A POSSIBLE APPLICATION OF LICHEN IN DENTAL PRACTICE

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ABSTRACT

Possible application of the lichen genus Cladonia in dental practice due to antibacterial properties of lichen acids and enhanced bioavailability of obtained product after mechanochemical processing.

Keywords: biotechnology, biochemistry, lichen, dental, mechanochemical

A STUDY OF THE SURFACE PROPERTIES OF BACTERIA CAPABLE TO BOND HEAVY METALS FOR THE USE IN ENVIRONMENTAL BIOTECHNOLOGY

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ABSTRACT

In this study, the bacteria were isolated from heavy metal contaminated environments, and the applicability of their ability to remove heavy metals from polluted environment was evaluated at a laboratory scale. We have identified species with the highest efficiency for the removal of zinc, lead and cadmium from the model solutions. The results of study show that most of species had a hydrophobic cell surface, which probably had an influence on their ability to bound heavy metals. In many species of soil bacteria we have found out the structure of their surface receptors via experiments focused on testing their bond to ECM molecule. Different ability to bond each ECM molecule will probably be useful in searching good potential absorbents of heavy metals among a microorganism.

Keywords: bacterial surface, heavy metal, absorption

ADVANCED BIOTECHNOLOGIES FOR OBTAINING BIODEGRADABLE COLLAGEN BASED "CORE-SHELL/HOLLOW" STRUCTURAL NANO - SIO_2 COMPOSITE AND ITS APPLICATIONS FOR DRUG

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ABSTRACT

The aim of the paper is to create new biomaterials- biodegradable *protein (Collagen)-based "Core-Shell/Hollow" structural nano- SiO_2 composite* and to find applications for drug delivery system. These surfactant based composites can used for biomedical field, for ensure health and improvement of life quality. Biocompatibility between drugs and substrates (membranes, matrices, polymer films, hydrogels, creams, capsules, pearls, powders, nanoparticles) is a very important issue for the optimal prescription of different treatments for the human body and maintaining health.

It was obtained biomaterials by immobilizing drugs on various polymeric substrates, establishing the optimal conditioning formula, both in the preparation phase and in the adsorption phase of active components on the substrate. These are structured nanoparticles which contain a core from one material (or hollow) and a protective shell from another material, with sizes ranging between: 20 and 200 nm. The basic composition for both the core and the shell can be changed, providing a wide range of properties and applications (e.g. nanosensors, dyes).

"Core-Shell/Hollow" structures are synthesized in two stages: the core is synthesized through conventional polymerization in emulsion and then it is incubated with a secondary emission, containing monomers and initiators, synthesizing the shell. The droplet fusion process and monomer migration determine core occurrence in the second emulsion, on which shells are formed by polymerization.

Protein/"Core-Shell/Hollow" and SiO_2 nanoparticle structures, with applications in controlled drug release systems are a new trend in biomedicine and a challenge for experts in the field.

Keywords: biopolymer, "Core-Shell" composites

ANTI-AGING EFFECT ON OCULAR TISSUES OF ANTIOXIDANT VEGETAL SUPPLEMENTS FROM ROMANIAN MARKET

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ABSTRACT

The aim of the paper is to reveal any differences of therapy response which might be related to antioxidant activity of anti – aging vegetal supplement represented by tablets that contain active vegetal principles such as (*Coleus forkohlii* extract, omotaurina (a natural molecule extracted from certain varieties of seaweed, able to get to all body tissues, including the central nervous system, GABA and taurine like structures), magnesium, L-carnosine; vitamins (B_2, B_6, B_1) and folic acid. For this reason we used 3 groups of 40 persons of each one divided after gender (males and females) and age (20 – over 65 years) and different affections (20 patients with myopia, 15 patients with macular degeneration, 5 patients with peripheral retinal degenerescence), from these 3 groups one was the control one. From the two experimental groups, one received daily 1 tablet, and the other one, received daily 2 tablets, both over one year. Clinical evaluation before and after the treatment of these vegetal supplements action was done by Amsler ophthalmologic test, visual acuity, visual field, ophthalmological examination for degenerescence maculopathy. For peripheral retinal degenerescence, clinical evaluation of the vegetal supplements action was done by visual acuity, visual field, ophthalmoscopic aspect of the retina and for myopia disease by refraction, visual acuity, visual field and ophthalmoscopic examination. The antioxidant activity of these different vegetal used supplements was determined by a photochemiluminescence method, based on the multiple acceleration of a natural reaction leading to the generation of a superoxide anion radical. The measured anti-oxidative capacity is then quantified by comparison with a standard substance used for calibration, Trolox as tocopherol analog using Photochem, Analytik Jena AG apparatus. The antioxidant capacity results show that after the treatment based on different vegetal active principles, some of visual parameters improved or at least remained the same compared to control group, without treatment.

Keywords: anti-aging effect, ocular tissue, vegetal supplement, antioxidant activity

ANTIBACTERIAL AND ANTIFUNGUL EFFECTS OF FLAVONOÏDS ISOLATED FROM *CRATEAGUS OXYACANTHA* (L.) FRUITS IN THE NORTH ALGERIAN REGIONS (BOUMERDES AND BAINEM)

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ABSTRACT

The extracts of plants are currently the subject of many scientific researches aiming to exploit their properties antimicrobial appreciated so much in the therapeutic, nutritional, cosmetic, and pharmaceutical fields. In this work, we have study the antimicrobial activity of the extracts namely flavonoïds resulting from the *Crateagus oxyacatha* fruits in two bioclimatic stages (Dellys and Bainem). The determination of the antimicrobial effects on stocks bacterial of $Gram^{-}$; *Escherichia coli, Pseudomonas aeruginosa* and *Klebsiella pneumoniae* and $Gram^{+}$ (*Bacillus subtilis* and *Staphylococcus aureus*). We have also tested two yeasts; *Candida albicans and Saccharomycec cereviciae*.

As regards the extract of *C. oxyacantha* of the area of Bainem, one announces that *E. Coli* is slightly sensitive to the extract of *C. Oxyacantha.* However *S. aureus and B. subtilis* have a strong sensitivity to this extract. Whereas the other bacteria are fairly sensitive.

With regard to yeasts, one notices that *S. cerevisiae* is slightly resistant to the extract. This solution has an inhibiting effect on *C. albicans*.

Concerning the extract of *C. oxyacantha* of the area of Dellys, one notes that *E.Coli* is slightly sensitive to the extract of *C. Oxyacantha*. However *S. aureus and B. subtilis* have a strong sensitivity to this extract. Whereas the other bacteria are fairly sensitive.

With regard to yeasts, one notices that *S. cerevisiae* is slightly resistant to the extract. This extract has a strong inhibiting effect on *C. albicans*.

Through this study, one notices clearly the sensitivity of bacteria Gram-plus compared to the bacteria Gram-for the two areas.

Keywords: *Crateagus oxyacantha*, flavonoïds, bacteria, yeast, antimicrobial activity, Dellys, Bainem.

ANTIMICROBIAL ACTIVITY OF OIL EXTRACTED FROM THE ALMONDS OF THE FRUITS OF *ARGANIA SPINOSA* IN THE WEST OF ALGERIA (MOSTAGANEM)

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ABSTRACT

This work examines the study of the antimicrobrial effect of oil extracted from the almonds of *Argania spinosa* L. (Sapotaceae) in the area of Stida (Mostaganem). This natural substance is extracted by using the Soxhlet. The antimicrobial activity of this oil is evaluated on several microorganisms. It has been tested on five bacterial strains; *Escherichia coli, Pseudomonas aeruginosa, Klebsiella pneumoniae*, *Bacillus subtilis* and *Staphylococcus aureus*. The extract has been studied by using *Candida albicans.* It should be noted that these agents are characterized by a high frequency of contamination and pathogenicity.
Through this study, we note that these microorganisms are moderately sensitive to the argan oil.

Keywords: *Argania spinosa*, oil, several microorganisms, almonds, antimicrobial activity.

ANTIOXIDATIVE ACTIVITY OF INDIGEN BITTER CHERRY FRUITS EXTRACT CORELLATED WITH POLYFENOLS AND MINERALS CONTENT

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ABSTRACT

The aim of this paper was to establish the content in polyphenols compounds and minerals from the fluid extract of indigen *Cerasus avium* (L.) Moench. *fructus* (bitter cherry) collected from Dobrudjia region, Romania, correlated with total antioxidative capacity (TEAC) of the soluble lipid compounds, through photo-chemiluminescence method, according ACL procedure of Analytik Jena AG, by comparing with the standard Trolox (tocopherol derivative) solution, using Photochem apparatus. The HPLC determinations of hydroalcoholic (70/30,v/v) fruits extract, identified an increased content of polyfenols compounds (gallic acid, 3-methyl gallic acid, chlorogenic acid, ellagic acid and cinnamic acid). *Cerasus avium* (L.) Moench. hydro-alcoholic fruits extract emphasize an increased total antioxidative capacity which may be attributed to the high level content of polyphenols compounds, especially gallic acid. The minerals and heavy metals content determined by AAS method, using ContraA-700 Analytik Jena AG spectrophotometer, conclude that no heavy metals (Pb, Cd, Hg) occur in fruits fluid extracts, but a high biometals and oligominerals content (Ca, Mg, Zn, Cu) was registered. The increased antioxidative activity correlated with the high minerals content sustains the possibility to use the *Cerasus avium* (L.) Moench. *fructus* fluid extracts in different molar ratio, as potential tincture in phytotherapy.

Keywords: bitter cherry, hydroalcoholic extract, antioxidative activity, polyphenols, minerals

APPLICATION OF BIOPOLYMER IN NATURAL RUBBER BLENDS

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ABSTRACT

Galactomannan-filled rubber blends were prepared, and the effect of galactomannan Locust Bean Gum (0 – 55 phr) and tenside sodium dodecyl sulfate (0, 3 phr) loading on natural rubber (NR) were investigated. Mechanical properties and hardness of Locust Bean Gum filled vulcanisates were measured before and after thermo-oxidative aging for 72 h at 100 °C. The results were compared with unfilled NR vulcanisates with and without sodium dodecyl sulfate. The results indicate that, overall, the scorch time (t_{S2}), cure time (t_{90}), tensile strength and elongation at break decrease with Locust Bean Gum loading, whereas an increment was observed in the maximum torque (M_{max}) and hardness of filled rubber blends. Rubber-filler interaction was measured by FT-IR. The effect of galactomannan loading on thermal properties of NR blends was studied by TGA. Morphology of the tensile fractured surface of the vulcanisates was studied using by scanning electron microscopy (SEM). SEM analysis confirmed filler agglomeration formation of NR blends as hydrophilic Locust Bean Gum loading was increased. Dynamic mechanical thermal analysis (DMA) results showed change in the glass transition temperature (T_g) of the rubber matrix upon addition of Locust Bean Gum.

Keywords: elastomeric blends, biopolymers, mechanical properties, natural rubber, curing characteristic

APPLICATION OF INTERNATIONAL STANDARDS, REFERENCE DOCUMENTS ON BEST AVAILABLE TECHNIQUES AND GUIDELINES ON BEST PRACTICES IN THE BAKING INDUSTRY

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ABSTRACT

Opportunities for the modernisation of the larger baking industries using approaches of business process reengineering approaches and implementing Best Available Techniques are considered. Peculiarities of the application of ISO standards on Management Systems are discussed.

Keywords: Food industry, baking industry, Best Available Techniques, process-structural planning, business-processes reengineering.

APPLICATIONS OF A NEW METHOD OF DETERMINING LORATADINE BY HPLC/DAD FROM VARIOUS DOSAGE FORMS AND BIOLOGICAL SAMPLES

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ABSTRACT

The aim of current study is to see if this new HPLC/DAD method, which was performed, established and validated in our previous researches, is suitable for the analysis of drugs in pharmaceutical chemistry and for clinical purpose.

HPLC/DAD method was applied to various pharmaceutical forms, from the Romanian market (oral tablets with loratadine, modified release tablets with loratadine and pseudoephedrine sulphate and syrup with loratadine) and biological samples (serum, urine and breast milk).

For the determination of loratadine in human serum and urine were sampled blood and urine of 6 healthy volunteers, who agreed to receive loratadine orally in doses of 10 mg once daily (normal therapeutical dosage) at the same time (9:00 AM). The sample of breast milk has been taken from a woman volunteer diagnosed with urticaria, two months after giving birth.

The sampling was done to 0 hour, 1 hours, 2 hours, 3 hours, 6 hours and 8 hours after the administration of antihistamine treatment (10 mg loratadine). All volunteers are adults, similar ages, race and weight.

Sampling was done during three days at the same time of day.

Chromatographic conditions were as follows: HPLC Agilent 1200 quaternary pump, DAD, thermostat, degassing system, autosampler, column chromatography type C18 (250 x 4.6) 5µm XDB - C18 Agilent (Zorbax Eclipse XDB-18 or equivalent, flow 1 mL/min, column temperature: 27°C, injection volume: 10 mL, mobile phase: 0.01% solution of triethylamine adjusted to pH = 2.75 with ortho-phosphoric acid / acetonitrile (46/54, v/v)] - isopropanol (90/10, v/v), detection: 264 nm; the concentration of samples was calculated using the calibration equation and then it was statistically processed.

A recovery of 98.51% was registered on tablets with loratadine compared to the declared content of active substance. The recovery of 92.71% on modified release tablets with loratadine and pseudoephedrine sulphate and a 102.49% recovery on loratadine syrup were recorded. All values are within the permissible deviations according to European Pharmacopoeia.

A small increase of unmethabolised loratadine concentration in first time interval and then a decrease due to metabolism and renal elimination was noticed in serum samples. This method reveals the presence of loratadine in urine and breast milk without being altered by other components of the samples. HPLC method is sensitive and can detect traces of loratadine in all biological samples whereas its peak does not interfere with other peaks of sample components.

Finally, this method proved to be sensitive, valid and reliable in determination of loratadine in various dosage forms and biologic samples.

Keywords: loratadine, HPLC/DAD method, dosage forms, biologic samples, selectivity, sensitivity.

BIOGROUT TECHNOLOGY APPLIED ON TRANSILVANIAN SANDS

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ABSTRACT

Development of construction field in the past years lead to the necesity of finding new solutions for foundation soil improvement. Soil stabilisation is a problem that often occurs during the construction process and because of that, this topic became one the most important research topics in geotechnical engineering. This paper presents Biogrout Technology and the procedure used to apply it on Transilvanian sands. Biogrouting is a new biological ground improvement method in geotechnics, in which microorganisms (ureolytic bacteria: Sporosarcina Pasteurii DSMZ 33) are used to induce calcite based Microbial Carbonate Precipitation (MICP) in the ground in order to increase the shear strength and stiffness of granular sandy soils (source of carbon: $CO(NH_2)_2$, source of calcite: $CaCl_2$). The paper also presents the results obtained in the laboratory after testing the new material using triaxial compression tests.

Keywords: Biogrout, Microbial Carbonate Precipitation (MICP), Modulus of Elasticity, Triaxial compression test, Sporosarcina Pasteurii

BIOLOGICAL ACTIVITY OF SOME NEW Ln(III) COMPLEX COMPOUNDS BASED ON BIGUANIDE DERIVATIVES

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ABSTRACT

The *N*-substituted biguanide derivatives have shown a considerable attention for their antidiabetic and antimalarial activity and for the therapeutic treatment of pain, anxiety and memory disorders as 5-HT_3 serotonin receptors. The biological action of these complexes on the human body may be explained by the formation of these compounds. We have synthesized a new series of La(III) and Ce(III) complexes based on *N*-substituted biguanide. These derivatives were characterized by elemental analysis, molar electrical conductivity, IR, UV-VIS and electronic spectroscopy. In the present paper we report the biological effects of the new La(III) and Ce(III) compounds on the saprophyte bacterian *Halomonas* sp. isolated from Romanian Black Sea Coast. Also, the new complexes and ligand were tested against different Gram positive (*Staphylococcus coagulase positive*, *Streptococcus β-haemolitic A group, Streptococcus β-haemolitic B group*, *Streptococcus faecalis*, *Bacillus cereus*, *Corynaebacterium dyphtheriae)*, Gram negative (*Pseudomonas aeruginosa, Shigella flexneri*, *Escherichia coli*, *Salmonella B group)* bacteria strains and fungal (*Candida albicans*, *Saccharomices cerevisiae)* species for their antimicrobial action. The results emphasize that all complex compounds present antimicrobial activity compared with the ligand, against most of the tested species.

Keywords: Ln(III) complex compounds, *N*- substituted biguanide, biological activity

CHALLANGING THE BIOGEOCHEMICAL POTENTIAL OF ANTARCTIC YEAST: BIOREACTOR DYNAMICS IN VISCOUS BROTHS CONTAINING EXOPOLYSACCHARIDES

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ABSTRACT

The biogeochemical potentials of cold-tolerant Antarctic microorganisms to release organic matter has allowed production of valuable components of pharmaceuticals and food. Recently, a bioprocess for exopolysaccharides and biomass involving Antarctic yeast has been introduced and put forward for examination. The fermentation broth is viscous and non-Newtonian and good mixing and oxygen transfer are essential for the microorganisms. The paper presents a study of the bioreactor performance that evolves when using a modified backswept impeller termed impeller MV. As related to the importance of oxygen for the specific yeast metabolism and based on preliminary data, the bioreactor dynamics is studied both experimentally and by simulation. The impeller power draw gas volume fraction and oxygen mass transfer were measured and the bioreactor fluid dynamics corresponding to the bioprocess evolution were revealed. New experimental data is obtained. The results are compared with reference data for the conventional bioreactor equipped with two six flat-blade turbines. Both reactive and non-reactive conditions related to the bioreaction evolution are studied. Moderate rotational speeds typical for the conventional impeller were applied and the bioprocess time-course for the two mixing cases was registered. The bioprocess corresponding to MV mixing has been found to be slightly delayed what is discussed in terms of the impeller specific substrate distribution and its weaker gas dispersion function. Good gassed power draw and drag reduction properties of the impeller are found that allow its application at high rotational speed and further multiple impeller configurations.

Keywords: bioreactor, exopolysaccharides (EPS), Antarctic yeast, impeller mixing

CHROMOSOMAL ABERRATIONS INDUCED BY PENTIMETHALIN IN *ALLIUM SATIVUM* ROOT MERISTEMS

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ABSTRACT

Garlic (*Allium sativum*) is an edible plant used as food and spice. In popular medicine it is considered, along with the onions, a real remedy due to the rich content of vitamins and minerals. Pentimethalin is the active component of the herbicide Stomp 330 EC; this is frequently used by the farmers to control weeds in the garlic cultures.

Cytogenetic effects of Pentimethalin have been tested on the root tip cells of *Allium sativum L*., with a series of concentrations (1.5; 2 and 3 ppm), for 6, 12 and 24 hours. The control has been untreated. Garlic bulbs have been grown in water at room temperature (20 ± 2 °C); when the newly emerged roots are 2 cm in length, they are used in the test. Microscopic slides have been prepared by using Feulgen-Rossenbeck method for coloring the chromosomes and squash technique. The measurements were made under an optic microscope (two models have been used: MBL-2000 Kruss and Celestron 44340 LCD Digital) by considering 15 microscopically areas per slide. Two parameters were studied: the mitotic index and chromosomal abnormalities. The number of abnormal cells was counted in each phase of mitosis. The analysis of variance was used to assess the significant differences between control and each treatment. The results were analyzed using statistical program for Windows.

The effects of increasing concentrations of Pentimethalin were: decrease in mitotic index and induction of a high level of chromosomal abnormalities. Thus, the mitotic index decreased with increasing the herbicide concentration at each exposure time; on the other hand, various chromosomal abnormalities like rings, fragments, bridges, stickiness, laggards and micronucleus were observed. From this point of view, the bridges were generally observed in all treatment alternatives. The frequencies of chromosomal abnormalities increase with increasing the herbicide concentration. In this regard, the differences among the concentrations have been significant, when compared with untreated control. Our study reveals a direct correlation between herbicide concentration, exposure time and mutagenic effects observed in exposed *Allium sativum* root cells.

Cytologic effects of Pentimethalin to garlic, suggest prudence regarding abusive usage of this substance. However, supplementary studies are necessary to determine the molecular mechanisms whereby Pentimethalin induce genotoxic effects to plants. Besides, there are still many chemical substances for plant protection whose possible genotoxic effects are unknown.

Keywords: Garlic, Pentimethalin, mitotic index, chromosomal aberrations.

CLINICAL RESEARCH - MANAGEMENT OF PHYSICIAN – PATIENT COMMUNICATION

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ABSTRACT

The legitimacy of patient satisfaction as an outcome measure of health care has grown considerably over the past decade. Satisfaction is considered an indicative of quality of care. Satisfaction is also being used to assess the performance of health care delivery at multiple levels – organizational (hospital, clinic…), unit (surgery, laboratory, radiology, etc.) and individual (physician, nurses…). Satisfaction might be characterized as the net result of patient expectations filtered through perceptions of the patient acquires during and after the service encounter. When a patient's health care experience exceeds his or her expectations the experience is satisfactory; when the experience falls short of expectations, the experience is unsatisfactory. One of the dimensions of patient satisfaction, that is most frequently assessed, refers at the interpersonal aspects of care. On the other hand, the most frequently studied aspect of medical care is the extent and accuracy of communication between physicians and patients.

Keywords: Physician, patient, satisfaction, communication, patient perception and feelings who do we listen to, learn empathy

COMPARATION BETWEEN TWO IN VITRO TESTS FOR TOXICITY ASSESSING OF A LIPOPHYLE EXTRACT OF PELLOIDIC MUD FROM TECHIRGHIOL LAKE, CONSTANTA, ROMANIA

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ABSTRACT

The aim of this paper was to assess cyto- and genotoxic effects of a lipophyle extract of pelloidic mud (LE) from Techirghiol Lake, Romania, using two in vitro tests: cell viability determination in a mice fibroblasts culture (NCTC, clone L 929) and *Triticum* assay. The extract contains a mixture of saturated and unsaturated hidrocarbonated compounds with carbonilic and carboxylic groups.

Cytotoxic effect of LE, in a dilution ranging between 0.025- 1 g/mL, on the mice fibroblasts culture was assessed by neutral red (NR) test after 24 and 48 h of cultivation according to ISO 10993-5:2003. Cell viability was calculated by comparison with the cell culture control considered to be 100% viable cells, at each period of time. The morphological observations were done on culture plates after the cultured cells were fixed in methanol and Giemsa stained.

In *Triticum* assay we used two concentrations of LE in alcoholic solutions (0.025 g/mL and 0.045 g/mL). The *Triticum* seeds were preliminary imbued in water, and then they were treated for 6, 12 and 24 hours in LE solutions. The control group was treated with tap water. In the end of the experiment the harvested root tips were prepared according to Feulgen's squash technique using Schiff reagent. The cytotoxic effects of LE were investigated by calculating the mitotic index and also through the analysis of chromosomes alterations during the mitosis.

In mice fibroblasts culture the LE expressed a cytotoxic effect only in higher amounts than 0.066 g/mL. In lower concentrations of LE, the cells had 95% viability and there were no morphological changes, after 48 h of cultivation.

Triticum assay showed that the powerful effect on the cell division was in 0.025 g/mL LE after 12 or 24 hours of treatment. It was observed a rise of mitotic index and a small number of chromosomal aberrations in all variants. Because the studied concentrations

of LE on the seeds of *Triticum aestivum* were smaller than 0.066 g/mL, we can notice that LE solutions had cellular regeneration effects and also cell metabolism stimulating.

As conclusions: LE was not cytotoxic in the range of concentration 0-0.066 g/mL and can be used in cosmetic products. The information given from the two assays correlated each other and offered a better image concerning the toxic effects of LE. The two methods could be used together in the future studies as alternative methods for toxicity assay.

Keywords: pelloidic mud, fibroblasts culture, *Triticum* assay, cytotoxic effect

CORRELATION BETWEEN ANTIOXIDANT ACTIVITY OF VEGETAL SUPPLEMENT AND AGE RELATED MACULOPATHY

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ABSTRACT

Because ARM (age related maculopathy) is one of the leading causes of irreversible visual loss among people aged 45 - 65 years in the world and as well in Romania, the aim of this paper is to reveal any differences of therapy response which might be related to different antioxidant activity of vegetal supplement (tablets). This supplement contains only Sunphenon EGCG 90% dry extract from *Camellia sinensis* leaves, standardized in 90% epigallocatechine gallate. Epigallocatechine gallate acts as a powerful antioxidant compound that neutralizes reactive oxygen species resulted during metabolic processes at eye level, contribute to the normalization functionality of nerve cells and, in particular, of the retina; protects and nourishes the ocular structures (optic nerve, retina) affected by degenerative processes. For this reason we used 4 groups of 20 persons of each one divided after gender (males and females) and age (45 – 65 years) and different diseases (one third with diabetic maculopathy). From these 4 groups one was the control that received no treatment. Clinical evaluation of this supplement action was done by Amsler ophthalmologic test, visual acuity, visual field, ophthalmoscopic aspect of the fundus of the eye, before and after the treatment. The antioxidant activity of this supplement was determined by a photochemiluminescence method (PCL), based on the multiple acceleration of a natural reaction leading to the generation of a superoxide anion radical. The measured antioxidative capacity is then quantified by comparison with a standard substance used for calibration, Trolox as tocopherol derivative (in ACL method) using a Photochem, Analytik Jena AG apparatus. The antioxidant capacity results show that after the treatment based on epigallocatechine gallate supplement, some of visual parameters improved or at least remained the same compared to control group without treatment, in which the ophthalmologic situation got worse, more or less. Preliminary results emphasized the importance of this supplement in age related maculopathy.

Keywords: age related maculopathy, antioxidant activity, vegetal supplement, epigallocatechine gallate

CORRELATION BETWEEN *IN VITRO* CYTOTOXICITY AND ANTIOXIDANT ACTIVITY OF SOME NEW BIOADHESIVE GELS BASED ON CHLORHEXIDINE METALLIC COMPLEXES

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ABSTRACT

The new bioadhesive gels obtained in this paper aim to diversify the market of semisolid dosage forms with oropharyngeal mucosa action, covers a general need of human and veterinary health area for their disinfectant and antioxidant properties and could be used for oral hygiene. Were prepared several innovative semisolid preparations type bioadhesive gels, based on synthesized Cu (II) and Zn complex compounds of chlorhexidine salts incorpored in gelatin, glycerol and sorbitol as excipients. The obtained bioadhesive gels were evaluated regarding their physical-chemical properties from compendial sources, such as: appearance, homogenity, *p*H, spread-ability and penetration capacity, using standard methods according to European Pharmacopoeia. *In vitro* cytotoxicity of these bioadhesive gels on fibroblast cultures were determined. In this order were analyzed the cellular viability by MTT method and cellular morphology. At concentrations in range of 100 µg/mL – 1 mg/mL we noticed no effect in morphology fibroblast modification and a 95% viability after 24 h. The antioxidant activity of these bioadhesive gels comparative to Cu (II) and Zn complex compounds of chlorhexidine was determined by chemiluminescence method, based on the multiple acceleration of a natural reaction leading to the generation of a superoxide anion radical. The antioxidant capacity was quantified by comparison with standard luminol, using a Turner Design TD 20/20 SUA apparatus, at λ 420 nm wavelength. From the obtained results we noticed that comparative to the chlorhexidine complexes with copper (II) and zinc, the new bioadhesive gels had an increased antioxidative capacity (84-89%), which suggest them as efficient antioxidant agents, with low toxicity on fibroblasts.

Keywords: bioadhesive gel, chlorhexidine, Cu(II) and Zn complexes, cytotoxicity, antioxidant activity

DEVELOPMENT OF THE INFORMATION SYSTEM IN THE FIELD OF BIOTECHNOLOGY

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ABSTRACT

The article addresses information support issues for research projects and programmes conducted in such fields as pharmaceutical industry and biotechnology. The system developed provides free access to the information and research resources grouped by key directions (priorities), reflecting current characteristics of biotechnology development. This information system contains a number of sub-systems, which include such types of documents as: patents, reports on research projects and programmes, reports on practices investigations (covering such aspects as equipment construction, technological parameters, etc.), research articles, conference and workshop proceedings, and other publications in the field of pharmaceutics and biotechnology.

Keywords: information system, biotechnology, pharmaceutical industry.

EFFECT OF MINERAL FERTILIZERS AND BIOFERTILILZERS ON SOIL MICROBIAL CHARACTERISTICS AND POTATO YIELD

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ABSTRACT

Safe food production is essentially dependent on safe primary agricultural production which, inter alia, involves a reduction in the use of agrochemicals. However, their uncontrolled use for increased productivity is a frequent practice which ignores their disastrous effect on the biosphere and, hence, the quality of primary products. Soil microorganisms are important parameters used in assessing the quality and level of pollution of the biogeosphere and plant products. Therefore, the objective of this study was to evaluate the effect of different application rates of mineral nitrogen fertilizerz on soil microbial characteristics (total microbial count, numbers of ammonifiers and proteolytic activity) and potato yield, and their potential replacement with biological fertilizers (produced from nitrogen fixing strains of *Klebsiella planticola*).

The experiment was conducted at the experimental field of the Biotechnical Faculty in Podgorica in a randomized block design in four replications. The test plant was potato cultivar 'Kennebeck'. The trial included five treatments: unfertilized control; treatment N1 - 100 kg/ha CAN (calcium ammonium nitrate, 27% N); treatment N2 - 200 kg/ha CAN; treatment N3 - 300 kg/ha CAN; treatment with Enteroplantin, a *Klebsiella planticola*-based biofertilizer. The total microbial count and the numbers of ammonifiers were determined by the plate culture method using appropriate selective media, and proteinase activity was assessed by titration with $FeCl_3$.

Results suggest that low nitrogen fertilizer rates improved soil microbial characteristics, whereas the highest application rate (300 kg/ha CAN) reduced all of the traits analyzed, except proteolytic activity. The highest increase in soil biological characteristics was observed in the treatments involving biofertilizer use, which led to increased plant growth and tuber yield of potato, compared to mineral nitrogen fertilization.

The present results suggest that reduction in the use of mineral fertilizers through their replacement or supplementation with biofertilizers is recommended in safe food production.

Keywords: biofertilization, potato, microorganisms, soil, mineral nitrogen, yield

EFFECT OF RIPENING ON PHENOLIC COMPOUND OF *VITIS VINIFERA* L. SEED GRAPES FROM MURFATLAR VINEYARD DETERMINED BY A SIMPLE HPLC/DAD METHOD

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ABSTRACT

The aim of this research is to determine the polyphenolic compounds in grape seeds during ripening of three different varieties by a HPLC/DAD method.
Grape seeds from three different varieties (Pinot Noir, Coarna neagra, Cabernet Sauvignion) were collected in August and September 2012, during three different times of ripening, from Murfatlar, Constanta district, Romania.
The seed extracts were obtained with ethanol 50% after two different extractions: maceration 7 days at room temperature, 6h reflux.
A HPLC system (Agilent 1100/1200) with quaternary pump, DAD, autosampler and 5µm Zorbax Eclipse XDB-C18 (250 x 4,6mm, Agilent Technologies) column, was used for analysis of phenolic compounds. Also, total polyphenol content was determined spectrometrically using Folin-Ciocalteus method. The absorbance was measured at 725 nm in UV-VIS spectrophotometer Jasco V-630.
HPLC analysis of seed extracts showed that all extracts contain high levels of total phenolic compounds. The following phenolic compounds were founded: trans resveratrol, cis resveratrol, chlorogenic acid, caffeic acid, cinnamic acid, vanillin, gallic acid. The retention times were between 0.990±0.025minutes for gallic acid and 15.867±0.007minutes for cinnamic acid. The amount of polyphenols in grape seeds reaches the value of 8523.66mg ellargic acid/100g product of Cabernet Sauvignon grape variety.
Polyphenol content varies according to ripening period and depends on the extraction method. The content of resveratrol, one of the most known polyphenol compound, varies depending on the method of extraction and ripening period.
Keywords: phenolic compound, grape seeds, HPLC/DAD method.

ELITE HYBRID OF PERSPECTIVE FOR TABLE GRAPES OBTAINED IN INCDBH STEFANESTI

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Abstract

In order to promote Romanian products on the international market and primarily to penetrate the European market, it is necessary to achieve superior products in terms of quality with low costs, consistent with international standards to cope with competitive pricing policy. To achieve this goal and solve the problems facing today's wine practice, breeders channel their efforts towards the fulfillment of benchmarks, such as: the creation of new varieties with high adaptability to climatic conditions of the growing areas in Romania, the complex biological varieties resistant to pests and diseases, and accidents of climate, development of technology for producing virus-free planting material. To achieve this goal and solve the problems facing today's wine practice, breeders channel their efforts towards the fulfillment of benchmarks, such as: the creation of new varieties with high adaptability to climatic conditions of the growing areas in Romania, the complex biological varieties resistant to pests and diseases, and accidents of climate, development of technology for producing virus-free planting material, etc.Directed hybridization method created numerous varieties, filling the current selection in relation to specific requirements and conditions of culture, achieving both a diverse gene pool with a rich germplasm source.Elite hybrid grapes were created via sexual hybridization in viticultural center Ştefăneşti, that meet the following parameters: 3 future elites were analyzed into improvement fields and which, through outstanding quality traits, will be proposed for inclusion in the Official Catalog of varieties as new varieties for table grapes with different maturation periods. To analyze potential quality, elites were compared with varieties of the same maturing group.

Keywords: improvement, vine, hybrids, qualitative attributes

GEOGRAPHIC DISTRIBUTION OF *RHODOCOCCUS* SP. AND ITS CHARACTERISTICS IN THE REMEDIATION PROCESSES OF CONTAMINATED ECOSYSTEMS

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ABSTRACT

Bacterial communities are known to be important components of the Earth's biosphere. Still, their coexistence and species variations have not been examined thoroughly. The paper focuses on the bacterial strain of *Rhodococcus* sp. CCM 4446 and its significant phenotype and physiological characteristics, which are contrasted to its closest relative species within the up-to-date taxonomic position of the strain. The geographic context of the closest relative species' occurrence shows that the strain is a generally wide-spread species and its activity as well as its hitherto proved utilisation and resistance capacities play an important role in the remediation of ecosystems contaminated by mining and heavy industry.

Keywords: taxonomic position; diversity; phenotype study; utilisation and resistance capacities; *Rhodococcus* sp.

IDENTIFICATION OF THE WAVE PATTERNS OF BEHAVIOR

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ABSTRACT
On examples [1] the method of identification of nonlinear trends and wave regular-ities in the form of asymmetric wavelet signals of behavior of genes on grouped (nmeth.2724-f3.xls1) and primary basic data (to nmeth.2724-f2.xls1, nmeth.2724-f1.xls1) is shown. Unknown regularity of influence of a dependent factor of Seed on thyA CO and WT indicators is revealed. On one example of 10-3 Mod SD =f (10-3 Expt SD) from the array1 nmeth.2724-f1.xls Growth_Data_Summary the wavelet-analysis technique is shown.
The method is applicable to processing of results of measurements of behavior of any objects.
It proceeds from the unique algebraic equation according to Rene Descartes for describe the behavior of any objects, each member of which contains 6 to increasingly complex design "bricks" Hilbert becoming complicated on a design. Thus the left col-umn to the biotechnical law gives an asymmetric wavelet-signal, and the right column allows to identify infinitely measured (in comparison with an interval of time of meas-urements) on amplitude oscillatory adaptations.
Keywords: genes, group, primary data, wavelet analysis, new factors, wave models

IMPORTANT BIOACTIVE COMPOUNDS FROM MARINE ALGAE - POTENTIAL SOURCE FOR PHARMACEUTICAL INDUSTRY

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Contribution note: All the authors have equal contribution to the paper.

ABSTRACT

During the last years, it became obvious that the marine ecosystem presents an excess of marine algae, which should be turned valuable in one way or another. Marine algae are a heterogenic group of organisms that is comprised of approximate 10 000 species, spread especially in the aquatic environment but also on the solid wet substratum. The importance of the macro- benthic flora – algae and phanerogames – for the general productivity of the marine environment, especially in shallow waters, is becoming more and more obvious from the biological, as well as from the economical point of view. The macrophytes also represent a particular life form in aquatic water. In this paper are presented the most important marine algae, *Cladophora vagabunda* (L.), *Enteromorpha intestinalis* (L.), *Ulva Lactuca*, *Ceramium rubrum*, *Cystoserira barbata*, from Black Sea Romanian costal waters. The characterization of marine algae was presented for all the analyzed algae. The important bioactive compounds from this algal biomass were identified by modern phyto-chemical analyses.

Keywords: marine algae, bioactive compounds, macrophytes

IMPROVEMENT OF BIOCHEMICAL PARAMETERS OF SILKWORM (*BOMBYX MORI* L.) TO OBTAIN AN ORGANIC RAW MATERIALS FOR TEXTILE INDUSTRY

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ABSTRACT

During six generations it has been studied a total of 30 inbred lines of silkworm pursuing the effect of inbreeding on some biochemical parameters. The amount of protein of silkworm eggs on the whole experience was in I_3 (3^{rd} generation of inbreeding) between 11.91 % -14.20% and in I_6 (6^{th} generation inbreeding) between 12.22-14.62%, not influenced by the process of inbreeding. Some quantitative differences were correlated with the studied stage of embryonic development. The amount of lipids in silkworm eggs was in I_3 between 80.6-98.8 mg/g eggs, ranging from embryogenesis stage, and 82.2-97.3 mg/g eggs I_6, being influenced by the same factor. Inbred lines in both generations of inbreeding shows higher values of the control batch, but also do not show differences in statistical significance. In I_6 the amount of fat shows the differences in less compared to I_3, but these are insignificant. Biosynthesis of amino acids from sericine gland and from larvae hemolymph was not influenced by practice related type crossings brother x sister. In all samples was revealed a total of 18 amino acids and quantitative differences between samples, in general, insignificant were not correlated with inbred or not inbred character of silkworm lines. Determined silk fibroin content in I_3 was within 73.16-77.18% for the lines group Baneasa White and between 71.16-75.86 % for the group lines Baneasa 75. Same component presented in I_6 values between 73.20-76.90% for the first group of lines that are found significant differences against control batch and between 72.10-76.21% for the second group. Silk sericine contains was not affected by inbreeding depression. This presented to the group of lines Baneasa White an average value 24.24% in I_3 and 24.57% in I_6, being higher in the second group of lines, Baneasa 75, respectively 26.50% in I_3 and 26.40% in I_6.

Keywords: inbreeding, silkworm, line, blastokinesis

IN VITRO PROPAGATION OF RUBUS CHAMAEMORUS L. AND RUBUS ARCTICUS L.

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ABSTRACT

Rubus chamaemorus L. and *Rubus arcticus* L. are rare plant species in a particular region of the Russian Federation, the preservation of these species is of great importance for maintaining biodiversity. At the same time *R. chamaemorus* and *R. arcticus* are a source of biologically active substances. *In vitro* propagation of *R. chamaemorus* and *R. arcticus* is an important instrument for the preservation and reproduction of economically valuable plants in which tissue is freed from all kinds of infections and remains unchanged genetic structure of the plant organism. For an introduction to culture *in vitro R. chamaemorus* used shoots isolated from male and female plants for introducing young *R. arcticus* used metameres 0,5 cm long was found that the induction of morphogenesis *R. arcticus* must use MS medium supplemented with BA 1,0 mg l^{-1} for *R. chamaemorus* Quoirin and Lepoivre medium supplemented with BA 1,5 mg l^{-1}. The optimal pH levels at 5,2 for micropropagation *R. chamaemorus* and 4,9 for *R. arcticus*.

Keywords: *Rubus chamaemorus* L., *Rubus arcticus* L., clonal micropropagation, genotype, rooting, *in vitro*

INFLUENCE OF SOME THERMAL TREATMENTS ON CHLOROPHYLL AND CAROTENOIDS CONTENT FROM BROCCOLI (*BRASSICA OLERACEA, VAR. BOTRYTIS*) AND BRUSSELS SPROUTS (*BRASSICA OLERACEA, VAR. GEMMIFERA*)

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ABSTRACT

The aim of this paper was to determine the effect of some thermal treatments on chlorophyll and carotenoids content from broccoli and Brussels sprouts, using a specrophotometric method. Vegetables were analyzed fresh and after blanching, boiling, freezing raw and freezing blanching prior. Of the two analyzed vegetables, broccoli has the highest chlorophyll and carotenoids content (fresh broccoli - total chlorophyll: 417.35 mg/g, carotenoids: 82.15 μg/g, fresh Brussels sprouts- total chlorophyll: 256.84 mg/g, carotenoids: 68.23 μg/g). Both for broccoli and Brussels sprouts the higest loss of chlorophyll, as a result of different thermal treatments, have registered with the chlorophyll "b". For samples of broccoli, percentage loss of chlorophyll "b" are higher than similar samples of Brussels sprouts. Regarding chlorophyll "a" and total chlorophylls, the most significant percentage losses were recorded in the thermal treated Brussels sprouts samples. For both vegetables was reported that the largest percentage loss of chlorophyll and carotenoids occur after freezing blanching prior (freezing time: 2 months), followed by boiling and freezing of raw samples.

Keywords: chlorophyll, carotenoids, broccoli, Brussels sprouts, thermal treatments.

INFLUENCE OF TEMPERATURE ON EMERGENCE SOME ROOTSTOCKS USED IN ROMANIA AT GRAFTING OF CUCURBITS VEGETABLES

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ABSTRACT

The research aimed to determine the optimum temperature to a qualitative emergence (early and uniform) of some cucurbit rootstocks. The experience was carried out in 2014, inside the Laboratory of Protected Cultures, in greenhouse specialized in producing from grafted vegetable seedlings of the Research and Development Institute for Processing and Marketing of the Horticultural Products – Horting, Bucharest. The experience has varied with following factors: rootstock and emergence temperature. The biological material used was formed from five F_1 hybrids: two inter-specific (*Cucurbita moschata x C. maxima*) rootstocks – Shintoza and TZ148 and three *Lagenaria siceraria* rootstocks – Argentario, Achille and Macis. Rootstocks seeds were sown in alveolar trays (24 ml/cell volume), in nutritive substrate ($peat_3$: $perlite_1$); peat with grain size 0-10 mm, NPK (1 kg/m³), microelements B, Mg, Cu, Mn, Zn, Fe, S (0.050 kg/m³), calcar (4.7 kg/m³), pH 6, wetting agent 100 ml/m^3. After sowing and wetting, temperature was regulated in 3 different variants: 15^0C, 20^0C, 28^0C. The germination temperature was maintained at constant value (day and night) until to plant emergence. The data were subjected to analysis of variance and compared at the 0.01 or 0.05 significance levels. Correlation coefficients were calculated between temperatures and uniformity rates in first emergence day. The statistical analysis showed differences between variants. The temperature has influenced the emergence of the rootstocks (length of time between sowing and emergence and uniformity of plants). All rootstocks had an optimal emergence at 28^0C; a maximum uniformity (95%) between 4–4.5 days after sowing. An optimal emergence of the cucurbits rootstocks is an important aspect in the technology for producing of grafted seedlings. This technology is developing in Romania.

Keywords: *C. moschata x C. maxima*, emergence, *L. siceraria*, temperature

INTEGRATED PROCESSING OF SUNFLOWER MEAL

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ABSTRACT

Sunflower meal, a by-product of oil production, was investigated as a primary product for protein production. Sunflower protein isolates can be used as a component of cattle diets. Integrated processing of secondary products of sunflower oil production considered includes enzyme-assisted extraction. Enzyme-assisted alkaline extracts were obtained under various conditions. The influences of temperature, pH, and type of enzyme on the degree of protein extraction were studied and the optimal conditions were determined. The process studied allows obtaining light-colored protein extracts. Ultrafiltration for concentrating and removal of low molecular weight protein fraction and carbohydrates from crude sunflower extracts was developed. The concentrates obtained were tried out as a source of nitrogen in the nutrient medium for *Bacillus cereus* fermentation. Solid deproteinised meal can be subjected to chemical or enzymatic hydrolysis as a medium component for heterophase fermentation to produce protein-enriched fodder additive.

Keywords: sunflower meal, sunflower processing, sunflower protein, spray drying, protein concentrates

METHOD OF IDENTIFICATION

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ABSTRACT

Method of identification refers to the statistics (probability) modeling.

And in Your magazine to section «Computational and bioinformatic methods for analysis, modeling or visualization of biological data».

The difference is that the step of selecting the formulas we formalized and there-fore it is only the second stage of modeling - the choice of parameter values identified on the initial data of the generalized model or, in the special case of equation. In addi-tion, each parameter of any member has a physical meaning. This dramatically increases the value compared to the linear regression correlation coefficient of 0.9999. History modeling completely given additional information.

Here we will show not only advantages of our method, but also possibility of identification according to aprioristic information of essentially new regularities in the form of Seed factor. Because of high definiteness of the first stage of process of statistical modeling essentially new aposteriorny information is shown. As a result «Whole-cell model» method improvement for acceleration of biological opening is possible. The greatest effect gives our method without averaging and other group of basic data. The computing data set receives accurate physical sense and it increases definiteness of forecasting. The group of contradictions1 will decrease, and new opening will appear during modeling.

It isn't necessary for data1 of division on categories that was required because of application of linear regression. Therefore "Whole-cell model" addition with our wave equations would allow to give not only qualitative, but also quantitative, essence. Therefore our method of identification will allow to open the mechanism of behavior of populations of any objects.

Keywords: bricks Hilbert, the wavelet signals, generalized model, statistics, identification, verification, wave patterns

MORPHOLOGICAL AND BIOCHEMICAL ISSUES TO SOME *ROSA CANINA* L. POPULATIONS FROM THE SPONTANEOUS FLORA FROM SOUTH-WEST ROMANIA

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ABSTRACT
Current needs in the food and pharmaceutical natural products require more careful study and knowledge of the biochemical composition of non agricultural plant species, respectively briar fruits for cultivating them for alimental use. *Rosa canina* L. (*Rosaceae*) is a shrub of the spontaneous flora recognized for its nutritional and therapeutic properties because of the content of vitamin C, carotenoids, vitamins E, K, PP, D, B1, B2, sugars, pectins, malic acid, citric acid, α and β tocopherol (vitamin E) and carotenoids. In terms of the food, rosehip fruits can be used singly or in combination with other fruits (apple, sea buckthorn, tomato, etc) prepared in the soups, pasta, cakes, jam or marmalade, wine, juice or consumed as tea. Currently rosehip extracts are used in traditional medicine as a diuretic, laxative, for arthritis, gout, colds, vitamin C deficience, etc. Rosehip fruits can be sold as organic products derived from spontaneous flora, which do not apply to synthetic or treatments or products from organic plantations. Although in Romania and other countries, sweet briar grows in abundance in wild flora, few know the importance of this species. This species has a key position in the strategy of sustainable culture can offer solutions to problems the social, economic and environmental. As with all other countries rosehip is cultivated from a long time, in Romania recently began to setting up experimental plantations. Natural biodiversity of this species is very high, even in small habitat. The aim of the study is to identify and retrieve some valuable genotypes from tecnological and biochemical point of view, from the spontaneous flora from South-West, Romania. For the study were collected from rose hip fruits of local populations of *Rosa canina*, derived from the existing biodiversity in this area, on surfaces not worked for a period of over 10 years. Within those populations were studied the variability of technological parameters: length fruit, fruit diameter, weight and ratio L/D and biochemical content: TSS, vitamin C and acidity titrabila. The results were analyzed statistically, using LSD and comparison method (t-Test). The obtained values indicate the existence of populations of *Rosa canina* of a valuable content in the TSS, which is between 11% (P3) and 21% (P12), especially vitamin C content, over 600 mg/100g populations P1, P7, P12 and P19. The acidity in the study population was 1.5 to 2 %. This material could be used for the selection of plants with superior features, intended to be placed in programs of breeding in order to create varieties that meet the demands of the modern world.
Keywords: Rosehip**,** Titrable acidity, TSS, Vitamin C

NATURAL INTERSPECIFIC *ESCHERICHIA-PROTEUS* GENETIC TRANSFORMATION IN WASTE WATER CONDITIONS *VERSUS* URINE

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ABSTRACT

Based on cultural and biochemical characteristics, a number of uropathogen strains of *Escherichia coli* and *Proteus sp.* have been isolated and identified. For this isolated strains, the spectrum of sensitivity - resistance against 10 antibiotics has been determined. One pathogenic strain of *E. coli* has been randomly chosen, sensitive to all tested antibiotics. This strain has been used as genetic material acceptor strain. Another uropathogen strains of *E. coli* and *Proteus sp.*, both ciprofloxacin-resistant with chromosomal resistance, have been used as donor strains. Chromosomal DNA donor strains were initially subjected to a plasmidial curing process and then used in genetic transformation experiments by growing strains in common environments acceptor fluid - urine and domestic waste water - ensuring physiological conditions of temperature and calcium concentration. The frequency and the efficiency of natural intergeneric *Escherichia - Proteus* genetic transformation and natural interspecific *Escherichia – Escherichia* genetic transformation were assessed.

Keywords: natural genetic transformation, antibiotic resistance markers, uropathogen, waste water, urine, transformation frequency

NEW STRAINS OF COPPER-RESISTANT *PSEUDOMONAS* BACTERIA ISOLATED FROM ANTHROPOGENICALLY POLLUTED SOILS

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ABSTRACT

The article examines and compares the physiological properties of Cu^{2+} tolerance in new bacterial isolates of *Pseudomonas* bacterial genus, originating from localities contaminated by mining and heavy industry. The resistance of the strains is evaluated on the grounds of the minimum inhibitory concentration (MIC) and the maximum tolerable concentration (MTC) for the individual species, where MTC is the highest metal concentration, which has no effect on the growth of the resistant strain. The experimental results confirm a clearly higher capacity for Cu-resistance in the new bacterial isolates, when compared with type bacterial strains (isolated in diverse environments without any proved metal content), as almost double values are obtained. The capacities of resistance in the newly isolated strains point at an extensive species diversity of the *Pseudomonas* genus. Among the decisive factors for resistance formation is a high capacity of adaptation in *Pseudomonas*, which is conditioned by the operon organisation and the abundance of resistance plasmids, in particular.

Keywords: copper, resistance, maximum tolerance concentration (MTC), minimum inhibitory concentration (MIC), *Pseudomonas* sp.

OPTIMAL SOLUTIONS FOR THE OPERATION AND MAINTENANCE OF A WASTEWATER TREATMENT SYSTEM WITH FILTERS PLANTED WITH REEDS

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ABSTRACT

A wastewater treatment plant by growing plants is a natural, inexpensive and safe operation for wastewater treatment in rural areas. Ecological success of this technique with low maintenance and stable as the process is harmonized interaction between plants and microorganisms substrate

The aim of this work is to identify the optimal solutions for operating and maintenance as well as a more efficient system of wastewater treatment plant by means of filters planted with reeds. It is known that this system of wastewater treatment plant serves the localities of 3000 inhabitants, require an operating staff, average skill; minimum maintenance services; the minimum land area required for construction of wastewater treatment plant, i.e. two square feet per capita.

New technology has many advantages that relate primarily to costs. Thus, if the treatment plant based on activated sludge system amounts to 1,200,000 euros, the system "filters planted with reeds' reach 830.000 euros. At the first station, operating costs / capita / year are worth 38 euros, while the second at 3.05 euros. Exploiting a period of 25 years requires an investment of nearly three million for the first system and the second for just 230,000 euros.

Keywords: wastewater treatment plant, filters planted with reeds, sludge, organic matter

OPTIMIZING OF TECHNOLOGY FOR OBTAINING THE GRAFTED WATERMELONS IN DIFFERENT PHENOLOGICAL PHASES OF THE SCION IN THE CLIMATIC CONDITIONS FROM ROMANIA

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ABSTRACT

The research aimed to establish the technological stages for obtaining the grafted watermelons in different phenological phases of the scion in the climatic conditions from Romania. The observations were done in 2013-2014 period, inside the Laboratory of Protected Cultures, in greenhouse specialized in producing from grafted vegetable seedlings of the Research and Development Institute for Processing and Marketing of the Horticultural Products – Horting, Bucharest. Grafting is based on the merge between scion and rootstock. The experience has varied with following factors: scion, rootstock and phenological phase of the scion. The biological material used was formed from five F_1 hybrids: two *Lagenaria siceraria* rootstocks – UG29A and Macis and three scions – Sorento, Pată neagră, Vasko. The scion and rootstock seedlings were obtained in alveolar trays (24 ml/cell volume for scion and 15 ml/cell volume for rootstock), in nutritive mixture ($peat_3$: $perlite_1$). The germination conditions were: 25-27^{0}C, 80% relative atmospheric humidity. The germination temperature was maintained at constant value (day and night) until to plant emergence. The plants were maintained between emergence and grafting according to classical technology for obtaining the cucurbit seedlings. The grafting was performed in different phenological phases of the scion: cotyledon leaves, one true leaf, two true leaves. The statistical analysis showed differences between variants. The phenological phase of the scion has influenced the survival rate of the grafted plants. The optimal phenological phase was first true leaf for all scions. For a successful grafting is necessary to observe the optimal phase of the watermelon scions; it is an important aspect in the technology for producing of grafted watermelons.

Keywords: *Citrullus lanatus* sp. *vulgaris*, grafting, technological stages

PSEUDOMONAS MONTEILII LA-11 STRAIN'S CAPACITY OF RESISTANCE: A NEW ISOLATE FROM CONTAMINATED LAGOONS, CZECH REPUBLIC

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ABSTRACT

Pseudomonas monteilii LA-11, isolated in contaminated sediments of Ostrava lagoons (Czech Republic), is a new bacterial isolate, whose physiological properties of resistance have not been reported to date. Its taxonomic status has been confirmed on the grounds of genotype analyses. The article summarizes the findings on this bacterial strain and describes its basic morphological and biochemical characteristics accompanied by verified resistance towards As, Cd, Cr, Co, Cu, Fe, Hg, Li, Mg, Ni, Pb, and Zn. The high resistance values towards certain metals, such as Cd, Cu, Co, Pb, As and Hg, predestine the strain as promising in further practical applications, particularly in the processes of in situ bioremediation, leading to the attenuation of toxicity of anthropogenically contaminated environments.

Keywords: phenotyping, genotyping, biotypisation, taxonomy, metal resistance, contaminated sediments, *Pseudomonas monteilii* LA-11

RESULTS CONCERNING THE PRODUCTIVE CAPACITY AND CHEMICAL COMPOSITION OF GROUNDNUTS CULTIVATED ON THE SANDY SOILS FROM SOUTHERN ROMANIA

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ABSTRACT

Groundnuts are an important oilseed crops cultivated worldwide. Seeds of groundnuts have a double advantage: a source of fat (> 50%) and protein. The high content of seed in protein substances gives them a high food value. Carbohydrate content (25-50%), mineral (2.5-3.5%), the content of phosphorus, calcium and vitamin is also high. Thus, in this sense was founded comparative culture with several varieties of peanuts, which determined production capacity and its main elements which determine the formation and chemical composition of minerals of groundnuts seeds.

Due to poor agro capacity of sandy soils where were cultivated, registered yields were relatively small. The analyzed samples at five varieties of groundnut (Venus, Solar, Jelud, Braziliene negre and Tamburesti) grown under the same conditions was examined micro and macro content in seeds. In the analyzed samples, the content of Na, Mg, Al, Ca, Cr, Mn, Fe, Cu, Se; Ni, B and were determined using ICP-MS technique and K content was determined by atomic absorption spectrophotometer.

The results of these analyses showed significant variation between the studied varieties. Mineral substances, such as: *sodium* ranged from 2.529 mg/100g to Venus variety up to 3.664 mg/100g to Tamburesti variety; *potassium* ranged from 632, 024 mg/100g to Jelud variety up to 931.683 mg/100g to Solar variety), *iron* (5.083 mg/100g to Jelud variety up to 9.323 mg/100 to Jelud variety), *calcium* (from 21.436 mg/100g to Venus, up to 40.065 mg/100g to Braziliene negre variety).

Groundnuts may be considered as a source of minerals and genetic variability found in the studied varieties, show that these various preparations can be used for selection purposes or for improvement from the point of view of productivity.

Keywords: groundnut, productive capacity, mineral substances

SEMISOLID PHARMACEUTICAL PREPARATIONS BASED ON METALLIC COMPLEX COMPOUNDS OF CHLORHEXIDINE SALTS WITH ANTIMICROBIAL ACTIVITY

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ABSTRACT

The paper relates to pharmaceutical preparations type cream based on chlorhexidine metallic complex compounds and a process for their preparation. Pharmaceutical topical preparations for external use type creams described in the paper are destined to human health and veterinary medicine domain, regarding their disinfectant and antifungal action and can be used to teguments treat as dermatological germostop. For this reason we prepared several semisolid preparations (creams) based on synthesized metallic (Cu^{II}, Ag^{I}) complex compounds of chlorhexidine salts in oinment base type emulsion oil/water with lipophylic excipients. The antioxidant activity of these creams comparative to copper (II) and silver (I) complex compounds of chlorhexidine salts was determined by chemiluminescence method, based on the multiple acceleration of a natural reaction leading to the generation of a superoxide anion radical. The antioxidant capacity was quantified by comparison with standard luminol, using a Turner Design TD 20/20 SUA apparatus, at λ 420 nm wavelength. The comparative antimicrobial activity of semisolid pharmaceutical preparations and synthesized metallic (Cu^{II}, Ag^{I}) complex compounds of chlorhexidine salts by diffusion method on different bacterial and fungal strains *(Staphylococcus aureus, Escherichia coli, Candida albicans)* was evaluated. From the obtained results we noticed that comparative to the metallic complex compounds of chlorhexidine salts, the pharmaceutical preparations as cream type based on Cu^{II} and Ag^{I} complex of chlorhexidine (molar ratio 1:1:1) had an increased antioxidant capacity (88-94%) correlated with a higher antimicrobial activity.

Keywords: cream, chlorhexidine salts, metallic complex compounds, biological activity

STUDIES REGARDING THE VARIABILITY OF BEAN PRODUCTION PER PLANT IN A COLLECTION OF BUSH BEAN LOCAL LANDRACES (*PHASEOLUS VULGARIS* VAR.*NANUS)*

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ABSTRACT

The aim of our studies was to evaluate the variability of bean production per plant in a collection of bush bean local landraces in order to establish if they can be used in breeding programs. Biologic material consisted in a collection of 56 bean landraces collected from western Romania and 6 cultivars. We assessed the number and weight of seeds per plant. The experiment was conducted in field conditions without irrigation. The collection proved to be less valuable for these characters. These genotypes are cultivated mostly for pods and are originating from hilly areas with cold and wet climate. Local landraces are inferior to bred cultivars. Landrace Sebis 1 stands out, producing over 40 seeds per plant, with also the highest seed weight (21.79 g). Beans productions above 15 g were observed only at 3 landraces: Voiteg, Paulean 2 and Vinga. The landraces studied are not adapted to conditions in the plains

Keywords: landraces, bean production per plant

STUDY ABOUT THE USE OF MONITORING OF ELECTROCHEMICAL PARAMETERS TO CONTROL OF INOCULATION OF THE LACTIC ACID BACTERIA IN TO COWMILK

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ABSTRACT

The variation of *p*H and oxidation-reduction potential in time may constitute strong indicators of the State of fermentation in cow's milk that are inoculated with lactic acid bacteria.

The activity of specific microbiological agents – use in order to obtain some milk products – can be monitored through the integrated study of electrochemical parameters of variation within a limited time frame.

The variation of main electrochemical parameters (the specific *p*H and redox potential of cows ' milk) is it a direct result of the activity of oxidoreductases secreted by certain lactic acid bacteria. The study identifies certain biotechnological correlations that occur at inoculation in the conditions of use of specific lactic acid bacteria.

Keywords: electrochemical parameters, oxido-reductases, food industry

STUDY OF VARIABILITY INDUCED BY *IN VITRO* CULTURES AT BLUEBERRY POPULATIONS

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ABSTRACT

In vitro cells culture is a good method to induce somatic variability in plants. The selection of plant tissues with a good capacity of cellular biosynthesis is necessary to obtain the important secondary metabolites by *in vitro* culture system. In our experiments we used biochemical methods to evaluate the variability induced by *in vitro* callus culture at three blueberry populations native in Romania. Callus obtained from Arieseni, Retezat and Valea Sebeşului populations, on WPM medium was sub-cultured in presence of ANA, BAP and AS. Antioxidant capacity using the FRAP method, glutathion (GSH), total anthocyanin, macroelements, microelements and heavy metals contents from callus lines selected were investigated. The AS concentration positively affects the activity of glutathione, with a significantly positive correlation coefficient ($r = 0.54$, $p < 0.05$). The use of this hormone facilitates the obtaining of blueberry callus biomass with an increased antioxidant activity. There was also found a strong positive correlation between the total content of anthocyanin and FRAP values ($r = 0.60$, $p < 0.05$) and a positive correlation with the level of GSH, respectively ($r = 0.47$, $p < 0.05$).

Keywords: callus, native blueberry populations, biochemical methods

THE CROSS-POLLINATION STUDY BETWEEN GENETICALLY MODIFIED AND CONVENTIONAL CORN CROPS IN ROMANIA

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ABSTRACT

In Romania, the GM commercial crops are limited to MON 810 corn that is resistant to the European corn borer (ECB, *Ostrinia nubilalis*). This GM corn is authorized for cultivation since 2007 (when Romania became a member of the European Union). To ensure the coexistence, the adventitious presence of the genetically modified organisms must not exceed the level of 0.9 % established by Regulation (EC) 1829/2003. Because the corn is a species with female and male flowers formed in separate parts of the same plant, the gene flow between plants is high. The pollen – mediated gene flow of corn can be monitored by measurement the rate of cross-pollination. The objective of this study was the cross-pollination rate between GM and conventional corn by xenia effect. For this, three experimental fields were established at ARDS Simnic. Within the first experience, where the MON 810 event was planted at the centre of the experimental field and surrounded by conventional corn as receiver, the rate of cross-pollination ranged from 0.83% (plot N-E) to 3.72% (plot W). Within the second experience, where the receiver corn was planted at the centre of the experimental field and surrounded by the donor MON 810, there was recorded the highest rate of cross - pollination, respectively of 27.62%. In a third experiment where they used different isolation distances, cross-pollination rates were between 1.40 and 1.74% for 10 – 19.8 m distance, between 0.77 and 0.94% for 20 – 29.8 m distance and between 0.90 and 0.94% for 30-30.8 m distance. The high levels of cross - pollination rate has been determined by: the compatibility gametophyte at genotypes studied, the coincidence in flowering donor and receiver corn, the isolation distance as well as the prevailing wind direction of pollination period. Under these circumstances, the coexistence of the genetically modified and conventional corn it is not possible, excepting the situation when we use isolation distances for over 40 m or other strategies.

Keywords: MON 810 event; gene flow; isolation distance; xenia effect.

THE INFLUENCE OF ASCORBIC ACID AND POLYPHENOLS CONTENT AFTER FRUITS ADDING IN HONEY

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ABSTRACT

In this paper we have studied the influence of fruits adding in honey related to ascorbic acid and total polyphenols content. To determine the ascorbic acid it was used a spectrophotometric method with leuco-malachite-green. In order to determine the total polyphenols level there was used the Folin-Ciocalteu assay. The ascorbic acid content was improved in honey samples with fruits, varying between 3.27 and 4.01 mg/100 g while the control sample (honey without any fruit) registered 3.24 mg/100 g. The highest polyphenols level was found in honey fortified with raspberry (0.079 mg gallic acid equivalent /g) while the lowest (0.012 mg gallic acid equivalent /g) level of polyphenols was registered in the control honey samples.

Keywords: honey, fruits, ascorbic acid, polyphenols.

THE INFLUENCES OF CLIMATE CHANGES IN ACUTE GLAUCOMA

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ABSTRACT

The importance of pathological effects of the weather type was noticed starting from Hippocratic times. The tendency revealed by the last decades of increased frequency of the extreme meteorological phenomenons made us look for the impact of weather changes on acute glaucoma. Our study included a number of 174 cases of patients, presented in Ophthalmology Department from Constanta Emergency Hospital, between 2004 and 2013, for acute glaucoma. Acute glaucoma represents a major ophthalmological emergency, which requires urgent hospital presentation. The phase's survey offers the advantage of synthetically vision on the situation of all meteorological factors and the opportunity to study glaucoma during stable or changing weather. The analysis of acute glaucoma was made thinking about the hypothesis of some weather conditions responsible for the crisis onset, revealing the trigger role of some environmental factors: increasing temperature, atmospherically pressure, Thom and Miss Index, cloudy weather and weather changes in acute glaucoma onset. The results obtained emphasize that climate changes have an obvious role in generating acute glaucoma.

Keywords: climate changes, meteorological factors, acute glaucoma, survey phase

THE IRRADIATION OF ENERGETIC WILLOW CUTTINGS BY LASER LIGHT. CHEMICAL, TECHNICAL AND CALORIMETRIC ANALYSIS OF BIOMASS

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ABSTRACT

The article presents issues related to the growth stimulation of some plant species, using a low power laser light. This technology could be helpful in increasing the yield and germination energy as well as accelerating development and growth of plants. The presented experiment was part of a wider research on the effects of laser light on the different varieties of energetic willow (*Salix* sp.). The aim of this particular experiment was to ascertain whether the selected laser stimulation parameters of willow cuttings could enhance and accelerate the production of biomass without changing wood properties relevant to the energetic use. The *Salix viminalis* Turbo cuttings were used as biological material. Two devices were used as the sources of coherent light: laser - wave length: λ = 670 nm and laser diode - wave length: λ = 473 nm. Willows had been cultivated for two years. The willow shoots were collected after the second growing season. Wood samples of control and experimental groups were dried and the calorimetric analysis have been made. Additionally, the analysis of technical parameters as well as carbon, hydrogen and sulfur content of the harvested wood were carried out. The results clearly indicate that stimulation by low power lasers with parameters of irradiation properly chosen for the *Salix viminalis* Turbo can significantly speed up growth of plants without changing the chemical and technical characteristics and the calorific value of biomass.

Keywords: willow biomass, laser stimulation, irradiation, energetic willow, calorific value

THE *KNOX* GENES INVOLVEMENT IN THE DEVELOPMENT OF MULTILEAFLED TRAIT ON TETRAPLOID *MEDICAGO SATIVA*

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ABSTRACT

The deciphering of the metabolic pathway which induce the multileaflet trait in alfalfa it is of great importance due to the economic importance of the high biomass and the increased protein content. For this purpose the *knox* genes involved in meristem development and leaf morphogenesis were investigated. Thus, the *knox* genes expression were comparative analyzed for trileaflets plant and multileaflet ones in order to determine their specific involvement in leaf development using the semi quantitative one-step RT-PCR method. Four types of tissues were investigated: shoot tips, young leaves, old leaves and roots to determine the *knox* genes function in different stages of tissues development. It turned out that the average of the *knox* genes expression for all of the experimental variants was significantly higher for the mulileaflet plants, compared with the trileaflet ones.

Keywords: alfalfa, *knox* genes, RT-PCR

THE MONITORING OF ENZYME ACTIVITY OF GLUCOAMYLASE AND ENDOXYLANASE ON THE BREAD DOUGH

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ABSTRACT

This study presents the chemical action of two enzyme preparation: based on glucoamylase and endoxylanase, in the chemical structure of the bread dough. The determination of the rheological characteristics of the dough is obtained by alveographic method and consistographic method. The addition of glucoamylase and endoxylanase enzymes allows adjustment of the rheological characteristics of dough according to the needs of the technological process. The specific effect of glucoamylase and endoxylanase on the physico-chemical properties of dough show a positive influence on the volume and porosity of the bread, also on reducing the kneading process of the dough and the energy consumption for the technological process.

Keywords: glucoamylase, endoxylanase, alveograph method, consistographic method

THE MONITORING OF ENZYME ACTIVITY OF PROTEASE ON THE WAFFLE DOUGH

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ABSTRACT

This study presents the action of an exogenous enzyme: protease in different dosages, in the dough used in the technology of waffles products. The determination of the rheological characteristics of the dough is obtained by alveographic and consistographic method. The addition of proteolytic enzymes allows adjustment of the rheological characteristics of dough according to the needs of the technological process. The specific effect of proteases on the physical properties of gluten shows that by proteolysis there is a break and a reorientation of protein chains that form the gluten network. It is also shown that the dough samples with proteases addition have a better behavior when they are injected on the oven plate and that the waffles obtained from dough with proteases addition are lighter, with less humidity and a lower water activity. Moreover the waffles with the addition of protease are more porous, more crispy and with a more developed filigree structure in comparison with the dough samples without protease addition. Addition of the correct dosage of protease in dough can improve the extension of freshness, increases of the quantity of fermentation sugars that can make finite products with a more pronounce color of crust. A lower dosage of protease does not have a big improvement effect on the quality of the dough and it is not relevant for the technological process. The overdose of protease leads to a wet and sticky content of the dough which affects the dough handling during the technological process and an abnormal volume and porosity. Selecting a correct dosage of protease will be made in conformity with the rheological characteristics of dough and the proportions from the dough will be added so that they would be maximal.

Keywords: waffles, protease, alveographic method, consistographic method

THE SERUM BIOCHEMICAL PARAMETERS CHANGES IN THE FROG *Rana ridibunda* Pall. AT DIFFERENT WATER TEMPERATURE REGIMES

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ABSTRACT

During the period March - May 2013, the serum concentration of glucose, cholesterol, triglycerides, total lipids, albumins, globulins and total proteins in the frog *Rana ridibunda* Pall were analyzed. For this research were used 40 individual frogs, taken in two different water springs with different water temperature, in Terdevc village (water temperature 7.9 °C - 19.7°C) and Banja village (24.7°C - 29.0°C) of Malisheva.
Analyses were conducted in the frog serum using standard biochemical methods, ready reagents from the firm Elitech and modern equipment from Screen plus company.
The research results show higher values of concentration of the parameters analyzed in the frog's serum taken in warm water spring of Banja compared with the frogs of cold water taken in the village Terdevc. These changes were observed during the spring season (March-May) and in some cases were significantly higher ($P<0.05$, $P<0.01$, $P<0.001$, respectively). The highest significances values were observed in particular during the May.
Statistical calculations of the results were performed using software ANOVA and student t - test.
Results of this study indicate that temperature is a crucial factor that determines the state of the organism, its metabolic level respectively. Since frogs are poikilotherm organisms, these changes probably can be ascribed the metabolic activity of the organism in relation to the temperature of the surrounding environment. Therefore, changes in the analyzed biochemical parameters derived as a consequence of change in the temperature regime and it is a good indicator to show seasonal rhythm of the body.

Keywords: Rana ridibunda Pall. biochemical parameters, temperature regime, seasonal rhythms

THE STIMULATION OF MORPHO-PRODUCTIVE CHARACTERS AT *MOMORDICA CHARANTIA L.* BY USING BIO-STIMULATORS

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INTRODUCTION

Momordica charantia L. – the bitter cucumber is a species of tropical origin and which has many therapeutic uses as an important source of active principles with anti-diabetic action. The species is less cultivated and studied in Romania, its acclimatization in the west of the country began in 2001 in the Arad agro-ecological area. The extract obtained from the fruit of *Momordica charantia L.* and/ or the entire plant showed a remarkable hypoglycaemic action in the treatment of diabetes, the active substance with such properties being "charantin" (a stereo-glicosyde). [1, 2]

In the Arad agro-ecological area, the thermal regime is mostly appropriate for the requirements of this species. The influence of the Mediterranean climate favours the growth in very good conditions of most thermophile long day species. Having a poorly developed root system, with rooting depth with a trend of growing towards the soil surface, the studied cultivation area offers optimal development conditions especially on light soils, which are well-structured, rich in humus, with neutral reaction and clay and sand structure. Sandy soils cause early and higher yields due to their lighter heating and accumulation of a number of degrees near optimal conditions required by the species. [3]

Keywords: active principles, anti-diabetes action, area, agro-ecological

USING BIO-FERTILIZERS IN ECOLOGICAL AGRICULTURE – SAFE AND CHEAP ALTERNATIVES FOR CHEMICAL AND CONVENTIONAL FERTILIZERS

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ABSTRACT

The studies which are carried out at a global level have shown that fertility contributes in a percentage of approximately 40% to the raising of production. Among fertilizers, nitrogen is the first by its contribution to the determination of the harvest growth. Thus, satisfying the food necessities of the increasing global population, as well as the supply of some raw materials for the industries, which they take from agriculture, largely depends on ensuring the corresponding quantities of nitrogen together with the other elements needed by plant metabolism.

Lasting agriculture, the current global strategy of agriculture development, involves healthy ecological practices which are also economically attractive. The biological fixing of nitrogen is a technology that fulfils both requirements, offering different ways to reduce prices and energetic input. The capacity of fixing the atmospheric nitrogen is a value that belongs to some prokaryotics, free or associated with plants, unlike what was believed not too long ago, of some eukaryote from the vegetable kingdom. Many researches have reported the presence and the abundance of some various nitrogen-fixing groups of microorganisms, in the most varied environmental conditions.

Alternative solutions to the usage of chemical fertilizers in agriculture are represented by biofertilizers. Lately, this industry has developed further. Basically having the capacity of the soil bacteria to fix atmospheric nitrogen in a symbiotic, associative and free manner and to have this reachable availability for plants, this industry is nonpolluting and has beneficial effects in remaking the fauna and soil biodiversity.

Keywords: metabolism, lasting agriculture, vegetable kingdom

USING BIO-POLYMER MATERIALS TO ENHANCE SANDY SOIL BEHAVIOR

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ABSTRACT

Nowadays, strength characteristics of soils have more importance due to increasing building loads. In some projects, geotechnical properties of the soils are be improved using man-made materials varying from cement-based to chemical-based. These materials have proven successful in improving the engineering properties of the soil such as shear strength, compressibility, permeability, bearing capacity etc.. However, the use of these artificial injection formulas often modifies the pH level of soil, contaminates soil and groundwater. This is attributed to their toxic and hazardous characteristics. Recently, an environmentally friendly soil treatment method or Biological Treatment Method (BTM) was to bond particles of loose sandy soils. This research paper presents the preliminary results of using biopolymers for strengthening cohesionless soil. Xanthan gum was identified for further study over a range of concentrations varying from 0.25% to 2.00%. Xanthan gum is a polysaccharide secreted by the bacterium *Xanthomonas campestris*, used as a food additive and it is a nontoxic material.

A series of direct shear, unconfined compressive strength, and permeability tests were carried out to investigate the behavior of sandy soil treated with Xanthan gum with different concentration ratios and at different curing times. Laser microscopy imaging was also conducted to study the microstructure of the treated sand. Experimental results demonstrated the compatibility of Xanthan gum to improve the geotechnical properties of sandy soil. Depending on the biopolymer concentration, it was observed that the biopolymers effectively increased the cohesion intercept and stiffness of the treated sand and reduced the permeability of sand. The microscopy imaging indicates that the cross-links of the biopolymers through and over the soil particles increase with the increase of the biopolymer concentration.

Keywords: Biopolymer; Xanthan gum; Biological Treatment Method; Direct Shear; and Permeability.

A POSSIBLE APPLICATION OF LICHEN IN DENTAL PRACTICE

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ABSTRACT

Possible application of the lichen genus Cladonia in dental practice due to antibacterial properties of lichen acids and enhanced bioavailability of obtained product after mechanochemical processing.

Keywords: biotechnology, biochemistry, lichen, dental, mechanochemical

A STUDY OF THE SURFACE PROPERTIES OF BACTERIA CAPABLE TO BOND HEAVY METALS FOR THE USE IN ENVIRONMENTAL BIOTECHNOLOGY

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ABSTRACT

In this study, the bacteria were isolated from heavy metal contaminated environments, and the applicability of their ability to remove heavy metals from polluted environment was evaluated at a laboratory scale. We have identified species with the highest efficiency for the removal of zinc, lead and cadmium from the model solutions. The results of study show that most of species had a hydrophobic cell surface, which probably had an influence on their ability to bound heavy metals. In many species of soil bacteria we have found out the structure of their surface receptors via experiments focused on testing their bond to ECM molecule. Different ability to bond each ECM molecule will probably be useful in searching good potential absorbents of heavy metals among a microorganism.

Keywords: bacterial surface, heavy metal, absorption

ADVANCED BIOTECHNOLOGIES FOR OBTAINING BIODEGRADABLE COLLAGEN BASED "CORE-SHELL/HOLLOW" STRUCTURAL NANO - SIO_2 COMPOSITE AND ITS APPLICATIONS FOR DRUG

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ABSTRACT

The aim of the paper is to create new biomaterials- biodegradable *protein (Collagen)-based "Core-Shell/Hollow" structural nano- SiO_2 composite* and to find applications for drug delivery system. These surfactant based composites can used for biomedical field, for ensure health and improvement of life quality. Biocompatibility between drugs and substrates (membranes, matrices, polymer films, hydrogels, creams, capsules, pearls, powders, nanoparticles) is a very important issue for the optimal prescription of different treatments for the human body and maintaining health.

It was obtained biomaterials by immobilizing drugs on various polymeric substrates, establishing the optimal conditioning formula, both in the preparation phase and in the adsorption phase of active components on the substrate. These are structured nanoparticles which contain a core from one material (or hollow) and a protective shell from another material, with sizes ranging between: 20 and 200 nm. The basic composition for both the core and the shell can be changed, providing a wide range of properties and applications (e.g. nanosensors, dyes).

"Core-Shell/Hollow" structures are synthesized in two stages: the core is synthesized through conventional polymerization in emulsion and then it is incubated with a secondary emission, containing monomers and initiators, synthesizing the shell. The droplet fusion process and monomer migration determine core occurrence in the second emulsion, on which shells are formed by polymerization.

Protein/"Core-Shell/Hollow" and SiO_2 nanoparticle structures, with applications in controlled drug release systems are a new trend in biomedicine and a challenge for experts in the field.

Keywords: biopolymer, "Core-Shell" composites

ANTI-AGING EFFECT ON OCULAR TISSUES OF ANTIOXIDANT VEGETAL SUPPLEMENTS FROM ROMANIAN MARKET

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ABSTRACT

The aim of the paper is to reveal any differences of therapy response which might be related to antioxidant activity of anti – aging vegetal supplement represented by tablets that contain active vegetal principles such as (*Coleus forkohlii* extract, omotaurina (a natural molecule extracted from certain varieties of seaweed, able to get to all body tissues, including the central nervous system, GABA and taurine like structures), magnesium, L-carnosine; vitamins (B_2, B_6, B_1) and folic acid. For this reason we used 3 groups of 40 persons of each one divided after gender (males and females) and age (20 – over 65 years) and different affections (20 patients with myopia, 15 patients with macular degeneration, 5 patients with peripheral retinal degenerescence), from these 3 groups one was the control one. From the two experimental groups, one received daily 1 tablet, and the other one, received daily 2 tablets, both over one year. Clinical evaluation before and after the treatment of these vegetal supplements action was done by Amsler ophthalmologic test, visual acuity, visual field, ophthalmological examination for degenerescence maculopathy. For peripheral retinal degenerescence, clinical evaluation of the vegetal supplements action was done by visual acuity, visual field, ophthalmoscopic aspect of the retina and for myopia disease by refraction, visual acuity, visual field and ophthalmoscopic examination. The antioxidant activity of these different vegetal used supplements was determined by a photochemiluminescence method, based on the multiple acceleration of a natural reaction leading to the generation of a superoxide anion radical. The measured anti-oxidative capacity is then quantified by comparison with a standard substance used for calibration, Trolox as tocopherol analog using Photochem, Analytik Jena AG apparatus. The antioxidant capacity results show that after the treatment based on different vegetal active principles, some of visual parameters improved or at least remained the same compared to control group, without treatment.

Keywords: anti-aging effect, ocular tissue, vegetal supplement, antioxidant activity

ANTIBACTERIAL AND ANTIFUNGUL EFFECTS OF FLAVONOÏDS ISOLATED FROM *CRATEAGUS OXYACANTHA* (L.) FRUITS IN THE NORTH ALGERIAN REGIONS (BOUMERDES AND BAINEM)

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ABSTRACT

The extracts of plants are currently the subject of many scientific researches aiming to exploit their properties antimicrobial appreciated so much in the therapeutic, nutritional, cosmetic, and pharmaceutical fields. In this work, we have study the antimicrobial activity of the extracts namely flavonoïds resulting from the *Crateagus oxyacatha* fruits in two bioclimatic stages (Dellys and Bainem). The determination of the antimicrobial effects on stocks bacterial of $Gram^{-}$; *Escherichia coli, Pseudomonas aeruginosa* and *Klebsiella pneumoniae* and $Gram^{+}$ (*Bacillus subtilis* and *Staphylococcus aureus*). We have also tested two yeasts; *Candida albicans and Saccharomycec cereviciae*.

As regards the extract of *C. oxyacantha* of the area of Bainem, one announces that *E. Coli* is slightly sensitive to the extract of *C. Oxyacantha.* However *S. aureus and B. subtilis* have a strong sensitivity to this extract. Whereas the other bacteria are fairly sensitive.

With regard to yeasts, one notices that *S. cerevisiae* is slightly resistant to the extract. This solution has an inhibiting effect on *C. albicans*.

Concerning the extract of *C. oxyacantha* of the area of Dellys, one notes that *E.Coli* is slightly sensitive to the extract of *C. Oxyacantha*. However *S. aureus and B. subtilis* have a strong sensitivity to this extract. Whereas the other bacteria are fairly sensitive.

With regard to yeasts, one notices that *S. cerevisiae* is slightly resistant to the extract. This extract has a strong inhibiting effect on *C. albicans*.

Through this study, one notices clearly the sensitivity of bacteria Gram-plus compared to the bacteria Gram-for the two areas.

Keywords: *Crateagus oxyacantha*, flavonoïds, bacteria, yeast, antimicrobial activity, Dellys, Bainem.

ANTIOXIDATIVE ACTIVITY OF INDIGEN BITTER CHERRY FRUITS EXTRACT CORELLATED WITH POLYFENOLS AND MINERALS CONTENT

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ABSTRACT

The aim of this paper was to establish the content in polyphenols compounds and minerals from the fluid extract of indigen *Cerasus avium* (L.) Moench. *fructus* (bitter cherry) collected from Dobrudjia region, Romania, correlated with total antioxidative capacity (TEAC) of the soluble lipid compounds, through photo-chemiluminescence method, according ACL procedure of Analytik Jena AG, by comparing with the standard Trolox (tocopherol derivative) solution, using Photochem apparatus. The HPLC determinations of hydroalcoholic (70/30,v/v) fruits extract, identified an increased content of polyfenols compounds (gallic acid, 3-methyl gallic acid, chlorogenic acid, ellagic acid and cinnamic acid). *Cerasus avium* (L.) Moench. hydro-alcoholic fruits extract emphasize an increased total antioxidative capacity which may be attributed to the high level content of polyphenols compounds, especially gallic acid. The minerals and heavy metals content determined by AAS method, using ContraA-700 Analytik Jena AG spectrophotometer, conclude that no heavy metals (Pb, Cd, Hg) occur in fruits fluid extracts, but a high biometals and oligominerals content (Ca, Mg, Zn, Cu) was registered. The increased antioxidative activity correlated with the high minerals content sustains the possibility to use the *Cerasus avium* (L.) Moench. *fructus* fluid extracts in different molar ratio, as potential tincture in phytotherapy.

Keywords: bitter cherry, hydroalcoholic extract, antioxidative activity, polyphenols, minerals

ANTIOXIDATIVE ACTIVITY OF INDIGEN BITTER CHERRY FRUITS EXTRACT CORELLATED WITH POLYFENOLS AND MINERALS CONTENT

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ABSTRACT

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Keywords: bitter cherry, hydroalcoholic extract, antioxidative activity, polyphenols, minerals

APPLICATION OF BIOPOLYMER IN NATURAL RUBBER BLENDS

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ABSTRACT

Galactomannan-filled rubber blends were prepared, and the effect of galactomannan Locust Bean Gum (0 – 55 phr) and tenside sodium dodecyl sulfate (0, 3 phr) loading on natural rubber (NR) were investigated. Mechanical properties and hardness of Locust Bean Gum filled vulcanisates were measured before and after thermo-oxidative aging for 72 h at 100 °C. The results were compared with unfilled NR vulcanisates with and without sodium dodecyl sulfate. The results indicate that, overall, the scorch time (t_{S2}), cure time (t_{90}), tensile strength and elongation at break decrease with Locust Bean Gum loading, whereas an increment was observed in the maximum torque (M_{max}) and hardness of filled rubber blends. Rubber-filler interaction was measured by FT-IR. The effect of galactomannan loading on thermal properties of NR blends was studied by TGA. Morphology of the tensile fractured surface of the vulcanisates was studied using by scanning electron microscopy (SEM). SEM analysis confirmed filler agglomeration formation of NR blends as hydrophilic Locust Bean Gum loading was increased. Dynamic mechanical thermal analysis (DMA) results showed change in the glass transition temperature (T_g) of the rubber matrix upon addition of Locust Bean Gum.

Keywords: elastomeric blends, biopolymers, mechanical properties, natural rubber, curing characteristic

APPLICATION OF INTERNATIONAL STANDARDS, REFERENCE DOCUMENTS ON BEST AVAILABLE TECHNIQUES AND GUIDELINES ON BEST PRACTICES IN THE BAKING INDUSTRY

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ABSTRACT

Opportunities for the modernisation of the larger baking industries using approaches of business process reengineering approaches and implementing Best Available Techniques are considered. Peculiarities of the application of ISO standards on Management Systems are discussed.

Keywords: Food industry, baking industry, Best Available Techniques, process-structural planning, business-processes reengineering.

APPLICATIONS OF A NEW METHOD OF DETERMINING LORATADINE BY HPLC/DAD FROM VARIOUS DOSAGE FORMS AND BIOLOGICAL SAMPLES

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ABSTRACT

The aim of current study is to see if this new HPLC/DAD method, which was performed, established and validated in our previous researches, is suitable for the analysis of drugs in pharmaceutical chemistry and for clinical purpose.

HPLC/DAD method was applied to various pharmaceutical forms, from the Romanian market (oral tablets with loratadine, modified release tablets with loratadine and pseudoephedrine sulphate and syrup with loratadine) and biological samples (serum, urine and breast milk).

For the determination of loratadine in human serum and urine were sampled blood and urine of 6 healthy volunteers, who agreed to receive loratadine orally in doses of 10 mg once daily (normal therapeutical dosage) at the same time (9:00 AM). The sample of breast milk has been taken from a woman volunteer diagnosed with urticaria, two months after giving birth.

The sampling was done to 0 hour, 1 hours, 2 hours, 3 hours, 6 hours and 8 hours after the administration of antihistamine treatment (10 mg loratadine). All volunteers are adults, similar ages, race and weight.

Sampling was done during three days at the same time of day.

Chromatographic conditions were as follows: HPLC Agilent 1200 quaternary pump, DAD, thermostat, degassing system, autosampler, column chromatography type C18 (250 x 4.6) 5µm XDB - C18 Agilent (Zorbax Eclipse XDB-18 or equivalent, flow 1 mL/min, column temperature: 27°C, injection volume: 10 mL, mobile phase: 0.01% solution of triethylamine adjusted to pH = 2.75 with ortho-phosphoric acid / acetonitrile (46/54, v/v)] - isopropanol (90/10, v/v), detection: 264 nm; the concentration of samples was calculated using the calibration equation and then it was statistically processed.

A recovery of 98.51% was registered on tablets with loratadine compared to the declared content of active substance. The recovery of 92.71% on modified release tablets with loratadine and pseudoephedrine sulphate and a 102.49% recovery on loratadine syrup were recorded. All values are within the permissible deviations according to European Pharmacopoeia.

A small increase of unmethabolised loratadine concentration in first time interval and then a decrease due to metabolism and renal elimination was noticed in serum samples. This method reveals the presence of loratadine in urine and breast milk without being altered by other components of the samples. HPLC method is sensitive and can detect traces of loratadine in all biological samples whereas its peak does not interfere with other peaks of sample components.

Finally, this method proved to be sensitive, valid and reliable in determination of loratadine in various dosage forms and biologic samples.

Keywords: loratadine, HPLC/DAD method, dosage forms, biologic samples, selectivity, sensitivity.

BIOGROUT TECHNOLOGY APPLIED ON TRANSILVANIAN SANDS

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ABSTRACT

Development of construction field in the past years lead to the necesity of finding new solutions for foundation soil improvement. Soil stabilisation is a problem that often occurs during the construction process and because of that, this topic became one the most important research topics in geotechnical engineering. This paper presents Biogrout Technology and the procedure used to apply it on Transilvanian sands. Biogrouting is a new biological ground improvement method in geotechnics, in which microorganisms (ureolytic bacteria: Sporosarcina Pasteurii DSMZ 33) are used to induce calcite based Microbial Carbonate Precipitation (MICP) in the ground in order to increase the shear strength and stiffness of granular sandy soils (source of carbon: $CO(NH_2)_2$, source of calcite: $CaCl_2$). The paper also presents the results obtained in the laboratory after testing the new material using triaxial compression tests.

Keywords: Biogrout, Microbial Carbonate Precipitation (MICP), Modulus of Elasticity, Triaxial compression test, Sporosarcina Pasteurii

BIOLOGICAL ACTIVITY OF SOME NEW Ln(III) COMPLEX COMPOUNDS BASED ON BIGUANIDE DERIVATIVES

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ABSTRACT

The *N*-substituted biguanide derivatives have shown a considerable attention for their antidiabetic and antimalarial activity and for the therapeutic treatment of pain, anxiety and memory disorders as 5-HT_3 serotonin receptors. The biological action of these complexes on the human body may be explained by the formation of these compounds. We have synthesized a new series of La(III) and Ce(III) complexes based on *N*-substituted biguanide. These derivatives were characterized by elemental analysis, molar electrical conductivity, IR, UV-VIS and electronic spectroscopy. In the present paper we report the biological effects of the new La(III) and Ce(III) compounds on the saprophyte bacterian *Halomonas* sp. isolated from Romanian Black Sea Coast. Also, the new complexes and ligand were tested against different Gram positive (*Staphylococcus coagulase positive*, *Streptococcus β-haemolitic A group, Streptococcus β-haemolitic B group*, *Streptococcus faecalis*, *Bacillus cereus*, *Corynaebacterium dyphtheriae)*, Gram negative (*Pseudomonas aeruginosa, Shigella flexneri*, *Escherichia coli*, *Salmonella B group)* bacteria strains and fungal (*Candida albicans*, *Saccharomices cerevisiae)* species for their antimicrobial action. The results emphasize that all complex compounds present antimicrobial activity compared with the ligand, against most of the tested species.

Keywords: Ln(III) complex compounds, *N*- substituted biguanide, biological activity

CHALLANGING THE BIOGEOCHEMICAL POTENTIAL OF ANTARCTIC YEAST: BIOREACTOR DYNAMICS IN VISCOUS BROTHS CONTAINING EXOPOLYSACCHARIDES

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ABSTRACT

The biogeochemical potentials of cold-tolerant Antarctic microorganisms to release organic matter has allowed production of valuable components of pharmaceuticals and food. Recently, a bioprocess for exopolysaccharides and biomass involving Antarctic yeast has been introduced and put forward for examination. The fermentation broth is viscous and non-Newtonian and good mixing and oxygen transfer are essential for the microorganisms. The paper presents a study of the bioreactor performance that evolves when using a modified backswept impeller termed impeller MV. As related to the importance of oxygen for the specific yeast metabolism and based on preliminary data, the bioreactor dynamics is studied both experimentally and by simulation. The impeller power draw gas volume fraction and oxygen mass transfer were measured and the bioreactor fluid dynamics corresponding to the bioprocess evolution were revealed. New experimental data is obtained. The results are compared with reference data for the conventional bioreactor equipped with two six flat-blade turbines. Both reactive and non-reactive conditions related to the bioreaction evolution are studied. Moderate rotational speeds typical for the conventional impeller were applied and the bioprocess time-course for the two mixing cases was registered. The bioprocess corresponding to MV mixing has been found to be slightly delayed what is discussed in terms of the impeller specific substrate distribution and its weaker gas dispersion function. Good gassed power draw and drag reduction properties of the impeller are found that allow its application at high rotational speed and further multiple impeller configurations.

Keywords: bioreactor, exopolysaccharides (EPS), Antarctic yeast, impeller mixing

CHROMOSOMAL ABERRATIONS INDUCED BY PENTIMETHALIN IN *ALLIUM SATIVUM* ROOT MERISTEMS

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ABSTRACT

Garlic (*Allium sativum*) is an edible plant used as food and spice. In popular medicine it is considered, along with the onions, a real remedy due to the rich content of vitamins and minerals. Pentimethalin is the active component of the herbicide Stomp 330 EC; this is frequently used by the farmers to control weeds in the garlic cultures.

Cytogenetic effects of Pentimethalin have been tested on the root tip cells of *Allium sativum L*., with a series of concentrations (1.5; 2 and 3 ppm), for 6, 12 and 24 hours. The control has been untreated. Garlic bulbs have been grown in water at room temperature (20 ± 2 °C); when the newly emerged roots are 2 cm in length, they are used in the test. Microscopic slides have been prepared by using Feulgen-Rossenbeck method for coloring the chromosomes and squash technique. The measurements were made under an optic microscope (two models have been used: MBL-2000 Kruss and Celestron 44340 LCD Digital) by considering 15 microscopically areas per slide. Two parameters were studied: the mitotic index and chromosomal abnormalities. The number of abnormal cells was counted in each phase of mitosis. The analysis of variance was used to assess the significant differences between control and each treatment. The results were analyzed using statistical program for Windows.

The effects of increasing concentrations of Pentimethalin were: decrease in mitotic index and induction of a high level of chromosomal abnormalities. Thus, the mitotic index decreased with increasing the herbicide concentration at each exposure time; on the other hand, various chromosomal abnormalities like rings, fragments, bridges, stickiness, laggards and micronucleus were observed. From this point of view, the bridges were generally observed in all treatment alternatives. The frequencies of chromosomal abnormalities increase with increasing the herbicide concentration. In this regard, the differences among the concentrations have been significant, when compared with untreated control. Our study reveals a direct correlation between herbicide concentration, exposure time and mutagenic effects observed in exposed *Allium sativum* root cells.

Cytologic effects of Pentimethalin to garlic, suggest prudence regarding abusive usage of this substance. However, supplementary studies are necessary to determine the molecular mechanisms whereby Pentimethalin induce genotoxic effects to plants. Besides, there are still many chemical substances for plant protection whose possible genotoxic effects are unknown.

Keywords: Garlic, Pentimethalin, mitotic index, chromosomal aberrations.

CLINICAL RESEARCH - MANAGEMENT OF PHYSICIAN – PATIENT COMMUNICATION

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ABSTRACT

The legitimacy of patient satisfaction as an outcome measure of health care has grown considerably over the past decade. Satisfaction is considered an indicative of quality of care. Satisfaction is also being used to assess the performance of health care delivery at multiple levels – organizational (hospital, clinic…), unit (surgery, laboratory, radiology, etc.) and individual (physician, nurses…). Satisfaction might be characterized as the net result of patient expectations filtered through perceptions of the patient acquires during and after the service encounter. When a patient's health care experience exceeds his or her expectations the experience is satisfactory; when the experience falls short of expectations, the experience is unsatisfactory. One of the dimensions of patient satisfaction, that is most frequently assessed, refers at the interpersonal aspects of care. On the other hand, the most frequently studied aspect of medical care is the extent and accuracy of communication between physicians and patients.

Keywords: Physician, patient, satisfaction, communication, patient perception and feelings who do we listen to, learn empathy

COMPARATION BETWEEN TWO IN VITRO TESTS FOR TOXICITY ASSESSING OF A LIPOPHYLE EXTRACT OF PELLOIDIC MUD FROM TECHIRGHIOL LAKE, CONSTANTA, ROMANIA

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ABSTRACT

The aim of this paper was to assess cyto- and genotoxic effects of a lipophyle extract of pelloidic mud (LE) from Techirghiol Lake, Romania, using two in vitro tests: cell viability determination in a mice fibroblasts culture (NCTC, clone L 929) and *Triticum* assay. The extract contains a mixture of saturated and unsaturated hidrocarbonated compounds with carbonilic and carboxylic groups.

Cytotoxic effect of LE, in a dilution ranging between 0.025- 1 g/mL, on the mice fibroblasts culture was assessed by neutral red (NR) test after 24 and 48 h of cultivation according to ISO 10993-5:2003. Cell viability was calculated by comparison with the cell culture control considered to be 100% viable cells, at each period of time. The morphological observations were done on culture plates after the cultured cells were fixed in methanol and Giemsa stained.

In *Triticum* assay we used two concentrations of LE in alcoholic solutions (0.025 g/mL and 0.045 g/mL). The *Triticum* seeds were preliminary imbued in water, and then they were treated for 6, 12 and 24 hours in LE solutions. The control group was treated with tap water. In the end of the experiment the harvested root tips were prepared according to Feulgen's squash technique using Schiff reagent. The cytotoxic effects of LE were investigated by calculating the mitotic index and also through the analysis of chromosomes alterations during the mitosis.

In mice fibroblasts culture the LE expressed a cytotoxic effect only in higher amounts than 0.066 g/mL. In lower concentrations of LE, the cells had 95% viability and there were no morphological changes, after 48 h of cultivation.

Triticum assay showed that the powerful effect on the cell division was in 0.025 g/mL LE after 12 or 24 hours of treatment. It was observed a rise of mitotic index and a small number of chromosomal aberrations in all variants. Because the studied concentrations

of LE on the seeds of *Triticum aestivum* were smaller than 0.066 g/mL, we can notice that LE solutions had cellular regeneration effects and also cell metabolism stimulating.

As conclusions: LE was not cytotoxic in the range of concentration 0-0.066 g/mL and can be used in cosmetic products. The information given from the two assays correlated each other and offered a better image concerning the toxic effects of LE. The two methods could be used together in the future studies as alternative methods for toxicity assay.

Keywords: pelloidic mud, fibroblasts culture, *Triticum* assay, cytotoxic effect

CORRELATION BETWEEN ANTIOXIDANT ACTIVITY OF VEGETAL SUPPLEMENT AND AGE RELATED MACULOPATHY

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ABSTRACT

Because ARM (age related maculopathy) is one of the leading causes of irreversible visual loss among people aged 45 - 65 years in the world and as well in Romania, the aim of this paper is to reveal any differences of therapy response which might be related to different antioxidant activity of vegetal supplement (tablets). This supplement contains only Sunphenon EGCG 90% dry extract from *Camellia sinensis* leaves, standardized in 90% epigallocatechine gallate. Epigallocatechine gallate acts as a powerful antioxidant compound that neutralizes reactive oxygen species resulted during metabolic processes at eye level, contribute to the normalization functionality of nerve cells and, in particular, of the retina; protects and nourishes the ocular structures (optic nerve, retina) affected by degenerative processes. For this reason we used 4 groups of 20 persons of each one divided after gender (males and females) and age (45 – 65 years) and different diseases (one third with diabetic maculopathy). From these 4 groups one was the control that received no treatment. Clinical evaluation of this supplement action was done by Amsler ophthalmologic test, visual acuity, visual field, ophthalmoscopic aspect of the fundus of the eye, before and after the treatment. The antioxidant activity of this supplement was determined by a photochemiluminescence method (PCL), based on the multiple acceleration of a natural reaction leading to the generation of a superoxide anion radical. The measured antioxidative capacity is then quantified by comparison with a standard substance used for calibration, Trolox as tocopherol derivative (in ACL method) using a Photochem, Analytik Jena AG apparatus. The antioxidant capacity results show that after the treatment based on epigallocatechine gallate supplement, some of visual parameters improved or at least remained the same compared to control group without treatment, in which the ophthalmologic situation got worse, more or less. Preliminary results emphasized the importance of this supplement in age related maculopathy.

Keywords: age related maculopathy, antioxidant activity, vegetal supplement, epigallocatechine gallate

CORRELATION BETWEEN *IN VITRO* CYTOTOXICITY AND ANTIOXIDANT ACTIVITY OF SOME NEW BIOADHESIVE GELS BASED ON CHLORHEXIDINE METALLIC COMPLEXES

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ABSTRACT

The new bioadhesive gels obtained in this paper aim to diversify the market of semisolid dosage forms with oropharyngeal mucosa action, covers a general need of human and veterinary health area for their disinfectant and antioxidant properties and could be used for oral hygiene. Were prepared several innovative semisolid preparations type bioadhesive gels, based on synthesized Cu (II) and Zn complex compounds of chlorhexidine salts incorpored in gelatin, glycerol and sorbitol as excipients. The obtained bioadhesive gels were evaluated regarding their physical-chemical properties from compendial sources, such as: appearance, homogenity, *p*H, spread-ability and penetration capacity, using standard methods according to European Pharmacopoeia. *In vitro* cytotoxicity of these bioadhesive gels on fibroblast cultures were determined. In this order were analyzed the cellular viability by MTT method and cellular morphology. At concentrations in range of 100 µg/mL – 1 mg/mL we noticed no effect in morphology fibroblast modification and a 95% viability after 24 h. The antioxidant activity of these bioadhesive gels comparative to Cu (II) and Zn complex compounds of chlorhexidine was determined by chemiluminescence method, based on the multiple acceleration of a natural reaction leading to the generation of a superoxide anion radical. The antioxidant capacity was quantified by comparison with standard luminol, using a Turner Design TD 20/20 SUA apparatus, at λ 420 nm wavelength. From the obtained results we noticed that comparative to the chlorhexidine complexes with copper (II) and zinc, the new bioadhesive gels had an increased antioxidative capacity (84-89%), which suggest them as efficient antioxidant agents, with low toxicity on fibroblasts.

Keywords: bioadhesive gel, chlorhexidine, Cu(II) and Zn complexes, cytotoxicity, antioxidant activity

DEVELOPMENT OF THE INFORMATION SYSTEM IN THE FIELD OF BIOTECHNOLOGY

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ABSTRACT

The article addresses information support issues for research projects and programmes conducted in such fields as pharmaceutical industry and biotechnology. The system developed provides free access to the information and research resources grouped by key directions (priorities), reflecting current characteristics of biotechnology development. This information system contains a number of sub-systems, which include such types of documents as: patents, reports on research projects and programmes, reports on practices investigations (covering such aspects as equipment construction, technological parameters, etc.), research articles, conference and workshop proceedings, and other publications in the field of pharmaceutics and biotechnology.

Keywords: information system, biotechnology, pharmaceutical industry.

EFFECT OF MINERAL FERTILIZERS AND BIOFERTILILZERS ON SOIL MICROBIAL CHARACTERISTICS AND POTATO YIELD

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ABSTRACT

Safe food production is essentially dependent on safe primary agricultural production which, inter alia, involves a reduction in the use of agrochemicals. However, their uncontrolled use for increased productivity is a frequent practice which ignores their disastrous effect on the biosphere and, hence, the quality of primary products. Soil microorganisms are important parameters used in assessing the quality and level of pollution of the biogeosphere and plant products. Therefore, the objective of this study was to evaluate the effect of different application rates of mineral nitrogen fertilizerz on soil microbial characteristics (total microbial count, numbers of ammonifiers and proteolytic activity) and potato yield, and their potential replacement with biological fertilizers (produced from nitrogen fixing strains of *Klebsiella planticola*).

The experiment was conducted at the experimental field of the Biotechnical Faculty in Podgorica in a randomized block design in four replications. The test plant was potato cultivar 'Kennebeck'. The trial included five treatments: unfertilized control; treatment N1 - 100 kg/ha CAN (calcium ammonium nitrate, 27% N); treatment N2 - 200 kg/ha CAN; treatment N3 - 300 kg/ha CAN; treatment with Enteroplantin, a *Klebsiella planticola*-based biofertilizer. The total microbial count and the numbers of ammonifiers were determined by the plate culture method using appropriate selective media, and proteinase activity was assessed by titration with $FeCl_3$.

Results suggest that low nitrogen fertilizer rates improved soil microbial characteristics, whereas the highest application rate (300 kg/ha CAN) reduced all of the traits analyzed, except proteolytic activity. The highest increase in soil biological characteristics was observed in the treatments involving biofertilizer use, which led to increased plant growth and tuber yield of potato, compared to mineral nitrogen fertilization.

The present results suggest that reduction in the use of mineral fertilizers through their replacement or supplementation with biofertilizers is recommended in safe food production.

Keywords: biofertilization, potato, microorganisms, soil, mineral nitrogen, yield

EFFECT OF RIPENING ON PHENOLIC COMPOUND OF *VITIS VINIFERA* L. SEED GRAPES FROM MURFATLAR VINEYARD DETERMINED BY A SIMPLE HPLC/DAD METHOD

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ABSTRACT

The aim of this research is to determine the polyphenolic compounds in grape seeds during ripening of three different varieties by a HPLC/DAD method.
Grape seeds from three different varieties (Pinot Noir, Coarna neagra, Cabernet Sauvignion) were collected in August and September 2012, during three different times of ripening, from Murfatlar, Constanta district, Romania.
The seed extracts were obtained with ethanol 50% after two different extractions: maceration 7 days at room temperature, 6h reflux.
A HPLC system (Agilent 1100/1200) with quaternary pump, DAD, autosampler and 5µm Zorbax Eclipse XDB-C18 (250 x 4,6mm, Agilent Technologies) column, was used for analysis of phenolic compounds. Also, total polyphenol content was determined spectrometrically using Folin-Ciocalteus method. The absorbance was measured at 725 nm in UV-VIS spectrophotometer Jasco V-630.
HPLC analysis of seed extracts showed that all extracts contain high levels of total phenolic compounds. The following phenolic compounds were founded: trans resveratrol, cis resveratrol, chlorogenic acid, caffeic acid, cinnamic acid, vanillin, gallic acid. The retention times were between 0.990±0.025minutes for gallic acid and 15.867±0.007minutes for cinnamic acid. The amount of polyphenols in grape seeds reaches the value of 8523.66mg ellargic acid/100g product of Cabernet Sauvignon grape variety.
Polyphenol content varies according to ripening period and depends on the extraction method. The content of resveratrol, one of the most known polyphenol compound, varies depending on the method of extraction and ripening period.
Keywords: phenolic compound, grape seeds, HPLC/DAD method.

ELITE HYBRID OF PERSPECTIVE FOR TABLE GRAPES OBTAINED IN INCDBH STEFANESTI

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Abstract

In order to promote Romanian products on the international market and primarily to penetrate the European market, it is necessary to achieve superior products in terms of quality with low costs, consistent with international standards to cope with competitive pricing policy. To achieve this goal and solve the problems facing today's wine practice, breeders channel their efforts towards the fulfillment of benchmarks, such as: the creation of new varieties with high adaptability to climatic conditions of the growing areas in Romania, the complex biological varieties resistant to pests and diseases, and accidents of climate, development of technology for producing virus-free planting material. To achieve this goal and solve the problems facing today's wine practice, breeders channel their efforts towards the fulfillment of benchmarks, such as: the creation of new varieties with high adaptability to climatic conditions of the growing areas in Romania, the complex biological varieties resistant to pests and diseases, and accidents of climate, development of technology for producing virus-free planting material, etc.Directed hybridization method created numerous varieties, filling the current selection in relation to specific requirements and conditions of culture, achieving both a diverse gene pool with a rich germplasm source.Elite hybrid grapes were created via sexual hybridization in viticultural center Ştefăneşti, that meet the following parameters: 3 future elites were analyzed into improvement fields and which, through outstanding quality traits, will be proposed for inclusion in the Official Catalog of varieties as new varieties for table grapes with different maturation periods. To analyze potential quality, elites were compared with varieties of the same maturing group.

Keywords: improvement, vine, hybrids, qualitative attributes

GEOGRAPHIC DISTRIBUTION OF *RHODOCOCCUS* SP. AND ITS CHARACTERISTICS IN THE REMEDIATION PROCESSES OF CONTAMINATED ECOSYSTEMS

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ABSTRACT

Bacterial communities are known to be important components of the Earth's biosphere. Still, their coexistence and species variations have not been examined thoroughly. The paper focuses on the bacterial strain of *Rhodococcus* sp. CCM 4446 and its significant phenotype and physiological characteristics, which are contrasted to its closest relative species within the up-to-date taxonomic position of the strain. The geographic context of the closest relative species' occurrence shows that the strain is a generally wide-spread species and its activity as well as its hitherto proved utilisation and resistance capacities play an important role in the remediation of ecosystems contaminated by mining and heavy industry.

Keywords: taxonomic position; diversity; phenotype study; utilisation and resistance capacities; *Rhodococcus* sp.

IDENTIFICATION OF THE WAVE PATTERNS OF BEHAVIOR

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ABSTRACT
On examples [1] the method of identification of nonlinear trends and wave regular-ities in the form of asymmetric wavelet signals of behavior of genes on grouped (nmeth.2724-f3.xls1) and primary basic data (to nmeth.2724-f2.xls1, nmeth.2724-f1.xls1) is shown. Unknown regularity of influence of a dependent factor of Seed on thyA CO and WT indicators is revealed. On one example of 10-3 Mod SD =f (10-3 Expt SD) from the array1 nmeth.2724-f1.xls Growth_Data_Summary the wavelet-analysis technique is shown.
The method is applicable to processing of results of measurements of behavior of any objects.
It proceeds from the unique algebraic equation according to Rene Descartes for describe the behavior of any objects, each member of which contains 6 to increasingly complex design "bricks" Hilbert becoming complicated on a design. Thus the left col-umn to the biotechnical law gives an asymmetric wavelet-signal, and the right column allows to identify infinitely measured (in comparison with an interval of time of meas-urements) on amplitude oscillatory adaptations.
Keywords: genes, group, primary data, wavelet analysis, new factors, wave models

IMPORTANT BIOACTIVE COMPOUNDS FROM MARINE ALGAE - POTENTIAL SOURCE FOR PHARMACEUTICAL INDUSTRY

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Contribution note: All the authors have equal contribution to the paper.

ABSTRACT

During the last years, it became obvious that the marine ecosystem presents an excess of marine algae, which should be turned valuable in one way or another. Marine algae are a heterogenic group of organisms that is comprised of approximate 10 000 species, spread especially in the aquatic environment but also on the solid wet substratum. The importance of the macro- benthic flora – algae and phanerogames – for the general productivity of the marine environment, especially in shallow waters, is becoming more and more obvious from the biological, as well as from the economical point of view. The macrophytes also represent a particular life form in aquatic water. In this paper are presented the most important marine algae, *Cladophora vagabunda* (L.), *Enteromorpha intestinalis* (L.), *Ulva Lactuca*, *Ceramium rubrum*, *Cystoserira barbata*, from Black Sea Romanian costal waters. The characterization of marine algae was presented for all the analyzed algae. The important bioactive compounds from this algal biomass were identified by modern phyto-chemical analyses.

Keywords: marine algae, bioactive compounds, macrophytes

IMPROVEMENT OF BIOCHEMICAL PARAMETERS OF SILKWORM (*BOMBYX MORI* L.) TO OBTAIN AN ORGANIC RAW MATERIALS FOR TEXTILE INDUSTRY

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ABSTRACT

During six generations it has been studied a total of 30 inbred lines of silkworm pursuing the effect of inbreeding on some biochemical parameters. The amount of protein of silkworm eggs on the whole experience was in I_3 (3^{rd} generation of inbreeding) between 11.91 % -14.20% and in I_6 (6^{th} generation inbreeding) between 12.22-14.62%, not influenced by the process of inbreeding. Some quantitative differences were correlated with the studied stage of embryonic development. The amount of lipids in silkworm eggs was in I_3 between 80.6-98.8 mg/g eggs, ranging from embryogenesis stage, and 82.2-97.3 mg/g eggs I_6, being influenced by the same factor. Inbred lines in both generations of inbreeding shows higher values of the control batch, but also do not show differences in statistical significance. In I_6 the amount of fat shows the differences in less compared to I_3, but these are insignificant. Biosynthesis of amino acids from sericine gland and from larvae hemolymph was not influenced by practice related type crossings brother x sister. In all samples was revealed a total of 18 amino acids and quantitative differences between samples, in general, insignificant were not correlated with inbred or not inbred character of silkworm lines. Determined silk fibroin content in I_3 was within 73.16-77.18% for the lines group Baneasa White and between 71.16-75.86 % for the group lines Baneasa 75. Same component presented in I_6 values between 73.20-76.90% for the first group of lines that are found significant differences against control batch and between 72.10-76.21% for the second group. Silk sericine contains was not affected by inbreeding depression. This presented to the group of lines Baneasa White an average value 24.24% in I_3 and 24.57% in I_6, being higher in the second group of lines, Baneasa 75, respectively 26.50% in I_3 and 26.40% in I_6.

Keywords: inbreeding, silkworm, line, blastokinesis

IN VITRO PROPAGATION OF RUBUS CHAMAEMORUS L. AND RUBUS ARCTICUS L.

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ABSTRACT

Rubus chamaemorus L. and *Rubus arcticus* L. are rare plant species in a particular region of the Russian Federation, the preservation of these species is of great importance for maintaining biodiversity. At the same time *R. chamaemorus* and *R. arcticus* are a source of biologically active substances. *In vitro* propagation of *R. chamaemorus* and *R. arcticus* is an important instrument for the preservation and reproduction of economically valuable plants in which tissue is freed from all kinds of infections and remains unchanged genetic structure of the plant organism. For an introduction to culture *in vitro R. chamaemorus* used shoots isolated from male and female plants for introducing young *R. arcticus* used metameres 0,5 cm long was found that the induction of morphogenesis *R. arcticus* must use MS medium supplemented with BA 1,0 mg l^{-1} for *R. chamaemorus* Quoirin and Lepoivre medium supplemented with BA 1,5 mg l^{-1}. The optimal pH levels at 5,2 for micropropagation *R. chamaemorus* and 4,9 for *R. arcticus*.

Keywords: *Rubus chamaemorus* L., *Rubus arcticus* L., clonal micropropagation, genotype, rooting, *in vitro*

INFLUENCE OF SOME THERMAL TREATMENTS ON CHLOROPHYLL AND CAROTENOIDS CONTENT FROM BROCCOLI (*BRASSICA OLERACEA, VAR. BOTRYTIS*) AND BRUSSELS SPROUTS (*BRASSICA OLERACEA, VAR. GEMMIFERA*)

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ABSTRACT

The aim of this paper was to determine the effect of some thermal treatments on chlorophyll and carotenoids content from broccoli and Brussels sprouts, using a specrophotometric method. Vegetables were analyzed fresh and after blanching, boiling, freezing raw and freezing blanching prior. Of the two analyzed vegetables, broccoli has the highest chlorophyll and carotenoids content (fresh broccoli - total chlorophyll: 417.35 mg/g, carotenoids: 82.15 μg/g, fresh Brussels sprouts- total chlorophyll: 256.84 mg/g, carotenoids: 68.23 μg/g). Both for broccoli and Brussels sprouts the higest loss of chlorophyll, as a result of different thermal treatments, have registered with the chlorophyll "b". For samples of broccoli, percentage loss of chlorophyll "b" are higher than similar samples of Brussels sprouts. Regarding chlorophyll "a" and total chlorophylls, the most significant percentage losses were recorded in the thermal treated Brussels sprouts samples. For both vegetables was reported that the largest percentage loss of chlorophyll and carotenoids occur after freezing blanching prior (freezing time: 2 months), followed by boiling and freezing of raw samples.

Keywords: chlorophyll, carotenoids, broccoli, Brussels sprouts, thermal treatments.

INFLUENCE OF TEMPERATURE ON EMERGENCE SOME ROOTSTOCKS USED IN ROMANIA AT GRAFTING OF CUCURBITS VEGETABLES

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ABSTRACT

The research aimed to determine the optimum temperature to a qualitative emergence (early and uniform) of some cucurbit rootstocks. The experience was carried out in 2014, inside the Laboratory of Protected Cultures, in greenhouse specialized in producing from grafted vegetable seedlings of the Research and Development Institute for Processing and Marketing of the Horticultural Products – Horting, Bucharest. The experience has varied with following factors: rootstock and emergence temperature. The biological material used was formed from five F_1 hybrids: two inter-specific (*Cucurbita moschata x C. maxima*) rootstocks – Shintoza and TZ148 and three *Lagenaria siceraria* rootstocks – Argentario, Achille and Macis. Rootstocks seeds were sown in alveolar trays (24 ml/cell volume), in nutritive substrate ($peat_3$: $perlite_1$); peat with grain size 0-10 mm, NPK (1 kg/m³), microelements B, Mg, Cu, Mn, Zn, Fe, S (0.050 kg/m³), calcar (4.7 kg/m³), pH 6, wetting agent 100 ml/m^3. After sowing and wetting, temperature was regulated in 3 different variants: 15^0C, 20^0C, 28^0C. The germination temperature was maintained at constant value (day and night) until to plant emergence. The data were subjected to analysis of variance and compared at the 0.01 or 0.05 significance levels. Correlation coefficients were calculated between temperatures and uniformity rates in first emergence day. The statistical analysis showed differences between variants. The temperature has influenced the emergence of the rootstocks (length of time between sowing and emergence and uniformity of plants). All rootstocks had an optimal emergence at 28^0C; a maximum uniformity (95%) between 4–4.5 days after sowing. An optimal emergence of the cucurbits rootstocks is an important aspect in the technology for producing of grafted seedlings. This technology is developing in Romania.

Keywords: *C. moschata x C. maxima*, emergence, *L. siceraria*, temperature

INTEGRATED PROCESSING OF SUNFLOWER MEAL

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ABSTRACT

Sunflower meal, a by-product of oil production, was investigated as a primary product for protein production. Sunflower protein isolates can be used as a component of cattle diets. Integrated processing of secondary products of sunflower oil production considered includes enzyme-assisted extraction. Enzyme-assisted alkaline extracts were obtained under various conditions. The influences of temperature, pH, and type of enzyme on the degree of protein extraction were studied and the optimal conditions were determined. The process studied allows obtaining light-colored protein extracts. Ultrafiltration for concentrating and removal of low molecular weight protein fraction and carbohydrates from crude sunflower extracts was developed. The concentrates obtained were tried out as a source of nitrogen in the nutrient medium for *Bacillus cereus* fermentation. Solid deproteinised meal can be subjected to chemical or enzymatic hydrolysis as a medium component for heterophase fermentation to produce protein-enriched fodder additive.

Keywords: sunflower meal, sunflower processing, sunflower protein, spray drying, protein concentrates

METHOD OF IDENTIFICATION

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ABSTRACT

Method of identification refers to the statistics (probability) modeling.

And in Your magazine to section «Computational and bioinformatic methods for analysis, modeling or visualization of biological data».

The difference is that the step of selecting the formulas we formalized and there-fore it is only the second stage of modeling - the choice of parameter values identified on the initial data of the generalized model or, in the special case of equation. In addi-tion, each parameter of any member has a physical meaning. This dramatically increases the value compared to the linear regression correlation coefficient of 0.9999. History modeling completely given additional information.

Here we will show not only advantages of our method, but also possibility of identification according to aprioristic information of essentially new regularities in the form of Seed factor. Because of high definiteness of the first stage of process of statistical modeling essentially new aposteriorny information is shown. As a result «Whole-cell model» method improvement for acceleration of biological opening is possible. The greatest effect gives our method without averaging and other group of basic data. The computing data set receives accurate physical sense and it increases definiteness of forecasting. The group of contradictions1 will decrease, and new opening will appear during modeling.

It isn't necessary for data1 of division on categories that was required because of application of linear regression. Therefore "Whole-cell model" addition with our wave equations would allow to give not only qualitative, but also quantitative, essence. Therefore our method of identification will allow to open the mechanism of behavior of populations of any objects.

Keywords: bricks Hilbert, the wavelet signals, generalized model, statistics, identification, verification, wave patterns

MORPHOLOGICAL AND BIOCHEMICAL ISSUES TO SOME *ROSA CANINA* L. POPULATIONS FROM THE SPONTANEOUS FLORA FROM SOUTH-WEST ROMANIA

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ABSTRACT
Current needs in the food and pharmaceutical natural products require more careful study and knowledge of the biochemical composition of non agricultural plant species, respectively briar fruits for cultivating them for alimental use. *Rosa canina* L. (*Rosaceae*) is a shrub of the spontaneous flora recognized for its nutritional and therapeutic properties because of the content of vitamin C, carotenoids, vitamins E, K, PP, D, B1, B2, sugars, pectins, malic acid, citric acid, α and β tocopherol (vitamin E) and carotenoids. In terms of the food, rosehip fruits can be used singly or in combination with other fruits (apple, sea buckthorn, tomato, etc) prepared in the soups, pasta, cakes, jam or marmalade, wine, juice or consumed as tea. Currently rosehip extracts are used in traditional medicine as a diuretic, laxative, for arthritis, gout, colds, vitamin C deficience, etc. Rosehip fruits can be sold as organic products derived from spontaneous flora, which do not apply to synthetic or treatments or products from organic plantations. Although in Romania and other countries, sweet briar grows in abundance in wild flora, few know the importance of this species. This species has a key position in the strategy of sustainable culture can offer solutions to problems the social, economic and environmental. As with all other countries rosehip is cultivated from a long time, in Romania recently began to setting up experimental plantations. Natural biodiversity of this species is very high, even in small habitat. The aim of the study is to identify and retrieve some valuable genotypes from tecnological and biochemical point of view, from the spontaneous flora from South-West, Romania. For the study were collected from rose hip fruits of local populations of *Rosa canina*, derived from the existing biodiversity in this area, on surfaces not worked for a period of over 10 years. Within those populations were studied the variability of technological parameters: length fruit, fruit diameter, weight and ratio L/D and biochemical content: TSS, vitamin C and acidity titrabila. The results were analyzed statistically, using LSD and comparison method (t-Test). The obtained values indicate the existence of populations of *Rosa canina* of a valuable content in the TSS, which is between 11% (P3) and 21% (P12), especially vitamin C content, over 600 mg/100g populations P1, P7, P12 and P19. The acidity in the study population was 1.5 to 2 %. This material could be used for the selection of plants with superior features, intended to be placed in programs of breeding in order to create varieties that meet the demands of the modern world.
Keywords: Rosehip**,** Titrable acidity, TSS, Vitamin C

NATURAL INTERSPECIFIC *ESCHERICHIA-PROTEUS* GENETIC TRANSFORMATION IN WASTE WATER CONDITIONS *VERSUS* URINE

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ABSTRACT

Based on cultural and biochemical characteristics, a number of uropathogen strains of *Escherichia coli* and *Proteus sp.* have been isolated and identified. For this isolated strains, the spectrum of sensitivity - resistance against 10 antibiotics has been determined. One pathogenic strain of *E. coli* has been randomly chosen, sensitive to all tested antibiotics. This strain has been used as genetic material acceptor strain. Another uropathogen strains of *E. coli* and *Proteus sp.*, both ciprofloxacin-resistant with chromosomal resistance, have been used as donor strains. Chromosomal DNA donor strains were initially subjected to a plasmidial curing process and then used in genetic transformation experiments by growing strains in common environments acceptor fluid - urine and domestic waste water - ensuring physiological conditions of temperature and calcium concentration. The frequency and the efficiency of natural intergeneric *Escherichia - Proteus* genetic transformation and natural interspecific *Escherichia – Escherichia* genetic transformation were assessed.

Keywords: natural genetic transformation, antibiotic resistance markers, uropathogen, waste water, urine, transformation frequency

NEW STRAINS OF COPPER-RESISTANT *PSEUDOMONAS* BACTERIA ISOLATED FROM ANTHROPOGENICALLY POLLUTED SOILS

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ABSTRACT

The article examines and compares the physiological properties of Cu^{2+} tolerance in new bacterial isolates of *Pseudomonas* bacterial genus, originating from localities contaminated by mining and heavy industry. The resistance of the strains is evaluated on the grounds of the minimum inhibitory concentration (MIC) and the maximum tolerable concentration (MTC) for the individual species, where MTC is the highest metal concentration, which has no effect on the growth of the resistant strain. The experimental results confirm a clearly higher capacity for Cu-resistance in the new bacterial isolates, when compared with type bacterial strains (isolated in diverse environments without any proved metal content), as almost double values are obtained. The capacities of resistance in the newly isolated strains point at an extensive species diversity of the *Pseudomonas* genus. Among the decisive factors for resistance formation is a high capacity of adaptation in *Pseudomonas*, which is conditioned by the operon organisation and the abundance of resistance plasmids, in particular.

Keywords: copper, resistance, maximum tolerance concentration (MTC), minimum inhibitory concentration (MIC), *Pseudomonas* sp.

OPTIMAL SOLUTIONS FOR THE OPERATION AND MAINTENANCE OF A WASTEWATER TREATMENT SYSTEM WITH FILTERS PLANTED WITH REEDS

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ABSTRACT

A wastewater treatment plant by growing plants is a natural, inexpensive and safe operation for wastewater treatment in rural areas. Ecological success of this technique with low maintenance and stable as the process is harmonized interaction between plants and microorganisms substrate

The aim of this work is to identify the optimal solutions for operating and maintenance as well as a more efficient system of wastewater treatment plant by means of filters planted with reeds. It is known that this system of wastewater treatment plant serves the localities of 3000 inhabitants, require an operating staff, average skill; minimum maintenance services; the minimum land area required for construction of wastewater treatment plant, i.e. two square feet per capita.

New technology has many advantages that relate primarily to costs. Thus, if the treatment plant based on activated sludge system amounts to 1,200,000 euros, the system "filters planted with reeds' reach 830.000 euros. At the first station, operating costs / capita / year are worth 38 euros, while the second at 3.05 euros. Exploiting a period of 25 years requires an investment of nearly three million for the first system and the second for just 230,000 euros.

Keywords: wastewater treatment plant, filters planted with reeds, sludge, organic matter

OPTIMIZING OF TECHNOLOGY FOR OBTAINING THE GRAFTED WATERMELONS IN DIFFERENT PHENOLOGICAL PHASES OF THE SCION IN THE CLIMATIC CONDITIONS FROM ROMANIA

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ABSTRACT

The research aimed to establish the technological stages for obtaining the grafted watermelons in different phenological phases of the scion in the climatic conditions from Romania. The observations were done in 2013-2014 period, inside the Laboratory of Protected Cultures, in greenhouse specialized in producing from grafted vegetable seedlings of the Research and Development Institute for Processing and Marketing of the Horticultural Products – Horting, Bucharest. Grafting is based on the merge between scion and rootstock. The experience has varied with following factors: scion, rootstock and phenological phase of the scion. The biological material used was formed from five F_1 hybrids: two *Lagenaria siceraria* rootstocks – UG29A and Macis and three scions – Sorento, Pată neagră, Vasko. The scion and rootstock seedlings were obtained in alveolar trays (24 ml/cell volume for scion and 15 ml/cell volume for rootstock), in nutritive mixture ($peat_3$: $perlite_1$). The germination conditions were: 25-27^{0}C, 80% relative atmospheric humidity. The germination temperature was maintained at constant value (day and night) until to plant emergence. The plants were maintained between emergence and grafting according to classical technology for obtaining the cucurbit seedlings. The grafting was performed in different phenological phases of the scion: cotyledon leaves, one true leaf, two true leaves. The statistical analysis showed differences between variants. The phenological phase of the scion has influenced the survival rate of the grafted plants. The optimal phenological phase was first true leaf for all scions. For a successful grafting is necessary to observe the optimal phase of the watermelon scions; it is an important aspect in the technology for producing of grafted watermelons.

Keywords: *Citrullus lanatus* sp. *vulgaris*, grafting, technological stages

PSEUDOMONAS MONTEILII LA-11 STRAIN'S CAPACITY OF RESISTANCE: A NEW ISOLATE FROM CONTAMINATED LAGOONS, CZECH REPUBLIC

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ABSTRACT

Pseudomonas monteilii LA-11, isolated in contaminated sediments of Ostrava lagoons (Czech Republic), is a new bacterial isolate, whose physiological properties of resistance have not been reported to date. Its taxonomic status has been confirmed on the grounds of genotype analyses. The article summarizes the findings on this bacterial strain and describes its basic morphological and biochemical characteristics accompanied by verified resistance towards As, Cd, Cr, Co, Cu, Fe, Hg, Li, Mg, Ni, Pb, and Zn. The high resistance values towards certain metals, such as Cd, Cu, Co, Pb, As and Hg, predestine the strain as promising in further practical applications, particularly in the processes of in situ bioremediation, leading to the attenuation of toxicity of anthropogenically contaminated environments.

Keywords: phenotyping, genotyping, biotypisation, taxonomy, metal resistance, contaminated sediments, *Pseudomonas monteilii* LA-11

RESULTS CONCERNING THE PRODUCTIVE CAPACITY AND CHEMICAL COMPOSITION OF GROUNDNUTS CULTIVATED ON THE SANDY SOILS FROM SOUTHERN ROMANIA

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ABSTRACT

Groundnuts are an important oilseed crops cultivated worldwide. Seeds of groundnuts have a double advantage: a source of fat (> 50%) and protein. The high content of seed in protein substances gives them a high food value. Carbohydrate content (25-50%), mineral (2.5-3.5%), the content of phosphorus, calcium and vitamin is also high. Thus, in this sense was founded comparative culture with several varieties of peanuts, which determined production capacity and its main elements which determine the formation and chemical composition of minerals of groundnuts seeds.

Due to poor agro capacity of sandy soils where were cultivated, registered yields were relatively small. The analyzed samples at five varieties of groundnut (Venus, Solar, Jelud, Braziliene negre and Tamburesti) grown under the same conditions was examined micro and macro content in seeds. In the analyzed samples, the content of Na, Mg, Al, Ca, Cr, Mn, Fe, Cu, Se; Ni, B and were determined using ICP-MS technique and K content was determined by atomic absorption spectrophotometer.

The results of these analyses showed significant variation between the studied varieties. Mineral substances, such as: *sodium* ranged from 2.529 mg/100g to Venus variety up to 3.664 mg/100g to Tamburesti variety; *potassium* ranged from 632, 024 mg/100g to Jelud variety up to 931.683 mg/100g to Solar variety), *iron* (5.083 mg/100g to Jelud variety up to 9.323 mg/100 to Jelud variety), *calcium* (from 21.436 mg/100g to Venus, up to 40.065 mg/100g to Braziliene negre variety).

Groundnuts may be considered as a source of minerals and genetic variability found in the studied varieties, show that these various preparations can be used for selection purposes or for improvement from the point of view of productivity.

Keywords: groundnut, productive capacity, mineral substances

SEMISOLID PHARMACEUTICAL PREPARATIONS BASED ON METALLIC COMPLEX COMPOUNDS OF CHLORHEXIDINE SALTS WITH ANTIMICROBIAL ACTIVITY

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ABSTRACT

The paper relates to pharmaceutical preparations type cream based on chlorhexidine metallic complex compounds and a process for their preparation. Pharmaceutical topical preparations for external use type creams described in the paper are destined to human health and veterinary medicine domain, regarding their disinfectant and antifungal action and can be used to teguments treat as dermatological germostop. For this reason we prepared several semisolid preparations (creams) based on synthesized metallic (Cu^{II}, Ag^{I}) complex compounds of chlorhexidine salts in oinment base type emulsion oil/water with lipophylic excipients. The antioxidant activity of these creams comparative to copper (II) and silver (I) complex compounds of chlorhexidine salts was determined by chemiluminescence method, based on the multiple acceleration of a natural reaction leading to the generation of a superoxide anion radical. The antioxidant capacity was quantified by comparison with standard luminol, using a Turner Design TD 20/20 SUA apparatus, at λ 420 nm wavelength. The comparative antimicrobial activity of semisolid pharmaceutical preparations and synthesized metallic (Cu^{II}, Ag^{I}) complex compounds of chlorhexidine salts by diffusion method on different bacterial and fungal strains *(Staphylococcus aureus, Escherichia coli, Candida albicans)* was evaluated. From the obtained results we noticed that comparative to the metallic complex compounds of chlorhexidine salts, the pharmaceutical preparations as cream type based on Cu^{II} and Ag^{I} complex of chlorhexidine (molar ratio 1:1:1) had an increased antioxidant capacity (88-94%) correlated with a higher antimicrobial activity.

Keywords: cream, chlorhexidine salts, metallic complex compounds, biological activity

STUDIES REGARDING THE VARIABILITY OF BEAN PRODUCTION PER PLANT IN A COLLECTION OF BUSH BEAN LOCAL LANDRACES (*PHASEOLUS VULGARIS* VAR.*NANUS)*

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ABSTRACT

The aim of our studies was to evaluate the variability of bean production per plant in a collection of bush bean local landraces in order to establish if they can be used in breeding programs. Biologic material consisted in a collection of 56 bean landraces collected from western Romania and 6 cultivars. We assessed the number and weight of seeds per plant. The experiment was conducted in field conditions without irrigation. The collection proved to be less valuable for these characters. These genotypes are cultivated mostly for pods and are originating from hilly areas with cold and wet climate. Local landraces are inferior to bred cultivars. Landrace Sebis 1 stands out, producing over 40 seeds per plant, with also the highest seed weight (21.79 g). Beans productions above 15 g were observed only at 3 landraces: Voiteg, Paulean 2 and Vinga. The landraces studied are not adapted to conditions in the plains

Keywords: landraces, bean production per plant

STUDY ABOUT THE USE OF MONITORING OF ELECTROCHEMICAL PARAMETERS TO CONTROL OF INOCULATION OF THE LACTIC ACID BACTERIA IN TO COWMILK

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ABSTRACT

The variation of *p*H and oxidation-reduction potential in time may constitute strong indicators of the State of fermentation in cow's milk that are inoculated with lactic acid bacteria.

The activity of specific microbiological agents – use in order to obtain some milk products – can be monitored through the integrated study of electrochemical parameters of variation within a limited time frame.

The variation of main electrochemical parameters (the specific *p*H and redox potential of cows ' milk) is it a direct result of the activity of oxidoreductases secreted by certain lactic acid bacteria. The study identifies certain biotechnological correlations that occur at inoculation in the conditions of use of specific lactic acid bacteria.

Keywords: electrochemical parameters, oxido-reductases, food industry

STUDY OF VARIABILITY INDUCED BY *IN VITRO* CULTURES AT BLUEBERRY POPULATIONS

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ABSTRACT

In vitro cells culture is a good method to induce somatic variability in plants. The selection of plant tissues with a good capacity of cellular biosynthesis is necessary to obtain the important secondary metabolites by *in vitro* culture system. In our experiments we used biochemical methods to evaluate the variability induced by *in vitro* callus culture at three blueberry populations native in Romania. Callus obtained from Arieseni, Retezat and Valea Sebeşului populations, on WPM medium was sub-cultured in presence of ANA, BAP and AS. Antioxidant capacity using the FRAP method, glutathion (GSH), total anthocyanin, macroelements, microelements and heavy metals contents from callus lines selected were investigated. The AS concentration positively affects the activity of glutathione, with a significantly positive correlation coefficient ($r = 0.54$, $p < 0.05$). The use of this hormone facilitates the obtaining of blueberry callus biomass with an increased antioxidant activity. There was also found a strong positive correlation between the total content of anthocyanin and FRAP values ($r = 0.60$, $p < 0.05$) and a positive correlation with the level of GSH, respectively ($r = 0.47$, $p < 0.05$).

Keywords: callus, native blueberry populations, biochemical methods

THE CROSS-POLLINATION STUDY BETWEEN GENETICALLY MODIFIED AND CONVENTIONAL CORN CROPS IN ROMANIA

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ABSTRACT

In Romania, the GM commercial crops are limited to MON 810 corn that is resistant to the European corn borer (ECB, *Ostrinia nubilalis*). This GM corn is authorized for cultivation since 2007 (when Romania became a member of the European Union). To ensure the coexistence, the adventitious presence of the genetically modified organisms must not exceed the level of 0.9 % established by Regulation (EC) 1829/2003. Because the corn is a species with female and male flowers formed in separate parts of the same plant, the gene flow between plants is high. The pollen – mediated gene flow of corn can be monitored by measurement the rate of cross-pollination. The objective of this study was the cross-pollination rate between GM and conventional corn by xenia effect. For this, three experimental fields were established at ARDS Simnic. Within the first experience, where the MON 810 event was planted at the centre of the experimental field and surrounded by conventional corn as receiver, the rate of cross-pollination ranged from 0.83% (plot N-E) to 3.72% (plot W). Within the second experience, where the receiver corn was planted at the centre of the experimental field and surrounded by the donor MON 810, there was recorded the highest rate of cross - pollination, respectively of 27.62%. In a third experiment where they used different isolation distances, cross-pollination rates were between 1.40 and 1.74% for 10 – 19.8 m distance, between 0.77 and 0.94% for 20 – 29.8 m distance and between 0.90 and 0.94% for 30-30.8 m distance. The high levels of cross - pollination rate has been determined by: the compatibility gametophyte at genotypes studied, the coincidence in flowering donor and receiver corn, the isolation distance as well as the prevailing wind direction of pollination period. Under these circumstances, the coexistence of the genetically modified and conventional corn it is not possible, excepting the situation when we use isolation distances for over 40 m or other strategies.

Keywords: MON 810 event; gene flow; isolation distance; xenia effect.

THE INFLUENCE OF ASCORBIC ACID AND POLYPHENOLS CONTENT AFTER FRUITS ADDING IN HONEY

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ABSTRACT

In this paper we have studied the influence of fruits adding in honey related to ascorbic acid and total polyphenols content. To determine the ascorbic acid it was used a spectrophotometric method with leuco-malachite-green. In order to determine the total polyphenols level there was used the Folin-Ciocalteu assay. The ascorbic acid content was improved in honey samples with fruits, varying between 3.27 and 4.01 mg/100 g while the control sample (honey without any fruit) registered 3.24 mg/100 g. The highest polyphenols level was found in honey fortified with raspberry (0.079 mg gallic acid equivalent /g) while the lowest (0.012 mg gallic acid equivalent /g) level of polyphenols was registered in the control honey samples.

Keywords: honey, fruits, ascorbic acid, polyphenols.

THE INFLUENCES OF CLIMATE CHANGES IN ACUTE GLAUCOMA

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ABSTRACT

The importance of pathological effects of the weather type was noticed starting from Hippocratic times. The tendency revealed by the last decades of increased frequency of the extreme meteorological phenomenons made us look for the impact of weather changes on acute glaucoma. Our study included a number of 174 cases of patients, presented in Ophthalmology Department from Constanta Emergency Hospital, between 2004 and 2013, for acute glaucoma. Acute glaucoma represents a major ophthalmological emergency, which requires urgent hospital presentation. The phase's survey offers the advantage of synthetically vision on the situation of all meteorological factors and the opportunity to study glaucoma during stable or changing weather. The analysis of acute glaucoma was made thinking about the hypothesis of some weather conditions responsible for the crisis onset, revealing the trigger role of some environmental factors: increasing temperature, atmospherically pressure, Thom and Miss Index, cloudy weather and weather changes in acute glaucoma onset. The results obtained emphasize that climate changes have an obvious role in generating acute glaucoma.

Keywords: climate changes, meteorological factors, acute glaucoma, survey phase

THE IRRADIATION OF ENERGETIC WILLOW CUTTINGS BY LASER LIGHT. CHEMICAL, TECHNICAL AND CALORIMETRIC ANALYSIS OF BIOMASS

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ABSTRACT

The article presents issues related to the growth stimulation of some plant species, using a low power laser light. This technology could be helpful in increasing the yield and germination energy as well as accelerating development and growth of plants. The presented experiment was part of a wider research on the effects of laser light on the different varieties of energetic willow (*Salix* sp.). The aim of this particular experiment was to ascertain whether the selected laser stimulation parameters of willow cuttings could enhance and accelerate the production of biomass without changing wood properties relevant to the energetic use. The *Salix viminalis* Turbo cuttings were used as biological material. Two devices were used as the sources of coherent light: laser - wave length: λ = 670 nm and laser diode - wave length: λ = 473 nm. Willows had been cultivated for two years. The willow shoots were collected after the second growing season. Wood samples of control and experimental groups were dried and the calorimetric analysis have been made. Additionally, the analysis of technical parameters as well as carbon, hydrogen and sulfur content of the harvested wood were carried out. The results clearly indicate that stimulation by low power lasers with parameters of irradiation properly chosen for the *Salix viminalis* Turbo can significantly speed up growth of plants without changing the chemical and technical characteristics and the calorific value of biomass.

Keywords: willow biomass, laser stimulation, irradiation, energetic willow, calorific value

THE *KNOX* GENES INVOLVEMENT IN THE DEVELOPMENT OF MULTILEAFLED TRAIT ON TETRAPLOID *MEDICAGO SATIVA*

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ABSTRACT

The deciphering of the metabolic pathway which induce the multileaflet trait in alfalfa it is of great importance due to the economic importance of the high biomass and the increased protein content. For this purpose the *knox* genes involved in meristem development and leaf morphogenesis were investigated. Thus, the *knox* genes expression were comparative analyzed for trileaflets plant and multileaflet ones in order to determine their specific involvement in leaf development using the semi quantitative one-step RT-PCR method. Four types of tissues were investigated: shoot tips, young leaves, old leaves and roots to determine the *knox* genes function in different stages of tissues development. It turned out that the average of the *knox* genes expression for all of the experimental variants was significantly higher for the mulileaflet plants, compared with the trileaflet ones.

Keywords: alfalfa, *knox* genes, RT-PCR

THE MONITORING OF ENZYME ACTIVITY OF GLUCOAMYLASE AND ENDOXYLANASE ON THE BREAD DOUGH

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ABSTRACT

This study presents the chemical action of two enzyme preparation: based on glucoamylase and endoxylanase, in the chemical structure of the bread dough. The determination of the rheological characteristics of the dough is obtained by alveographic method and consistographic method. The addition of glucoamylase and endoxylanase enzymes allows adjustment of the rheological characteristics of dough according to the needs of the technological process. The specific effect of glucoamylase and endoxylanase on the physico-chemical properties of dough show a positive influence on the volume and porosity of the bread, also on reducing the kneading process of the dough and the energy consumption for the technological process.

Keywords: glucoamylase, endoxylanase, alveograph method, consistographic method

THE MONITORING OF ENZYME ACTIVITY OF PROTEASE ON THE WAFFLE DOUGH

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ABSTRACT

This study presents the action of an exogenous enzyme: protease in different dosages, in the dough used in the technology of waffles products. The determination of the rheological characteristics of the dough is obtained by alveographic and consistographic method. The addition of proteolytic enzymes allows adjustment of the rheological characteristics of dough according to the needs of the technological process. The specific effect of proteases on the physical properties of gluten shows that by proteolysis there is a break and a reorientation of protein chains that form the gluten network. It is also shown that the dough samples with proteases addition have a better behavior when they are injected on the oven plate and that the waffles obtained from dough with proteases addition are lighter, with less humidity and a lower water activity. Moreover the waffles with the addition of protease are more porous, more crispy and with a more developed filigree structure in comparison with the dough samples without protease addition. Addition of the correct dosage of protease in dough can improve the extension of freshness, increases of the quantity of fermentation sugars that can make finite products with a more pronounce color of crust. A lower dosage of protease does not have a big improvement effect on the quality of the dough and it is not relevant for the technological process. The overdose of protease leads to a wet and sticky content of the dough which affects the dough handling during the technological process and an abnormal volume and porosity. Selecting a correct dosage of protease will be made in conformity with the rheological characteristics of dough and the proportions from the dough will be added so that they would be maximal.

Keywords: waffles, protease, alveographic method, consistographic method

THE SERUM BIOCHEMICAL PARAMETERS CHANGES IN THE FROG *Rana ridibunda* Pall. AT DIFFERENT WATER TEMPERATURE REGIMES

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ABSTRACT

During the period March - May 2013, the serum concentration of glucose, cholesterol, triglycerides, total lipids, albumins, globulins and total proteins in the frog *Rana ridibunda* Pall were analyzed. For this research were used 40 individual frogs, taken in two different water springs with different water temperature, in Terdevc village (water temperature 7.9 °C - 19.7°C) and Banja village (24.7°C - 29.0°C) of Malisheva.
Analyses were conducted in the frog serum using standard biochemical methods, ready reagents from the firm Elitech and modern equipment from Screen plus company.
The research results show higher values of concentration of the parameters analyzed in the frog's serum taken in warm water spring of Banja compared with the frogs of cold water taken in the village Terdevc. These changes were observed during the spring season (March-May) and in some cases were significantly higher ($P<0.05$, $P<0.01$, $P<0.001$, respectively). The highest significances values were observed in particular during the May.
Statistical calculations of the results were performed using software ANOVA and student t - test.
Results of this study indicate that temperature is a crucial factor that determines the state of the organism, its metabolic level respectively. Since frogs are poikilotherm organisms, these changes probably can be ascribed the metabolic activity of the organism in relation to the temperature of the surrounding environment. Therefore, changes in the analyzed biochemical parameters derived as a consequence of change in the temperature regime and it is a good indicator to show seasonal rhythm of the body.

Keywords: Rana ridibunda Pall. biochemical parameters, temperature regime, seasonal rhythms

THE STIMULATION OF MORPHO-PRODUCTIVE CHARACTERS AT *MOMORDICA CHARANTIA L.* BY USING BIO-STIMULATORS

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INTRODUCTION

Momordica charantia L. – the bitter cucumber is a species of tropical origin and which has many therapeutic uses as an important source of active principles with anti-diabetic action. The species is less cultivated and studied in Romania, its acclimatization in the west of the country began in 2001 in the Arad agro-ecological area. The extract obtained from the fruit of *Momordica charantia L.* and/ or the entire plant showed a remarkable hypoglycaemic action in the treatment of diabetes, the active substance with such properties being "charantin" (a stereo-glicosyde). [1, 2]

In the Arad agro-ecological area, the thermal regime is mostly appropriate for the requirements of this species. The influence of the Mediterranean climate favours the growth in very good conditions of most thermophile long day species. Having a poorly developed root system, with rooting depth with a trend of growing towards the soil surface, the studied cultivation area offers optimal development conditions especially on light soils, which are well-structured, rich in humus, with neutral reaction and clay and sand structure. Sandy soils cause early and higher yields due to their lighter heating and accumulation of a number of degrees near optimal conditions required by the species. [3]

Keywords: active principles, anti-diabetes action, area, agro-ecological

USING BIO-FERTILIZERS IN ECOLOGICAL AGRICULTURE – SAFE AND CHEAP ALTERNATIVES FOR CHEMICAL AND CONVENTIONAL FERTILIZERS

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ABSTRACT

The studies which are carried out at a global level have shown that fertility contributes in a percentage of approximately 40% to the raising of production. Among fertilizers, nitrogen is the first by its contribution to the determination of the harvest growth. Thus, satisfying the food necessities of the increasing global population, as well as the supply of some raw materials for the industries, which they take from agriculture, largely depends on ensuring the corresponding quantities of nitrogen together with the other elements needed by plant metabolism.

Lasting agriculture, the current global strategy of agriculture development, involves healthy ecological practices which are also economically attractive. The biological fixing of nitrogen is a technology that fulfils both requirements, offering different ways to reduce prices and energetic input. The capacity of fixing the atmospheric nitrogen is a value that belongs to some prokaryotics, free or associated with plants, unlike what was believed not too long ago, of some eukaryote from the vegetable kingdom. Many researches have reported the presence and the abundance of some various nitrogen-fixing groups of microorganisms, in the most varied environmental conditions.

Alternative solutions to the usage of chemical fertilizers in agriculture are represented by biofertilizers. Lately, this industry has developed further. Basically having the capacity of the soil bacteria to fix atmospheric nitrogen in a symbiotic, associative and free manner and to have this reachable availability for plants, this industry is nonpolluting and has beneficial effects in remaking the fauna and soil biodiversity.

Keywords: metabolism, lasting agriculture, vegetable kingdom

USING BIO-POLYMER MATERIALS TO ENHANCE SANDY SOIL BEHAVIOR

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ABSTRACT

Nowadays, strength characteristics of soils have more importance due to increasing building loads. In some projects, geotechnical properties of the soils are be improved using man-made materials varying from cement-based to chemical-based. These materials have proven successful in improving the engineering properties of the soil such as shear strength, compressibility, permeability, bearing capacity etc.. However, the use of these artificial injection formulas often modifies the pH level of soil, contaminates soil and groundwater. This is attributed to their toxic and hazardous characteristics. Recently, an environmentally friendly soil treatment method or Biological Treatment Method (BTM) was to bond particles of loose sandy soils. This research paper presents the preliminary results of using biopolymers for strengthening cohesionless soil. Xanthan gum was identified for further study over a range of concentrations varying from 0.25% to 2.00%. Xanthan gum is a polysaccharide secreted by the bacterium *Xanthomonas campestris*, used as a food additive and it is a nontoxic material.

A series of direct shear, unconfined compressive strength, and permeability tests were carried out to investigate the behavior of sandy soil treated with Xanthan gum with different concentration ratios and at different curing times. Laser microscopy imaging was also conducted to study the microstructure of the treated sand. Experimental results demonstrated the compatibility of Xanthan gum to improve the geotechnical properties of sandy soil. Depending on the biopolymer concentration, it was observed that the biopolymers effectively increased the cohesion intercept and stiffness of the treated sand and reduced the permeability of sand. The microscopy imaging indicates that the cross-links of the biopolymers through and over the soil particles increase with the increase of the biopolymer concentration.

Keywords: Biopolymer; Xanthan gum; Biological Treatment Method; Direct Shear; and Permeability.