as important source of polyphenols, olive oil by-products can also represent precious resource polyphenols, since 98% of olive fruit phenols are lost during oil

extraction into wastes. Researchers are all the time trying to find different ways of faster and most efficient and eco-friendly extraction procedure for these compounds from such plant material. The extraction techniques for bioactive compounds from fruit wastes are mainly based on solvent extraction (SE), while promising results are also obtained from procedures like supercritical fluid extraction (SFE), subcritical water extraction (SCW), use of enzymes, hydrolysis, ultrasounds, microwaves and recently also with ionic liquids.

APPLICATION OF LIGNOCELLULOSIC WASTE FOR URANIUM REMOVAL FROM AQUEOUS SOLUTIONS

Mustafa Memić, Elma Šabanović, Mirza Nuhanović

University of Sarajevo, Faculty of Science, Department of Chemistry, Zmaja od Bosne 33-35, 71 000 Sarajevo, Bosnia and Herzegovina

m_memic@yahoo.com

Keywords: **biosorption; *Citrus limon*; uranium; lignocellulosic waste.**

ABSTRACT:

In this work, use of biosorbent based on lemon (lat. Citrus limon) peel (endocarp) as possible biosorbent for the removal of U(VI) ions from aqueous solution was examined. In order to get biosorbent with highest sorption performances this material was chemically modified. In a series of experiments parameters that affect biosorption of U(VI) ions from aqueous solutions were triald (pH, concentration of biosorbent and contact time). Optimum values for each parameter were established: pH 8 for modified and 3 for unmodified biosorbent and solid/liquid ratio 0.1g/50mL for both biosorbents. The results showed that adsorption capacity is near 4 times higher in modified (15.28 mgUranium/g) than in unmodified lemon peel (4.05 mgUranium/g). Thus, optimization of the analyt/biosorbent contact time was carried out only for the modified sorbent with an optimum contact time 60 minutes.

Suggested modification model of lemon peel, as an lignocellulosic waste material from food industry, proved to be an excellent biosorbent of uranium ions from aqueous solutions. This process produces a double effect, environmental protection with a use of food industry waste.

POSSIBILITIES OF TREATING WASTE PLASTIC MATERIALS FROM SUSTAINABLE DEVELOPMENT ASPECT

Mahmut Jukić[1], Ifet Šišić[2]

[1]Univerzitet u Bihaću, Fakultet zdravstvenih studija, Bihać, Bosna i Hercegovina
[2]Univerzitet u Bihaću, Biotehnički fakultet, Bihać, Bosna i Hercegovina

mahmut.jukic@gmail.com

Keywords: plastic waste materials, recycling, mechanical method, energy method, sustainable development

ABSTRACT:

In the last few decades, plastic materials have a major role in the production of packaging for the packaging of products especially intended for human consumption, which after their use become a significant part of municipal waste that should be properly managed in order to avoid environmental damage.
In terms of sustainable development, it is necessary to look for new solutions for efficient treatment of waste plastic materials. Two possible solutions are material (recycling) and energy use.
Recycling is a process that transforms plastic waste into new materials for the production of new products. Energy use of plastic materials is a process of thermochemical conversion with the characteristic of waste that it is a fuel, using the resulting heat.
Efficient use of utility waste materials requires legal support from all levels of government, because recycling requires the participation of a large number of citizens in separate collection, which in practice is difficult to implement. The problem that occurs over time is the loss of recyclable properties due to frequent recycling, and therefore, the ultimate solution for the disposal of such waste is the energy use. The reason is that these two ways of treating waste plastic materials have to be harmonized in order to preserve non-renewable natural resources, protect the environment and human health, and encourage sustainable economic development.

MODULAR ECOLOGICAL SYSTEM FOR WASTE DISPOSAL

Ibro Badžak, Senad Rahimić, Mersida Manjgo

University „Džemal Bijedić“ of Mostar

senad.rahimic@unmo.ba

Keywords: Ecological, waste disposal, hydraulic system

ABSTRACT:

There is a large number of containers and wastes on public areas in our cities every day. Besides providing a very ugly picture of the city, that spreads unpleasnet smell, which is environmentally unacceptable. Especially, when there are lots of walkers on the streets in the summer days or in tourist season. Living in ecologically clean city, protecting and preserving the health of our children, youth and the entire population in our environment is certainly one of the great priorities of all of us. In this work, a new, modern solution will be introduced, that enables only designed waste dispensers that are placed on the surface, while the containers are placed below the surface. Once filled, the containers are lifted to the surface using a hydraulic platform. Waste Disposal is made to existing vehicles with the addition of a flexible hydraulic system of fast-disconnecting couplings and valves mounted on the vehicle. Flexible hydraulic hose with quick connection between the hydraulic system and the hydraulic installation of the platform, which allows for lifting of the platform and the usual way of releasing the container. After discharging the container, they return to the platform, using a hydraulic valve mounted on the vehicle, the platform and the containers are lowered below the surface.

COMPARISON OF WASTE MANAGEMENT SYSTEM IN THE REPUBLIC OF CROATIA AND THE EU COUNTRIES

Sanja Kalambura*, Nives Jovičić*, Filip Vujnović*

*Veleučilište Velika Gorica, Zagrebačka 5, 10 410 Velika Gorica, Republika Hrvatska

sanja.kalambura@vvg.hr

Keywords: waste management, disposal, recaycling, comparation CRO and EU

ABSTRACT:

Waste management represents a set of activities that are generally carried out in all EU countries equally, but still there are significant differences. In countriese were waste management is very well developed main activities are recacling, reuse and recovery. Disposal is less preferable option. In the Republic of Croatia, the waste management system is far from perfect and needs to be changed. Most of the waste that is produced goes to disposal while only a small part is reused and recycled. In the last few years, this trend has begun to change and new policies are being introduced so we can notice change in the system. Examples of good practice in waste management are systems in Germany, France and Austria, although some other European Union and European countries have very well developed waste management systems.

TECHNOLOGICAL PROCEDURES OF MECHANICAL RECYCLING OF VULCANIZED TIMBER RUBBER WITH APPLICATION OF NEW RAW MATERIAL

Ifet Šisić, Mahmut Jukić

[1]University of Bihać, Biotechnical Faculty, Bihać, Bosnia and Herzegovina
[2]Cantonal Administration for Inspection Affairs, Bihać, Bosnia and Herzegovina

sisic_btf@yahoo.com

Keywords: used tires, mechanical preparation, processing, new products.

ABSTRACT:

Discarded and used car tires are a great potential for the utilization of rubber materials by recycling processes, because if discarded tires are not adequately cared for, they are hazardous waste.
In the last ten years, the interest for mechanical, thermal and chemical treatment of waste tires has been demonstrated in Bosnia andHerzegovina, using several technological procedures, of which the most important is the mechanical processing and production of granulates by grinding and separating rubber components.
Recycling processes have an advantage over energy processing especially for the recycling of vulcanized (crosslinked) rubber.
The mechanical grinding process of the tire consists of several operations: cutting, grinding, sieving, magnetic separation and aerocyclone. These technological operations produce high-quality rubber particles (1.7 mm to 55 mm) of purity of 98-99%, with removed fibers and steel wires, as a new raw material.
This research presents the latest technologically acceptable equipment with the description of mechanical tire recycling operations and systematization of new raw material products as a basis for the production of new materials and final products. Namely, recycled products can be used as fillers in new tires, for sports fields and tracks, for the construction of sound walls on highways, for public and private surfaces, and for others.

MANAGEMENT OF WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT

Magdalena Miceva

Master's student, Faculty of Tourism and Business Logistics - Gevgelija,
University Goce Delcev-Stip, Republic of Macedonia,

magdalena.21815@student.ugd.edu.mk
magdalenamiceva@gmail.com

Keywords: waste, recycling, technology.

ABSTRACT:

Every year in the world, at an accelerated pace, the amount of electric waste that is being thrown increases, which makes this type of waste the fastest growing. Millions of tons of waste electrical and electronic equipment are rejected by households and companies. The most common causes of this increase are new technologies and the way of life where the old one is replaced with new ones. We live in an era of rapid technological development of society. People use one of the devices offered by modern technology every day, whether it's a mobile phone, a computer, a television set, or using an elevator in a building where he lives or works. But, like everything else, these appliances have a lifetime. At that moment, it is necessary to make the right decision and to recycle electric and electronic devices. The subject of research in this paper will focus on analyzing the effects of collecting, sorting and recycling of E-waste as an analysis of the advantages and disadvantages of collecting this type of waste for the protection of environmental stress. Theoretical part of the paper will give an overview of the basic concepts related to electrical and electronic waste, how the E-waste and the recycling benefits are shared. In the practical part of the paper will be presented the results of the survey conducted on the territory of the municipality of Gevgelija. The survey was conducted in order to obtain relevant information on how much the population is informed about the collection of E-waste and recycling.

THE SIGNIFICANCE OF GARBAGE DUMP 'SMILJEVIĆI' IN ECOLOGICAL HEALTH

Pazina Nedžad[1], Mahmutović Omer[1], Papić Sejfo[1]

Faculty of Pedagogy Sarajevo, University of Sarajevo

prazina@gmail.com

Keywords: garbage dump "Smiljevići", the impact of the garbage dump on the environment, waste water

ABSTRACT:

The impact of the Smiljevići garbage dump on the environment and on the health of the population living in the immediate area as well as in the wider area of Sarajevo was examined in this paper.All the waste collected in Sarajevo Canton is brought to the city's garbage dump Smiljevići, with a total area of 60ha.Waste water, from the entire dumpwhichis contaminated with chemical and biological pollutants,isreleased directly into the Lepenički potok, which then flows into the river Bosna. Waste water purification system has never been put into operation. Waste wateris contaminated with chemical and biological contaminants and presents a danger to the surrounding population that uses the water from the Lepenički steam for irrigation.The garbage dump releases source emissions of harmful substances that could come from mobile sources such as vehicles carrying out waste disposal, as well as from immovable sources, including facilities within the garbage dump. Air pollution is particularly dangerous to the population living near the garbage dump.

ECOSYSTEM PROTECTION

EFFECT OF COMPOSITION AND STRUCTURE OF ZEOLITE ON ADSORPTION OF BUTYRIC ACID FROM AQUEOUS ENVIRONMENT

S. Sladojevic, D. Bodroza, J. Penavin-Skundric, Z. Levi, M. Rakanovic, S. Vujasinovic

University in Banjaluka, Faculty of Technology, RS, Bosnia and Herzegovina

slavica.sladojevic@gmail.com

Keywords: butyric acid, wastewaters, zeolites, adsorption

ABSTRACT:

This paper studied physical and chemical characteristics of ZSM-5, Y and BETA zeolites (product of the company Zeolyst International, USA) and their effect on adsorption of butyric acid ($CH_3CH_2CH_2COOH$) from the aqueous environment. Since waste waters of the food, textile and chemical industry may contain organic acids as a constituent part of the hydrophobic component of pollution, butyric acid was selected as the adsorbate. It is known that the crystals of zeolite form an entire labyrinth of channels and pores of different profile that may detain various cations, water and other species. Access of adsorbates to cavities and channels is determined by the pore opening size. Character, number and location of active centers depend on the zeolite structure, present cation, SiO_2/Al_2O_3 ratio, as well as the manner of previous processing. In addition to the original samples, their decationized forms were also examined by observing adsorption of butyric acid, during which the scope of acid concentrations was from 0.02-0.20 mol/L. Characterization of zeolite samples was determined by the method of X-ray diffraction analysis (XRD), method of infrared spectroscopy with Fourier transformation (FT-IC), and identification of micro/nano porous structure by the scanning electronic microscopy (SEM). Values of specific surfaces are determined by the low-temperature adsorption method (BET method). Adsorption balances are described by the Freundlich adsorption isotherm and adsorption parameters. Results proved that for the adsorption of $CH_3CH_2CH_2COOH$, out of the tested zeolites, the most suitable ones are BETA zeolites.

THE INFLUENCE OF CURRENT DENSITY IN THE TREATMENT OF LANDFILL LEACHATE BY ELECTROCOAGULATION PROCESS

B.N. Malinović, T. Djuricić, T. Kovačević

University of BanjaLuka, Faculty of Technology, Stepe Stepanovica 73, 78000 Banja Luka, Bosnia and Herzegovina

tijana.malinovic@tf.unibl.org

Keywords: electrochemical treatment, iron, current density.

ABSTRACT:

In this paper was investigated the effect of current density on electrocoagulation proces of landfill leachate by the application of iron as an electrode material. All experiments were performed with an initial volume of landfill leachate of 500 cm^3, concentration of supporting electrolyte was μ_{NaCl} =5 g/L and the electrolysis duration was 30 minutes. The applied current density varied in the range of j=5-25 mA/cm^2. During the experiment was monitored changes in pH value, electrical conductivity, electrical resistivity, and total dissolved solids TDS.

EFFECT OF CLIMATE CHANGE ON ENVIRONMENT AND HUMAN HEALTH

Ajla Hasanagić

hasanagicka@hotmail.com

Keywords: environment, climate change, greenhouse gases, health

ABSTRACT:

Climate changes that are manifested by raising the sea level, extreme weather conditions like intensiveheat waves, drought and floods have far-reachingeffect on ecosistem and human helath. Climate changes effect biodiversity of land and see, as well as contagious disease, exposure to dangerous chemicals and spread of the transmit of various diseases. Mitigateclimate changes with significant reduction of greenhouse gas emissions can reduce risk on humane and natural systems. Adaptation measures about climate changes are one of very important tasks of every country which is reviewedthrough legal provisions and development of long-term strategies for climate change reduction. In order to mitigate the effects of climate changes in future we need to put accent on use of renewable sources of energy, exploitation of waste, technology change in industry, waste selection, use of public transport or use cars that consumeless fuel, and afforestation.

NOVEL VANGUARD METHODS FOR FAST SCREENING OF ENVIRONMENTAL POLLUTANTS AND BIOACTIVE COMPOUNDS AT TRACE LEVELS

Leja Goljat, Mingcheng Liu, Mojca Žorž Furlan, Mladen Franko

University of Nova Gorica, Laboratory for Environmental and Life Sciences

mladen.franko@ung.si

ABSTRACT:

Large numbers of samples need to be analysed daily in environmental monitoring campaigns and in regular controls of emissions from various sources of pollution. This clearly requires reliable, sensitive and fast-response analytical methods which are being recently developed and introduced through the concept of vanguard methods[1]. Conventional "rearguard" methods, which are usually time consuming and costly, are in such concept used only to analyse a small portion of samples, which were previously confirmed positive for the content of the analyte in question by a rearguard method.

With the objective of developing novel vanguard methods for fast screening of environmental pollutants and bioactive compounds, we have investigated the applicability of methods for determination of Cr(VI), Fe(III)/Fe(II), NH_4^+, as well as toxins such us microcystin at trace (ppb) levels in waters[2,3]. The developed methods are based on microfluidic flow injection analysis (μFIA) which provides a platform for injection of samples into the continuous carrier flow containing the required reagents, and enables fast completion of utilized colorimetric or enzymatic reactions as well as biorecognition of analytes through their interaction with corresponding antibodies. Highly sensitive detection is required due to short optical interaction lengths in microfluidic systems (100 μm) and was provided by thermal lens microscopy (TLM). TLM was shown to provide limits of detection lower than those offered by conventional transmission mode detection techniques such as spectrophotometry, which utilize much longer optical interaction lengths (1 cm). μFIA-TLM (Fig. 1) therefore enables the analysis of sub μL samples with sample throughputs as high as 20 samples/min.

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CONTENT OF IRON IN THE RIVER DREŽANKA

Sejit Bobar, Munir Mehović, Denis Bobar

University "Džemal Bijedić" in Mostar, Faculty of Teacher Education, Chemistry Department, Sjeverni logor bb 88104 Mostar

sejit.bobar@unmo.ba

Keywords: Drežnica, river Drežanka, iron, agricultural land, quality of water.

ABSTRACT:

River Drežanka is formed in flows through the karst valley, which represents the traditional agricultural land. Water from the river Drežanka is used for various purposes: water supply for the inhabitants, irrigation of farmland, fish farms, recreation and tourism. However, the great importance of the river Drežanka for residents of Drežnica as well as the fact of its insufficient research on the content of heavy metals in water. The main motive of this research is to determine the iron content (Fe) in the waters of the river Drežanka. This research included five localities along the river Drežanka, including sampling and determination of the selected iron metal. Water samples for the determination of metal content in the river Drežanka were taken in one cycle, in a period of low water flow. Water samples were determined in metal iron.
The metal was determined in accordance with EU standards, the AAS-flame technique was used. According to the results obtained, the following comment may be given. The results of the research show a low level of metal in the waters of the river Drežanka, the measured values have been within the prescribed limits and comply with the EU Water Framework Directive. Iron concentrations on the investigated sites ranged from 20.72 (μg / dm^3) to 120.04 (μg / dm^3)

CONTRIBUTION TO THE KNOWLEDGE OF BIRD FAUNA OF LAKTAŠI

Rajko Roljić

Faculty of Agriculture, University of Banja Luka
Bulevar vojvode Petra Bojovića 1a, 78000 Banjaluka, B&H

rajkoroljic@gmail.com

Keywords: bird fauna, Laktaši, 2016

ABSTRACT:

This paper presents research data of bird fauna, widespread in Laktaši region. The data is collected during ground study in period from January to December during the year 2016. Accumulated data is going to be used for planning future researches. During the study, 92 bird species from 34 families and 13 orders were determined. Among all recorded species, rare and significant sorts stand out for Bosnia and Herzegovina, such as: red-footed falcon (Falco vespertinus), peregrine falcon (Falco peregrinus), saker falcon (Falco cherrug), European turtle dove (Streptopelia turtur), Ural owl (Strix uralensis), grey-headed woodpecker (Picus canus), fieldfare (Turdus pilaris) and red crossbill (Loxia curvirostra).

AN ECOLOGICAL STUDY OF NESTING BIRDS IN THE VICINITY OF LAKTAŠI

Rajko Roljić

Faculty of Agriculture, University of Banja Luka
Bulevar vojvode Petra Bojovića 1a, 78000 Banjaluka, B&H

rajkoroljic@gmail.com

Keywords: breeding birds, Laktaši, 2016

ABSTRACT:

Field research of composition and abundance of breeding birds in Laktaši were preformed during spring and summer in 2016. A total of 57 breeding species from 26 families and 11 orders were determined. The most common birds are from passerine order - Passeriformes (31 species or 54.39%). The most numerous were birds belonging to the families: Columbidae, Corvidae and Passeridae. When the monitoring of nesting place was performed, it was determent that the largest number of species are the one nesting right on the trees, in the bushes and species which prefer the cavity as a nesting place (49 species or 85.96%). The results indicate that the lowest number of species nest on the ground (8 species or 14.04%). On the field of study, it was recorded larger number of residents (38 species or 41.31%) which is very significant due to the ecological development in habitat these species have most impact on.

DIET COMPROSITION OF THE LONG-EARED OWL (*Asio otus* Linnaeus, 1758) IN SELECTED PARKS HABITATS NEAR LAKTASI

Rajko Roljić

Faculty of Agriculture, University of Banja Luka
Bulevar vojvode Petra Bojovica 1a, 78000 Banjaluka, B&H

rajkoroljic@gmail.com

Keywords: Asio otus, pellet analysis, Laktaši

ABSTRACT:

The Long-eared owl (Asio otus) diet was researched on one sites in the core of Laktasi city centre. The study of was conducted in the period September 2017—May 2018. Based on the analysis of 241 whole pellets and certain amount of decayedones, 606 specimens were identified, belonging to a total of 18 small mammal species, four species of birds and one species of insects. Mean prey biomass was 2.89 g. The average number of prey per pellet was 2.51 varies from 1 to 6. Hence it can be concluded that long-eared owl is a dietary specialists relying mostly on the small mammal or their food and thus serves an important role of biological pest controller.

DIET OF THE BARN OWL (*Tyto alba*) AND LONG-EARED OWL (*Asio otus*) IN BANJA LUKA: A COMPARISON

Rajko Roljić

Faculty of Agriculture, University of Banja Luka
Bulevar vojvode Petra Bojovića 1a, 78000 Banjaluka, B&H

rajkoroljic@gmail.com

Keywords: ***Barn Owl, Long-eared Owl, diet, pellet analysis, Banja Luka***

ABSTRACT :

Diet composition and food of two common and widespread in Banja Luka owl species, Barn Owl (Tyto alba) and Long-eared Owl (Asio otus), were analysed from collected pellets. Tyto alba was characterised by a more diverse diet: 16 small mammal species (97.3%), a three birds species (2%) and representatives of one insects species (0.7%) were recovered, whereas for Asio otus – 11 small mammal species (98.54 %), four birds species (2%) and representatives of one insects species (0.33%) were recovered. By numbers, primary food resources of Tyto alba were Microtus arvalis (22.61%), Crocidura suaveolens (15.22%) and Mus musculus (11.74%), whereas of Asio otus - Microtus arvalis (31.68%), Apodemus agrarius (16.83%) and Sorex araneus (6.76%). The average number of prey items per pellet was 2.55 (max. 7) for Tyto alba and 2.53 (max. 6) for Asio otus.

PROTECTION OF SOURCES WATER – MUSIĆ, BUŽIM

Senita Isaković ,Una Čaušević

Panevropski univerzitet Apeiron, Pere Krece 13. 78 000 Banja Luka

senita0606isakovic@gmail.com
unacausevic24@hotmail.com

Keywords: quality, water, source

ABSTRACT:

The control of the health safety of drinking water is carried out according to the Ordinance on the health safety of drinking water in authorized laboratories. The largest number of defective drinking water samples come from local waterworks and individual water supply facilities (wells, tanks, etc.) in which water is irregularly or by no means controlled. In individual water supply facilities, water chlorination is often not done. The most common causes of chemical malfunction are the increased content of heavy metals, ammonia and nitrates, and the microbiological increase in the total number of bacteria. Water is one of the simplest and most prevalent substances in nature, whose physical and chemical properties are well known. Although it is simple in its chemical composition, it is still not possible to synthesically obtain it. Supplying hygienically proper drinking water is an imperative of modern life, and supplying the population with the right drinking water is one of the basic prerequisites for good health, and the right to drinking water is one of the basic human rights.

AMOUNT OF NITROGEN COMPOUNDS IN RADOBOLJA RIVER FOR HIGH AND LOW WATER LEVELS PERIOD

Munir Mehović, Sejit Bobar, Irma Dadić, Mejrema Salčin

University "Džemal Bijedić" in Mostar, Faculty of Teacher Education, Chemistry Department
USRC „Midhat Hudur Hujka“ Sjeverni logor bb 88104 Mostar

munir.mehovic@unmo.ba

Keywords: Radobolja, nitrogen, ammonia, nitrites, nitrates, water level, pollution

ABSTRACT:

The Radobolja River originates from the karst spring at the foothill of Mikuljača and flows through the suburban and urban areas of Mostar to the mouth of the river Neretva in the length of about 5 km. Because of its geographic position, the interactions between the river and the settlement through which it flows is important. One of the important features of the Radobolja River watercourse is a large fluctuation of water level depending on the season. Water quality was monitored at five sites from its source to the mouth during high water-level (May) and during low water-level (July), to determine the impacts of pollution to river Radobolja water quality. The ammonia (NH_3) content was from under the limit of qualification (LOQ) to 0.046 mg / l. The nitrites (NO_2^-) values was below the limit of qualification (LOQ) to 0.012 mg / l, and the nitrate (NO_3^-) concentrations range was from 0,224 mg / l to 0,589 mg / l. The content of ammonia as a fresh pollution indicator and nitrite as a transition form of nitrogen compounds in water is under the values recommended by the EU standards, while the levels of nitrates in the low water period are generally above the EU norms recommendation values, that indicating the high ecological burden of Radobolja waterflow with nitrogen compounds.

STEEL PRODUCTION AS SOURCE OF ENVIRONMENTAL POLLUTION BY RADIONUCLIDES

Tahir Sofilić[1], Don Vito Lukšić[2], Una Sofilić-Šimić[3]

[1]Tina Ujevića 25, 44103 Sisak, Hrvatska
tahir.sofilic@sk.t-com.hr
[2]Sveučilište u Zagrebu, Metalurški fakultet, Aleja narodnih heroja 3, 44103 Sisak, Hrvatska
vito.mmss@hotmail.com
[3]STSI – Integrirani tehnički servisi d.o.o., Lovinčićeva 4, 10 002 Zagreb, Hrvatska
una.sofilicsimic@stsi.hr

Keywords: steel mill, steel scrap, radionuclides, pollution

ABSTRACT:

Full knowledge of the physical and chemical properties of steel scrap today also includes knowledge of radionuclide content in this material. Specifically, it is known that admixtures and pollutants in steel scrap during melting stage and refining completely move into slag (Ca, Al, Si, Ti) or waste gas (Zn, Cd), that some only partially move into slag (Mn, Cr, S, P) or they remain in the steel melt (Cu, Ni, Mo, Sn ...). Unfortunately, it is less known that steel scrap can also contain particles from a group of radioactive metals, most commonly ^{60}Co, ^{90}Sr, ^{137}Cs, ^{192}Ir, ^{226}Ra, ^{232}Th and ^{241}Am which during the steel production process may cause significant defects in the quality of the produced steel and / or in the form of emissions from this process, also have harmful effects on the environment.

The purpose of this paper was to point out the need to introduce radionuclide monitoring and monitoring systems in steel mills to improve the quality and environmental management system without which no modern steel manufacturer can be imagined. This paper presents the basic types of radionuclide monitoring and monitoring system, the most common requirements to be met by such devices, and the process of measurement and imaging monitoring of radionuclide in steel waste.

ECOLOGY IN ELEMENTARY SCHOOL

Sanela Kadić[1], Nevzeta Ljubijankić[2], Sabina Begić[2], Anera Kazlagić[2], Sead Ljubijankić[3]

[1]Osnovna škola Mehmedalija Mak Dizdar, Žrtava Fašizma 14, Sarajevo, BiH
sanela.kadic@live.com
[2]Univerzitet u Sarajevu, Prirodno-matematički fakultet, Zmaja od Bosne 33-35, Sarajevo, BiH
nevzetalj@gmail.com, sabinab2001@yahoo.com, anerakazlagic@outlook.com
[3]Univerzitet u Bihaću, Fakultet zdravstvenih studija, Nositelja hrvatskog trolista 4, Bihać, BiH
seadlj@gmail.com

Keywords: ecology, environmental protection, education, elementary school

ABSTRACT:

Ecological problems and their systematic study and solving represent one of the most important tasks of modern society. Facing this issue requires an adequate and continouse ecological education, that needs to start, primarly, from elementary school. Elementary school students should comprehend the importance of environmental protection and conservation, and then, through further education, they should learn about ecology as a scientific discipline. Ecology is an interdisciplinary science, based on a whole range of other scientific disciplines. Ecology does not exist as an independent teaching subject in the curricula of elementary schools in Canton Sarajevo, but the basic unit, topics and contents from it are being elaborated within the framework of other subjects like biology. In this paper we examinated the outcomes from this kind of ecology education, and the knowledge from the elementary school students about basic environmental problems. The research was made by testing a hundred students from one elementary school in Sarajevo, and the results showed a significant ecological consciousness of the examinee.

PROPERTIES AND ECOTOXICOLOGY OF PHOSPHOROUS

Anera Kazlagić[1], Sead Ljubijankić[2], Sanela Kadić[3], Sabina Begić[1], Nevzeta Ljubijankić[1]

[1]Univerzitet u Sarajevu, Prirodno-matematički fakultet, Zmaja od Bosne 33-35, Sarajevo, BiH
nevzetalj@gmail.com, sabinab2001@yahoo.com, anerakazlagic@outlook.com
[2]Univerzitet u Bihaću, Fakultet zdravstvenih studija, Nositelja hrvatskog trolista 4, Bihać, BiH
seadlj@gmail.com
[3]Osnovna škola Mehmedalija Mak Dizdar, Žrtava Fašizma 14, Sarajevo, BiH
sanela.kadic@live.com

Keywords: phosphorous, ecotoxicology, toxicity

ABSTRACT:

Phosphorous is an element of the 15th group of the periodic table, it has an atomic number 15. Due to its high reactivity, it does not appear in elementary state in the nature, but in form of compounds. The main natural sources of phosphorous are phosphorite and various types of apatite. In addition, phosphorous is an essential element, and phosphorous compounds are parts of plant and animal matter. Mass fraction of calcium phosphate in the bones is about 60 %, and phosphorous compounds, ADP and ATP have very important role in the energy transfer which occurs in all living organisms. Phoshorous was first discovered in urine using dry destillation, in form of $NaNH_4HPO_4$. Phosphorous represents the only element that was primarily isolated from the living organism and after that discovered in the mineral sources. Various organic or inorganic phosphorus compounds have a wide range of uses: in the synthesis of artificial fertilizers, detergents, additives, pesticides and matches. From the ecotoxicology point of view, the main sources of phosphorous is its use in detergents, as well as in artificial fertilizers used in agriculture. Rivers, streams and lakes contain many organic and inorganic nutrients needed for plants and animals. At higher concentrations than allowed, they become pollutants. Increased concentration of phosphorous lead to eutrophication of aquatic systems, which leads to the extinction of many aquatic species. Generally speaking, different contaminants containing phosphorous or its compounds have a very harmful effect on all living beings, including humans. The effect of these compounds in the human organism in higher doses may have a lethal outcome.

TLS-FIA SYSTEM FOR SCREENING OF DISSOLVED IRON IN OCEAN WATER

Gaja Tomsič[1], Dorota Korte[1], Arne Bratkic [2], Mladen Franko[1]

[1]University of Nova Gorica, Laboratory for Environmental Research, Vipavska 13, POB 301, SI-5001 Nova Gorica, Slovenia

[2]Vrije Univeriteit Brussel, Boulevard de la Plaine 2, 1050 Ixelles,Brussel, Belgium

tomsic.gaja@yahoo.it

Keywords: flow injection analysis, iron concentration, ocean water, thermal lens spectroscopy.

Introduction:

Iron is an essential element for most of living organisms, both terrestrial and marine. However, due to the high pH of oceans and oxidising conditions, most of the dissolved iron in sea water, that is not bond to organic molecules or complexed, is oxidised to Fe(III) and precipitated as $Fe(OH)_3$. For that reason, ocean surface is characterised by an iron deficiency [1]. Iron can be a limiting element for the growth of ocean biomass [2]. This fact can furthermore have consequences on broader environment; it can slow down the CO_2 binding during photosynthesis [3].

The determination of small concentrations of iron is due to the complexity of ocean water challenging.

Materials and methods:

In this work we report on preliminary results of thermal lens spectroscopy (TLS) and UV-VIS measurements of Fe(II) and Fe(III) both in fresh and sea water. The detection was performed using 1,10- phenantrioline, that binds with Fe(II) ions to form a stable orange complex. The total amount of dissolved iron was analysed by reducing Fe(III) ions to Fe(II) in the presence of ascorbic acid. The TLS system was coupled with flow injection analysis (FIA) using a 633 nm probe laser and 450 nm pump laser beam.

Results:

The limit of detection (LOD) for Fe(III) and Fe(II) in fresh water on TLS-FIA was 26 nM and 28 nM respectively. When the analysed solutions were prepared in artificial sea water the LODs were 59 nM for Fe(III) and 85 nM for Fe(II). In the TLS-FIA system the susceptibility for iron

species was higher than in UV-VIS system, as the LODs for the same samples in artificial sea water were more than 5 times higher: 404 nM for Fe(II) and 379 nM for Fe(III).

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INFLUENCE OF ANTHROPOGENIC AIR POLLUTION ON WILDLIFE

Tešo Ristić[1]

[1]Nezavisni univerzitet Banja Luka

teso.ristic@gmail.com

Keywords: air pollution,burning,acid rain,industry,traffic,the living world

ABSTRACT:

Man has been changing,by his action,environmental conditions in which he lives and does.Until the industry has appeared,that influence was acceptable and did not significantly affect the climate.Besides industry and demographic explosion also the concentration of population in the cities and increased needs contributes to negative influence on the living world as a whole.Sources of air pollution are processed in the work and the answers are looked for overcoming of negative influence on air composition and influence on the climate and the living world. It is concluded that the biggest polluters are traffic,metallurgy,chemical industry,ore processing,etc.Besides contributing to green house effect,substances that pollute the atmosphere have negative influence on health of the humans,plants and animals but also damage the different natural and antrhopogenic good.Researching the influence of pollutants on humans,plants and animals has no only the aim to show the catastrophic consequences of pollution,but to reduce pollution to a minimum.

ASSESSMENT OF THE POTENTIAL IMPACTS OF THE BANJA LUKA-DOBOJ HIGHWAY ON THE ENVIRONMENTAL

Biljana Đukić[1], Veljko Đukić[1], Helena Galić[2]

[1]Paneuropean University Banja Luka,Faculty of Health Sciences Banja Luka
[2] University of Banja Luka, Faculty of Natural Sciences and Mathematics, Banja Luka

vljkuki@gmail.com

Keywords: highway, impact assessment, environment.

ABSTRACT:

As an integral part of the activities on the implementation of the Law on Environmental Protection, while respecting the positive principles related to the protection and improvement of the environment, the need to investigate possible impacts resulting from the construction and exploitation of the Banja Luka-Doboj highway was identified. The construction of this roadway allows for the balanced development of the area and the distribution of the population, the development of settlements and centers, their functioning in terms of raising the quality of life, the dislocation of some economic capacities and other activities.

The Environmental Impact Assessment has its role in the Low on Environmental Protection, which establishes a legal framework for issuing environmental permits, including provisions on subsidiary procedures such as the Environmental Impact Assessment, based on the concept of integrated pollution prevention and control.

The paper examines the problems of the Banja Luka - Doboj highway impact on the environment and is analyzed in the framework of several special units with the proposal of the necessary protection measures.

QUALITATIVE AND QUANTITATIVE CHARACTERISTICS OF WASTE STREAMS IN THE PROCESS FERROSILICON PRODUCTION

Veljko Đukić[1], Biljana Đukić[1], Zlatan Čizmić[2]

[1]Paneuropean University Banja Luka,Faculty of Health Sciences Banja Luka
[2]City of Bihać, Service for Communal Services, Water, Environmental Protection and Inspection Activities

vljkuki@gmail.com

Keywords: ferrosilicon, waste streams, environment

ABSTRACT:

By analyzing the technological processes of ferrosilicon production, the locations of emission and waste streams have been identified, which may have an adverse effect on the environment. The most important potential negative impacts of the plants for the production of ferrosilicon in the environment are predominantly related to processes of melting quartz in electric furnaces, and crushing and grading of ferrosilicon at separation, as well as for the preparation of raw materials.

The aim of the paper is to point at the presence and danger of emission of particles of ferrosilicon, the emission of flue gases, waste water from the cooling of the plant, noise emission and the formation of solid waste. Through the activities and measures to reduce emissions, it aims to preventively reduce the negative impact of the production of ferrosilicon on human health and the environment.

CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY OF BOSNIA AND HERZEGOVINA IN THE CONTEXT OF REGIONAL AND GLOBAL COOPERATION

Mehmed Cero[1], Senka Barudanović[2], Nerma Alagić[3]

Federal Ministry on Environment and Tourism
Faculty of Science, University of Sarajevo
Federal Ministry on Environment and Tourism / UNEP Bosnia and Herzegovina

mehmed.cero@fmoit.gov.ba
sebarudanovic@gmail.com
nerma.alagic@fmoit.gov.ba; nerma.alagic007@gmail.com

ABSTRACT:

Since 2002, Bosnia and Herzegovina, as a party to the United Nations Convention on Biological Diversity (UNCBD), has been following global trends of conservation and sustainable use of biodiversity. Regarding the Convention, five national reports were made, as well as the Strategy and Action Plan for Protection of Biological Diversity in Bosnia and Herzegovina (NBSAP) by 2020. These documents seek to ensure that protection and sustainable use of biodiversity be an unavoidable area in the development of relevant sectoral policies, strategies and legislation at all governmental levels of Bosnia and Herzegovina. The First National Report to the UNCBD (2008) was named Bosnia and Herzegovina – Land of Diversity. At present, preparatory activities for the Sixth National Report are being implemented in accordance with the SCBD's guidelines. In 2013, the Bosnian-Herzegovinian Clearing House Mechanism (CHM) portal for sharing information on biodiversity was established within global CBD CHM.

As a member country of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), Bosnia and Herzegovina actively represents and advocates the interests of the Eastern Europe UN region, especially regarding the capacity building needs and the status/availability of data and knowledge on biodiversity. Bosnia and Herzegovina's experts have made a significant contribution to the preparation of a Regional and Sub-Regional Assessment for Biodiversity and Ecosystem Services for Europe and Central Asia, which was adopted at the Sixth Plenary Session of IPBES (Medellin, Colombia, March 2018).

In the context of regional and global cooperation, Bosnia and Herzegovina had a significant contribution to the organization of the workshop and the preparation of a Eastern European Action Document on Pollinators, Food Security and Rural Development, within BES-Net Trialogue. Bosnia and Herzegovina confirmed its commitment to the status of pollinators by accessing to the global Coalition of the Willing on Pollinators at the 6th IPBES Plenary.

SOURCES OF POLLUTION IN CEMENT PRODUCTION

Osman Perviz, Samira Hotić ,Sebila Rekanović, Elvis Abdić, Anica Franjić, Ilda Mehinović, Mehira Čavkunović, Adnan Sović

University of Bihać, Biotechnical Faculty
Luke Marjanovića bb, 77000 Bihać

bio.fax@bih.net.ba
osmanperviz@yahoo.com

Keywords: cement industry, sources of pollution, energy, environmental protection

ABSTRACT:

Cement as the primary and irreplaceable building material is massively used and its production has reached 1.5 billion tones worldwide. Different types of impact in the environment can be attributed to the production of cement. Some of them are very negative, such as NO_X emissions (a mixture of gases NO and NO_2) and CO_2, or the depletion of natural resources. On the other hand, there is a great potential in the disposal of waste materials from other sectors of industry in a very environment friendly way.

PROTECTION OF NATURAL RESOURCES OF BUNA RIVER AREA IN VIEW OF HABITAT AND DISTRIBUTION OF ENDEMIC SPECIES *CHONDROSTOMA KNERII* Heckel, 1843 (Cypriniformes, Ostariophysi, Cyprinidae) and PERTAINING PLANT COMPOSITION

Denisa ŽUJO ZEKIĆ*[1], Emina ADEMOVIĆ[1], Aida ABAZA[1], Aida PELO[1]

[1]Biology Department, Faculty of Education, University „Džemal Bijedić“; USRC Sjeverni logor bb, Mostar, Bosnia and Herzegovina;

*Corresponding author: denisa@unmo.ba

Keywords: biological resources, *Chondrostoma knerii* Heckel, 1843, distribution and habitat, river Buna, phytocoenological footage

ABSTRACT:

Limited distribution of the species Chondrostoma knerii Heckel, 1843 in the flows of river Buna and Neretva is a reason of insufficient data on biology of this endemic species from the family Cyprinidae. In the period of April 2012. to January of 2013. researches have been done on river Buna and its tributaries with the goal of distribution assessment of the mentioned species. In field work 16 localities have been marked with position on two rivers, from which on the main flow of river Buna 9 localities and on tributaries 6 isolated localities.

By analyzing distribution of nose carp, its presence has been confirmed on 7 localities: Roginovac, estuary of Bunica into Buna, Crni vir, Bočine, estuary of Buna into Neretva, Posrt and Kotao (four localities were on the left tributary, river Bunica, and two on the right one, river Posrt), whereat uneven distribution of Chondrostoma knerii has been noticed with higher presence in tributaries. Assumption is that in river Buna, habitat itself, such as bottom of the riverbed, water vegetation, amount of oxygen, represent natural obstacles in one-way distribution of this endemic species of the Adriatic flow in the entire river flow.

Paper will also include overview of earlier research of this endemic species in Bosnia and Herzegovina, whose conservation status wasn't defined for this area, as well as overview of climatic community of coppiced woodland and bush, community of oriental hornbeam Rusco-Carpinetum orientalis, to which entire Mostar ravine belongs. Habitat degradation has had effect in a significant measure on distribution of certain plant species and stability of their communities. Method Braun-Blanquet, 1964. has been used and on its basis phytocoenological footages were made. On these localities multiple floors are clearly visible, where we differ floor of trees and brushwood and floor of herbaceous plants. Floor of trees and brushwood is

represented with 24 plant species: Pinus nigra Arnold, Ruscus aculeatus L., Juniperus communis L., Asparagus acutifolius L., Crataegus monogyna Jacq., Colutea arborescens L., Punica granatum L., Ficus carica L. In the floor of herbaceous plants 62 plant species are found: Sedum acre L., Asplenium trichomanes L., Teucrium chamaedrys L., Tussilago farfara L., Arum maculatum L., Bellis perennis L., Linum austriacum L., Sanquisorba minor Scop etc.

RESEARCH ON POSSIBILITY OF BIOREMEDIATION OF DEVASTATED SURFACES BY FILLING WITH INDUSTRIAL WASTE AND PLANTING FAST-GROWING TREES

[1]Zehrudin Osmanovic, [2]Nedžad Haracic, [3]Nisad Avdic, [4]Samira Huseinovic, [5]Sanida Bektic

[1]University of Tuzla, Faculty of Technology, Bosnia and Herzegovina
[2] Cement Factory Kakanj d.d., Heidelberg Cement Group Kakanj, Bosnia and Herzegovina
[3]Sisecam soda Lukavac Ltd., Lukavac, Bosnia and Herzegovina
[4,5]University of Tuzla, Faculty of Natural Sciences and Mathematics, Bosnia and Herzegovina

zehrudin.osmanovic@untz.ba

Keywords: industry, industrial waste, mines, bioremediation, fast-growing tree

ABSTRACT:

Vast areas are degraded due to opencast mining of coal and other mineral resources. According to the legislation which treats the exploitation of mineral resources and environmental protection, mines have an obligation to recultivate degraded areas, which is usually not the case. On the other hand, the development of industrial production followed by the exploitation of raw materials, with the decreased technological efficiency, resulted in the occurrence of a large amount of waste materials for which there were no purposes. Its direct consequence is the creation of small or large landfills near the industrial settlements.
This paper deals with the resulted industrial waste, industrial landfills, their capacity and structure. The aim of this paper is to find possibilities to use this waste after the treatment/separation. Several variants were discussed, from reusing waste in the industry to filling the devastated surfaces resulting from the exploitation of coal and their bioremediation by planting fast-growing trees.

NATURAL POTENTIAL OF VASCULAR FLORA AND PART OF FAUNE MOUNTAIN PRENJ - RUJISTE AND BIJELE VODE

Emina Ademović[1], Denisa Žujo Zekić[1], Edina Jasarević[1], Aldin Boškailo[1]

[1]Department of Biology, Faculty of education, University "Džemal Bijedić" in Mostar, USRC Midhat Hujdur Hujka, Sjeverni logor bb, 88 104 Mostar, Bosnia and Herzegovina

Corresponding author: Emina Ademovic;
E-mail: emina.ademovic@unmo.ba

Key words: flora, fauna, phytocoenological footagy, floristic composition of vegetation, biodiversity

ABSTRACT :

In the processes of integration and reconstruction of the Bosnian-Herzegovinian social, economic and scientific-research infrastructure, the natural resources contained in biological and ecological diversity are also of considerable importance. One such natural resource is the Prenj Mountains.

On the Prenj mountain two sites were selected (Rujište and Bijele vode), where research was conducted in the spring and autumn of 2016 with the aim of determining the diversity and distribution of certain plant and animal species inhabited by the forest and meadow ecosystem of the investigated area.

Using the Braun-Blanqet method (1964), a seasonal phytocenological survey was carried out at the sites where it was found that a large number of plant species belonging to different systematic categories exist on the same site. The research found that 96 plant species exist in the investigated area. The most numerous families are: Asteraceae with species Achillea millefolium L., Anthemis arvensis L., Chrysogon sp., Mycelis muralis (L.) Dum., Tragopogon orientalis L., Leucanthemum vulgare W., Tanacetum macrophyllum., Amphoricarpos autariatus Blecic & E. Mayer., Leontodon incanus (L.) Schrank.), then Rosaceae family of species: Rubus sp., Crataegus monogyna Jacq., Rosa canina L., Sanguisorba minor Scop., Fragaria vesca L., Filipendula hexapetala Gili., Cotoneaster integerrimus Medik., Amelanchier ovalis Medik and family Lamiaceae with species: Ajuga genus L., Calamintha grandiflora (L.), Moench Stachys silvata L., Teucrium chamaedrys L., Prunella grandiflora (L.) Scholler., Satureja subspicata Vis. ssp. Other species are represented by: Fabaceae, Ranunculaceae, Aceraceae Betulaceae, Euphorbiaceae, Crassulaceae, Pinaceae, Poaceae, Aspleniaceae, Polygonaceae, Liliaceae, Lamiaceae, Fabaceae, Ranunculaceae, Aceraceae.

In the biodiversity of the observed area, with reference to the inventory of animal species inhabited by forests and meadows of this area, there exist certain communities of the animal world: alpine triton - Ichtyosaurus alpestris, yellow cone -Bombina variegata, entomofauna (Ischnura pumilio, I. elegans, Aeshna cyanea, Sympetrum striolatum), Lacerta viridis, Podarcis muralis. The presence of European venom (Ophidia) was observed: vipera - Vipera ammodytes, bark - Viper berus, smuk - Zamenis longissimus etc. The herpetology of the area is also highlighted by Algyroides nigropunctatus and the species Testudo hermanni.

THE PROBLEM OF PRESERVATION OF ENVIRONMENT IN TEACHING TECHNICAL EDUCATION

Šeherzada Tahić, Safet Velić, Zulfo Ahmetović

Primary School "Bužim" General Izet Nanić ;os.buzim@bih.net.ba
Pedagogical Faculty Sarajevo,Skenderija 72,Sarajevo ;velic.safet@bih.net.ba
Center for upbringing ,education and rehabilitation "Vladimir Nazor" Aziza Šaćirbegović 80 Sarajevo

zulfo.ahmetovic@hotmail.com
velic.safet@bih.net.ba

Keywords: environment, ecology, education, technical education

ABSTRACT:

The problem of preservation of the environment in teaching of technical education is ultimately one of the issues that is posed to modern forms of education nowadays. We live in a world where engineering and technology offer unprecedented opportunities that are available to the humankind. All sectors of the economy, industry and traffic have experienced an envious level of development and the products of their functioning have enabled faster movement and far easier and better quality of life in the environment where people live. Moreover, there is always a question of negative factors which, as a consequence of this development, are the causes of threaten and damaging areas with long-term consequences, which again leads to a certain link between ecological issue and restriction that must be placed on the way of working of many economic subjects so as in some extent it was respected. Because of that it is very important for children in primary schools to be well aware of environmental protection and at the same time by adopting knowledge in the field of engineering and technology in order for the effect to be complete. We are witnessing that although the advancement of science and technology contributes remarkably to the quality of life in all segments and in all fields of human life and work, we are often overwhelmed with images that show how much by unforgivable behavior of mass-produced entities the human existence is questioned. Wild landfills, systemic destruction of green areas reserved for the construction of traffic infrastructure, large quantities of deterioration of seawater and lakes, mass extermination of animal species and the modification of global atmospheric images are just signs that presents an alarm to warn that it is necessary to approach the ecological way of thinking. Considering that and all the above, we must be aware that it is crucially to influence the behavior of man as the primary offender for conscious creation of ecological crises through proper upbringing and education.

THE CONCEPT OF EDUCATION ENVIRONMENTAL PROTECTION AND IMPROVEMENT

Sait Kačapor

Novi Pazar

saitkacapor@gmail.com

Keywords: Education, environment, human health

ABSTRACT:

This paper points to the necessity of organized, systematic and planned upbringing,especially in the institutions of the education system (preschool, elementary, secondary anduniversity) for the protection and improvement of the environment. Protecting and improving theenvironment is closely related to the protection and improvement of human health. When it comes to upbringing, considered the widest and most comprehensive pedagogical term, theeducation for the protection and improvement of the environment and in this regard protectionand improvement of health, it is not enough to focus on one subject, or on a group of subjects, ordifferent courses and presentations. This particular aspect of education must be an integral partof the overall education and go through the contents of all teaching subjects and extracurricularactivities.

In the paper, as practiced in pedagogical theory, education is viewed through fiveessential components: physical and health education, intellectual education, moral education,work and technical education, and aesthetic education.The key feature of this paper is that theprotection and improvement of the environment, and in this regard, the health, are observedwithin each of the educational components. In this way, it is directly intended to point out thatthere is no curricular and extracurricular activity, that there is no educational work that can notbe traced back to the necessity for the education on the protection and improvement of theenvironment. In other words, the paper presents the education for the protection of theenvironment as the basis for total educational activity in the institutions of education fromkindergarten to the highest academic level.

AIR QUALITY POLLUTION IN TUZLA AND LUKAVAC – COMPARATIVE REVIEW FOR 2016. AND 2017.

Abdel Đozić[1], Nedim Hodžić[2], Vahida Selimbasić[1], Vedran Stuhli[1], Mirnesa Zohorović[1], Hana Alihodžić[1]

[1] Faculty of Technology, University of Tuzla, 75000 Tuzla, Bosnia and Herzegovina
[2]MC-Bauchemie, 46238 Bottrop, Germany

abdel.dozic@untz.ba

Keywords: air quality, particulate matter, pollution, emissions

ABSTRACT:

The urban area of Tuzla and Lukavac, due to the industrial facilities in the immediate vicinity, belongs to the category of the most polluted areas in Bosnia and Herzegovina. Compared to the $PM_{2.5}$ particulate matter pollution, according to WHO data for 2014, Bosnia and Herzegovina is the most polluted country in Europe. Excessive air pollution is particularly evident during the winter period where the measured SO2 and PM2.5 concentrations exceed the limit values. The negative impact of the polluted air is particularly pronounced on the health of the general population, which is reflected in an increase in the number of respiratory and heart diseases. This paper presents the results of the comparative air quality analysis for 2016 and 2017 for Tuzla and Lukavac. The average measured annual concentrations of SO_2 and $PM_{2.5}$ show the limit values exceeded and the increase in air pollution in 2017. During the year 2017, extremely high concentrations of SO_2 and $PM_{2.5}$ were recorded.

ADSORPTION OF CADMIUM IONS FROM WATER SOLUTIONS BY MODIFIED Ca-BENTONITE CLAY

Nedim Hodžić[1], Abdel Đozić[2], Vahida Selimbasić[2], Franc Andrejaš[2], Indira Šestan[2], Hana Alihodžić[2]

[1] MC-Bauchemie, 46238 Bottrop, Germany
[2] Faculty of Technology, University of Tuzla, 75000 Tuzla, Bosnia and Herzegovina

nedim.hodzic@mc-bauchemie.com

Keywords: waste water, bentonite, adsorption, cadmium

ABSTRACT:

Bentonite is the name for the clay sediment of volcanic origin with high mineral content of montmorillonite. It belongs to a group of clay minerals, dioctahedron smectite subgroups, whose basic structural unit consists of two tetrahedral coordinated layers of silicon ions, among which one octahedral layer is made of aluminum ions. Bentonite clay has a wide-ranging application in environmental protection that is reflected in their application and soil protection against erosion, stabilization and recultivation of contaminated soil, detoxification of drinking water and waste water purification. These properties of bentonite, distribution and low price make it a good sorbent of organic pollutants but also heavy metals from waste water, which contributes significantly to its application in environmental protection. The aim of the paper was to determine the possibility of using modified Ca-bentonite in the treatment of waste water with heavy metals. For the preparation of waste water, stock solutions were prepared from CMR for cadmium in different concentration ranges. The percentage of removal of cadmium for bentonite modified with HCl ranged from 89.50% to 96.89%, a slightly lower percentage of adsorption was observed for bentonite modified with H2SO4 ranging from 86.54% for initial concentration of Cd of 3 mg/l to 94.78% for Cd concentration of 0.5 mg/l. The highest percentage of adsorption Cd was observed for thermally modified Ca-bentonite, the adsorption percentage ranged from 75.63% to 97.60%. The modified Ca-bentonite used in this study represents a very economical and applicable natural adsorbent for lowering cadmium ions at lower concentrations.

ENVIRONMENTAL QUALITY ANALYSIS NEAR THERMAL POWER PLANT „TUZLA“

Abdel Đozić[1], Nedim Hodžić[2], Vedran Stuhli[1], Franc Andrejaš[1], Hana Alihodžić[1]

[1] Faculty of Technology, University of Tuzla, 75000 Tuzla, Bosnia and Herzegovina
[2]MC-Bauchemie, 46238 Bottrop, Germany

abdel.dozic@untz.ba

Keywords: heavy metals, coal, ash and ash, thermal power plants

ABSTRACT:

The Tuzla thermal power plant is the largest thermal power plant in Bosnia and Herzegovina, according to the amount of waste streams it is the dominant pollutant of the Tuzla region, whose influence on the air is recognizable through the emission of flue gases and on soil and water with slime and ash emissions. Sand and ash is the most significant waste stream generated by coal combustion. During combustion, some of the elements go into the gaseous state, adsorbed onto solid particles and emitted into the atmosphere, the remaining elements are incorporated into slag and ash where it can also reach their concentration. Eightin samples of slag and ash were analyzed for the following heavy metals: As. Cd, Cu, Hg, Cr, Pb and Zn. The highest concentration was recorded for Cr and was 186.2 mg/kg and the lowest for mercury 0.003 mg/kg. Metal concentrations are reduced in the following order: Cr> Cu> As> Zn> Pb> Cd> Hg. According to the pollution level of 398,393, ash and ash have been extremely polluted by arsenic, and on this basis, it is forbidden to cultivate plants for human and animal use, with the necessity of carrying out technical and biological recultivation measures. Analysis of the PM_{10} particulate matter content in the presence of heavy metals shows an extremely high concentration of aluminum which is being studied more and more in environmental studies as a potential cause of many diseases. In addition to alumina, the Pb, As and Cr. In all samples of surface water, the concentration of chromium and nickel is increased, which makes water highly polluted. The presence of As and Cd in hair samples was found, with 33.3% of the As concentration of the subjects above the recommended values. By analyzing samples of plant and animal origin, the presence of lead exceeds the permitted limit value in root crops (garlic, red onion) in the Divkovici and Plane settlements. In the analyzed sample of fish concentration of heavy metals did not exceeded permitted values, however bioavailability of arsenic and mercury was observed.

ENVIRONMENTAL AUDIT

Muamer Peljto, Aleksandra Obradović, Andrea Čurea

TUVADRIA d.o.o. Sarajevo, Muhameda ef. Pandže bb

muamer.peljto@tuvadria.com

Keywords: ecological audit, man, nature, criteria, standards, responsibility

ABSTRACT:

Since the creation of human beings, man and nature have developed and progressed harmoniously. Nature helped the man to survive, offering him his wealth, and was selfless toward him. By developing science and technology, in the race with the industry's development in order to earn as much profits, man has forgotten on nature. Today, there are methods and quality tools to prevent endangering the balance in nature. In order to be sure that one does not take more from nature than giving it back, it is necessary to perform constant measurements and conduct an environmental audit.

The concept of audit means a systematic, independent and documented process of collecting and evaluating objective evidence of compliance with and meeting the criteria under which the audit was carried out. The audit criteria were defined by the implementation of the quality management system that has been audited. In the environmental management system, this is ISO 14001 and the internal documentation of the organization's management system that has been audited. This paper presents the way and how to preserve the balance between man and nature.

PHYTOREMEDIATION OF WASTEWATER WITH DUCKWEED (*LEMNA MINOR L.*)

Jasmina Ibrahimpašić, Merima Toromanović, Azra Bakrač, Subha Džafić

University of Bihać, Biotechnical faculty
Luke Marjanovića bb, 77000 Bihać

toromanovic_merima@hotmail.com

Keywords: phytoremediation, duckweed, synthetic wastewater

ABSTRACT:

Water is a renewable resource, and renewal is carried out through the natural way and processes managed by man. Today, it is evident that new wastewater treatment technologies are being introduced, which do not further burden the environment with new, harmful chemical substances and nus products of treatment. Alternative methods used by plants for the removal of pollutants from contaminated water, soil and air could, under one name, be referred to as phytoremediation. Plants play an important role in removing heavy metals and other pollutants from wastewaters because they do not only absorb nutrients from contaminated soil and water but can absorb and accumulate toxic elements.

Lemna minor is one of the fastest growing water plants. It is a small floating plant that is found in the waters of the stalls and rivers. It is used for wastewater purification because it has the ability to bind nutrients (carbon, nitrogen and phosphorus) used for protein synthesis, has the ability to bind simpler organic compounds that can be assimilated in the form of carbohydrates and various amino acids, and the abillity of bonding and removing heavy metals and toxic substances from wastewaters.

In the study, synthetic wastewater with heavy metals was prepared. Samples were analyzed before and after phytoremediation with duckweed. The duckweed was stored under appropriate conditions (suitable temperature and sufficient amount of light), and after the experiment the efficiency of phytoremediation was calculated. The results of the research show that L. minor is extremely efficient in the phyto-accumulation of heavy metals: iron, cadmium, zinc, lead, cobalt and chromium.

The aim of the paper is to familiarize the phytoremediation technologies and their use with the possibility of using them for wastewater treatment with duckweed (Lemna minor L.).

PROBLEMS OF ENVIRONMENT PROTECTION

Esad Bajramović[1], Senada Pobrić[2], Atif Hodžić[1]

[1]Univerzitet u Bihaću, Tehnički fakultet Bihać, Dr Irfana Ljubijankića bb
esad.bajramovic@unbi.ba
[2]Univerzitet „Džemal Bijedić“ Mostar, Mašinski fakultet, Univerzitetski Kampus 88104 Mostar
senada.pobric@unmo.ba

Keywords: ecology, problems, environmental protection, water, soil, scientific methods

ABSTRACT:

The aim of this paper is to emphasize several issues that point to problems arising from non-implementation of the laws of Bosnia and Herzegovina related to environmental protection. Why it is necessary to harmonise the value of laws and the environment? Environmental protection is a set of appropriate activities and measures aimed at preventing the environmental pollution, preventing the occurrence of damage, reducing and removing damage to the environment and restoring the environment to its original state.
It refers to maintaining the quality of drinking water, air, land, natural resources, plants, animals and human health. This means that, for the purpose of environmental engineering, scientific and engineering methods are applied in order to build up protective systems that will protect life on earth from many types of pollution.

ANALYSIS OF TIME SERIES IN THE ASSESSMENT OF WATER QUALITY OF DABRAVINA VELIKA KLADUŠA

Džemila Agić[1], Halid Makić[2], Sejfudin Agić[3], Samira Dedić[2], Ifet Šišić[2], Adijan Ružnić[4]

[1]Centar za energiju i ekologija Filipa Kljajića 22, Tuzla 75000
[2]Biotehnički fakultet Univerziteta u Bihaću, Luka Marjanovića bb 77000 Bihać
[3]Elektrotehnička škola Muhameda Hevaije Uskufija 2, Tuzla 75000
[4]JKUP KOMUNALIJE Ive Marinkovića, Velika Kladuša

sisic_btf@yahoo.com
samira.dedic@yahoo.com

Keywords: time series, water quality, water resources

ABSTRACT:

In order to ensure more adequate protection, conservation of water resources for the aquatic population, the selection of water preparation technology, consideration should be given to the problem of deterioration of groundwater quality resulting from uncontrolled human activities, uncontrolled pollution and the mild reduction of pollutant emissions in order to adjust their concentration to the limit values prescribed.

Many factors contribute to variations in groundwater quality. Their inherent indeterminacy carries weight, as a greater number of variables affect the quality of water, and therefore the quality of groundwater quality and qualitative decision-making on the basis of the data obtained is a very complex and multidimensional task. Complexity refers to work with a large number of variable variables of quality (physical-chemical and biological), the influence of natural perturbations or intermittent pollution, meteorological parameters, and hydrological parameters. Water quality monitoring data is not practical for use if they are not numerically processed and do not find the numeric linkage of these data. This paper analyzes the time series of water quality data for Dabravina Velika Kladuša for a period of 6 years for nine parameters. Time series are defined as sequencesnumerical data arranged by chronology. By this time, the timing of time series is interdependent, given their time sequence. It is in this time-scale of water quality parameters that is based on the analysis of time series. In this paper, mean values and standard deviations, linear trend and regression analysis were performed.

The results of the statistical analysis are credible and it is better to analyze a larger number of input data, but on the other hand, statistics are a compulsory preparatory step for analysis with more complex software.

SOIL POLLUTION ANALYSIS ON HEAVY METALS LEAD, CADMIUM AND ZINC NEAR THE M4.2 HIGHWAY

Medić Emina[1], Muhamedagić Fatima[1], Abdić Jasminka[1], Džaferović Aida[1], Salkić Kemal[2], Jaganjac-Mehadžić Adijana[2]

[1]Univerzitet u Bihaću, Biotehnički fakultet, Ul. Luke Marjanovića bb, 77000 Bihać
[2]Poljoprivredni zavod Unsko-sanskog kantona, Ul. Omera Novljanina 4, 77000 Bihać

eminamedic@hotmail.com

Key words: soil, lead, cadmium, zinc, AAS, degree of contamination

ABSTRACT:

Nowadays have pollution effects of traffic become a significant ecological problem for agricultural lands. Most endangered are lands next to highways with high traffic intensity. One of the highways with the most traffic in Unsko-sanski kanton is the M4.2 highway.
In the following work are presented results of analysis on heavy metal concentration for lead (Pb), cadmium (Cd) and zinc (Zn), for the agricultural land next to the M4.2 highway in Mihaljevac settlement, minicipality of Cazin. Soil samples were taken at a distance of 2,5m, 5m and 10m from the road, both from the left and the right side, from two different pieces of land about 500m apart.
The goal of this research was to determine contamination degree (So) when it comes to aforementioned heavy metals, in the parts that are closest to the road. Samples were analysed with an atomic absorption spectrophotometer (AAS), using an open flame technique. Value levels for heavy metals were compared with border values that are set by law regulation of F BiH.
The results have shown very low contamination degrees. Maximum values of lead were 0,00128 (left side) and 0,00126 (right side), of zinc 0,00013 (left side) and 0,0011 (right side), of cadmium 0,0676 (left side) and 0,0682 (right side). These values are indicating that inspected soil is clean, first class soil, at least when it comes to contamination with Pb, Zn and Cd.

REDISCOVERY OF GENUS *LEPIDURUS* (CRUSTACEA, NOTOSTRACA): NEW DATA OF OCCURRENCE IN BOSNIA AND HERZEGOVINA

Dragana Miličić[1], Goran Šukalo[2], Dejan Dmitrović[2], Ivana Šaganović[1], Srećko Čolić[1]

[1]University of Belgrade, Faculty of Biology, Studentski trg 16, 11000 Belgrade, Serbia
[2]University of Banja Luka, Faculty of Natural Sciences and Mathematics, Department of Biology and Department of Ecology and Environment Protection, Mladena Stojanovića 2, 78000 Banja Luka, Republic of Srpska, Bosnia and Herzegovina

draganam@bio.bg.ac.rs

Keywords: *Lepidurus*, new finding, Bosnia and Herzegovina

ABSTRACT:

Genus Lepidurus belongs to the ancient order Notostraca, whose taxa are referred as 'living fossils' in crustacean evolution. This genus has been recorded in Bosnia and Herzegovina at Livanjsko polje almost 40 years ago, in the southwest of the country. Recently, we made screening of astatic water bodies along the Sava River that were not formerly known to have large branchiopods. During spring 2016, we found and documented new population, for the first time since 1979, in considerable large stagnant flooding areas near the village Bajinci in the northern part of the country. A great number of individuals could be seen in shallow water rich in submerged macrophytes. The water was rich in dissolved oxygen, and pH was slightly alkaline. The sex ratio of discovered population was heavily biased in favour of individuals with ovisacs hence population is characterized as highly female-biased. Our report indicates that flooding areas and other temporary waters can contain very rare crustacean populations, which have highly restricted distribution. However, when the protection of these aquatic habitats is concerned, they have still drawn a little attention in Bosnia and Herzegovina.

THE INFLUENCE CONCENTRATION OF THE SODIUM HLORIDE ON PROPERTIES SOLUTION SODIUM LAURILETERSULPHATE IN WATER

Pero Dugić[1], Tatjana Botić[1], Aleksandra Šinik[1]

[1] University of Banja Luka, Faculty of Technology, Stepe Stepanovića 73,

pero.dugic@tf.unibl.org; tatjana.botic@tf.unibl.org; aleksandra.sinik@tf.unibl.org

Keywords: critical concentration of micelle, sodium hloride, sodium lauryl ether sulfate

APSTRACT:

The critical concentration of micelle (CMC) is the characteristic concentration of surfactant in which the micelles can be considered formed. In these areas of concentrations, there are changes in many physical properties of the surfactant solution, such as surface tension. By measuring the change in surface tension with the concentration of surfactant, CMC can be determined. The value of CMC depends on the chemical type surfactant, but also on the presence of additives. In this paper, the effect of sodium chloride concentration on the value of surface tension and critical micellar concentration of sodium lauryl ether sulfate solution as one of the most frequently used active components in the wash agents was tested.

GREEN POLICY OF SLOVENIAN TOURISM

Marjetka Rangus, Mitja Gorenak, Boštjan Brumen

University of Maribor, Facutly of Tourism, Cesta prvih borcev 36, 8250 Brežice, Slovenia

marjetka.rangus@um.si

Keywords: tourism policy, green tourism, tourism planning

ABSTRACT:

Slovenia is sometimes presented as the green pearl in the heart of Europe. The slogan of Slovenian tourism »Green. Healthy. Active.« is promoting a story of Slovenia as five-star boutique destination, based on many green facts and commitment to high quality service. With around 60% of its surface covered in forest, Slovenia is among most forested countries in Europe. In quantity of river water per inhabitant, Slovenia is one of the richest countries in Europe. Its more than 22,000 animal and plant species rank Slovenia among the most nature-wealthy countries in Europe. Drinking water in Slovenia is among the purest in Europe and even in the world. In addition to this, virgin forest can be found just 60 kilometres from the capital city, Ljubljana. In 2016 Slovenia has become the first Green Destination in the world, proceeded and followed by many other awards honouring Slovenian green tourism development. In 2014 Slovenia has adopted green policy of Slovenian tourism, following first strategic guidelines and action from 2009. The Green Scheme of Slovenian Tourism (GSST) is a tool and certification programme that aims at bringing together different partners from different sectors in order to promote green and quality tourism development for present and future. In 2017 Slovenia adapted national strategy for sustainable growth of tourism 2017-2021 and in 2018 the new Act on Promotion of Tourism Development was enacted. In this paper in-depth analysis of Slovenian green policy is presented.

DIGITALIZATION AND SAFETY IN TOURISM: EU-LEVEL THEMATIC INITIATIVE

Boštjan Brumen, Marjetka Rangus, Mitja Gorenak

University of Maribor, Faculty of Tourism, Cesta prvih borcev 36, Si-8250 Brežice, Slovenia

bostjan.brumen@um.si

Keywords: tourism, policy, digitalization, safety, investments

ABSTRACT:

There are several common issues impacting the Tourism industry across Europe, such as security and safety, economic competitiveness, ICT-related issues and competition from other destinations. The European tourism businesses need to create solutions to address these issues that go beyond their borders. It is thus crucial to link the fragmented potential and solutions developed in Europe and use the available tools and information to create a horizontal answer for the tourism industry. The mission of the "Digitalization and Safety in Tourism" partnership is to provide collaborative solutions to reinforce the regional innovation capacity to facilitate investments based on open innovation infrastructure or new technology by clusters in regional innovation ecosystems. The paper describes the partnership and outlines its main contribution.

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