



20.
international research conference
proceedings

the peer-reviewed conference proceedings are indexed in



april 16-17, 2018 lisbon portugal
international scholarly and scientific research & innovation

Article	TABLE OF CONTENTS	Page
225	A Constrained Model Predictive Control Scheme for Simultaneous Control of Temperature and Hygrometry in Greenhouses <i>Ayoub Moufid, Najib Bennis, Soumia El Hani</i>	494 - 500
226	The Influence of Lactic Acid Bacteria Combinations on Wheat Bread Quality <i>Vita Lele, Vadims Bartkevics, Iveta Pugejeva, Paulina Zavistanaviciute, Daiva Zadeike, Grazina Juodeikiene, Elena Bartkiene</i>	501 - 501
227	Development of Antimicrobial Properties Nutraceuticals: Gummy Candies with Addition of Bovine Colostrum, Essential Oils and Probiotics <i>E. Bartkiene, M. Ruzauskas, V. Lele, P. Zavistanaviciute, J. Bernatoniene, V. Jakstas, L. Ivanauskas, D. Zadeike, D. Klupsaite, P. Viskelis, J. Bendoraitiene, V. Navikaite-Snipaitiene, G. Juodeikiene</i>	502 - 502
228	Examinations of Sustainable Protection Possibilities against Granary Weevil (<i>Sitophilus granarius</i> L.) on Stored Products <i>F. Pal-Fam, R. Hoffmann, S. Keszthelyi</i>	503 - 503
229	Nanoparticle Emission Characteristics during Methane Pyrolysis in a Laminar Premixed Flame <i>Mohammad Javad Afroughi, Farjad Fatahatai, Larry W. Kostuk, Jason S. Olfert</i>	504 - 504
230	The Underestimate of the Annual Maximum Rainfall Depths Due to Coarse Time Resolution Data <i>Renato Morbidelli, Carla Saltalippi, Alessia Flammini, Tommaso Picciafuoco, Corrado Corradini</i>	505 - 505
231	Water Economy Balance: As a Basis of Water Management System <i>Yakhtang Geladze, Nana Bolashvili, Tamazi Karalashvili, Nino Machavariani, Ana Karalashvili, George Geladze</i>	506 - 509
232	Carbonaceous Monolithic Multi-Channel Denuders as a Gas-Particle Partitioning Tool for the Occupational Sampling of Aerosols from Semi-Volatile Organic Compounds <i>Vesta Kohlmeier, George C. Dragan, Juergen Orasche, Juergen Schmelke-Kreis, Dietmar Breuer, Ralf Zimmermann</i>	510 - 510
233	Sampling and Chemical Characterization of Particulate Matter in a Platinum Mine <i>Juergen Orasche, Vesta Kohlmeier, George C. Dragan, Gert Jakobi, Patricia Forbes, Ralf Zimmermann</i>	511 - 511
234	Homogeneity and Trend Analyses of Temperature Indices: The Case Study of Umbria Region (Italy) in the Mediterranean Area <i>R. Morbidelli, C. Saltalippi, A. Flammini, A. Garcia-Marin, J. L. Ayuso-Munoz</i>	512 - 512
235	Association between Noise Levels, Particulate Matter Concentrations and Traffic Intensities in a Near-Highway Urban Area <i>Mohammad Javad Afroughi, Vahid Hosseini, Jason S. Olfert</i>	513 - 513
236	Aerobic Training Combined with Nutritional Guidance as an Effective Strategy for Improving Aerobic Fitness and Reducing BMI in Inactive Adults <i>Leif Inge Tjelta, Gerd Lise Nordbotten, Cathrine Nyhus Hagum, Merete Hagen Helland</i>	514 - 514
237	The Effect of Different Strength Training Methods on Muscle Strength, Body Composition and Factors Affecting Endurance Performance <i>Shaher A. I. Shalfawi, Fredrik Hviding, Bjornar Kjellstadli</i>	515 - 515
238	The Effect of Hypertrophy Strength Training Using Traditional Set vs. Cluster Set on Maximum Strength and Sprinting Speed <i>Bjornar Kjellstadli, Shaher A. I. Shalfawi</i>	516 - 516
239	The Strategy for Detection of Catecholamines in Body Fluids: Optical Sensor <i>Joanna Cabaj, Sylwia Baluta, Karol Malecha, Kamila Drzozga</i>	517 - 517
240	Comparison of Plantar Pressure Distribution between Hallux Valgus and Normal Feet Using Foot Pressure Platform <i>Raed Eid Alzahrani, Tracey Wilkinson, Fraser Harrold, Rami J. Abboud</i>	518 - 518
241	Magnetophotonics 3D MEMS/NEMS System for Quantitative Mitochondrial DNA Defect Profiling <i>Dar-Bin Shieh, Gwo-Bin Lee, Chen-Ming Chang, Chen Sheng Yeh, Chih-Chia Huang, Tsung-Ju Li</i>	519 - 519
242	Assessing the Antimicrobial Activity of Chitosan Nanoparticles by Fluorescence-Labeling <i>Laidson P. Gomes, Cristina T. Andrade, Eduardo M. Del Aguila, Cameron Alexander, Vania M. F. Paschoalin</i>	520 - 525
243	Preparation of Pegylated Interferon Alpha-2b with High Antiviral Activity Using Linear 20 KDa Polyethylene Glycol Derivative <i>Ehab El-Dabaa, Omnia Ali, Mohamed Abd El-Hady, Ahmed Osman</i>	526 - 526
244	Providing Support for Minority LGBTQ Students: Developing a Queer Studies Course <i>Karen Butler</i>	527 - 527

Development of Antimicrobial Properties Nutraceuticals: Gummy Candies with Addition of Bovine Colostrum, Essential Oils and Probiotics

E. Bartkiene, M. Ruzauskas, V. Lele, P. Zavistanaviciute, J. Bernatoniene, V. Jakstas, L. Ivanauskas, D. Zadeike, D. Klupsaite, P. Viskelis, J. Bendoraitiene, V. Navikaite-Snipaitiene, G. Juodeikiene

Abstract—In this study, antimicrobial nutraceuticals - gummy candies (GC) from bovine colostrum (BC), essential oils (EOs), probiotic lactic acid bacteria (PLAB), and their combinations, were developed. For antimicrobial GC preparation heteropolysaccharide (agar) was used. The antimicrobial properties of EOs (*Eugenia caryophyllata*, *Thymus vulgaris*, *Citrus reticulata* L., *Citrus paradisi* L.), BC, *L. paracasei* LUHS244, *L. plantarum* LUHS135, and their combinations against pathogenic bacteria strains (*Streptococcus mutans*, *Enterococcus faecalis*, *Staphylococcus aureus*, *Salmonella enterica*, *Escherichia coli*, *Proteus mirabilis*, and *Pseudomonas aeruginosa*) were evaluated. The highest antimicrobial properties by EO's (*Eugenia caryophyllata* and *Thymus vulgaris*) were established. The optimal ingredients composition for antimicrobial GC preparation was established, which incorporate the BC fermented with *L. paracasei* LUHS244 in combination with *Thymus vulgaris* or *Eugenia caryophyllata*. These ingredients showed high inhibition properties of all tested pathogenic strains (except *Pseudomonas aeruginosa*). Antimicrobial GC formula consisting of thyme EO (up to 0.2%) and fermented BC (up to 3%), and for taste masking, mandarin or grapefruit EOs (up to 0.2%) was used. Developed GC high overall acceptability and antimicrobial properties, thus, antimicrobial GC could be a preferred form of nutraceuticals.

This study was fulfilled with the support of the LSMU-KTU joint project.

E. B. is with the Lithuanian University of Health Sciences, Tilzes str. 18, LT-47181, Kaunas, Lithuania (phone: +370-662-52136; e-mail: elena.bartkiene@lsmuni.lt).

M. R. is with the Lithuanian University of Health Sciences, Tilzes str. 18, LT-47181, Kaunas, Lithuania (phone: +370-662-52136; e-mail: modestas.ruzauskasC@lsmuni.lt).

V. L. is with the Lithuanian University of Health Sciences, Tilzes str. 18, LT-47181, Kaunas, Lithuania (phone: +370-662-52136; e-mail: vita.lele@lsmuni.lt).

P. Z. is with the Lithuanian University of Health Sciences, Tilzes str. 18, LT-47181, Kaunas, Lithuania (e-mail: paulina.zavistanaviciute@lsmuni.lt).

J. B. is with the Lithuanian University of Health Sciences, Sukileliu pr. 13, LT-47181, Kaunas, Lithuania (phone: +370-662-52136; e-mail: jurga.bernatoniene@lsmuni.lt).

V. J. is with the Lithuanian University of Health Sciences, Sukileliu pr. 13, LT-47181, Kaunas, Lithuania (phone: +370-662-52136; e-mail: valdas.jakstas@lsmuni.lt).

L. I. is with the Lithuanian University of Health Sciences, Sukileliu pr. 13, LT-47181, Kaunas, Lithuania (phone: +370-662-52136; e-mail: liudas.ivanauskas@lsmuni.lt).

D. Z. is with Kaunas University of Technology, Radvilenu str. 19, LT-50254, Kaunas, Lithuania. (e-mail: daiva.zadeike@ktu.lt).

D. K. is with Kaunas University of Technology, Radvilenu str. 19, LT-50254, Kaunas, Lithuania. (e-mail: dovile.klupsaite@ktu.lt).

P. V. is with Institute of Horticulture, Lithuanian Research Centre for Agriculture and Forestry, Kauno str. 30, LT-54333 Babtai, Lithuania (e-mail: biochem@lsci.lt).

J. B. is with Kaunas University of Technology, Radvilenu str. 19, LT-50254, Kaunas, Lithuania. (e-mail: joana.bendoraitiene@ktu.lt).

V. N. S. is with Kaunas University of Technology, Radvilenu str. 19, LT-50254, Kaunas, Lithuania. (e-mail: vesta.navikaite@ktu.lt).

G. J. is with Kaunas University of Technology, Radvilenu str. 19, LT-50254, Kaunas, Lithuania. (e-mail: grazina.juodeikiene@ktu.lt).

Keywords—Antimicrobial activity, bovine colostrum, essential oil, gummy candy, probiotic.

Examinations of Sustainable Protection Possibilities against Granary Weevil (*Sitophilus granarius* L.) on Stored Products

F. Pál-Fám, R. Hoffmann, S. Keszthelyi

Keywords—*Sitophilus granarius*, stored product, protection, alternative solutions.

Abstract—Granary weevil, *Sitophilus granarius* (L.) (Col.: Curculionidae) is a typical cosmopolitan pest. It can cause significant damage to stored grains, and can drastically decrease yields. Damaged grain has reduced nutritional and market value, weaker germination, and reduced weight. The commonly used protectants against stored-product pests in Europe are residual insecticides, applied directly to the product. Unfortunately, these pesticides can be toxic to mammals, the residues can accumulate in the treated products and many pest species could become resistant against the protectants.

During recent years, alternative solutions of grain protection have received increased attention. These solutions are considered the most promising alternatives to residual insecticides.

The aims of our comparative study were to obtain information about the efficacies of the 1. diatomaceous earth, 2. sterile insect technology and 3. herbal oils against the *S. granarius* on grain (foremost maize), and to evaluate the influence of the dose rate on weevil mortality and progeny.

The main results of our laboratory experiments are the followings:

1. Diatomaceous earth was especially efficacious against *S. granarius*, but its insecticidal properties depends on exposure time and applied dose. The efficacy on barley was more better, than on maize. Mortality value of the highest dose was 85% on 21st day in the case of barley. It can be ascertained, that completely elimination of progeny was evidenced on both gain types. Summarizing, a satisfactory efficacy level was obtained only on barley at a rate of 4g/kg. Alteration of efficacy between grain types can be explained with differences in grain surface.

2. The mortality consequences of Roentgen irradiation on the *S. granarius* was highly influenced by the exposure time and the dose applied. At doses of 50 and 70Gy, the efficacy accepted in plant protection (mortality: 95%) was recorded only on the 21st day. During the application of 100 and 200Gy doses, high mortality values (83.5% and 97.5%) were observed on the 14th day. Our results confirmed the complete sterilizing effect of the doses of 70Gy and above. The autocide effect of 50 and 70Gy doses were demonstrated when irradiated specimens were mixed into groups of fertile specimens. Consequently, these doses might be successfully applied to put sterile insect technique (SIT) into practice.

3. The results revealed that both studied essential oils (*Callendula officinalis*, *Hippophae rhamnoides*) exerted strongly toxic effect on *S. granarius*, but *C. officinalis* triggered higher mortality. The efficacy (94.62±2.63%) was reached after a 48 hours exposure to *H. rhamnoides* oil at 2ml/kg while the application of 2ml/kg of *C. officinalis* oil for 24 hours produced 98.94±1.00% mortality rate. Mortality was 100% at 5 ml/kg of *H. rhamnoides* after 24 hours duration of its application, while with *C. officinalis* the same value could be reached after a 12 hour-exposure to the oil. Both essential oils applied eliminated the progeny.

F. Pál-Fám is with Department of Plant Production and Protection, Kaposvár University, H-7400, Kaposvár, Hungary (e-mail: pf3pf3@gmail.com).