

**UNIVERSITY OF AGRONOMICAL SCIENCES AND  
VETERINARY MEDICINE BUCHAREST**

# **PROGRAM AND ABSTRACTS**

**4<sup>th</sup> International Symposium  
“New Researches in Biotechnology”  
*SimpBTH2011***

# **BIOTECHNOLOGY**

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FACULTY OF BIOTECHNOLOGY



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**4<sup>th</sup> International Symposium of Biotechnology  
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Bogdan Matei

**4<sup>th</sup> International Symposium of Biotechnology  
10 – 11<sup>th</sup> November 2011, Bucharest, Romania**

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## **PROGRAM**

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**November 10<sup>th</sup>**

<b>8.30 – 9.00</b>	<b>Registration</b>	
<b>9.00 – 9.30</b>	<b>Opening ceremony</b>	Prof. Dr. <b>NICULITA Petru</b> Dean of the Faculty of Biotechnology, USAMV Bucharest, Romania
<i>Section V: Food Safety</i>		
<i>Chairman:</i> Conf. Dr <b>Amalia Mitelut</b> , Faculty of Biotechnology, USAMV Bucharest, Romania <i>Vice-chairman:</i> Lecturer Dr <b>Florentina Israel-Romig</b> , Faculty of Biotechnology, USAMV Bucharest, Romania		
<b>9.30 – 9.50</b>	HOW TO REACH GLOBAL HARMONIZATION OF FOOD SAFETY REGULATIONS AND LEGISLATION?	<b>GEICU Mihaela</b>
<b>9.50 – 10.20</b>	INNOVATION IN BIOTECHNOLOGY	<b>BRAILOIU Cristian</b> Novainterned SRL
<b>10.20 – 10.50</b>	MICROBIAL IDENTIFICATION AND PHENOTYPE CHARACTERISATION OF MICROBIAL CELLS	<b>KULSUM Jassat</b> BIOLOG Inc.
<b>10.50 – 11.10</b>	<b>Coffee break &amp; Poster viewing</b>	
<b>11.10 – 11.40</b>	HIGH PERFORMANCE EQUIPMENT FOR BIOTECHNOLOGICAL RESEARCH	<b>DUMITRESCU Carmen</b> AnalytikJena Romania
<b>11.40 – 12.00</b>	FOOD SOVEREIGNTY AS PRECONDITION OF FOOD SECURITY	<b>BEGEA Mihaela</b>
<b>12.00 – 12.20</b>	CORRELATION OF OCHRATOXIN A LEVEL IN WINE WITH VINE ENVIRONMENT	<b>BOICU ROTARU Simona</b>
<b>12.20 – 12.40</b>	NEW PACKAGING MATERIALS AND THEIR EFFECT ON THE SHELF-LIFE OF PACKAGED SALAD	<b>MUSTATEA Gabriel</b>
<b>12.40 – 13.00</b>	DETERMINATION OF ZEARALENONE IN MAIZE	<b>ISRAEL-ROMING Florentina</b>
<b>13.00 – 14.30</b>	<b>LUNCH</b>	

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**4<sup>th</sup> International Symposium of Biotechnology  
10 – 11<sup>th</sup> November 2011, Bucharest, Romania**

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***Section I: Agricultural and Biotechnology & Section IV: Industrial and Environmental  
Biotechnology***

**Chairman:** Prof. Dr. **Stefana JURCOANE**, CBM BIOTEHGEN/Faculty of Biotechnology, USAMV  
Bucharest, Romania

**Vice-chairman:** Lecturer Dr. **Florentina MATEI**, Faculty of Biotechnology, USAMV Bucharest,  
Romania

<b>14.30 – 14.50</b>	BIOGENIC AMINE PRODUCTION BY <i>OENOCOCCUS OENI</i> UNDER ACIDIC CONDITIONS	<b>DANDACH Saïd</b>
<b>14.50 – 15.10</b>	MOLASSES INFLUENCE ON THE EFFICIENCY OF INDUSTRIAL BIOTECHNOLOGICAL PROCESSES	<b>BEGEA Mihaela</b>
<b>15.10 – 15.30</b>	BIODEGRADABLE SLOW RELEASE FERTILIZERS FOR PLANT POTS	<b>POPA Mona Elena</b>
<b>15.30 – 15.50</b>	ISOPEROXIDASE PROFILES IN SOYBEAN <i>IN VITRO</i> CULTURES UNDER OSMOTIC STRESS	<b>TASHEVA Krasimira</b>
<b>15.50 – 17.30</b>	<b>Poster session</b>	
<b>19.00 - ...</b>	<b>Participants' Dinner</b>	

**November 11<sup>th</sup>**

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***Section III: Food Biotechnology***

**Chairman:** Prof. Dr. **Mona Elena POPA**, Faculty of Biotechnology, USAMV Bucharest, Romania

**Vice-chairman:** Conf. Dr. **Nastasia BELC**, National Institute of R&D IBA-Bucuresti

<b>9.00 – 9.20</b>	EUROPEAN SCREENING OF IDEAL SKILLS FOR FOOD SCIENCE AND TECHNOLOGY SPECIALIST TOWARDS FOOD INDUSTRY	<b>POPA Mona Elena</b>
<b>9.20 – 9.40</b>	THE INFLUENCE OF RIPENING TEMPERATURE ON DIVERSITY OF NON- STARTER LACTIC BACTERIA IN SEMI- HARD CHEESES	<b>CIPROVICA Inga</b>
<b>9.40 – 10.00</b>	DETERMINATION OF CHEESE ORIGIN BY USING 26S rDNA FINGERPRINTING OF YEAST COMMUNITIES BY PCR DGGE: AN APPLICATION ON FRIED CHEESE OF WIELKOPOLSKA REGION	<b>RYCHLIK Tomasz</b>

**4<sup>th</sup> International Symposium of Biotechnology  
10 – 11<sup>th</sup> November 2011, Bucharest, Romania**

10.00 – 10.30	Coffee break & Poster viewing	
10.30 – 10.50	REFRIGERATION TREATMENTS EFFECT ON VISCOELASTIC BEHAVIOR OF GOAT MILK PROTEIN CURD	PRICOP Eugenia Mihaela
10.50 – 11.10	STUDY ON OPTIMIZATION OF SOLID-PHASE MICROEXTRACTION AND GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS FOR THE VOLATILE FRACTION OF PASTURES	CULETU Alina
11.10 – 11.30	Final conclusions	
STUDENTS SCIENTIFIC SESSION		
Chairman: Lecturer Dr. Alina ORTAN, Faculty of Biotechnology, USAMV Bucharest, Romania		
Vice-chairman: Assitant Dr. Mihaela GEICU, Faculty of Biotechnology, USAMV Bucharest, Romania		
11.30 – 12.45	Oral presentations	
12.45 – 13.00	Poster viewing	
13.00 – 14.30	Lunch	

**4<sup>th</sup> International Symposium of Biotechnology  
10 – 11<sup>th</sup> November 2011, Bucharest, Romania**

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**PRESENTATIONS**

<b>ORAL PRESENTATIONS</b>	
<b>SECTION I: AGRICULTURAL BIOTECHNOLOGY</b>	
O.I.1. ISOPEROXIDASE PROFILES IN SOYBEAN <i>IN VITRO</i> CULTURES UNDER OSMOTIC STRESS	Georgina Kosturkova, Georgi Angelov, Margarita Dimitrova, Krasimira Tasheva
<b>SECTION III: FOOD BIOTECHNOLOGY</b>	
O.III.1. THE INFLUENCE OF RIPENING TEMPERATURE ON DIVERSITY OF NON-STARTER LACTIC BACTERIA IN SEMI-HARD CHEESES	Inga Ciprovica, Alla Mikelson
O.III.2. BIOGENIC AMINE PRODUCTION BY <i>OENOCOCCUS OENI</i> UNDER ACIDIC CONDITIONS	Said Dandach, Hervé Alexandre and Michèle Guilloux-Benatier
O.III.3. STUDY ON OPTIMIZATION OF SOLID-PHASE MICROEXTRACTION AND GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS FOR THE VOLATILE FRACTION OF PASTURES	Amalia Mitelut, Alina Culetu, Mona Popa, Petru Niculita
O.III.4. EUROPEAN SCREENING OF IDEAL SKILLS FOR FOOD SCIENCE AND TECHNOLOGY SPECIALIST TOWARDS FOOD INDUSTRY	Mona Popa, Katherine Flynn
O.III.5. REFRIGERATION TREATMENTS EFFECT ON VISCOELASTIC BEHAVIOR OF GOAT MILK PROTEIN CURD	Eugenia Mihaela PRICOP, Mona Elena POPA, Aurelia IONESCU, Livia MANTOC
O.III.6. DETERMINATION OF CHEESE ORIGIN BY USING 26S rDNA FINGERPRINTING OF YEAST COMMUNITIES BY PCR DGGE: AN APPLICATION ON FRIED CHEESE OF WIELKOPOLSKA REGION	Tomasz Rychlik, Edna Arcuri, Didier Montet, Jacek Nowak and Zbigniew Czarnecki
<b>SECTION IV: INDUSTRIAL AND ENVIRONMENTAL BIOTECHNOLOGY</b>	
O.IV.1. MOLASSES INFLUENCE ON THE EFFICIENCY OF INDUSTRIAL BIOTECHNOLOGICAL PROCESSES OF PRODUCING YEAST BIOMASS	Mihaela Begea, Alexandrina Sirbu, Yannis Kourkoutas, Romulus Dima
O.IV.2. BIODEGRADABLE SLOW RELEASE FERTILIZERS FOR PLANT POTS	Mona Popa, Gabriela Neata, Amalia Mitelut, Bela Pukanszky
<b>SECTION V: FOOD SAFETY</b>	
O.V.1. FOOD SOVEREIGNTY AS PRECONDITION OF FOOD SECURITY	Mihaela BEGEA, Alexandrina SIRBU
O.V.2. HOW TO REACH GLOBAL HARMONIZATION OF FOOD SAFETY REGULATIONS AND LEGISLATION?	Mihaela Geicu, Huub Lelieveld
O.V.3. NEW PACKAGING MATERIALS AND THEIR EFFECT ON THE SHELF-LIFE OF PACKAGED SALAD	Mariana Ionescu, Gabriel Mustatea, Valentin Ionescu, Irina Smeu, Giuseppe Spadaro, Zina Vuluga
O.V.4. DETERMINATION OF ZEARELENONE IN MAIZE	Florentina Israel-Roming, Danuta Lupascu, Ionelia Taranu, Daniela Marin

**4<sup>th</sup> International Symposium of Biotechnology**  
**10 – 11<sup>th</sup> November 2011, Bucharest, Romania**

O.V.5. CORRELATION OF OCHRATOXIN A LEVEL IN WINE WITH VINE ENVIRONMENT  
 Simona ROTARU, Florentina ISRAEL-ROMING, Gheorghe CAMPEANU, Georgiana DECIU

**POSTER PRESENTATIONS**

**SECTION I: AGRICULTURAL BIOTECHNOLOGY**

P.I.1. INFLUENCE OF ESSENTIAL OILS TREATMENTS ON PEROXIDASE ACTIVITY IN TUBERS FROM HEALTHY AND PVY INFECTED *SOLANUM TUBEROSUM* PLANTS

Carmen Liliana Bădăraș, Mărculescu Angela, N. Cojocaru, Damșa Florentina

P.I.2. RESVERATROL BIOSYNTHESIS IN VITRO CULTURE CONDITIONS ON GRAPEVINE (CV. FETEASCA NEAGRA AND CABERNET SAUVIGNON) UNDER THE ACTION OF ALCL<sub>3</sub> AS ELICITOR AGENT

Carmen Bejan and Emilia Visoiu

P.I.3. RESEARCH REGARDING THE INFLUENCE OF SYNCHRONOUSLY MODULATED LASER RADIATION AND ACOUSTIC FIELDS UPON THE GROWTH AND DEVELOPMENT OF SOME FLOWER SPECIES

Burnichi Floarea, Maria-Gabriela Pârvu, Silvana Dănăilă-Guidea, Petru Niculiță, Esofina Ristici, Marian Ristici

P.I.4. THE INFLUENCE OF MODULATED RED LASER LIGHT ON SEEDLINGS OF SOME ANNUAL ORNAMENTAL SPECIES (*DIANTHUS CARYOPHYLLUS* AND *PETUNIA HYBRIDA*)

Silvana Dănăilă-Guidea, Petru Niculiță, Esofina Ristici, Mona Popa, Marian Ristici, Floarea Burnichi, Mihaela Draghici, Mihaela Geicu

P.I.5. INVESTIGATION OF NEW AGRICULTURAL DECISIONS FOR THE MAINTENANCE OF THE SOIL FERTILITY OF THE VERTISOIL

Ivan Dimitrov, Totka Mitova, Svilen Rajkov, Dafina Nikolova, Stajka Stratieva

P.I.6. TECHNOLOGICAL EVALUATION OF THE USED SIDERATES WITH AN ALTERNATIVE BIOTECHNOLOGICAL METHOD OF RE-CULTIVATION

Ivan Dimitrov, Totka Mitova, Svilen Raykov, Ivan Pachev

P.I.7. STUDY OF THE SEED MICRO FLORA IN WHEAT AND BARLEY GROWN IN ENVIRONMENTALLY FRIENDLY CONDITIONS

Mariela Georgieva-Andreeva, Svilen Raykov, Krasimira Tanova

P.I.8. EFFECT OF DIRECT ALTERNATING CURRENT STIMULATION ON VIRUS – ELIMINATION IN GRAPEVINE

Ionela Cătălina Guță, Elena-Cocuța Buciumeanu, Benedict Oprescu, Lavinia Tătaru

P.I.9. OENOLOGICAL POTENTIAL OF WINE YEAST ISOLATED FROM DEALURILE BUJORULUI VINEYARD

Florentina Matei, Adrian Gageanu, Aurel Ciubuca

P.I.10. AN ANALYSIS OF THE EFFECT OF TEMPERATURE ON THE QUANTITY OF BT TOXIN IN COTTON VARIETIES

MUHAMMAD SAJJAD ALI, INTEZAR ALI

P.I.11. A MODEL POST COMMERCIALIZATION MONITORING FRAMEWORK FOR BT COTTON IN PAKISTAN

MUHAMMAD SAJJAD ALI, INTEZAR ALI

P.I.12. EFFECT OF INORGANIC NITROGEN NUTRITION ON IN VITRO PRODUCTION OF POTATO MICROTUBERS

Andreea NISTOR, Nicoleta CHIRU, Carmen BĂDĂRĂU

P.I.13. EFFECT OF SILVER NITRATE ON IN VITRO ROOT FORMATION OF *GENTIANA LUTEA*

Mariya PETROVA, Ely ZAYOVA and Antonina VITKOVA

P.I.14. *IN VITRO* CONSERVATION BY SLOW GROWTH OF *ARNICA MONTANA*

**4<sup>th</sup> International Symposium of Biotechnology  
10 – 11<sup>th</sup> November 2011, Bucharest, Romania**

Mariya PETROVA, Ely ZAYOVA, Luba EVSTATIEVA	
P.I.15. BIOTECHNOLOGICAL APPLICATION OF THE SWEET SORGHUM ST135 VARIETY IN BIOGAS PRODUCTION	
Georgeta Radulescu, Florentina Matei-Radoi, Eugenia Mocanu, Gabriela Savoiu, Ionut Dopcea, Vasilica Manea, Getuta Nicolae, Irina Fierascu, Radu-Claudiu Fierascu	
P.I.16. INFLUENCE OF PRE-SOWING TREATMENT OF SORGHUM SEEDS WITH MICROELEMENTS ON THE GERMINATION AND GROWTH OF PLANTS IN THE INITIAL STAGES OF THEIR DEVELOPMENT	
SVILEN RAYKOV, MARIELA ANDREEVA, MILENA SIMEONOVA	
P.I.17. <i>RHODIOLA ROSEA</i> L. <i>IN VITRO</i> PLANTS MORPHOPHYSIOLOGICAL AND CYTOLOGICAL CHARACTERISTICS	
Krasimira TASHEVA and Georgina KOSTURKOVA	
<b>SECTION II: BIOTECHNOLOGY IN VETERINARY MEDICINE</b>	
P.II.1. DEVELOPMENT OF MAMMALIAN EMBRYOS AT THE INTERNATIONAL SPACE STATION	
D.M. Barry	
<b>SECTION III: FOOD BIOTECHNOLOGY</b>	
P.III.1. THE STUDY OF ADDED PREBIOTICS ON B GROUP VITAMINS CONCENTRATION DURING MILK FERMENTATION	
Ilze BEITANE, Inga CIPROVICA	
P.III.2. STUDIES CONCERNING THE BIOCHEMICAL COMPOSITION OF DIFFERENT KOMBUCHA TEA	
Andrei Sorin BOLOCAN, Luminita Anca GEORGESCU, Florin BOLOCAN	
P.III.3. ANTIOXIDANT ACTIVITY EVALUATION OF THE FUNGAL DYE OIL-IN-WATER EMULSIONS OBTAINED BY CYCLIC VOLTAMMETRIC TECHNIQUE	
Romică Crețu, Ștefan Dima, Gabriela Bahrim	
P.III.4. ANALYSIS OF PUMPERNIKEL BREAD MICROBIOTA BY USING 16S rDNA FINGERPRINTING OF BACTERIAL COMMUNITIES BY PCR-DGGE	
Kamila GODERSKA, Tomasz RYCHLIK, Zbigniew CZARNECKI, Ángel ALEGRÍA, Baltasar MAYO	
P.III.5. INFLUENCE OF LACTOBIONIC ACID AND LACTOSE ON THE GROWTH OF CHOSEN PROBIOTIC BACTERIA	
Kamila GODERSKA, Anna JORDÁN RUIZ, Zbigniew CZARNECKI	
P.III.6. DETERMINATION OF LIPOXYGENASE PATHWAY PROTEIN AND TRANSGENIC CUCUMBER VOLATILE PROFILE	
Michał GOŚLIŃSKI, Tomasz RYCHLIK, Renata ZAWIRSKA-WOJTASIAK	
P.III.7. ISOLATION AND CHARACTERIZATION OF SOME LACTIC ACID BACTERIA ISOLATED FROM ROMANIAN FERMENTED VEGETABLES	
Silvia Simona GROSU TUDOR, Medana ZAMFIR	
P.III.8. EVALUATION OF BIOACTIVE COMPOUNDS IN EXTRACTS OBTAINED FROM THREE ROMANIAN MARINE ALGAE SPECIES	
Vicentiu-Bogdan HORINCAR, Georgiana PARFENE, Gabriela BAHIRM	
P.III.9. EVALUATION OF INULIN GELLING PROPERTIES IN NEW TYPES JELLIES	
MAIJA KRONBERGA, DAINA KARKLINA, DACE KLAVA	
P.III.10. LIPOLYTIC ACTIVITY OF LIPASES FROM DIFFERENT STRAINS OF YARROWIA LIPOLYTICA IN HYDROLYSED VEGETABLE FATS AT LOW TEMPERATURE AND WATER ACTIVITY	
Georgiana PARFENE, Vicentiu Bogdan HORINCAR, Lucia VANNINI, Davide GOTTARDI, Maria Elisabetta GUERZONI	
P.III.11. FODDER PROBIOTIC EFFECT ON QUALITY INDICATORS OF FISH MEAT – A	

**4<sup>th</sup> International Symposium of Biotechnology**  
**10 – 11<sup>th</sup> November 2011, Bucharest, Romania**

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**LITERATURE REVIEW**

Mona POPA, Mihaela GEICU, Petru NICULITA, Amalia MITELUT, Mihaela DRAGHICI  
P.III.12. SENSORIAL CHARACTERISTICS CHANGES OF LOW – SODIUM FRANKFURTERS  
USING DIFFERENT PACKAGING SYSTEMS

Mona POPA, Mihaela GEICU, Amalia MITELUT, Mihaela DRAGHICI, Petru NICULITA, Tamara  
MIHOCIU, Elena DRAGU

P.III.13. GENETICALLY MODIFIED FOOD

Popescu Dan

P.III.14. PHYSICAL-CHEMICAL PROPERTIES OF MONASCUS METABOLITES

Nicoleta Radu, Yianis Kourkoutas, Mariana Ferdes

P.III.15. HEAT-INDUCED STRUCTURAL CHANGES OF BOVINE A-LACTALBUMIN AS  
MEASURED BY FLUORESCENCE SPECTROSCOPY

N. Stănciuc, S. Dima, G. Răpeanu, G. Bahrin

P.III.16. THE EFFECT OF PREPARATES BASED ON SODIUM CARBONATE AND CITRIC  
ACID ON THE PARAMETER FALLING NUMBER IN HYPERDIASTAZIC FLOURS

TAMBA-BEREHOIU R., POPESCU S., POPA C. N.

P.III.17. INFLUENCE OF THE CULTURE MEDIUM ON TORULARHODIN PIGMENT  
BIOSYNTHESIS

Camelia UNGUREANU, Mariana FERDES

P.III.18. THE MATHEMATICAL MODELING IN OPTIMIZATION OF REFRIGERATION  
PROCESS

Mioara Varga, Mira Turtoi, Mihaela Ghidurus

P.III.19. STUDY METHODS TO EXTRACTION OF PHENOLIC COMPOUNDS IN THE  
PROCESS OF OBTAINING ROSE WINES WITH STABLE CHROMATIC CHARACTERISTICS

VISAN LUMINITA

P.III.20. STUDY OF FACTORS EVENT INFLUENCING THE QUALITY OF RED WINES

VISAN LUMINITA, DANAILA SILVANA, RADU TOMA

**SECTION IV: INDUSTRIAL AND ENVIRONMENTAL BIOTECHNOLOGY**

P.IV.1. HARVESTING OF SELENIUM BY-PRODUCTS FROM WINEMAKING PROCESS  
THROUGH BIOCONVERSION

Iuliana Diana BARBULESCU, Mariana FERDES, Razvan TEODORESCU

P.IV.2. TOTAL POLYPHENOLS EXTRACTED FROM THE SKIN OF FUJI APPLE AND  
INCORPORATED BY LIPOSOME IN GALENIC BASES: AN ALTERNATIVE TO USE BY-  
PRODUCTS OF FOOD INDUSTRY

Aline M. Cardoso, Lidiane C. Lemos, Monica Frigheto, Estela O. Nunes

P.IV.3. THE ADAPTATION OF SOME GRAM-NEGATIVE BACTERIA TO ACIDIC  
ENVIRONMENTAL CONDITIONS

Carmen Mădălina Cișmașiu

P.IV.4. IN VITRO CULTIVATION OF SOME ENDEMIC AND RARE *ALCHEMILLA* SPECIES IN  
BULGARIA

Rossen GORGOROV, Marina STANILOVA, Antonina VITKOVA

P.IV.5. IN VITRO CULTURES OF BALKAN AND BULGARIAN ENDEMIC *CENTAUREA*  
SPECIES

Rossen GORGOROV, Marina STANILOVA, Svetlana BANCHEVA

P.IV.6. ASSESSMENT OF THE POLYPHENOLS CONTENT IN SORGHUM ROOTS

Florentina ISRAEL-ROMING, Daniela BALAN, Gabriela LUTA, Evelina GHERGHINA

P.IV.7. EPIFLUORESCENCE MICROSCOPY AND TEM INVESTIGATIONS ON BACTERIA IN  
MARINE MICROCOSMS

Gabriel PRODAN, Ioan ARDELEAN, Simona GHITA

**4<sup>th</sup> International Symposium of Biotechnology**  
**10 – 11<sup>th</sup> November 2011, Bucharest, Romania**

- P.IV.8. THERAPEUTIC EFFECT OF MONASCUS METABOLITES  
Nicoleta Radu, Sidira Marianthi, Mariana Ferdes
- P.IV.9. ISOLATION OF CYNOBACTERIA AND QUANTIFICATION OF THEIR BIOTECHNOLOGICAL POTENTIAL WITH RESPECT TO REDOX PROPERTIES  
Iris SARCHIZIAN, Marinela CÎRNU and Ioan I. ARDELEAN
- P.IV.10. INVESTIGATION OF ORGANIC SOLVENT RESISTANCE MECHANISMS IN MARINE BACTERIA

Mihaela Marilena STANCU

**SECTION V: FOOD SAFETY**

- P.V.1. THE EFFECTS OF THE COMPONENTS SPECIFIC MIGRATION FOR THE FOOD STUFF CONSERVATION IN METALLIC CANS  
Buculei Amelia, Rebenciuc Ioana, Gheorghe Campeanu, Valentin I. Ionescu, Mariana I. Ionescu, Gabriela Constantinescu (Pop), Adriana Dabija
- P.V.2. ANTIMICROBIAL ACTIVITY OF ESSENTIAL OILS AGAINST FOOD-BORNE BACTERIA EVALUATED BY TWO PRELIMINARY METHODS  
Alina DOBRE, Valeria GAGIU, Niculita PETRU
- P.V.3. KINETIC ANALYSIS AND THERMAL INACTIVATION OF  $\gamma$  -GLUTAMYL TRANSFERASE IN GOAT AND BOVINE MILK - A COMPARATIVE STUDY  
Dumitrascu Loredana, Gabriela Rotaru, Nicoleta Stanciuc
- P.V.4. ANALYSIS AND QUANTIFICATION OF RESVERATROL IN WINE FROM MUNTENIA AND OLTENIA REGIONS (ROMANIA)  
Elisabeta-Irina Geana, Andreea-Maria Iordache, Roxana-Elena Ionete
- P.V.5. CAROTENE CONTENT FROM MILK SAMPLES OBTAINED IN DIFFERENT FEEDING CONDITIONS  
Fulvia A. Manolache, Denisa E. Duță, Valentin Ionescu, Luminita Catana, Vasile A. Blaj, Amalia Mitelut
- P.V.6. RESEARCH ON MYCOTOXIN CONTENT OF *TRITICUM AESTIVUM* IN ROMANIAN SOUTH CROPS  
Amalia MITELUȚ, Alina CULEȚU, Irina SMEU, Mona POPA
- P.V.7. MARKET STUDY REGARDING FOOD SAFETY VERSUS CONSUMPTION BENEFITS OF FISH AND FISH PRODUCTS  
Mona POPA, Mihaela DRAGHICI, Mihaela GEICU, Silvia DRAGNEA
- P.V.8. BIODEGRADABLE ALTERNATIVE TO PLASTICS FOR AGRICULTURE APPLICATION  
Maria RÂPĂ, Mona Elena POPA, Patrizia CINELLI, Andrea LAZZERI, Rica BURNICHI, Amalia MITELUT, Elena GROSU
- P.V.9. THE POLYOLEFIN PACKAGE INFLUENCE UPON THE QUALITY OF THE BREAD ENRICHED WITH EXOGENOUS BUCKWHEAT ADDING  
Rebenciuc Ioana, Buculei Amelia, Constantinescu Gabriela, Dabija Adriana, Ionescu Mariana
- P.V.10. STUDY ON THE APPLICATION OF A NEW METHOD FOR THE VIRAL DETECTION IN FOODSTUFFS. EXPERIMENTAL TESTS ON CALICIVIRUSES  
Zoni Roberta, Tibollo Simone, Mariani Elisa, Sansebastiano Giuliano Ezio
- P.V.11. WATER VAPOUR PERMEABILITY OF PACKAGING MATERIALS – AN IMPORTANT FACTOR AFFECTING FOOD SAFETY  
Mira Turtoi, Mihaela Ghidurus, Mioara Varga, Petru Niculita, Mircea Istudor

**SECTION VI: MISCELLANEOUS**

- P.VI.1. DETERMINATION OF CHEESE ORIGIN BY PCR-DGGE: APPLICATION TO TRADITIONAL MINAS CHEESES

**4<sup>th</sup> International Symposium of Biotechnology**  
**10 – 11<sup>th</sup> November 2011, Bucharest, Romania**

<p>Edna F. ARCURI, Tomasz RYCHLIK, Ali F. El SHEIKHA, Didier MONTET</p> <p>P.VI.2. RESEARCH ABOUT INFLUENCE OF DENSITY AND FERTILISATION ON PROTEIN AND STARCH CONTENT IN SOME GENOTYPES OF BARLEY, VARIETY DISTICHUM</p> <p style="text-align: right;">AXINTI NICOLETA, TRIFAN DANIELA</p> <p>P.VI.3. STUDY OF CORRELATIONS BETWEEN MAIN QUALITY INDICES OF BARLEY AND TECHNOLOGICAL PARAMETERS OF BREWING</p> <p style="text-align: right;">AXINTI NICOLETA, TRIFAN DANIELA</p> <p>P.VI.4. INFLUENCE OF ESSENTIAL OILS TREATMENTS ON PEROXIDASE ACTIVITY IN TUBERS FROM HEALTHY AND PVY INFECTED <i>Solanum tuberosum</i> PLANTS</p> <p style="text-align: right;">Carmen Liliana Bădăraș, Mărculescu Angela, N. Cojocaru, Damșa Florentina</p> <p>P.VI.5. STUDIES ABOUT THE PHOTOSYNTHETIC PIGMENTS IN HEALTHY AND PVY<sup>NTN</sup> INFECTED POTATO PLANTS GROWN IN GREEN HOUSE</p> <p style="text-align: right;">Carmen Bădăraș, Mărculescu Angela, Damșa Florentina, Chiru Nicoleta</p> <p>P.VI.6. CRYOPRESERVATION OF <i>IN VITRO</i> GROWN BRYOPHYTE GAMETOPHYTES</p> <p style="text-align: right;">Gina Cogălniceanu</p> <p>P.VI.7. COMPARATIVE STUDY OF NEW INDETERMINATE TOMATO CULTIVARS IN VEGETABLE PRODUCTION AREA OF MATCA: QUALITY ASPECTS</p> <p style="text-align: right;">M. PETRACHE, C. POHRIB, G. CAMPEANU, GABRIELA NEATA</p> <p>P.VI.8. STUDIES REGARDING THE EFFECT OF MULCHING WITH TRANSPARENT FILM IN GREENHOUSES OF MATCA VEGETABLE AREA ON QUALITY OF TOMATOES</p> <p style="text-align: right;">C. POHRIB, M. PETRACHE, G. CAMPEANU, GABRIELA NEATA</p>
<b>STUDENTS SCIENTIFIC SESSION</b>
<p>S.O.1. CONSUMPTION OF FOOD PRODUCTS CONTAINING <i>TRANS</i> FATTY ACIDS AND HUMAN HEALTH ASPECTS – A LITERATURE REVIEW</p> <p style="text-align: right;">Letitia CIORTAN, Amalia MITELUT, Mona POPA, Mihaela GEICU</p> <p>S.O.2. COMPARATIVE QUALITY ANALYSIS OF ROMANIAN TRADITIONAL AND HAND-MADE JAMS VERSUS INDUSTRIAL ONES</p> <p style="text-align: right;">Raluca DUDESCU, Dorina FARAFIN BRAD, Alexandru VLAS, Mihaela GEICU, Mona POPA</p> <p>S.O.3. INHIBITION OF B-GLUCOSIDASE AND CARBOXIMETHYLCELLULOSE ACTIVITY</p> <p style="text-align: right;">LUPASCU Danuta, Mirea Sorina, ISRAEL-ROMING Florentina</p> <p>S.O.4. EFFECT OF MINIMAL PROCESSING OPERATIONS ON THE SHELF-LIFE AND QUALITY CHARACTERISTICS OF ROMANIAN LETTUCE</p> <p style="text-align: right;">Irina SMEU, Mona-Elena POPA</p> <p>S.P.1. MONITORING THE HYGIENE AND THE MICROBIAL QUALITY INDICATORS OF THE WHITE BREAD ON THE FLOW PRODUCTION</p> <p style="text-align: right;">Florina ANDREI, Mihaela GEICU, Radu TOMA, Mona POPA</p> <p>S.P.2. BIOTECHNOLOGY APPLIED TO IMPROVE HANDLING OF HYBRID SUNFLOWER (<i>HELIANTHUS ANNUUS</i> L.) "JUSTIN"</p> <p style="text-align: right;">CIOCAN Ioana-Clementina, ROȘU Ana, DOBRINOIU Ricuța, DĂNĂILĂ - GUIDEA Silvana, VISAN Luminita</p> <p>S.P.3. RESEARCH ON CONSUMER BEHAVIOR RELATED TO ORGANIC PRODUCTS</p> <p style="text-align: right;">Steliana DOBRE, Mihaela DRAGHICI, Mona POPA, Petru NICULITA</p> <p>S.P.4. A STUDY OF FOOD LIPIDS</p> <p style="text-align: right;">Dodan Georgiana, Enache Monica, Popa Mona Elena</p> <p>S.P.5. SAFETY ISSUES ON HAM TECHNOLOGY: A COMPARISON BETWEEN OHMIC HEATING AND TRADITIONAL THERMAL PROCESSING</p> <p style="text-align: right;">Maria HERDEA COLTEANU, Amalia MITELUT, Mihaela GEICU, Mona POPA</p>

**4<sup>th</sup> International Symposium of Biotechnology**  
**10 – 11<sup>th</sup> November 2011, Bucharest, Romania**

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S.P.6. MONITORING THE HYGIENE ON THE PRODUCTION FLOW AND QUALITY INDICATORS OF THE ROMANIAN SIBIU SALAMI PRODUCT

Ioana SOREANU, Amalia MITELUT, Mihaela GEICU, Mona POPA

S.P.7. RESEARCH AND IMPLEMENTATION OF HACCP SYSTEM ON THE SMOKED SALMON FILLET PROCESSING UNIT

Georgiana TAR, Amalia MITELUT, Mihaela GEICU, Mona POPA

S.P.8. STUDIES ON KILLER PROPERTIES OF WINE YEAST ISOLATED FROM DEALU MARE VINEYARD

GAGEANU A., CAMPEANU Gh, MATEI F.

S.P.9. MOLECULAR CHARACTERIZATION OF *PENICILLIUM* ISOLATES BY PCR ITS-RFLP  
G. NICOLAE, I. CAPLEA, C.F. DIGUTA, F. MATEI

S.P.10 RESEARCH ON LABORATORY SCALE DISINTEGRABILITY OF SOME BIO-COMPOSITE MATERIALS

TANASE Elena, POPA Vlad, MITELUT Amalia

# **ORAL PRESENTATIONS**

### O.I.1. ISOPEROXIDASE PROFILES IN SOYBEAN *IN VITRO* CULTURES UNDER OSMOTIC STRESS

Georgina KOSTURKOVA<sup>1</sup>, Georgi ANGELOV<sup>2</sup>, Margarita DIMITROVA<sup>1</sup>, Krasimira TASHEVA<sup>1</sup>

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**Keywords:** peroxidase, osmotic stress, soybean, *Glycine max*, *in vitro* cultures

*Soybean is commonly used grain legume with multiple product applications. However, its yield is reduced by environmental stress with drought is one of them. Due to the complex nature of drought tolerance, the problem has been studied from different aspects. Biotechnological methods complement classical ones and make possible modeling of stress in vitro. Biochemical analysis of stress related proteins contribute to better evaluation of the tolerant genotypes. The aim of the present work is to compare isozyme profiles of peroxidase in organogeneic soybean cultures cultivated in normal and stressed conditions. Adventitious shoots and callus cultures from cv Rosa were induced on modified Murashige and Skoog medium. Clusters of shoots were transferred to control medium and media containing polyethylene glycol (PEG) of concentrations of 4%, 6%, 8% u 10%. In callus cultures 4 izoforms of peroxidases were identifies without induction of a new one. In shoots were identified 3 peroxidase isoforms. One of them can not be detected in the control and is induced under stress. Induction is weaker at PEG concentration of 4% and more pronounced at 6% and 8% PEG. Enzyme profiles were identified in shoots subjected to stress for periods of 1, 3, 6 and 23 days. Differential response was recorded depending on PEG concentration and time treatment.*

### O.III.1. THE INFLUENCE OF RIPENING TEMPERATURE ON DIVERSITY OF NON-STARTER LACTIC BACTERIA IN SEMI- HARD CHEESES

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**Keywords:** NSLAB, cheese, ripening, *Lactobacillus* spp.

The role of non-starter lactic bacteria (NSLAB) in determination of cheese quality is still unclear. The only way how to ensure quality of cheese is corrections in technological process. The aim of the study was to evaluate impact of the selected ripening temperature on the growth rate of NSLAB in experimental *Holandes* and *Krievijas* (Dutch type) cheeses.

The samples of unripened semi-hard cheeses have been analysed. Cheeses were produced at two cheese factories and ripened at laboratories of LUA for 60 days at 6 and 12°C. Both ripening regimes help understand better the influence of microflora on the quality of cheese, including the formation of sensory properties.

The following analyses are performed in the study: pH, water activity ( $a_w$ ), CFU of *Lactobacillus* spp., identification of *Lactobacillus* species and isolation of DNA for confirmation of isolated *Lactobacillus* species. The obtained sequences are analysed at Staden Package 1.6.0 release and compared to sequences available in the BLAST ([www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov)).

In order to control the rate of cheese ripening and the growth dynamics of mesophilic NSLAB, some researchers have suggested decreasing of ripening temperature. Decreasing of ripening temperature slows down the growth rate of mesophilic NSLAB, but it is impossible to liberate cheese from their presence. The differences are observed in qualitative composition of cheese microflora. *L.curvatus* dominated during the rest of the ripening time 6°C and *L.plantarum* 1 was detected at 12°C in cheese samples. DNA fragment sequencing of most frequently identified *L.plantarum* 1 and *L.curvatus* revealed that nucleotide sequence of *L.curvatus* of ripened cheese at 6°C for 60 days conforms with the strain *L.paracasei* subsp. *paracasei* JCM8133; in cheese ripened at 12°C for 60 days at the strain *L.paracasei* subsp. *paracasei* JCM8133; in cheese ripened at 12°C for 60 days at the strain *L.paracasei* MH55. In their turn, the isolated *L.plantarum* 1 from cheese samples ripened at 12 °C for 60 days conform to *L.plantarum* DSPV 354T.

This study reveals that the concentration of NSLAB differs between cheeses ripened at 6°C (5.26-6.90 log CFU g<sup>-1</sup>) and 12°C (5.26-7.70 log CFU g<sup>-1</sup>) at least by 1 log. Higher concentrations were found in cheeses ripened at 12°C. These findings should be taking account, because the temperature at ripening is subordinated to the rate of biochemical processes in manufacture of a particular cheese variety. Any change has a significant impact on the whole complex of sensory properties of cheese.

### O.III.2. BIOGENIC AMINE PRODUCTION BY *OENOCOCCUS OENI* UNDER ACIDIC CONDITIONS

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**Keywords:** wine, acid medium, biogenic amines, *Oenococcus oeni*.

*Biogenic amines (BA) results from the decarboxylation of amino acids under the effect of decarboxylase enzymes. The presence of the amino acid precursor is essential and so some strains of lactic bacteria of wine are able to synthesize them. The BA most commonly found in wine are: putrescine, histamine, tyramine, cadaverine, ethylamine and phenylethylamine. The ability to synthesize BA seems depending on the bacterial strain and not on the species.*

*This study aims to understand better the physiological role played by BA towards the lactic bacteria of wine. Is decarboxylation of amino acids allow a better adaptation and/or a better survival of *Oenococcus oeni* in the acid stress conditions.*

*The *Oenococcus oeni* strains tested were isolated from red French wines. Their auxotrophies towards the precursors of the BA were characterized as well as the presence or the absence of the genes coding for decarboxylase enzymes. BA production and amino acids consumption were estimated by RP-HPLC in two medium (wine and chemically defined medium) at different pH. Cells were monitored by measurement of the optical absorption and by counting on Petri dishes. In this study, no correlation was found between BA production levels and lactic acid bacteria resistance in acidic conditions.*

*However, the production of agmatine (decarboxylation of arginine) appears closely related to strain. Metabolism of arginine in these *Oenococcus oeni* strains has to be studied more thoroughly.*

**O.III.3. STUDY ON OPTIMIZATION OF SOLID-PHASE  
MICROEXTRACTION AND GAS CHROMATOGRAPHY-MASS  
SPECTROMETRY ANALYSIS FOR THE VOLATILE FRACTION  
OF PASTURES**

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**Keywords:** pasture, solid-phase microextraction, gas chromatography-mass spectrometry, volatile compounds

*In this study, identification of volatile compounds from pastures collected from Bucegi area (Romania) was performed using solid-phase microextraction (SPME) combined with gas chromatography-mass spectrometry (GC-MS) technique.*

*Optimum conditions of SPME analysis of the headspace volatile compounds of pastures in sealed bottles, using a carboxen/polydimethylsiloxane fiber were developed. Also, GC-MS operating parameters were varied in order to find a better profile of the volatile compounds.*

*Accordingly, there have been investigated different sample processing methods in order to improve the analytical procedure.*

#### O.III.4. EUROPEAN SCREENING OF IDEAL SKILLS FOR FOOD SCIENCE AND TECHNOLOGY SPECIALIST TOWARDS FOOD INDUSTRY

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**Keywords:** food science and technology, ideal skills, food industry

*Food Science is the discipline in which the engineering, biological, and physical sciences are used to study the nature of foods, the causes of deterioration, the principles underlying food processing, and the improvement of foods for the consuming public. Food Technology is the application of food science to the selection, preservation, processing, packaging, distribution, and use of safe, nutritious, and wholesome food.*

*The food and drink industry is the single largest manufacturing sector in the EU and is mainly comprised by SMEs and microenterprises (99.1% of European food and drink businesses). The European food industry is in the lower part of the innovation performance ranking, and is losing relative importance in the global food market. This situation was a primary reason for the initiation of the ETP Food4 Life, which seeks to stimulate and underpin innovation in the agro food chain. TRACK\_FAST fp7 project is drawn from all geographic points of Europe, and its main objective is the identification of the training and career requirements of future European food scientists and technologists (FST), and implementation of a European strategy to recruit the next generation FST leaders. TRACK\_FAST will achieve this goal through: Identification and definition of personal skills requirements in food job market; Developments for the regulation of food science and technology professions in Europe; Establishment of a framework for continual professional training and career development for the FST professional; and Motivation of young people to enter and pursue of a career in food science and technology in Europe.*

*This paper presents mainly the results obtained regarding the ideal skills asked from industry side during the brainstorming workshop organized in Bucharest in the frame of this project.*

### O.III.5. REFRIGERATION TREATMENTS EFFECT ON VISCOELASTIC BEHAVIOR OF GOAT MILK PROTEIN CURD

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**Keywords:** protein curd, refrigeration treatments, dynamic oscillatory measurements

*The effect of three months of freezing followed by thawing and cooling process on visco-elastic behavior of whole raw goat milk protein curd were studied in comparison with a non-frozen control.*

*The protein curd was submitted to four low or fast freezing methods, and at the same storage temperatures (two replicates for each set conditions).*

*The effect of refrigeration treatments on the visco-elastic behavior of a goat milk protein curd was studied using small amplitude oscillatory strain (SAOS) measurements. Dynamic oscillatory measurements were performed using the AR2000ex Rheometer (TA Instruments, New Castle, DE).*

*The parameters measured were storage modulus ( $G'$ ), loss modulus ( $G''$ ), loss tangent ( $\delta$ ), and complex modulus ( $G^*$ ) as a function of the frequency  $f$  (Hz) and temperature ( $^{\circ}\text{C}$ ) respectively. The differences between the frozen and non-frozen samples were significant for  $G'$ ,  $G''$ ,  $G^*$  and loss tangent,  $\delta$ .*

*The results allowed us to conclude that the refrigeration treatments can be used as a long time preservation method of a whole raw goat milk protein curd, but the freezing process must be performed only after determining of the optimum parameters to ensure minimal structural changes.*

**O.III.6. DETERMINATION OF CHEESE ORIGIN BY USING  
26S rDNA FINGERPRINTING OF YEAST COMMUNITIES BY  
PCR DGGE: AN APPLICATION ON FRIED CHEESE OF  
WIELKOPOLSKA REGION**

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*Protected Geographical Status is a system which protects the authenticity of traditional and/or regional food products in the European Union. Fried Cheese from the Wielkopolska region (west part of Poland) is one of the few traditional products labeled as Protected Geographical Designation in Poland and should not be manufactured in any other part of the country. To eliminate unfair competition and the misleading of consumers by promoting non-genuine products, it is necessary to create an effective traceability system of food articles. The main aim of this study was to propose an analytical tool that will permit to link microbial ecology to geographical origin of the food. Polymerase Chain Reaction – Denaturing Gel Gradient Electrophoresis (PCR-DGGE) system a molecular tool that permits to analyze in a single step all the yeasts present in the cheese matrix with the objective to link yeast communities to the geographical origin and avert the single evaluation of each yeast strain by sequencing. For this purpose, molecular techniques employing 26S rDNA profiles generated by PCR-DGGE were used to assess the variation in the yeast community of traditional fried cheeses from six different producers, five from the Wielkopolska and one from Silesia. Statistical analysis of PCR-DGGE profiles obtained after direct DNA extraction and amplification showed significant differences in migration patterns on the DGGE gel. Some common bands appeared in all of the samples, regardless of location and producer. The band profiles of cheeses from different sources were specific for almost each district and in particularly the product from Silesia which is not protected by UE law. This method seems to be an effective traceability tool providing biological bar code which allows tracking back the food to their authentic location.*

#### O.IV.1. MOLASSES INFLUENCE ON THE EFFICIENCY OF INDUSTRIAL BIOTECHNOLOGICAL PROCESSES OF PRODUCING YEAST BIOMASS

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**Keywords:** molasses, baking yeast, nutrients, process efficiency.

*The aim of this study was to investigate the behaviour of selected yeast strains of *Saccharomyces cerevisiae* to produce baking yeast biomass on different substrates. The molasses represents the main raw material for baking yeast industry in Romania and the most important role for an efficient baking yeast technological process is the quality of the molasses used as raw material.*

*The main objective of the research was to investigate the differences in yeast biomass accumulation between sugar beet and sugar cane molasses supplemented with biotin, inositol and pantothenic acid.*

*The yield in biomass was calculated for both categories of molasses and a comparison between technological variants was performed in order to settle the most economical variant for the culture medium.*

*The technological variant using sugar beet molasses used as raw material supplemented with biotin registered comparable results with the variant using sugar beet molasses in mixture with sugar cane molasses.*

*The results of this study suggest the feasibility of cheaper and more efficient technological procedure that can be applied in the industrial biotechnological processes.*

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## O.IV.2. BIODEGRADABLE SLOW RELEASE FERTILIZERS FOR PLANT POTS

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**Keywords:** biodegradability, fertilization, slow release, plant pots

*Biodegradable bio-composite used as matrix for active substances incorporation and slow release of them in the delivery process represent sustainable solutions for land fertilization.*

*In this paper some biodegradable slow release fertilizers which have been developed in the frame of an fp7 project FORBIOPLAST, GA 212239 / 2008 have been tested on some flowers growing and very good results of fertilization process have been obtained. Different composite materials were used as fertilizers matrix and the bio degradation process have been observed.*

*Trials have been conducted on two flowers which are often commercialized for gardening, namely: Dianthus caryophyllus and Petunia hybrid. Trials have been organized in 6 fertilization variants and 10 replicates for each variant. The fertilizers sticks have been analyzed for the following parameters: pH, N, P, K existent as total amount but also in soluble form both initial, and for a certain period of plants vegetation. During the vegetation period, biometric observations regarding growing and developments of plants, namely: height, roots length, number of shoots, and number of flowers. At the same time, weekly based, samples of plants have been harvested and were analyzed for dry matter content and minerals (total amount). Analysis performed (after standardized methods) were: pH – potentiometric, soluble salts – conductometric, N as ammonium and nitric, P - colorimetric and K flamephotometric.*

## O.V.1. FOOD SOVEREIGNTY AS PRECONDITION OF FOOD SECURITY

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**Keywords:** food sovereignty, food security, food production, human rights

*Food security has become a common issue, but is not always understood in correlation with food sovereignty. The notion of food sovereignty is associated primarily with the phenomenon of food insecurity, food sovereignty being considered a precondition for food security.*

*The International Peasant Movement Via Campesina defines food sovereignty as the right of people, countries and world states to create their own food and agricultural policy, without unjust economic practices which discriminate against third world countries.*

*The opinions of experts who propose to reform the food system in order to give priority to consumers above supranational organizations should be considered. In certain regions of the world there is a risk of instability of food security due to the lack of continuity of long-term policies.*

*The aim of this paper was to analyse the actual opinion that national states and Romania also could lose an important part of their cultural heritage if the control of agricultural production will be lost.*

## O.V.2. HOW TO REACH GLOBAL HARMONIZATION OF FOOD SAFETY REGULATIONS AND LEGISLATION?

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**Keywords:** food safety standards, global harmonization, food regulations.

*It is generally assumed around the world that food is safe. Food must be safe for its intended use for human consumption, but food safety and regulatory measures should not unnecessarily hamper the availability of human food.*

*To achieve food security and safety is necessary to introduce quality standards of food that best meets the goal of consumer protection and health promotion.*

*Human health problems have always prevailed in a society which should be taken into consideration in establishing policies and legislation in the field of food. In addition, the state and quality of the environment can affect the quality of food products in various stages of the food chain. Therefore, environmental policies play an important role in obtaining safe food for consumers.*

*You most likely are aware of the Global Harmonization Initiative (GHI) of which the ultimate goal is to have globally harmonized food safety regulations. Movement of food across borders should not be blocked by differences in regulations that are based on hypes instead of sound science. To achieve this, undue barriers to free trade that masquerade as food safety protections must be vanquished. Such barriers include differences in regulations and legislation between countries globally.*

*The international scientific community must, therefore, work towards achieving global consensus on the science underpinning food regulations and legislations. To achieve this goal, we invite all food scientists, technologists, engineers, toxicologists and nutritionists to join GHI. The goal of the Global Harmonization Initiative (GHI) is to ensure the global availability of safe and wholesome food products for all consumers.*

### O.V.3. NEW PACKAGING MATERIALS AND THEIR EFFECT ON THE SHELF-LIFE OF PACKAGED SALAD

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**Keywords:** packaging, nanocomposites, films, salad, shelf-life

*The quality of fresh products, minimally processed, such as salad, depends on preparation method, packaging material and storage conditions. Packaging material affect sensory properties of salad, because the intensity of respiration and color change of the product depend on the composition of the used material.<sup>1</sup>*

*Depending on the product, process and storage conditions the microbiological shelf-life may be determined by either the growth of spoilage or pathogenic microorganisms. Traditional methods for the determination of shelf-life include storage of the product at different temperatures and determining spoilage by sensory evaluation or microbial count. This will involve the natural flora of the product, which may vary between batches. For products where the shelf-life may be set by the growth of pathogenic microorganisms this may involve challenge testing the product with the organism prior to storage and microbial analysis at intervals.<sup>2</sup>*

*In the experiments was used salad – chopped fresh leaves, packed in normal atmosphere, using different types of new packaging materials: nanocomposite-based LDPE/modified silicate monolayer films containing starch and hydrolyzed collagen and usually PP films. Bags containing salad were stored at 5 Celsius degrees.*

*Packaging material effect on product was followed by microbiological and sensory analysis during storage up to 10 days under mentioned conditions. Sensory evaluation parameters included: color, browning, odor, degradation and overall quality.*

*Microbiological and sensory analyses results were correlated with the permeability properties to O<sub>2</sub>, CO<sub>2</sub> and water vapor.*

*The best option may be considered LDPE/silica-Amp for which can be estimate a shelf-life longer than 7 days obtained with PP films currently used.*

#### References

1. Del Nobile M., Baiano A., Benedetto A., Massignan. (2006) Respiration rate of minimally processed lettuce as affected by packaging. *J. Food Eng.*, 74(1), pp. 60–69.
2. C. de W. Blackburn, Unilever Research, Sharnbrook (2000) Modelling shelf-life in *Stability and shelf-life of food*, Cambridge, Woodhead Publishing Limited and CRC Press LLC, First published, pp.55– 57.

#### O.V.4. DETERMINATION OF ZEARELENONE IN MAIZE

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**Keywords:** zearalenone, mycotoxin, maize

*Maize is constantly exposed to risk of fungi development due to its biochemical composition. Zearalenone (ZEA), a fusariotoxin produced by several species of Fusarium genus, is common in maize and maize products. The determination of this mycotoxin in food and feed is important both due to its possible toxicity on human beings and animals and for economic reasons. European authorities have fixed maxima ppb permitted levels to protect consumers. In this context it is very important to have reliable analytical methods to work with. The aim of the present study was to test a sensitive and reproductible HPLC analysis method in order to identify and quantify ZEA in maize. Extraction was performed in 75% acetonitrile and the samples were cleaned-up by immunoaffinity chromatography. HPLC separation was done using an acetonitrile:methanol:water mobile phase, with 1.0 ml/min flow rate and a fluorescence detector at excitation wavelength 274 nm and emission wavelength 455 nm. The toxin level was quantified with ZEA 0.5 ng/μl standard solution. The analyzed samples consisted in maize certified reference material with 258.5 ±30.9 ppb ZEA, uncontaminated maize spiked before analyzing with 100 ppb pure ZEA and four contaminated maize based feed samples. Statistical performance characteristics were evaluated with good reliability: linearity, correlation, repetability and recovery.*

## O.V.5. CORRELATION OF OCHRATOXIN A LEVEL IN WINE WITH VINE ENVIRONMENT

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**Keywords:** ochratoxin A, wine, climatic factors

*The amount of ochratoxin A in must and wine is strongly influenced by the pre-harvesting conditions and the vinification techniques. The effect of pre-harvesting conditions on ochratoxin A biosynthesis depends mainly on the geoclimatic particularities of the grapes cultivation area. The pre-harvesting conditions that affect ochratoxin A level in wine and related products are: climatic factors, vineyard location and grape variety. This paper refers to the correlation of these factors. The contamination with ochratoxin A was analyzed in 84 wine samples, 11 varieties produced in Iasi, Vrancea, Prahova, Constanta, Galati, Arges, Dolj and Mehedinți vineyards, during 2007 and 2010. The mycotoxin level was correlated with the mean values of air temperature, air humidity, rainfall and shining during September of each production year.*

# **POSTER PRESENTATIONS**

**P.I.1. INFLUENCE OF ESSENTIAL OILS TREATMENTS ON  
PEROXIDASE ACTIVITY IN TUBERS FROM HEALTHY AND PVY  
INFECTED *Solanum tuberosum* PLANTS**

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**Keywords:** potato virus Y, peroxidase activity, essential oils

Antioxidants such as rosmarinic acid, chlorogenic acid, polyphenols presents in essential oils extracted from Lamiaceae family plants and many other compounds like hydrogen peroxide and ascorbic acid are implicated in the process signaling against stress. The goal of this research was to evaluate the effects of treatments with essential oils from *Thymus serpyllum*, *Rosmarinus officinalis*, *Ocimum basilicum*, *Mentha piperita* and *Abies alba* on peroxidase activity and minituber yield from healthy and mechanical PVY inoculated plants (variety Roclas) The treatments of positive potato plants significantly reduced the number of minitubers, enhancing their weight in all the variants. The tubers from plants treated with *Thymus serpyllum* oils and mechanical inoculated with the potato virus Y had the higher value of peroxidase activity (significantly comparatively with the other variants).

**P.I.2. RESVERATROL BIOSYNTHESIS IN VITRO CULTURE CONDITIONS ON GRAPEVINE (CV. FETEASCA NEAGRA AND CABERNET SAUVIGNON) UNDER THE ACTION OF ALCL3 AS ELICITOR AGENT**

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**Keywords:** *Vitis vinifera*, resveratrol synthesis, eliciting agent.

*Stilbenes are considered the most important phytoalexin group synthesised in grapevine (Vitis vinifera) and they are known to contribute to the protection against various pathogens. The main typical stilbenes of grapevine which show antifungal and pharmaceutical characteristics are resveratrol and his derivatives. Recently study prominence also their benefit in human health by their antifungal, anticancerigen, hypolipidemic and antidiabetic properties. Present study was focused on induction of resveratrol biosyntheses in vitro vine culture conditions under effect of AlCl3 as eliciting agent. Specific medium for vine in vitro multiplication (M&S, 1962 + 1 mg/L BAP +0, 5 mg/L AIA) has been supplemented with different doses of 1% AlCl3 (0, 01%; 0, 03%; 0, 05%). Reservation dosage was made by high performance liquid chromatography (HPLC) with pressure liquid chromatography Merck – Lunchrom and UV detector. Using modified mediums resveratrol synthesis has been intensified at Cabernet Sauvignon cv. up to 97, 94 µg/g soluble solids in plant at the 0,05 %.*

### P.I.3. RESEARCH REGARDING THE INFLUENCE OF SYNCHRONOUSLY MODULATED LASER RADIATION AND ACOUSTIC FIELDS UPON THE GROWTH AND DEVELOPMENT OF SOME FLOWER SPECIES

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**Keywords:** annual flower, laser radiation and synchronously modulated acoustic field, stressless ecologic model, plant growth

*Within the framework of the experiments made throughout the year 2011 a model of ecologic and stressless experimental treatment of mature flower plants was made with superposed physical laser and acoustic fields, which were synchronously modulated.*

*This experiment based on a laser radiation field was applied to three flower species: carnations chabaud (*Dianthus caryophyllus* Chabaud L.), petunia (*Petunia hybrida* var. *grandiflora* Vilm.) and marigold (*Tagetes patula* L.), using as irradiation source an experimental device for laser radiation and synchronously modulated acoustic field treatment. Musical pieces as: Franz Liszt's „Praludium un Fuge uber BACH”, Maurice Ravel's Bolero and Antonio Vivaldi's „Spring” (Four Seasons) were chosen as sources for the modulation of the acoustic field. The treatment lasted 5, 10 and 15 minutes for transplants and mature plants. There have been made observations and measurements regarding the evolution of morphological and biological parameters of flower plants during the vegetation period and also regarding the influence of the synchronously modulated laser field and acoustic field treatment upon their growth and development. Statistical processing of the results indicated significant differences regarding the plants' size, growth rhythm and development.*

**P.I.4. THE INFLUENCE OF MODULATED RED LASER LIGHT ON  
SEEDLINGS OF SOME ANNUAL ORNAMENTAL SPECIES  
(*DIANTHUS CARYOPHYLLUS* AND *PETUNIA HYBRIDA*)**

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**Keywords:** red laser light diode, light stimulation of plant, light and audio field simultaneously modulated, light treatment of plants

*The modulation of the laser light by an audio field leads to a complex source that stimulates the vegetative growth and flower development, in a relaxing and unstressful mode. Red light laser in the spectral range of 660 nm – 680 nm is a very important source, considering the strong absorption bands of chlorophylls “a” and “b” in this type of plants. The development of an experimental device using the high power of a red light laser diode of 200mW output power, modulated simultaneously by the audio field, with an aimed arm, a support and the electronic source. This experimental device is not expensive and can be used in all green-houses without special environmental conditions.*

*The S1- seedlings of Dianthus caryophyllus L. -cv. Feuerkőning, Fam. Caryophyllaceae and S2 – seedlings of Petunia hybrida Vilm. Fam. Solanaceae, line L7, used in breeding at SCDLBuzau, were tested in our experiments, each of them in 3 variants for three exposure times (5, 7 and 10 min), corresponding to the laser doses (0.7, 1.0 and 1.4 J/cm<sup>2</sup>).*

**Acknowledgements:**

This work belongs to a national research project, PN II 52-136/2008PLANTCAMP, funded by the National Ministry of Research by CNMP (UEFISCDI).

## P.I.5. INVESTIGATION OF NEW AGRICULTURAL DECISIONS FOR THE MAINTENANCE OF THE SOIL FERTILITY OF THE VERTISOIL

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**Keywords:** soil tillage, fertilization, soil fertility

*The changes in the soil, climatic and economic conditions lead to the application of new effective decisions for the agricultural activities to full use utilization of the productive potential of the cultivated cultures. The new production technologies contribute to the maintenance of the soil fertility.*

*In the report are treated the results of three years examination of technologies for polish production in two crop–rotation.*

*It was found out in the investigation that with the applying of new decisions for the soil cultivation and mainly for the mineral fertilization the increase of the crop from 13.4 to 17.0% of the cultivated cultures could be achieved. A tendency towards improvement of the values of some of the main physical and agrochemical parameters of the soil fertility is established.*

**P.I.6. TECHNOLOGICAL EVALUATION OF THE USED  
SIDERATES WITH AN ALTERNATIVE BIOTECHNOLOGICAL  
METHOD OF RE-CULTIVATION**

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**Keywords:** re-cultivation, siderates, biomass, organic matter

*The alternative biotechnological method is based on the usage of green fertilization as a source for accumulation of organic mass, needed for the process of humification. With it, however, the construction of correct crop rotations is accompanied by many problems. The main requirement is that more modest cultures are grown, developing in poor and unstructured soils with a poor water and air regime (2, 3, 4, 5.) The number of treatments is reduced to the possible limit so that the processes of densification and denitrification are limited. This, on its part, strongly narrows the species composition of the cultures (1, 4.)*

*The purpose of this research is to reach a quick accumulation of organic matter in the newly-formed substrates and appropriate soil conditions for the growing of siderate cultures in a compacted succession of crops.*

### P.I.7. STUDY OF THE SEED MICRO FLORA IN WHEAT AND BARLEY GROWN IN ENVIRONMENTALLY FRIENDLY CONDITIONS

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**Keywords:** wheat, barley, fungi, micro flora, seeds

*By the method of placement in Chapek environment, 40 samples of wheat and barley grown in environmentally friendly and conventional agriculture conditions are set.*

*The total contamination of samples has been determined and fungi have been isolated in clean environment and have been defined by species. The mycological analysis showed that the following species of fungi are found: Fusarium, Alternaria, Mucor, Penicillium, Helminthosporium, Cladosporium, Botrytis and Rhizopus. In the makeup of the seminal micro flora, the percentage of fungi species Fusarium (53%) and Alternaria (32%) is significantly higher compared to that of the other species.*

*The average percent of contamination in seeds is higher in these samples than in cultures grown conventionally. Seeds from the conventional field have stronger Fusarium fungi infection, and the materials from the ecological field have stronger Alternaria infection.*

*Problem in ecologically clean foods and feed production is current on a global scale. Technology for conventional agricultural production used by now, leading to a high increase of productivity is connected to a high degree of pollution, disruption of natural functions and ecosystem integrity, and above all leads to the loss of enormous quantities of non-renewable energy (Knauer.N.1993;Spedding,C.R.W.,1988).*

*Methods of plant protection had the biggest impact on ecosystems, primarily – the chemical method, which led to mobilization of genetic volatility of harmful species and increased the effect of the pesticide “boomerang” (Stancheva, 1999;).*

*As an answer to these negative processes in agronomy, alternative systems of agricultural production were created and developed. Bulgaria, as a part of Europe, is a part of these problems. 90% of the area in the country are suitable for the production of ecological foods and by 2013 a sharp increase of areas for biological production is expected.*

*Cereal cultures are of the most important species that are being grown biologically.*

*Their growing in ecologically friendly conditions requires the development of a technology, combining stable methods of production (crop rotations, mechanical treatment, sustaining of soil fertility by fertilization with manure and plowing of crop residues, biological control of pests).*

*Benign and healthy seeds are needed for sustainable yields and quality crops of cereal foods and feed, as a great part of the seed transmitted pathogens can provoke rotting, decrease in germination, and in later stages – systematic infections that can destroy big parts of the crops (Bateman, GL and H. Kwasna. 1999., Chong, LM and JE Sheridan. 1982., Glazek, M. 1997., Kubiak K. and M. Korbas.1999.).*

*In conventional production, seed pathogens are controlled by fungicides but in bio-farming no effective methods of control are defined. This requires the study of seed pathology in different ways of cultivating the crop in order to establish methods of biological control against phytopathogenic seed parasites.*

## P.I.8. EFFECT OF DIRECT ALTERNATING CURRENT STIMULATION ON VIRUS – ELIMINATION IN GRAPEVINE

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**Keywords:** *Vitis*, virus, eradication, electrotherapy

*The meristem type culture and thermotherapy are individually or in combination the most frequent methods of obtaining virus-free plants. The application of heat treatment for virus-elimination in plants is time and energy consuming and needs special equipments (chambers for heat treatment). In the case of the meristem culture, the percent of virus elimination is influenced by the genotype, the type of the virus and especially of the difficulty of meristem excision (the percent of virus elimination is inverse proportion to the explants dimensions).*

*The use of electrotherapy with discontinuous electric current followed by in vitro culture was investigated as alternative technique to eliminate grapevine viruses, in simple or mixed infections at a time, in seven *Vitis vinifera* L. varieties naturally infected. The study had in view the most dangerous viruses of this crop: fanleaf virus (GFLV), arabis mosaic virus (ArMV), leafroll associated virus 1 (GLRaV-1), leafroll associated virus 3 (GLRaV-3), and fleck virus (GFkV). Alternating electric current of 1; 100; 1000 and 10000 kHz was applied for 5; 10 and 20 min at the cut ends of one budded herbaceous cuttings. Treated axillary buds were grown on MS-medium containing growth regulators. The efficacy of virus elimination process was assessed by enzyme-linked immunosorbent assay (ELISA) testing of regenerated acclimated grapevine plants. The analysis showed some encouraging results for elongated viruses GLRaV-1 and GLRaV-3 in single infections and no virus eradication in mixed infections had been obtained. The electrotherapy of GLRaV-1-infected material produced maximum 12,5% virus-free plants at 1000 kHz for 10 min of exposure, and 4,5% GLRaV-3-free vines at 10000 kHz for 10 min of exposure. The result regarding GLRaV-1 elimination was not reproducible in the case of mixed infection containing it. No satisfactory results have been achieved for isometric viruses eradication (GFLV, ArMV, GFkV) either in simple or mixed infections. This treatment did not influenced significantly the in vitro regeneration process of grapevine.*

**P.I.9. OENOLOGICAL POTENTIAL OF WINE YEAST ISOLATED  
FROM DEALURILE BUJORULUI VINEYARD**

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**Keywords:** wine yeast biodiversity, oenological potential, Dealurile Bujorului vineyard

*This study is part of a national effort towards the increase of Romanian wines visibility and authenticity in the context of the globalization and standardization of wines in the world. It is well known that the specific characters of a wine come in the mean time from the vineyard eco-pedological conditions, as well as from the grape variety. Moreover, in the last decade has been demonstrated that the use of local isolated microorganisms (e.g yeast) improves the wine character.*

*In this context, we have isolated and purified from Dealurile Bujorului vineyard 140 yeast strains on specific media (must-agar, GYP) and by rapid physiological API 20 C test we performed the identification. It has been proved that 27 strains belong to the gender *Saccharomyces*, respectively 19.3% from total strains. All these strains have been pretested in laboratory conditions (200 ml volume) for their fermentative potential on synthetic must and in natural must. The growth curves for the strains have been determined, as well as the measurement of alcoholic yield. From these 27 strains only 5 have been kept for their oenological capacity.*

*Further, the 5 kept strains (SB 16, SB 27, SB 35, SB 43, SB 56) have been tested on micro-vinification conditions (20 l volume) for their oenological potential. The tests have been performed on an autochthonous grape variety for white wines (*Feteasca Regala*) harvested from Dealurile Bujorului vineyard, same areal for the yeast isolation.*

*The measurements have proven that the alcoholic content in the final wines varied between 12.2 (SB 56) and 14.4 % (SB 35 and SB 43) on a pH level around 3.0. For the residual sugars the best behaviour have showed SB 56 which lead to less than 1 g/l residual sugar, while SB 27 could reduce the sugar only to a content of 24,6 g/l. The glycerol formation varied between 5 and 11 g/l, the best producer being SB 16. There has been also proven that some of these strains have a pelicular character.*

*These strains are now subject to a PCR-ITS amplification for a molecular characterisation. In the mean time, because of the aromatic profile of the obtained wines, identified during wine tasting, it is recommended to be performed further HPLC measurements in order to prove the aromatic potential of the strains.*

## **P.I.10. AN ANALYSIS OF THE EFFECT OF TEMPERATURE ON THE QUANTITY OF BT TOXIN IN COTTON VARIETIES**

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**Keywords:** Cry toxin; quantity; temperature; correlation

*The expression of Bt transgene in cotton cultivars is dependent upon a host of factors. Extreme variations in temperature not only affect overall plant vigour and growth but the expression of CryIAC gene is also compromised. The expression of Bt content correlated with temperature was quantified in six cotton varieties during the cotton year 2010-2011. The results indicate a decline in expression of CryIAC over temperature independent of the hybrid genotype. The situation necessitates a post commercialization monitoring of the formally approved cotton varieties.*

## **P.I.11. A MODEL POST COMMERCIALIZATION MONITORING FRAMEWORK FOR BT COTTON IN PAKISTAN**

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**Keywords:** Bt cotton; stakeholders; monitoring; framework

*Cotton varieties were formally approved for large scale cultivation in Pakistan in late 2010. However, the prevalence of Bt cotton varieties in farmers' fields can be traced back since 2002. The cultivation of unapproved varieties with an unknown parent germplasm and a doubtful compatibility of such varieties with local flora must be analysed for environmental consequences. The flow of transgene in local ecosystem needs to be monitored at earliest. A regulatory model is designed for the monitoring of ill effects/spread of Bt transgene. The model presents a plan from sampling to results interpretation involving the active role of all agricultural stake holders in Pakistan.*

## P.I.12. EFFECT OF INORGANIC NITROGEN NUTRITION ON IN VITRO PRODUCTION OF POTATO MICROTUBERS

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**Keywords:** microplants, mineral nutrition, microtubers, *Solanum tuberosum* L., tissue culture

*The effect of inorganic nitrogen nutrition on production of microtubers was studied in two potato genotypes Nicoleta and Christian. The objective of this study was to investigate whether a reduction in total nitrogen level in the Murashige & Skoog medium would improve microtuberization. The effect of three levels of total nitrogen (30, 45 and 60 meq) on tuberization was studied at constant (20 meq K). Reducing the total nitrogen supply increased the number but decreased the size of microtubers. The weight of microtubers per vessel was the highest at the highest nitrogen concentration (60 meq): 1.91 g for Christian variety. A reduction in total nitrogen supply reduced the size of microtubers, the lowest weight being at the lowest nitrogen level – 30 meq: 1.01 g for Nicoleta variety, with a difference of -0.66 g, significant in a negative way. Decreasing the total nitrogen supply caused increasing the number of microtubers/ vessel which was the highest at the lowest nitrogen concentration (30 meq): 19.67 microtubers, with a difference of 4.34 microtubers, significant in a positive way, for Christian variety. The number of microtubers per vessel was the lowest at the highest nitrogen concentration (60 meq): 15.33 microtubers, for both varieties.*

**P.I.13. EFFECT OF SILVER NITRATE ON IN VITRO ROOT  
FORMATION OF *GENTIANA LUTEA***

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**Keywords:** *Gentiana lutea*, silver nitrate, bacterial contamination, *in vitro* rooting

*Gentiana lutea* (Gentianaceae) is valuable, protected species and is included in the Red Book of Bulgaria. Microbial contamination is one of the most critical and often encountered problems in plant tissue cultures. The influence of silver nitrate (AgNO<sub>3</sub>) on *in vitro* rooting of *G. lutea* was examined. Considerable limitation of late bacterial contamination and improved *in vitro* rooting of plants were achieved on ½ MS2 rooting medium supplemented with IBA (1 mg/l) and AgNO<sub>3</sub> (1 mg/l). The optimization of this medium was provided a high degree of rooting (90%) and lack of bacterial contamination. Different concentrations of silver nitrate had the greatest effect on the various growth parameters. A maximum plant height (2.5 cm), number of roots/plant (4.5) with mean length 1.5 cm was obtained on ½ MS2 after four weeks of culture. The effect of different mixture substrate during acclimatization stage was also studied. Best response (65%) was obtained in peat: perlite: sand (2:1:1 v/v/v) after three week of transplantation in *ex vitro* conditions. This technique can be effectively used to *in vitro* rooting of *G. lutea*.

P.I.14. ***IN VITRO* CONSERVATION BY SLOW GROWTH OF  
*ARNICA MONTANA***

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**Keywords:** *Arnica montana*, in vitro conservation, mannitol, slow growth

*The addition of osmoticums to the nutrient medium has proved efficient for reducing growth rates of different plant species. An efficient protocol for mass micropropagation of A. montana was developed, which is an essential requirement for prolonged in vitro storage. In vitro study of mannitol on conservation of A. montana plants was conducted. The plants were cultured on ½ Murashige and Skoog (MS) rooting medium containing 20 g/l sucrose, 0.5 mg/l IBA and different addition of mannitol (0, 10, 20, 30 and 40 g/l). The developments of shoot and root growth as well as percentage of survival were evaluated during 1, 3 and 6 months of in vitro storage. It was found that ½ MS medium supplemented with 20 g/l mannitol effectively retarded shoot and root length and number of formed roots. After six months the survival rate was 65%. A combination of mannitol and low light intensity was most effective in prolonging the term between subcultures. The survival plantlets regenerate new shoots after subcultured onto the fresh propagation medium. An effective protocol for long-term in vitro conservation of A. montana in slow growth conditions was developed, allowing the storage of this endangered species in tissue culture.*

## P.I.15. BIOTEHNOLOGICAL APPLICATION OF THE SWEET SORGHUM ST135 VARIETY IN BIOGAS PRODUCTION

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**Keywords:** sweet sorghum, biogas

*Biomass is one of the renewable resources that enable a sustainable energy production. The aim of this paper is the study on the biological conversion of biomass to biogas. Bacteria from manure convert organic matter to lower metabolites like organic acids, carbon dioxide and hydrogen. The hydrogen is immediately consumed by methanogenic bacteria, and methane is the final end-product which becomes available.*

*The raw material studied was sweet sorghum which is under serious examination as a potential European energy crop. All materials were characterized as water content, organic matter, cellulose, hemicellulose and lignin, the content of the mineral matter and respectively microelements. By elemental analysis was determined the content in carbon, hydrogen, nitrogen and sulfur.*

*The lignocelulosic materials are renewable carbon and nitrogen resources which can be released from structures by different pretreatment procedures: milling, wet thermooxidative-explosion, chemical hydrolysis and with hydrolytic enzyme complexes or a mixture of procedures.*

*There were performed two experimental series based on dry, milled sorghum stem before and after the extraction of sugars by boiling. As digesters were used brown serum bottles 600ml capacity, working volume 300ml, closed with rubber septum, fixed with aluminium screwed caps. The substrates were: a) dry milled sorghum stem pretreated with hydrolytic enzymes produced by *Thricoderma reesei*; b) dry milled sorghum stem pretreated with hydrolytic enzymes produced by a consortia isolated from rotten wood; c) dry milled sorghum stem pretreated with wet thermooxidative-explosion method. As inoculum was used cattle manure.*

*Digesters were kept in darkness, at 34-36°C, with occasional stirring to assure an even distribution of gases and nutrients. At the bioprocesses initiation the pH value was adjusted to 6,5-7,0 with NaHCO<sub>3</sub> 1M. The CH<sub>4</sub> content in biogas was determined at 2-3 days intervals with a Gasalertmicroclip detector, for a period of 144 days.*

*The biogas production varied between 2000-3500ml, and the methane yields, in the mentioned biogas volumes, varied between 330-1000ml, with a maximum at 28-30 days.*

**P.I.16. INFLUENCE OF PRE-SOWING TREATMENT OF  
SORGHUM SEEDS WITH MICROELEMENTS ON THE  
GERMINATION AND GROWTH OF PLANTS IN THE INITIAL  
STAGES OF THEIR DEVELOPMENT**

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**Keywords:** seeds, sorghum, microelements, germination

*Container tests with sorghum seeds soaked for 24 hours in solutions with concentration 20mg/l of the following substances -  $ZnSO_4$ ,  $MnSO_4$ ,  $H_3BO_3$ ,  $CuSO_4$ ,  $MgSO_4$ , and control sample – with water - were carried out, after which 50 seeds were planted. The germination has been reported and after gathering of the test plants, the length of their roots and aboveground mass and the weight of the fresh and dried biomass.*

*Based on the reported data it has been determined that the highest germination is present in the option treated with  $MgSO_4$  and in the control sample (92%), followed by the options with  $H_3BO_3$  (88%) u  $CuSO_4$  (84%), and the lowest germination was with seeds, treated with  $MgSO_4$  (80%) and  $ZnSO_4$  (78%).*

*The pre-sowing treatment with  $ZnSO_4$  and with  $CuSO_4$  stimulates the development of the root system (respectively 49% and 20% longer than the control sample's roots), and with  $H_3BO_3$  – of the aboveground mass (12% higher than the control samples).*

*Microelements stimulate the accumulation of more water in plant tissue.*

**P.I.17. *RHODIOLA ROSEA* L. IN VITRO PLANTS  
MORPHOPHYSIOLOGICAL AND CYTOLOGICAL  
CHARACTERISTICS**

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**Keywords:** medicinal plant, golden root, in vitro, cytological and morphological characteristics

*Rhodiola rosea* L. (Golden Root, Roseroot) is an endangered species and is protected by law in Bulgaria and other countries. Rhizome and roots extracts are used as a stimulant of immune system, adaptogen, and for prophylactics and cure of socially important diseases – cancer, cardiovascular, etc.

Schemes for in vitro propagation and plant regeneration were established previously. The aim of the present work is to characterize morphologically and cytologically regenerants. Concerning flowers, leaves, stem and rhizomes no differences were recorded between the wild plants and the regenerated plants grown ex vitro in the adaptation room, in the green house and in the mountain. To detect chromosome number, commonly used techniques for squash preparations were modified for use of *Rhodiola rosea* root tip meristem cells from regenerants. In vitro plants obtained on different culture media were subjected to cytological analysis. The chromosome number in all samples was  $2n = 22$ , which confirms the diploid level of plant regenerants and cytogenetic identity with the wild type.

The study indicates that the established in vitro schemes are suitable for mass propagation and production of identical plants of this endangered medicinal species which could be a basis for restoration of the natural habitats and for establishment of fields for growing plants for production of pharmacologically valuable substances.

## P.II.1. DEVELOPMENT OF MAMMALIAN EMBRYOS AT THE INTERNATIONAL SPACE STATION

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**Keywords:** sheep, mice, mammalian embryos, International Space Station, culture.

*During the launch of the Soyuz rocket and Space Capsule No. 33 by Energia, the Russian Rocket and Space Corporation, from Baikonur, Kazakhstan, we sent mammalian embryos for a period of 10 d in a portable incubator (Biotherm, Australia) with Mark Shuttleworth, (the first African in space), to the International Space Station (ISS).*

*One-cell stage embryos were collected from multi-ovulated local Tegeres sheep ewes, and the 1-cell mice embryos (n = 510) were collected from F1-hybrid mice bred in Moscow, Russia. The sheep and mice embryos were collected at Baikonur, close to the Soyuz launching site. The embryos were cultured at 38.5°C at the ISS.*

*During the flight the culture medium in the test tubes containing the embryos were changed every second to third day by injecting the medium from reservoir tubes into the specially adapted culture test tubes in the portable Biotherm incubator. The culture medium used was TCM-199 with 20% FBS, 1% antibiotics, and 0.5% of both essential and non-essential amino acids. A filter in the culture test tubes prevented the suspended experimental embryos from being flushed out of the culture tubes. The spent medium was collected into a plastic bag by means of a fixed tube. Control embryos samples were cultured under similar conditions on earth for the duration of the space flight.*

*After their return from outer space, the embryo and the corresponding control samples were frozen immediately (Freeze Control, Cryologic, Australia) in liquid nitrogen, using ethylene glycol as a cryo-preservative. The control and space samples were then transported to a Biotechnology laboratory in South Africa for evaluation and further analysis. It was shown that the sheep and mouse embryos grown under micro-gravity conditions for the 10-d interval at the ISS developed past the hatching stage of the embryo, and an enlargement and outgrowth of the inner cell mass was observed. Of the sheep embryos cultured at the ISS, 37.5% reached the hatched blastocyst stage, while 25% of the control sheep embryos hatched.*

### P.III.1. THE STUDY OF ADDED PREBIOTICS ON B GROUP VITAMINS CONCENTRATION DURING MILK FERMENTATION

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**Keywords:** B group vitamins, prebiotics, fermented milk

*The effect of different concentrations of lactulose and inulin was studied during milk fermentation on B group vitamins: thiamin, riboflavin, pyridoxine and cobalamin concentration. Pasteurized milk, freeze-dried culture Bb-12 (Chr. Hansen, Denmark), inulin – RAFTILINE® HP (ORAFI, Belgium), syrup of lactulose (Duphalac®, the Netherlands) were used for experiments. Following lactulose and inulin concentrations: 0, 1, 2, 3, 4 and 5% were used. The fermentation process was realized at 37 °C for 16 hours. The content of B<sub>1</sub> and B<sub>2</sub> vitamin was determined by AOAC Official Method 986.27 and 970.65, B<sub>6</sub> vitamin – using J.Odincovas method (Vulfa, 1977) and B<sub>12</sub> vitamin – using Escherichia coli 113-3 (Valdmanis, 1959).*

*The added prebiotics concentrations significantly influence the content of vitamins B<sub>1</sub> and B<sub>2</sub> ( $p < 0.05$ ) in fermented milk samples. The highest concentration of vitamins B<sub>1</sub> and B<sub>2</sub> was observed in fermented milk samples with 3% of lactulose (0.44 mg·kg<sup>-1</sup> and 2.73 mg·kg<sup>-1</sup>) and 4% of inulin (0.47 mg·kg<sup>-1</sup> and 3.16 mg·kg<sup>-1</sup>). There are not established significant differences between the analyzed concentrations of prebiotics. The concentration of vitamin B<sub>6</sub> in fermented milk is possible to increase ( $p > 0.05$ ) by adding lactulose in concentrations to 3% (0.51 – 0.60 mg·l<sup>-1</sup>) and inulin to 4% (0.49 – 0.58 mg·l<sup>-1</sup>). The type and the concentration of added prebiotics have not significant influence ( $p > 0.05$ ) on the concentration of vitamin B<sub>6</sub> in fermented milk samples. The concentration of prebiotics has the significant influence on vitamin B<sub>12</sub> content in fermented milk ( $p < 0.05$ ). There are established significant differences between control and fermented milk samples with prebiotics in concentrations of 4% and 5%, it means to increase concentrations of added prebiotics suppress the vitamin B<sub>12</sub> synthesis in fermented milk.*

## P.III.2. STUDIES CONCERNING THE BIOCHEMICAL COMPOSITION OF DIFFERENT KOMBUCHA TEA

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**Keywords:** tea, Kombucha, vitamins, chromatography, organic acids

*Kombucha is a traditional fermented beverage, typically prepared by fermenting black tea, sweetened with sugar, involving a symbiosis of yeast species and acetic acid bacteria. The tea fermentation occurs at room temperature after 7 to 12 days, and the finished product contains organic acids, tea components, vitamins, minerals, and it is slightly carbonated.*

*With respect to their health effect and remarkable therapeutic benefits, it has been claimed that kombucha can regulate cell proliferation, increase detoxification, and protect liver. Kombucha has also anti-carcinogenic effects, especially for hormone dependent tumors (Jayabalan et al., 2007; Yang et al., 2010).*

*The aims of this study were a comparative analysis of the biochemical composition of different kombucha tea, made with black, green, white and rooibos tea, under the same fermentative conditions. The analyzed biochemical components were sugars, organic acids and vitamins (thiamine, riboflavin pyridoxine and ascorbic acid) by HPLC methods, and uronic acids through a spectrophotometric method. The reducing power of tea was determined according to the method of Oyaizu, and the total polyphenol content was estimated using Folin-Ciocalteu phenol reagent.*

*Analysis of the fermented drinks has revealed the presence of acetic, lactic and gluconic acids as major biochemical compounds. Changes in content of acetic and uronic acids in black, green and rooibos tea during kombucha fermentation depend on fermentation duration, a longer fermentation time leading to a higher organic acids content. For all kombucha tea, the production of lactic acid was significant the first three days. After a 12 days fermentation, pH levels for kombucha tea beverages were 2.8-3.5.*

*The best vitamin profile was detected in kombucha made of green tea.*

*The reducing power was positive correlated with the total polyphenol content for all tea. The reducing power of kombucha drink made of rooibos tea remained inferior to those of green and black kombucha tea.*

### P.III.3. ANTIOXIDANT ACTIVITY EVALUATION OF THE FUNGAL DYE OIL-IN-WATER EMULSIONS OBTAINED BY CYCLIC VOLTAMMETRIC TECHNIQUE

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**Keywords:** emulsions, emulsifiers, fungal dye, cyclic voltammetry, voltammetric sensors

*Lipid constituents oxidative degradation from food emulsions presumes both toxicological and economic aspect.*

*Recently, industrial interest in fungi as natural dye sources has been revived because of  $\beta$ -carotene that has been fermentatively produced from some fungus and approved for food use.*

*Antioxidant potential of used fungal dye that has been produced by a strain selected from *Epicoccum nigrum* collection of bioresearch platform (acronym MIUG), was partially characterized in previous studies. However, the fungal dye antioxidant capacity comparatively studied with other potential inhibitors of lipid peroxidation (cochineal dye) has not been fully elucidated, especially regarding its behavior in emulsions.*

*Using a voltammetric technique, this study presents the antioxidant potential of yellow dye synthesized in SSF system by *Epicoccum nigrum* fermentation strain selected MIUG 2.15, after microencapsulation by microemulsification in food emulsions model.*

*Fungal dye antioxidant activity in emulsions is correlated with its electrochemical behavior. Thus, in order to highlight the emulsions oxidation potential containing dyes the cyclic voltamograms (scan rate: 100 mVs<sup>-1</sup>) were determined. Corresponding oxidation peaks were observed more clearly, compared with the corresponding reduction, which were lower.*

*Regarding the control emulsion, which relate to the antioxidant effect of dyes present in the system, is properly noted the appearance of a little platinum electrode; the equilibrium potential is  $E_0 = 0.07$  V. From cyclic voltamograma peak of the emulsion with propylgalate, the reduction in peak intensity for platinum electrode and the appearance of an anode peak ( $\approx 500$  mV), corresponding to the propylgalate introduced in emulsion was observed.*

*Specifically in this case of cochineal dye containing emulsion is the appearance of both two anode and two cathode peaks in cyclic voltamogram, which means that in this case, there were several redox processes induced by this dye presence into emulsion.*

*On the other hand, the currents are small to very small and the emulsion shows equilibrium potential of - 65 mV. This is due to -OH and = C = groups that are colour specific, which are largely responsible for its antioxidant activity.*

*For fungal dye containing emulsion, the cyclical voltamogram presents less defined redox processes. However, small oxidation peaks can be assigned to conjugated double bonds systems presented in flavonoids which are found in fungal dye, perhaps by producing a radical intermediate during the oxidation process.*

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**References**

1. Romică Crețu, Gabriela Bahrin, Dima Stefan, Mihaela Olteanu, *Evaluation of physical and chemical characteristics of yellow colorant produced by Epicoccum nigrum MIUG 2.15 in crude extracts and emulsions*, Romanian Biotechnological Letters, 13 (2008), (5), 59-68
2. Sameer A.S. Mapari, Ulf Thrane, Anne S. Meyer, Fungal polyketide azaphilone pigments as future natural food colorants?, Trends in Biotechnology, 28 (2010), 300-307

#### P.III.4. ANALYSIS OF PUMPERNIKEL BREAD MICROBIOTA BY USING 16S RDNA FINGERPRINTING OF BACTERIAL COMMUNITIES BY PCR-DGGE

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**Keywords:** bread, bacteria identification, PCR-DGGE

*Pumpernikel is one of the few bakery products which is still manufactured in a traditional way. The fermentation of rye to sour dough is done under uncontrolled microbial conditions, which allow the development of a great variety of microorganisms. Therefore, the microbiota composition of the final product depends on several manufacturing factors, and may have a significant influence on product quality and safety. Last step of production - pasteurization process - should guarantee quality of product till the end of the expiry date.*

*Different bacterial species have differences in sequence within the variable regions of their 16S rRNA gene, which makes possible to distinguish them by several molecular, culture-independent techniques such as PCR-DGGE. The combined use of culture and culture-independent techniques are thought to give complementary results for a better description of different ecosystems, including those of traditional food fermentations.*

*In this study, analysis of the amplified variable V3 region of the 16S rDNA by PCR-DGGE was used to differentiate and identify the bacterial populations present in the final product. Total microbial DNA was used as a template in PCR amplification of the V3 region of the bacterial 16S rRNA gene by using the universal primers F357 and R518 as described elsewhere (Alegría et al., (2009). DGGE was performed using a DCode apparatus at 60°C in 8% polyacrilamide gels with a denaturing gradient of 40-60%. The PCR-DGGE technique identified 11 different bacterial species in Pumpernikel (final product); e.g.: *Lactobacillus sanfrancisiensis*, *Lactobacillus paracasei*, *Lactobacillus plantarum*, *Lactobacillus reuteri*, *Lactococcus lactis*, *Streptococcus parauberis*, *Escherichia coli*, *Enterococcus faecium*, and *Enterococcus faecalis*. Though the technique is semiquantitative, *Lb. sanfranciscensis* constitute the more prominent DGGE band, indicating it is the dominant microorganism during fermentation.*

*Counts of total aerobic mesophilic bacteria were done on Nutrient Agar Broth by Koch's plate method. The levels of viable bacteria were around 10<sup>4</sup> cfu per g of bread, whereas the levels of lactic acid bacteria were around 10<sup>3</sup> cfu per g.*

*The PCR-DGGE method seems to be an effective tool for the microbial analysis of natural fermentations. This work provides the first data on the microbial composition and evolution during manufacture and storage of the Polish traditional bread Pumpernikel.*

#### References

Alegría, A., Alvarez-Martín, P., Sacristán, N., Fernández, E., Delgado, S., and Mayo, B. 2009. Diversity and evolution of the microbial populations during manufacture and ripening of Casín, a traditional Spanish, starter-free cheese made from cow's milk. *Int. J. Food Microbiol.* 136, 44-51.

### P.III.5. INFLUENCE OF LACTOBIONIC ACID AND LACTOSE ON THE GROWTH OF CHOSEN PROBIOTIC BACTERIA

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**Keywords:** lactobionic acid, whey, Lactobacillus, Bifidobacterium

*Lactobionic acid is unabsorbable lactose derivative with prebiotic potential. Lactobionic acid can be good source for the growth of bacteria, especially probiotic bacteria.*

*Chosen strains from Lactobacillus, Lactococcus and Bifidobacterium were tested. The growth of Lactobacillus and Lactococcus strains on lactose and lactobionic acid was performed in basal MRS medium or M58 medium supplemented with lactose or lactobionic acid and inoculated with probiotic bacteria (Department of Fermentation and Biosynthesis, DSMZ). The aim of this study was to apply selected strains from Lactobacillus, Lactococcus and Bifidobacterium species in media supplemented with lactobionic acid and lactose and check the influence of lactobionic acid and lactose on the growth.*

*The following bacterial strains were used in the test: Lactobacillus acidophilus, Lactobacillus paracasei, Lactobacillus delbrueckii, Lactococcus lactis and Lactobacillus casei (isolated from fermented milk product) and Bifidobacterium.*

*Number of live bacteria was determined using the Koch's plate method on MRS at 30°C and 37°C. Cultures of Lactobacillus were carried out in the atmosphere modified by 10 % proportion of CO<sub>2</sub>. The inoculum of the examined bacteria (10<sup>4</sup> cfu/ml) at the amount of 10% (v/v) was added to the medium. The analysis were done using Biotek Fast Monitoring of the growth. The amount of acids and sugars were determined by HPLC.*

*Growth of the Lactobacillus strains was confirmed although it was lower on lactobionic acid than on lactose. During the fermentation process we analyzed the amount of lactobionic acid as carbon source. Bifidobacterium can utilize the amount of lactobionic acid in 25%. Growth of bacteria on lactobionic acid was higher than on lactose in case of strain Lb. acidophilus CH5 and Lb. paracasei. The viable cell counts of these two probiotic culture reached 10<sup>8</sup> cfu/ml during 48 h of growth in this medium. The number of L. casei isolated from fermented milk product reached 10<sup>4</sup> cfu/ml of the product after 24 h till 72 h of fermentation at 30°C. The growth of this bacteria was significantly higher than on medium with lactose. The higher level of lactic acid produced on media with lactobionic acid, confirming their metabolic activity were recognized. The level of probiotic bacteria recommended in food products by many researchers is 10<sup>6</sup> cfu/ml per gram of the product. The results showed that lactobionic acid can be good source of carbon for chosen probiotic strains.*

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### P.III.6. DETERMINATION OF LIPOXYGENASE PATHWAY PROTEIN AND TRANSGENIC CUCUMBER VOLATILE PROFILE

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**Keywords:** transgenic cucumber fruits, thaumatin II, lipoxygenase pathway, SDS-PAGE

*Aroma is one of the most important quality criteria of fruit and vegetables products. Plants have the ability to produce aroma volatile aldehydes and alcohols, which give rise to characteristic flavors and odors. Damage to plants, wounding, cutting, and so on, initiates a cascade of enzymic reactions, ending with the production of carbonyl compounds and their derivatives, which is known as the lipoxygenase pathway. Such rapid formation of flavor compounds is common in fruits and vegetables, including cucumber fruits.*

*The main constituents of cucumber aroma are six- and nine- carbon atoms compounds biosynthesized from fatty acids. Isolation and identification of volatile components from blended cucumber tissue has shown that (E, Z)-2,6-nonadienal and (E)-2-nonenal are the most important.*

*Thaumatococcus represents a unique class of sweet-tasting plant proteins. It was quite recently identified and currently 5 forms of it are distinguished i.e. I, II, III, b and c. They are especially interesting as they sweet taste for humans.*

*Four lines of genetically modified cucumbers with different levels of thaumatin II transgene expression were selected for evaluation. Plants of non-modified Borszczagowski cv. (*Cucumis sativus* L.) were used as a control (line B). The transgenic lines were obtained with vector transformation methods using a gene construct that contains cDNA of preprothaumatin II under the control of 35S promoter. These cucumbers showed different metabolic profiles depend on transgene location on the chromosomes. The position effect leads to variation in transgene expression, as its location in the genome can cause the disruption or modification of the expression of other genes. The influence of genetic transformation on the volatile profile of cucumber fruits seems to be very interesting.*

*For protein extraction from the cucumber tissue a combination of TCA/acetone and phenols method were used. The protein mass determination was performed by SDS-PAGE electrophoresis using thaumatin and lipoxygenase as standards.*

*The aim of this study was isolation and identification of proteins, especially thaumatin and enzymes of lipoxygenase pathway. Furthermore it was investigated whether the genetic modification produce some changes in cucumber volatile profile.*

### P.III.7. ISOLATION AND CHARACTERIZATION OF SOME LACTIC ACID BACTERIA ISOLATED FROM ROMANIAN FERMENTED VEGETABLES

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**Keywords:** lactic acid bacteria, fermented vegetables

*Vegetables are strongly recommended in the human diet since they are rich in antioxidants, vitamins, dietary fibres and minerals. Fresh vegetables have, however, a very short shelf-life because of their microbial load and endogenous enzyme activities. The most simple but important method of preservation, used since ancient times, is fermentation, which also maintains and/or improves the nutritional and sensory properties of vegetables. The spontaneous fermentation process is mainly carried out by lactic acid bacteria (LAB), which also enhance the vegetable digestibility and increase the vitamin levels. These beneficial microorganisms produce numerous helpful enzymes as well as antimicrobials and anticarcinogenic substances. Their main end product, lactic acid, not only keeps vegetables and fruits in a state of perfect preservation but can also promote the growth of healthy microbiota throughout the intestine.*

*In this context, the aim of our study was to isolate and identify the LAB involved in spontaneous fermentations of vegetables (cauliflower, cucumbers, green tomatoes, cabbage carrots etc). Brine and vegetable samples were collected from 17 spontaneous vegetable fermentations carried out at household level in the region of Valenii de Munte (Chiojdu) and Bucharest. They were analysed for acidification (pH measurements) and plated on VRBG agar medium (for enumeration of enterobacteriaceae) and MRS agar medium (for enumeration and isolation of LAB). Colonies were randomly picked up, purified and tested for catalase production and Gram-staining. Gram-positive, catalase-negative isolates (107) were stored at -75°C in MRS liquid medium supplemented with 25% (vol/vol) of glycerol as cryoprotectant and used in our further experiments. Cell morphology was further investigated by optical microscopy. The thermophilic or mesophilic character of the isolates was determined by incubating them at different temperatures (10°C, 37°C, 45°C), while the capsule (CPS) formation was evaluated by the Chinese ink negative staining technique.*

*The final pH of the brines of all end-samples of the different spontaneous vegetable fermentations carried out was on average pH 3.6. LAB were prevalent in all end-samples, as represented by their MRS counts [ca. 10<sup>9</sup> (cfu/ml)], whereas enterobacterial counts were low in most cases, indicating good fermentation quality. Concerning the cell morphology, most of the isolates (86) were bacilli, ten cocci and eleven cocobacilli. All isolates grew well at 37°C and 45°C (after 24 h of incubation), while 77 grew well also at 10°C. A total of 72 isolates were found to produce CPS, 16 strains showing a large capsule formation.*

### P.III.8. EVALUATION OF BIOACTIVE COMPOUNDS IN EXTRACTS OBTAINED FROM THREE ROMANIAN MARINE ALGAE SPECIES

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**Keywords:** algae polyphenols, antioxidant activity, marine algae, DPPH assay, solvent extraction, volatile compounds, SPME, TPC

*Algae are used in many purposes: in food industry, animal feeding, medicine, cosmetic industry and for soil enrichment. There are also many secondary ways for using algae: producing alginates and derivatives of algae used in industry. Nowadays researchers use to analyse algae for medical purposes, because they have a strong potential against many diseases, in alimentation because they act like a protective and functional additives.*

*In this present work it was studied the antioxidant activity and the total phenolics content of five different extracts of the three species of algae harvested from Romanian area of Black Sea shore (Ceramium rubrum, Cladophora vagabunda and Enteromorpha intestinalis) and it was performed a SPME-MS analysis for a screening of volatile compounds. From all five kind of extractions the aim was to establish what solvent extract better the phenolic compounds. After extractions it was studied the total phenolic content by Folin Ciocalteu method and antioxidant activity by DPPH assay were determined. The best results were obtained by extraction with water but also with others solvents it was obtained good results. At the final of this study it was demonstrated that the wild marine algae from Black Sea have phenolic compounds with an antioxidative activity and also have some important volatile compounds that can be used in industry.*

### P.III.9. EVALUATION OF INULIN GELLING PROPERTIES IN NEW TYPES JELLIES

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**Keywords:** Inulin, agar-agar, jellies, gels

*Inulin-type fructans have become a topic of much interest for both the food industry and for researchers (Roberfroid, 2005). At high concentrations in water above 25% for standard chicory inulin and above 15% for long – chain material, inulin has gelling properties (Wouters , 2008). Inulin gel formation is different from that obtained with hydrocolloids. Inulin forms participle gels whereas the increase of viscosity most hydrocolloids are obtained by bonds between chains. Therefore the aim of the research work was to examine properties of jellies'gels prepared by replaced part of agar-agar by inulin syrup.*

*The research was carried out at Latvia University of Agriculture, Faculty of Food Technology. In gel production the Jerusalem Artichoke Juice Concentrate produced Topina, Diät Rohstoff Gmb, Germany inulin syrup was used to replace the agar-agar.*

*To prepare control sample the following recipe was used: agar- agar (2 g), glucose syrup (62 g) – sugar (104 g), water (100 g). In the research the replacement of agar-agar by inulin syrup was in the following range: 1.0; 1.25; 1.5; 1.75, 2.0 g. Agar-agar water solutions was boiled for 5 minutes at the temperature of 105 oC then the sucrose, citric acid and glucose syrup were added to the boiled solution and cool down to 65°C. Then inulin syrup was added and was hot filled in polystyrene containers (150 ml), which sealed with their covers and cooled, down to 18°C.*

*The analyses of gel strength (hardness) was characterised by texture profile analysis. Texture was determined using a Texture Analyser (Model TA.XT Plus; Stable Micro Systems). Wire cutter (A/BC) was used to slice the jelly samples. Measurements were carried out on room tempered samples on the next day after samples of gel were prepared.*

*In gel sample production, inulin concentration influences the strength of the gels. The decreases in hardness of the gels can be explained by the properties of inulin and agar-agar. Agar-agar and inulin as polysaccharides have ability to form a gel and its strength depends on the properties and concentration of polysaccharides. The strength of the gels becomes weaker when inulin syrup is used as agar-agar substitute.*

**P.III.10. LIPOLYTIC ACTIVITY OF LIPASES FROM DIFFERENT STRAINS OF YARROWIA LIPOLYTICA IN HYDROLYSED VEGETABLE FATS AT LOW TEMPERATURE AND WATER ACTIVITY**

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**Keywords:** lipolytic activity, lipases, *Yarrowia lipolytica*, palm kernel fat, shea fat

*Yarrowia lipolytica* it's very important yeast because many strains from this yeast are able to produce the extracellular lipases. These lipases show great interests in different applications of food and chemistry industry at different conditions. Cold active lipases are one of the important and widely used enzymes whose spectrum of applications has widened in many industries such as in detergent formulations, food industry, leather processing, environmental bioremediations, and fine chemical synthesis as well as in pharmaceutical industries. Cold active lipases are largely distributed in microorganisms surviving at low temperatures near 4°C.

Although a number of lipase producing sources are available, only a few bacteria and yeast were exploited for the production of cold active lipases. Attempts have been made from time to time to isolate cold active lipases from these microorganisms having high activity at low temperatures. In this study, it was evaluated the lipolytic activity of lipases from different strains of *Yarrowia lipolytica* in the critical conditions. The aim of this research was to evaluate the ability of different *Yarrowia lipolytica* strains, having different origin, to grow and to produce the lipases at low temperature (4°C). Lipases from *Yarrowia lipolytica* coded as PO1, PO11, RO3, RO15, Y10, Y22, LP PAST to 1a, LC TL TO 4b, LP TQ to 1a, LN2, 1 II YL 4, 16B and 27D, was used for enzymatic hydrolysis of five crude vegetable fats like: white palm kernel fat and shea fat. The conditions of hydrolysis was a low temperature (4°C) and low values water activity ( $a_w$  0.98 and 0.96). The lipolytic activity of the lipases was evaluated by measuring the hydrolysis zone diameters at specified time. At 4°C and  $a_w$  0.98, the *Yarrowia lipolytica* strains such as: RO3, 1 II YL4 and LC TL to 4b had produced the cold active lipase that has the higher lipolytic activity on the palm kernel fat. In the same conditions, lipases from yeast strains like: RO3, RO15 and 1 II YL4 has a strong lipolytic activity on the shea fat. At  $a_w$  0.96, the lipase produced by the same strains of *Yarrowia lipolytica* shows a higher specificity of palm kernel fat and shea fat.

### P.III.11. FODDER PROBIOTIC EFFECT ON QUALITY INDICATORS OF FISH MEAT – A LITERATURE REVIEW

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**Keywords:** fish quality, probiotics, lactic acid bacteria, aquaculture

*Nowadays the aquaculture outbreaks of infectious diseases caused by viruses, bacteria, and parasites are considered to be a major economic problem. A significant limitation to the industry is loss of stock through bacterial disease. Traditional methods to combat disease with antibiotics have been questioned and alternatives have been sought. Antibiotic use in aquaculture may be detrimental to the environment and human health, and involves the development and transfer of resistance to other aquatic bacteria fish pathogens human pathogens and the accumulation of residual antibiotics in aquaculture products. Alternative disease control strategies involve improved husbandry and water quality, better nutrition, and lower stocking densities.*

*Recently, attention has focused on the use of probiotics, making a parallel with the methods developed for human medicine and agriculture for which the mechanisms by which probiotics operate have been well defined. Fish should be fed with a balanced diet as nutritional deficiency can have an adverse impact on disease resistance.*

*The use of beneficial microorganisms like probiotics bacteria is widely expected to become an alternative method for the prevention and control of fish diseases. In the last decade, probiotics, especially lactic acid bacteria (LAB), as a dietary supplement, have been widely employed to protect fish from various infectious diseases. The fish fed with probiotic enriched fodder showed significant improvement in length than the fish fed with probiotic free control fodder.*

*The present study reveals that the probiotic plays a vital role in fish growth and digestion, survival and disease resistance of the animal by maintaining also good water quality parameters throughout the culture period.*

### P.III.12. SENSORIAL CHARACTERISTICS CHANGES OF LOW – SODIUM FRANKFURTERS USING DIFFERENT PACKAGING SYSTEMS

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**Keywords:** low-sodium Frankfurters, sensorial characteristics, sensory profile, salt intake, consumer preferences

*Nowadays consumer awareness about sodium intake levels is increasing and a growing number of consumers are reading the manufactured food products label when making purchasing decisions. Therefore, food industry will need to reduce levels of sodium without losing their custom.*

*It has been demonstrated that a reduction of sodium in food affects many important functions like taste, texture, shelf life and food safety. However, there are specific technical challenges in reducing salt, since salt performs functions other than flavoring, such as improving the binding of proteins in meat products.*

*Preferences for salty taste depend on the individual's habitual salt intake and can change across the age span. The preference is not hereditary and is strongly influenced by the environment, social medium and by the salt concentration in the foods we consume. Reducing levels of salt in food by a significant amount at one time may result in an alteration of the flavor profile that could be noticeable to consumers. A very good strategy is based on salt intake reductions made in small, gradual steps and a number of small planned adjustments over a longer time frame, more than 3 to 4 weeks, will result in no change in perceived taste.*

*The aim of this study was to investigate the effects of different packaging systems on sensorial characteristic changes of Frankfurters with three different percentage of sodium chloride substitution. Therefore sensory analysis has been done (was carried out) using a 5-point hedonic scale scoring 1 (lowest) to 5 (highest). Sensory evaluation was performed by 10 trained panelists. Results obtained have shown there is the possibility of replacement sodium chloride by potassium chloride in meat products, but limited by its bitter taste.*

### P.III.13. GENETICALLY MODIFIED FOOD

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**Keywords:** genetically modified, food, safety

*The variety of foods consumed by humans has changed greatly over the centuries, altering the balance of nutrients in the diet. Nutritional changes may have a more profound impact on the health of the population. Traditional plant breeding techniques of intra and inter-species crossing and mutation are designed to create genetic variation upon which selection of the most desired genotype is the expected outcome. All plant breeding procedures can produce unexpected effects. Generally consumers consider that traditional foods (that have often been eaten for thousands of years) are safe. When new foods are developed by natural methods, some of the existing characteristics of foods can be altered, either in a positive or a negative way. The purpose of this research was to establish the opinion of future food engineers (final year students) concerning the genetically modified organisms, so I asked them to complete a questionnaire of seven questions. The research conclusion was that more than 75% of them don't consider that the genetically modified organisms use is safe for consumption. However most of them don't really know what genetically modified organisms are so their opinion is not endorsed but is revealing for the lack of public information in this field.*

### P.III.14. PHYSICAL-CHEMICAL PROPERTIES OF MONASCUS METABOLITES

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**Keywords:** biopigment, food safety, mycotoxin content

*Monascus metabolites are widely using as food colorant in Asia, Europe and United States. Bioprocesses, based on solid state or submerged biosynthesis [1-3] are recommended as natural food dyes, but the safety product is insufficiently solved, due to content of citrinin. Citrinin is a mycotoxin especially toxic to liver and kidney tissue and is suspected of being a renal carcinogen leading to renal tumors. Used two strains we obtained the biopigments which are characterized by UV-VIS, infrared spectra, mass spectrometry and HPLC, in order to establish the major compounds in Monascus metabolite and the mycotoxin concentration in them. The main conclusion of our study is the following: metabolites obtaining in solid state or in submerged biosynthesis were a content of mycotoxin less than 25 ppm and is suitable to use as raw material in food industry.*

#### References

1. You-Zhi Wang Xiu-Lian Ju and Yu-Guang Zhou (2005), The variability of citrinin production in *Monascus* type cultures *Food Microbiology*, (22)145-148.
2. Betina, V. (Ed.) (1984), *Mycotoxins - production, isolation, separation and purification*. Amsterdam: Elsevier. pp. 217-236.
3. Blanc, P. J.; Loret, M. O. and Goma, G. (1995), Production of citrinin by various species of *Monascus* *Biotech. Lett.*, 17 : (3), 291-294.

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**P.III.15. HEAT-INDUCED STRUCTURAL CHANGES OF BOVINE  
A-LACTALBUMIN AS MEASURED BY FLUORESCENCE  
SPECTROSCOPY**

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**Keywords:** alpha-lactalbumin, heat treatments, structural changes, fluorescence spectroscopy.

*$\alpha$ -Lactalbumin ( $\alpha$ -La) is a monomeric globular protein with a molecular mass of 14,200 and is one of the best understood proteins in protein folding studies.  $\alpha$ -La has two domains, an  $\alpha$ -domain comprising the residues 1-39 and 81-123 and a  $\beta$ -domain comprising the residues 40-80. The structure is stabilized by four disulfide bridges (6-120, 61-77, 73-91, and 28-111). It has calcium ( $\text{Ca}^{2+}$ )-binding site, for disulfide bond formation and for folding in the reduced denatured protein, calcium ion plays a major role. The two domains are held together by the cystine bridge between residues 73 and 91, forming a loop.*

*$\alpha$ -La serves as a useful model for the protein folding problem since it has several partially folded intermediate states and is known to be present in molten globule form under various conditions.*

*In this study, the pH and heat-induced conformational changes were analyzed using the fluorescence techniques. The experimental results demonstrate an all-or-none transition at 7.0. The heat treatment caused the decrease of intrinsic fluorescence and, respectively, the increase in ANS fluorescence intensity.*

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**P.III.16. THE EFFECT OF PREPARATES BASED ON SODIUM  
CARBONATE AND CITRIC ACID ON THE PARAMETER  
FALLING NUMBER IN HYPERDIASTAZIC FLOURS**

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**Keywords:** wheat flour, sodium carbonate, citric acid, falling number

*The objective was to assess the influence of compounds of sodium carbonate and citric acid on the amylase activity of hyperdiastazic flour. Four samples of wheat, with Falling Number values between 88 sec and 153 sec, were ground on pilot mill. Flour was treated with varying amounts of sodium carbonate/citric acid prepares and combinations. Results showed that the sodium carbonate prepare provides a significant improvement of Falling Number values at doses above 50 g per 100 kg, and citric acid increases Faling Number values of flour at doses greater than 200 g/100 kg. Combinations of the two, generally cancel this effect. Consequently, the use of sodium carbonate to improve Falling Number parameter values is limited because it is necessary to maintain acid pH at which bakery processes occur.*

### P.III.17. INFLUENCE OF THE CULTURE MEDIUM ON TORULARHODIN PIGMENT BIOSYNTHESIS

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**Keywords:** carotenoids, torularhodin, *Rhodotorula rubra*,  $\beta$ -carotene

*The aim of the present work is to study the formation of the intracellular carotenoid pigment - torularhodin depending on culture medium composition and other cultivation factors.*

*Culture media have a considerable influence on the yeast biomass accumulation and carotenoid pigments biosynthesis, particularly torularhodin, component with a high-level antioxidant potential.*

*For all carbon sources tested the *Rhodotorula rubra* ICCF 209 strain presented a good growth as can be seen from the  $OD_{600}$  nm values. The yeast strain growth is stimulated by glucose, fructose, sucrose and maltose, but inhibited by lactose.*

*The studied characteristics – yeast growth, the total carotenoids formation, and the torularhodin formation recommend the initial pH range of 6-7 as being favorable, the torularhodin ratio from the total carotenoids content being greater for the pH of 7.*

*At the same time an inoculum concentration of 1-2 % is favorable for both yeast growth and carotenoids formation.*

*When  $NH_4NO_3$  is replaced in the control medium with other mineral nitrogen sources ( $NH_4H_2PO_4$ ,  $(NH_4)_2SO_4$ , or  $NH_4Cl$ ) both the growth and the carotenoids formation are higher when acid ammonium phosphate was used; in this case a fraction of about 95 % torularhodin is formed in the pigments mixture.*

*The medium composition variant, where there were both - the replacement of  $NH_4NO_3$  as anorganic nitrogen source with the same concentration of -  $NH_4H_2PO_4$  and the supplementation with alanine (0.1%), threonine (0.2%), and oleic acid (0.1%) – represents the optimum composition studied so far for torularhodin formation.*

*Though the growth is not influenced by the temperature change from 28 °C to 30 °C, the carotenoids formation is influenced for all the medium variants, this indicating a general metabolic trend.*

*The pigments extraction was achieved in n-hexane for total carotenoid pigments and in basic methanol for torularhodin, the unique acid component.*

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### P.III.18. THE MATHEMATICAL MODELING IN OPTIMIZATION OF REFRIGERATION PROCESS

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**Keywords:** objective function, linear model, polynomial model, stochastic model

*In recent decades there is a continuing concern in the food industry for optimization of refrigeration process. Improvement of conservation technologies of perishable food products has as primary objective the combination of capabilities extending the validity of the product with keep physical, chemical, nutritional and sensory properties. The mathematical modeling is a fundamental solution to which appeals most often to optimize a random process, including the refrigeration.*

*In the first part of this paper we present the main theoretical elements that characterize the optimization process using certain mathematical models. Then, we apply the theoretical concepts previously presented to optimize two refrigeration processes.*

**P.III.19. STUDY METHODS TO EXTRACTION OF PHENOLIC  
COMPOUNDS IN THE PROCESS OF OBTAINING ROSE WINES  
WITH STABLE CHROMATIC CHARACTERISTICS**

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**Keywords:** rose wines, polyphenol extraction, criomaceration

*Lately at European level is distinguished in our country and a growing demand for rosé wines, due to freshness, fruitiness and olfactory characteristics of these wines. However, to obtain quality rosé wines technologist faces numerous problems, mostly related to extraction of phenolic compounds, so the chromatic characteristics of wine taste and balance.*

*Several methods have been studied for extraction of polyphenols from grape varieties typically used to obtain dark red wines: Cabernet Sauvignon, Feteasca neagra and Pinot noir: extraction of phenolic compounds by maceration of grape pomace short duration (6 h, 12 h), at a temperature of 18 ° C– V<sub>1</sub>; extraction by maceration-fermentation at 20-22 ° C temperature - V<sub>2</sub>; criomaceration pulp at a temperature of 5 ° C, 5-day.*

*The results of physico-chemical and organoleptic results that the method of extraction of polyphenols shows a great importance for color and organoleptic characteristics of wine, each variety of black grapes with a potential technology of phenolic compounds, behaving differently depending on the version extraction used. Of the three grape varieties, Cabernet Sauvignon, followed by Feteasca neagra variety shows a large pool of phenolic compounds compared with Pinot noir.*

*Thus, for the first two varieties of the best ways of extracting them is short maceration and criomaceration; by fermentation-maceration is high concentration of phenolic compounds. The wines are intensely colored and lacking the finesse of rosé wines.*

*For Pinot noir, a variety of phenolic potential lower than the other two varieties is the best option fermentation-maceration, the criomaceration is the method by which to extract the small amount of phenols.*

### P.III.20. STUDY OF FACTORS EVENT INFLUENCING THE QUALITY OF RED WINES

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**Keywords:** ecoclimatic factors, grape varieties, red wine

*The quality wine is a result of the interdependence of many factors; a very important role is attributed to the ecosystem of the vineyard and the climatic conditions of the harvest.*

*Mode of recovery of environmental conditions (soil - local climate and microclimate - climatic factors of year of harvest) is done by every variety of vines in the metabolism of specific. It was studied the influence of environmental conditions on the technological potential and quality of wines from Cabernet Sauvignon, Merlot and Feteasca neagra in 2 wine centers: Samburesti and Urlati, according to the years 2007 to 2010.*

*The results of experiments showed that both vineyard ecosystem and climate of the harvest has a major influence on the technological potential of the variety that, the quality of wine results. Significant differences were recorded on color characteristics of grapes and wines of three varieties analyzed.*

*In terms of year of harvest, 2007 saw the most favorable climatic conditions, this positive influence both production and quality of wines in both viticulture centers analyzed. Feteasca neagra and Merlot varieties fared best in the center Urlati and wine center Samburesti offered the best conditions of grape variety Cabernet Sauvignon.*

#### P.IV.1. HARVESTING OF SELENIUM BY-PRODUCTS FROM WINEMAKING PROCESS THROUGH BIOCONVERSION

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**Keywords:** selenium, yeast, ICP-MS

*The aim of this experiment was to analyze the content of selenium in residual biomass, powder from grapes skin and seeds as an alternative to the known process for obtaining selenium enriched yeast. Samples of grapes were harvested from the Romanian region.*

*The effect sodium selenite on yeast cells during cultivation was studied, in order to obtain a selenium enriched residual biomass and powder from grapes skin and seeds enriched with selenium with a high rate of bioconversion, using *Saccharomyces cerevisiae* strains.*

*We used the selected strains, adapted to high concentrations of selenium. We analyzed the contents of selenium from the supernatant (wine samples).*

*The process is efficient from the biotechnological point of view and economic at the same time because the by-products proved to incorporate high selenium contents.*

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**P.IV.2. TOTAL POLYPHENOLS EXTRACTED FROM THE SKIN  
OF FUJI APPLE AND INCORPORATED BY LIPOSOME IN  
GALENIC BASES: AN ALTERNATIVE TO USE BY-PRODUCTS OF  
FOOD INDUSTRY**

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**Keywords:** apple skin, total polyphenols, food industry by-product.

*Among of vary properties with therapeutic finality, the apple, whose the name is Malus domestica Borkhausen stands out by it is antioxidants activities. It is attributed to the flavonoids in the diet obtained, that act as free radical interceptors preventing oxidation of chemical substances and their harmful effects on cells. Therefore, offering anti-aging properties and certain photo-protection degree. The usage of controlled releasing system of drugs, such as, liposome in order to carry and control the releasing of hydrophilic and hydrophobic active ingredients at specific action sites. Above mentioned and because Santa Catarina State is responsible for 59% of Brazilian apples production is that study in application of biotechnological process was done, or else, looking for an alternative to add value to the skin, that is a by-product from apple processing. The work involved the following steps: extraction of total polyphenols from skin of Fuji apple with or without preservative addition (butyl-hidroxitoluen – BHT 0,02% + Sodium bisulfite 0,1%) using ethylic alcohol as solvent; quantification of total polyphenols by Folin-Ciocalteu method; development of liposome with the extract of apple skin by reverse phase evaporation at 40oC. Three galenic bases were tested (Polavax®, Lanete cream and Gel-cream) with the incorporation of liposome with extract of apple skin. Three series of tests were done in parallel to the liposome incorporated: (A) extract without preservative (B) extract with preservative and (C) without extract, for each of the bases studied, with subsequent application primary stability test. The samples that were extracted with preservatives showed higher concentration of total polyphenols suggesting the presence of the same delay the oxidation process, however, it is suggested HPLC analysis to rule out the possibility of interference of preservatives in the quantification method used in this experiment. It was obtained success in the preparation and incorporation of liposome of polyphenols extracted from the skin of the Fuji apple on the galenic bases of Polavax (A) and (B) samples, which showed the best performance. By-product “apple skin” showed to be a good source of polyphenols, suggesting its use as raw material for the pharmaceutical industry. However, tests of chemical contaminants must be conducted in the future studies.*

### P.IV.3. THE ADAPTATION OF SOME GRAM-NEGATIVE BACTERIA TO ACIDIC ENVIRONMENTAL CONDITIONS

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**Keywords:** acidophilic microorganisms, resistance, heavy metals

*Bacteria that live in acidic environments are very important for industrial biotechnology. The physiological, biochemical and ecological studies, including the isolation of new acidophilic bacteria, will allow a better understanding of their signification for biodiversity and bioremediation. The aim of the present paper was to study the biosorption of heavy metallic ions by some strains of acidophilic bacteria, as well as their effect on bacterial growth. The acidophilic bacteria were isolated from mine waters and sediments collected from Rosia Poieni and Ilba mining sites, respectively. Among acidophilic heterotrophic bacteria were identified bacteria belonging to Acidiphilium genus. The bacteria identification was done based on their morpho-physiological characteristics (non-spore forming Gram-negative bacilli, strict aerobe, mesophilic, chemoorganotrophic, extremely acidophilic pH=3). The isolated bacteria were firstly selected based on MICs (minimum inhibitory concentrations) to several heavy metals ( $\text{Cu}^{2+}$ ,  $\text{Zn}^{2+}$  and  $\text{Ni}^{2+}$ ), and further characterized by the rate of biosorption of these ions in different culture conditions (temperature, pH and contact time between cells and metallic ions). The comparative study of the growth and the acid-stable glucoamylases activity of acidophilic bacteria at different pH and temperatures conditions revealed the highest activity between 24-28°C. The results show that a continuous exposure to higher temperatures (37°-42°C) and pH (4.0-5.0) values may induce a certain degree of the physiological adaptation of acidophilic bacteria to the termic and acidic conditions, confirming of them characteristics. Also, high percentages biosorption of several metal ions were obtained using populations of acidophilic bacteria compared with purified strains, which confirms the adaptation of populations to higher concentrations of  $\text{Cu}^{2+}$ ,  $\text{Zn}^{2+}$  and  $\text{Ni}^{2+}$ . Purified strains were less resistant to the concentrations of metal ions used, this fact being evidenced through a weak metabolic activity appreciated through the lower oxidation/reduction level in the medium of heavy metals. Further increase in the temperature and pH of the metal ions solution negatively affect the experiments of biosorption with acidophilic bacterial populations. The results argue that the acidophilic bacteria have potential for bioremediation which could be further investigated in a pilot study.*

#### P.IV.4. IN VITRO CULTIVATION OF SOME ENDEMIC AND RARE *ALCHEMILLA* SPECIES IN BULGARIA

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**Keywords:** medicinal plants, *in vitro* germination, gibberellic acid, propagation coefficient

*Alchemilla achtarowii* Pawł., *Alchemilla jumrukczalica* Pawł and *A. bundericensis* Pawł. (Rosaceae) are medicinal plants, Bulgarian high-mountain endemics, the former two occurring in the Central Balkan range and the latter one – in Pirin mountain. *A. mollis* (Buser) Rothm. is a medicinal plant, critically endangered in Bulgaria. The concentration of flavonoids and tannins in *A. mollis* and *A. jumrukczalica* is one of the highest among members of the genus. Due to these substances, *Alchemilla* species have a broad application in hematology and gynecology, for the treatment of myoma and chronic inflammation and kidney disease, for post-operation treatment as well as in veterinary medicine for the treatment of foot-and-mouth disease. Therefore the plants are being collected from their wild habitats by uprooting, which threatens their populations. All four species are included in the Red data book of Bulgaria, the Red list of Bulgarian vascular plants, the Biodiversity act and the Medicinal plants act of Bulgaria. Most of their habitats are included in Natura 2000 sites, national and nature parks and reserves. Along with their limited distribution in Bulgaria, the ability of their populations for natural reproduction is limited by low pollen fertility (less than 10% in *A. achtarowii*), low seed germination, slow growth and negative human impact. The complex studies on these species are a way towards their sustainable use and conservation by providing an alternative source of plant material to replace the collection from wild populations. The *ex situ* conservation measures taken by us include the maintenance of a living collection at the Institute of Biodiversity and Ecosystem Research (BAS), as well as *in vitro* cultivation in order to enhance propagation. In the present work, the germination of seeds of the species was tested *in vitro* and was stimulated by treatment with gibberellic acid (GA<sub>3</sub>). The germination without using the growth regulator was lower than 50%, *A. mollis* having the highest and *A. bundericensis* – the lowest rate. After stimulation with GA<sub>3</sub>, this ratio was preserved, but the overall germination increased. *In vitro* cultures were obtained from the successfully germinated seeds. The plants were propagated by subcultivation on media containing naphthaleneacetic acid (NAA) and benzylaminopurine (BAP). The species differed in their propagation coefficients, *A. mollis* having the highest one. The grown plants were subsequently adapted to ambient conditions with a high rate of survival.

**P.IV.5. IN VITRO CULTURES OF BALKAN AND BULGARIAN  
ENDEMIC *CENTAUREA* SPECIES**

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**Keywords:** knapweed, ex situ conservation, plant growth regulators

*The genus *Centaurea* s. l. is represented in the Bulgarian flora by more than 70 species and is among the plant groups whose center of speciation includes the territory of Bulgaria. It is also the genus richest in endemics in the Bulgarian flora (ca. 30%). In the new edition of the Red Data Book of Bulgaria (plants), 16 species are included (ca. 23%). Some of the *Centaurea* species are rare and are represented by one or few populations. This suggests measures for their conservation to be taken, both in situ and ex situ, especially considering the reproductive problems those species encounter. Their seeds have a generally low germination rate and are very often damaged by insects before being dispersed. In this study, in vitro culture of two endemic species was initiated as a method for ex situ conservation – *Centaurea davidovii* (a Bulgarian endemic) and *Centaurea caliacrae* (a Balkan endemic). Seeds were used as the initial plant material. They were sterilized successfully and germinated on MS nutrient medium. Explants from the seedlings and whole plantlets were cultivated in MS-based nutrient media with 11 different combinations of plant growth regulators (auxins and cytokinins), aiming micropropagation. Most of the explants grew callus and some produced roots and adventitious shoots. The majority of plantlets cultivated on phytohormone-free MS medium rooted and a successful ex vitro adaptation took place (84% surviving plants).*

#### P.IV.6. ASSESSMENT OF THE POLYPHENOLS CONTENT IN SORGHUM ROOTS

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**Keywords:** polyphenols, antioxidant, sorghum, roots

*Widely distributed polyphenols in plants are not directly involved in any metabolic process and are therefore considered secondary metabolites. Some polyphenolic compounds have a role as defense chemicals, protecting the plant from predatory attacks of herbivores, pathogenic fungi and parasitic weeds. These chemical compounds have an important antioxidant power, therefore they could be helpful in scavenging free radicals, major agents in degenerative disorders development (Hagerman et al. 1998). In this way polyphenols are involved in protection against many diseases: cancer, cardiovascular diseases, osteoporosis.*

*Sorghum is different comparing with other cultivated cereals due to its high capacity of polyphenols synthesis (Butler, 1990). Sorghum is one of the most drought tolerant cereal crops currently cultivated and are especially important in arid regions, where the grain is staple or one of the staples for poor and rural people. Moreover, sorghum is the fifth most important cereal crop in the world, being cultivated in more than 100 countries.*

*In many parts of the world the stalk and the seeds of some species of sorghum has traditionally been used in food products, for production of alcohol beverages, as well as biofuels. Also, the seeds, stalk, and leaves of sorghum plants are used for feeding livestock.*

*Researchers measured polyphenolic compounds and found that the sorghum bran (black varieties) have significant levels of antioxidants. In order to find a possibility of valorification for the roots of sorghum, the aim of this paper was to assess the polyphenols content in these parts of sorghum. Therefore roots of five varieties of sorghum were analysed from this point of view. The total phenolic content was measured by using the Folin-Ciocalteu assay, the results being reported in gallic acid equivalents (GAE).*

*The determinations were made on average samples of roots and also on three different zones of the roots. The obtained results indicated significant difference between sorghum varieties concerning the polyphenols content in roots. Also, the determinations showed that the polyphenols are distributed in different ways in the analysed parts of the roots: the polyphenols content registered in the inferior zone of roots was with 40% higher comparing with the one measured in the other zones of the roots in some variety of sorghum.*

**P.IV.7. TEM AND EPIFLUORESCENCE MICROSCOPY  
INVESTIGATIONS OF ACTIVE/GROWING BACTERIA IN  
MARINE MICROCOSMS**

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**Keywords:** microcosms, gasoline, TEM, PHB, Nile blue

*In microcosms supplemented with gasoline and gasoline-enriched marine populations has developed a microbiota able to metabolize nutrients and store carbon and energy in the form of poly- $\beta$ -hydroxybutyrate granules. In nalidixic acid and yeast extract medium the highest level of viable cells was observed in microcosms supplemented with gasoline (1%) and gasoline-enriched marine populations (M4). Measurements were performed using TEM analysis and automatic measurement software digital imaging, such as ImageJ to measure cell length and CellC. In microcosm 4 we detected cells with polyhydroxyalkanoic acid after stained with Nile blue, implying that under limited nitrogen and in the presence of source carbon, some bacteria can accumulate PHB. In epifluorescence microscopy PHB granules exhibited a orange fluorescence after staining with Nile blue by blue filter. By TEM technique we followed cell size distribution and morphology of the samples at the beginning and end of incubation natural samples. Our results on the development cell dimensions showed a temporal variation in individual size of bacterial populations in the experimental microcosms.*

#### P.IV.8. THERAPEUTIC EFFECT OF MONASCUS METABOLITES

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**Keywords:** Monascus metabolite, therapeutic effect

Many reports indicate the therapeutic effects for red yeast rice [1-3]. From this point of view, experiments performed on cell line type Hep2 and WiDr indicated an inhibitory effect on cancer cells. Another study performed on murin cell type RAW 264.7 stimulated with LPS reveal the inhibition of nitrogen oxide production in comparison with quercetin used as witness. These properties is due to presence of some compounds like monakarin A-F, monacolin K, dimerumic acid, monascopyridine C-D, xanthomonasin A-B, monascumic acid, which exists in metabolites produced of *Monascus* and the presence of ascorbic acid and polifenols. Our study performed with alcoholic red yeast rice extracts in the presence of 1% of collagen, reveals a powerful antioxidant effect, in which the quenching ratio is 95% in comparison with luminol, used as witness. Studies performed in vivo, regarding cicatrisation effect on mouse with the same sample (alcoholic extract of red yeast rice and 1 % collagen) indicate a potential cicatrisation effect, probably due to presence of glucosamine compound which acts as cicatrisation factor. Further study are needed to determine the therapeutic effect of other active component from red yeast rice, including sterols, isoflavones and tannins.

#### References

1. Akihisa, T., Tokuda, H. Et all., (2005), Azaphilones furanoisophthalides, and aminoacids from the extracts of *Monascus pilosus*-fermented rice (red mould rice) and ther chemopreventive effects. *J.Agric. Food Chem.*, 53, (3) 562-565.
2. Hossain, C.F., Okuyama, E., Yamazaki M., (1996). A new series of coumarin derivatives having monoamine oxidase inhibitory activity from *Monascus anka*. *Chem. Pharm. Bull.*, 44 (8), 1535-1539.
3. Taira, J., Miyagi, C., Aniya, Y., (2002). Dimerumic acid as an antioxidant of the mold, *Monascus anka*: the inhibition mechanism against lipid peroxidation and heme protein-mediated oxidation. *Biochem. Pharmacol.*, 63 (5), 1019-1026.

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**P.IV.9. ISOLATION OF CYNAOBACTERIA AND  
QUANTIFICATION OF THEIR BIOTECHNOLOGICAL  
POTENTIAL WITH RESPECT TO REDOX PROPERTIES**

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**Keywords:** cyanobacteria, glycocalys, poly hydroxibutirate, electron donating capacity

*This paper describes the isolation of oxigenic and anoxigenic cyanobacteria either in pure culture or in mixed population from samples collected from Obantul Mare (Mangalia), and quantitative results concerning their biotechnological potential. This potential is focused in this contribution on the synthesis of extracellular polymers-glycocalix, and intracellular one - poly hydroxibutirate, as well as on the ability of intact cyanobacteria to reduce extracellular added redox carriers, a prerequisite to use them as bioanodes in photo-bioelectrochemical fuel cells for the conversion of solar energy to chemical energy. There are presented results concerning the quantification of the ability of different cyanobacterial isolates to produce glycocalix and poly hydroxibutirate, with special emphasis on the effect of light/dark regimes and nitrogen availability. Special attention is devoted to the use of either i) impermeant; ii) permeant or iii) cocktails of impermeant and permeant (artificial ) electron acceptors on the rate by which they are reduced in dark or in light by intact cyanobacteria pure cultures or (selected) populations of cyanobacteria, and on their viability. The results are discussed with respect to indoor or outdoor biotechnological application. We also used in our studies digital image analysis for all cyanobacterial microphotographs taken with a 10 Megapixel Nikon Coolpix Digital Camera to distinguish some morphological and functional aspects of unicellular and filamentous cyanobacterial cells.*

## P.IV.10. INVESTIGATION OF ORGANIC SOLVENT RESISTANCE MECHANISMS IN MARINE BACTERIA

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**Keywords:** organic solvents, bacteria, adaptation mechanisms.

Marine environments have been contaminated for decades with petroleum and petroleum products, most of which contain several organic solvents. Some indigenous bacteria are able to perform *in situ* biodegradation after petroleum and petroleum products spills in marine environments. However, few organic solvent-tolerant marine bacteria have been reported in contaminated areas. Two bacterial strains, *Pseudomonas aeruginosa* Ct<sub>6</sub> and *Pseudomonas aeruginosa* Ct<sub>7</sub> tolerant to different organic solvents were isolated from Constanta harbour. Solvent-tolerant marine bacteria were subsequently evaluated for their genetic fingerprinting. The two isolated strains of *Pseudomonas aeruginosa* were separated into two distinguishable genotypic groups by rep-PCR (repetitive extragenic palindromic sequence). Alkanes (i.e., n-hexane, n-decane, n-pentadecane) and cycloalkanes (i.e., cyclohexane) with log  $P_{OW}$  (logarithm of partition coefficient in n-octanol and water) between 3.35 and 8.62, were less toxic for isolated marine bacteria, compared with aromatics (i.e., benzene, toluene, styrene, xylene isomers, ethylbenzene) with log  $P_{OW}$  between 2.14 and 3.17. The toxic effects of 1% (v/v) organic solvents (i.e., cyclohexane, n-hexane, n-decane, toluene, m-xylene, ethylbenzene) on marine bacteria, and the adaptation mechanisms behind its resistance, have been also investigated in this study. The adaptation mechanisms, underlying solvent tolerance in isolated marine bacteria showed a complex response (e.g., modification of cell viability, changes in the membrane's lipid and protein content) of cells 60 min after solvent shock. Exposure of marine bacteria to salt stress decreases the organic solvents tolerance of these bacteria. The high organic solvent resistance of isolated marine bacteria could be due to the presence of some catabolic (*alkB*, *alkB/alkB1*, *todC1*, *xylM*, *C23DO*) and transporter (*HAE1*, *acrAB*) genes. The catabolic genes detected in isolated bacteria highlight the potential use of these marine bacteria for the clean-up of environments contaminated with toxic organic solvents.

**P.V.1. THE EFFECTS OF THE COMPONENTS SPECIFIC  
MIGRATION FOR THE FOOD STUFF CONSERVATION IN  
METALLIC CANS**

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**Keywords:** metallic cans, tin layer, white lacquer

*Being known the effects of the components migration from the package in the food product it is necessary to be determined the degree of stability of the protection lacquers that are found in the structure of food metallic packagings.*

*The goals of the paper were:*

- the detection and quantification of certain migrants with toxic potential from certain inner side protection lacquers of the food metallic cans;*
- the analysis of the temporal stability of the lacquer layer in the case of the metallic cans for certain food products.*

*The approaching methods comprised not only the analysis of the package but also that of the product preserved. The specific components migration (bisphenol A) in food simulants was analyzed in two ways: the UV-VIS method and the GC-MS method and the analysis of the package heavy metal migration as well as the migration of the heavy metals from the product by the atomic absorption spectroscopy (AAS).*

*From the analysis of the inner side of the can and the organoleptic and physico-chemical analysis of the product „Fois gras” the yellow lacquer type we observed that the phenomena is more accentuated than in the case of the product „Pork meat in natural juice”. This thing wasn't seen in the cases with white lacquer.*

## P.V.2. ANTIMICROBIAL ACTIVITY OF ESSENTIAL OILS AGAINST FOOD-BORNE BACTERIA EVALUATED BY TWO PRELIMINARY METHODS

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**Keywords:** essential oils, foodborne pathogens, antibacterial activity, agar disc diffusion method, vapour phase

*The purpose of this research was to evaluate the in vitro antibacterial activity of selected essential oils (EOs) i.e., cinnamon leaf oil (Cinnamomum zeylanicum), garlic oil (Allium sativum), onion oil (Allium cepa), white thyme oil (Thymus vulgaris), oregano oil (Thymus capitatus), basil oil (Ocimum basilicum), clove bud oil (Eugenia caryophyllata), against two Gram-positive bacteria (Staphylococcus aureus ATCC 25923, Bacillus cereus ATCC 11778) and two Gram-negative bacteria (Escherichia coli ATCC 25922, Salmonella enteritidis ATCC 13076) using two preliminary methods: agar disc diffusion method and disc volatilization method (vapour phase activity).*

*Both methods used in this research are qualitative methods, used to select the most active EOs against test strains, and are based on the same principle only with one difference: placement of the filter disc impregnated with EOs [on the surface of the inoculated medium for the first method and on the lid of the Petri dish for the second method].*

*Results showed that all seven EOs presented antibacterial activity against all the test strains in direct contact method. On the other hand, only two EOs presented significant antibacterial effect through volatilization method against test bacteria. Oregano oil, clove bud oil and white thyme oil showed maximum activity against all the bacteria tested in direct contact method, having a greater inhibition diameter than the reference control (streptomycin 50 mg/ml). The best result were shown by oregano oil followed by white thyme oil > clove bud oil > cinnamon oil > garlic oil > onion oil > basil oil, in that order. Oregano oil and white thyme oil vapours presented a large growth inhibition zone against E. coli (27/46,3 mm) and S. enteritidis (43/48,3mm).*

*The results support the high efficacy of oregano, white thyme and clove bud essential oils to control pathogenic microorganisms and their use in developing new systems to prevent bacterial growth, extend the shelf life and increase the safety of the processed food.*

**P.V.3. KINETIC ANALYSIS AND THERMAL INACTIVATION OF  $\gamma$ -GLUTAMYL TRANSFERASE IN GOAT AND BOVINE MILK - A COMPARATIVE STUDY**

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**Keywords:** kinetic analysis, thermal inactivation,  $\gamma$ -glutamyl transferase, goat and bovine milk

*The thermal inactivation experiments of  $\gamma$ -glutamyl transferase (GGT) in goat and cow raw and skim milk was investigated in the temperature range of 60-77°C. Kinetic and thermodynamic studies were carried out at different time-temperature combination in order to evaluate the suitability of GGT as marker for the heat-treatment of caprine milk compared with bovine milk. Kinetic studies showed that the thermal inactivation of GGT followed the first-order kinetics. Based on the thermal death time model, decimal reduction time  $D$  and inactivation rate constant  $k$  values of GGT in caprine milk decreased and increased, respectively with increasing temperature, indicating a more rapid GGT inactivation at higher temperatures compared with bovine milk. The influence of temperature on the inactivation rate constant was quantified using the Arrhenius and thermal death time models. The corresponding  $z$ -values for skimmed and raw caprine milk were  $7.71 \pm 0.23^\circ\text{C}$ ,  $7.05 \pm 0.09^\circ\text{C}$  and  $5.96 \pm 0.03^\circ\text{C}$ ,  $5.80 \pm 0.05^\circ\text{C}$ , in skimmed and raw cow milk, respectively. Activation energy values varied between milk species, higher activation energy values resulted for bovine milk compared with that of caprine origin.*

#### P.V.4. ANALYSIS AND QUANTIFICATION OF RESVERATROL IN WINE FROM MUNTENIA AND OLTENIA REGIONS (ROMANIA)

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**Keywords:** trans-resveratrol, wines, HPLC

*Known for its several beneficial effects on human health (antioxidant, antibacterial, cardioprotective, antitumor, estrogenic, antiplatelet, anti-inflammatory, etc), the first supplement known to activate a longevity gene, resveratrol, is one of the major active compounds of stilbenes. It is a phytoalexin found in grapes, grape products, wine, peanuts, cranberries, strawberry, and some other botanical sources, in variable amounts, both as free and as piceid.*

*The aim of this work is the development of a high performance liquid chromatographic (HPLC) method for the determination of trans-resveratrol in wines from Muntenia and Oltenia region delimited appellation (Romania). The method permits direct injection of the sample followed by PDA detection, revealing to be time-saving and overcoming the need of sample pretreatment steps. Detection limit was 0.008 mg/L. Global uncertainty associated with the results, according to EURACHEM/CITAC rules was 23.5%.*

*Resveratrol content was determined for 24 Romanian AO ([appellation](#) of origin) wines; the concentration found ranging between 0.132 and 6.589 mg/L. The wines from Muntenia region have grater content of trans-resveratrol than wines from Oltenia region. The levels of trans-resveratrol were clearly higher in the red wines compared to the white wines (never exceeding 0.159 mg/L).*

## P.V.5. CAROTENE CONTENT FROM MILK SAMPLES OBTAINED IN DIFFERENT FEEDING CONDITIONS

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**Keywords:** milk, carotene, spectrophotometer, Atomic Absorbtion

*Carotene is important in human health and nutrition, because is a precursor to vitamin A. In spite of lower percentage in milk, carotene is involved in the sensorial properties of dairy products through their colorant and antioxidant properties. The aim of this research was to study the variability of carotene content according to farm feeding practices. Carotene content was determined using UV-VIS 550 spectrophotometer. Milk samples were analyzed from physico-chemical point of view. The metal content (Cu, Fe and Zn) of each sample was determined by Atomic Absortion Spectrophotometer (Analyst 400). The obtained results showed a variation of beta carotene content according to the feeding mode of cows.*

**P.V.6. RESEARCH ON MYCOTOXIN CONTENT OF *TRITICUM AESTIVUM* IN ROMANIAN SOUTH CROPS**

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**Keywords:** *Triticum aestivum*, Dropia variety, deoxynivalenol, zearalenone

*In this study, there have been analyzed 69 wheat samples (*Triticum aestivum*, Dropia variety) from 8 different regions situated in southern Romania; samples were provided in 2010 right after harvesting.*

*For these samples were determined microbiological analysis (total number of germ, yeasts and molds), mycotoxin content (deoxynivalenol – DON, zearalenone – ZEA) and also physical-chemical tests (percentage of impurities and foreign bodies, number of moldy grains).*

*Following the interpretation of results it was found that in all wheat samples studied, the mycotoxin content was below the maximum levels allowed for unprocessed cereals established by CE no. 1881/2006 regulation, except for Teleorman county were 2 samples exceed the limit for ZEA content.*

*There were samples in which mycotoxin content was not detected: 92,7% of samples analyzed for ZEA, respectively 34,8% for DON content, the values being below the limit of detection of the method used for analysis.*

*This paper is part of a research project funding by National Research Program PN II (no.52-132/2008).*

## **P.V.7. MARKET STUDY REGARDING FOOD SAFETY VERSUS CONSUMPTION BENEFITS OF FISH AND FISH PRODUCTS**

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**Keywords:** fish market, novel fish product, fish species, food safety.

*In the last century, freshwater fish was a popular food, consumed frequently, especially those from lower classes, because it was cheap and readily available. Today, as people become increasingly concerned about what they eat, eating fish gained again popularity as an alternative light and sound especially for red meat consumption.*

*Fish meat is healthy for anyone, but is useful especially for those suffering from various heart diseases and helps to maintain a constant level of glucose. Nutritionists suggest regular consumption fish weekly, regardless of age, to combat and prevent a wide range of conditions, from those found in children to asthma or prostate cancer. Fish fats, prevent premature aging and protects the nervous system. It has been shown that for children, fish consumption, stimulates intellectual capacity, and the elders who eat fish three or four times a week are less likely to suffer from the Alzheimer's disease risk.*

*Market study conducted by USAMV Bucharest aimed primarily to identify consumer preferences between the age of 16 and 25 years. The work was focused on this segment of consumers in order to try to outline terms of food preferences in fish products and knowledge that young people have in the field of nutrition. This is because is know that, currently, young people are attracted to fast-food meals that have been scientifically proven to cause a range of digestive diseases and obesity.*

*This paper will cover the main fish consumption trends by urban or rural medium, by age groups and financial incomes. It will give an overview on the market impact of a novel fish product, also projection for future demand for fishery products and novel fish products will be given. Finally fish consumption in Romania will be will be highlighted, giving an overview by species and by age groups.*

## P.V.8. BIODEGRADABLE ALTERNATIVE TO PLASTICS FOR AGRICULTURE APPLICATION

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**Keywords:** yarn, pot, processing, biodegradable, agriculture

European agriculture sector is based on a competitive, oriented towards market, fulfill also the other public offices, such as protecting the environment. Agriculture generates a considerable amount of waste from plastics, accounting for and estimated 10% by weight of the total plastics in landfills. In this context, the development of biodegradable products for agriculture use is consequently an important point to reduce the environmental impact of cultivated land.

Five bio-based composites with PLA and wood fiber in order to produce tomatoes yarns and transplanting pots were performed.

Processing of yarns was carried out on a Trusioma Extruder equipped with a screw with diameter of 32 mm and length to diameter ratio of 20:1.

Manufacturing of the pots was performed by a Victory injection molding machine, which had a screw with diameter of 30 mm and 2.5 tones and clamping force of 400 kN. The quality of the resulting pots was adjusted by changing of the injection speed and cooling time. A pressure of 200 barr was used for all formulations.

Tomatoes yarns and pots have been tested on tomato hybrid "SIRIANA F1" and Broccoli hybrid "MONTOP F1" in the premises of SCDL BUZAU.

The dimension (width, thickness) as well as physico-mechanical (tensile strength, tear strength) characteristics of yarns and pots and compared with conventional products were performed.

It found that the formulation with 15% wood fiber shown the best characteristics in order to produce tomato yarns while the use of pots leads to plants stressed because no biodegradation of these has been observed during more than 4 months and the roots couldn't exit out of pots.

**P.V.9. THE POLYOLEFIN PACKAGE INFLUENCE UPON THE  
QUALITY OF THE BREAD ENRICHED WITH EXOGENOUS  
BUCKWHEAT ADDING**

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**Keywords:** polyolefin package, buckwheat bread, global migration, witness sample, permeability

*The testing of the package for the bread products had as purpose not only the evaluation of the “food contact” quality but also the barrier properties for gases and water vapors. As a bread product we chose the bread enriched with exogenous buckwheat adding. There were tested four types of polyolefin packagings for the global migration of the components in different food simulants and we also led the heavy metals determination using a atomic absorption spectrophotometer. For the permeability tests we used devices for determining the permeability at gases and water vapors. The bread enriched with exogenous buckwheat adding was analyzed from the point of view of the technological quality indicators and the nutritional point of view by analyzing for the later the mineral substances content. The experiments underlined on one hand the benefits of the buckwheat adding in the panification process and proved on the other hand the fact that the packaging prolongues the shelf life ensuring the microbiological quality and the relative constant preservation of the characteristics of the finished product.*

**P.V.10. STUDY ON THE APPLICATION OF A NEW METHOD FOR  
THE VIRAL DETECTION IN FOODSTUFFS. EXPERIMENTAL  
TESTS ON CALICIVIRUSES**

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**Keywords:** new method, viral detection, foodstuffs, experiemental tests, calciviruses

*Noroviruses (NoVs), transmitted mainly through the fecal-oral route, are particularly infectious and only a few virions carried by contaminated water or food are sufficient to cause the disease. These viruses may cause outbreaks of large proportions that could be limited if there is a quickly detection of the source of infection and if would be prohibited or restricted to the sick people the contact with others. Foods normally involved in this disease are edible bivalve molluscs (mussels, oysters and clams) that are often eaten raw or under-cooked and frozen soft fruits imported from areas with low hygienic conditions. We developed a rapid, reliable and sensitive method for the viral detection in foodstuffs using proteinase K, a serine protease, often used in molecular biology to digest proteins and remove contamination from nucleic acids preparations. We applied this method to clams infected with Feline Calicivirus (FCV) strain F9 (used as substitute of NoV, which isn't able to replicate in vitro) and to soft fruits infected with a NoV solution. The protocol consists of three steps: first we homogenized the foodstuffs, then we put the samples in a tube together with proteinase K for an hour at 37°C and finally we centrifuged the sample at 3000 rcf for 5 minutes. We noticed a cytotoxic effect of proteinase K on cell cultures for tests with FCV and to avoid the problem we will add a phase of inactivation of the enzyme with a proper inhibitor. For tests with NoV we used for the detection the Real-time PCR that allowed also a quantification of the samples. Coupling our protocol with Real-time PCR makes detection quicker and it was possible to detect even low concentrations of viruses. Besides a step with RNase A will be introduced together with proteinase K to avoid false positive with real-time PCR.*

## P.V.11. WATER VAPOUR PERMEABILITY OF PACKAGING MATERIALS – AN IMPORTANT FACTOR AFFECTING FOOD SAFETY

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**Keywords:** food safety, food packaging materials, shelf-life, water vapour permeability

*Food safety is now the first priority of the food production and preservation industry, incorporating innovation and sustainability. New food packaging technologies used nowadays imply the existence of a great variety of new packaging materials that have to accomplish several important requirements. Thus, an ideal package must extend food shelf-life and maintain food freshness, in order to assure food safety and, at the same time, must be light and cheap, ease to handle, transport and store the packed products nevertheless must be an efficient marketing instrument.*

*One of the most important factors when selecting packaging materials to ensure food quality and safety is water vapour and gases permeability. Permeability values for a packaging film can vary widely, based on film thickness and temperature – relative humidity measurement conditions.*

*In the present paper we have studied water vapour permeability of some uncharacterized packaging materials used in food industry. Samples were selected from different manufacturers from our country and abroad. Water vapour permeability was measured using the tester L80-5000 from PBI Dansensor – Lyssy Line of Permeability Testers. Results were compared with water vapour permeability values of some polymeric food packaging materials from the literature.*

*Water vapour permeability values of all analysed samples were between 0...25 g/m<sup>2</sup>·24h, at 38°C and 90% RH, which demonstrates their applicability in modern food packaging technologies.*

*In conclusion, permeability is a decisive factor when selecting the appropriate packaging material for certain food product, because it brings to bear on preservation, quality and safety.*

**P.VI.1. DETERMINATION OF CHEESE ORIGIN BY PCR-DGGE:  
APPLICATION TO TRADITIONAL MINAS CHEESES**

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**Keywords:** traceability, geographical origin

*PCR-DGGE is a molecular technique considered as a new traceability tool for fish and some fruits (Montet et al., 2010). It allows linking the food product microbiological community to its geographical origin. Samples of traditional Minas cheese (made from raw milk) produced in four different regions of Minas Gerais state in Brazil, namely Cerrado, Araxa, Serro and Serra da Canastra, were purchased at the market. Samples of Minas cheese made with pasteurized milk from Serro region were used as control. Cheese samples were refrigerated then transported by plane to CIRAD, Montpellier, France, for analysis. Bacterial DNA from cheese samples were extracted in a unique step by phenol/chloroform method and used as template to amplify the V3 region of bacterial 16S rDNA using primers previously described in the literature. PCR products were analyzed by DGGE. The PCR-DGGE revealed 1 band for the cheese samples made from pasteurized milk and 4 to 10 bands for those from traditional cheeses. Some bands were common for all cheeses and some were unique for each region. The results suggest that specific band profiles from handcraft cheeses from each region may be used as a biological bar code to discriminate their origin. In addition, the band profiles clearly distinguished cheese made from pasteurized and raw milk.*

**Reference**

MONTET, D. et al. Déterminer l'origine des aliments grâce à la biologie moléculaire l'exemple de la PCR-DGGE. *Biofutur*, 307, p. 36-38, 2010.

**P.VI.2. RESEARCH ABOUT INFLUENCE OF DENSITY AND  
FERTILISATION ON PROTEIN AND STARCH CONTENT IN  
SOME GENOTYPES OF BARLEY, VARIETY DISTICHUM**

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**Keywords:** barley, density, fertilization, protein content, starch content

*This paper presents the results on the evolution of protein and starch content in barley cultivars, variety distichum (Annabelle, Thuringia, and Cristalia), obtained under differential fertilization (N0P0, N40P40, N80P80, N120P120) and different seeding densities (400 b.g./m<sup>2</sup>, 600 b.g./m<sup>2</sup>).*

*The average results obtained for this studied factors in the three experimental years (2007-2008, 2008-2009 si 2009-2010), in the Vadeni area, Braila county, shows that total protein varied between 9.85% and 13.2% and starch content varied between 61.86% and 64.1%.*

**P.VI.3. STUDY OF CORRELATIONS BETWEEN MAIN QUALITY  
INDICES OF BARLEY AND TECHNOLOGICAL PARAMETERS  
OF BREWING**

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**Keywords:** barley, density, fertilization, protein content, starch content

*The paper aims to establish the interdependence between the main quality indices of barley (MMB, protein content, starch content, range) and main technological parameters of brewing (extract in malt, Kolbach index, and Hartong parameters). It was determinate the linear correlation coefficients between pairs of values in some genotypes of barley (Annabelle, Thuringia, Cristalia, Trasco) grown in Braila Plain, in three experimental years (2007 - 2010). Experience highlights the importance of quality indicators to obtain quality malt for brewing.*

**P.VI.4. INFLUENCE OF ESSENTIAL OILS TREATMENTS ON  
PEROXIDASE ACTIVITY IN TUBERS FROM HEALTHY AND PVY  
INFECTED *Solanum tuberosum* PLANTS**

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**Keywords:** potato virus Y, peroxidase activity, essential oils.

Antioxidants such as rosmarinic acid, chlorogenic acid, poliphenols presents in essential oils extracted from Lamiaceae family plants and many other compounds like hydrogen peroxide and ascorbic acid are implicated in the process signaling against stress. The goal of this research was to evaluate the effects of treatments with essential oils from *Thymus serpyllum*, *Rosmarinus officinalis*, *Ocimum basilicum*, *Mentha piperita* and *Abies alba* on peroxidase activity and minituber yield from healthy and mechanical PVY inoculated plants (variety Roclas) The treatments of positive potato plants significantly reduced the number of minitubers, enhancing their weight in all the variants. The tubers from plants treated with *Thymus serpyllum* oils and mechanical inoculated with the potato virus Y had the higher value of peroxidase activity (significantly comparatively with the other variants).

**P.VI.5. STUDIES ABOUT THE PHOTOSYNTHETIC PIGMENTS IN  
HEALTHY AND PVY<sup>NTN</sup> INFECTED POTATO PLANTS  
GROWN IN GREEN HOUSE**

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**Keywords:** potato virus Y, photosynthetic pigment, varieties, necrotic strain.

*The goal of this study was to investigate the composition of leaf photosynthetic pigments of PVY<sup>NTN</sup> infected and uninfected plants (*Solanum tuberosum* L.) grown in green house. For this purpose, five cultivars were chosen: Hermes, Desiree, Record, Magic and Ostara. The qualitative composition of photosynthetic pigments was similar in healthy and virus infected plants for all the varieties. The chromatographic system clearly separated neoxanthin, violaxanthin, lutein, chlorophyll a,b, carotene, and five minor components. In the infected leaves of cv. Hermes, Ostara and Desiree whose growth was more inhibited, the amount of pigments was diminished. The ratios of chlorophyll a/b, xanthophylls/carotene and chlorophyll/ carotenoids were similar in both groups in all cultivars. In those infected varieties showing drastic changes of growth in green house the change of photosynthetic pigments are accompanied.*

**P.VI.6. CRYOPRESERVATION OF *IN VITRO* GROWN  
BRYOPHYTE GAMETOPHYTES**

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**Keywords:** cryopreservation, *in vitro* growth, bryophyte, gametophytes

*For any in vitro programme for the conservation of rare and threatened bryophytes a method of long-term, basal storage is required. The aim of this study was to determine the effectiveness of a cryopreservation protocol for *Bucegia romanica*, *Conocephalum conicum*, *Bartramia halleriana* and *Atrichum undulatum*. ABA, proline, PEG and low temperature long-term cultivation have been assessed as cryoprotecting pretreatments. The pretreatments before freezing has been found to increase the survival of cells tissues. In vitro grown gametophytic tissues were exposed to LN after open drying. Open drying itself decreased survival. Thawing of the frozen materials was achieved by plunging the vials into water at 40°C for 90 seconds. After thawing, samples were washed with liquid Knop medium and cultured on the same medium, solidified with Gelrite 2%. The tested technique for freeze preservation of bryophytes have to be refined, because the surviving did not exceed 60% in any experimental variant. Cryopreservation appears to be a technique which could be used for the stable preservation of in vitro cultures of bryophyte gametophytes and for the long-term storage of rare or endangered germplasm of bryophytes.*

**P.VI.7. COMPARATIVE STUDY OF NEW INDETERMINATE  
TOMATO CULTIVARS IN VEGETABLE PRODUCTION AREA OF  
MATCA: QUALITY ASPECTS**

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**Keywords:** tomato hybrid, fruit quality, indeterminate, C vitamin, lycopene

*Two new tomato varieties (*Lycopersicum esculentum* Mill.), hybrids F1 (Amanda F1, Lady Rosa F1), with indeterminate growth, Israeli origin from Zeraim Gedera seed company have been tested for their quality characteristics compare with Menhir F1 (Netherlands, Nunhems seeds company) as control variety. The tests have been made in the experimental plots of SC MARCOSER SRL from vegetable production area of Matca, Galati County. For these tomato varieties was tested some agrochemicals parameters and biological factors in order to establish the quality of the tomato fresh fruit. Ascorbic acid levels were found between 12.7 and 15.1 mg per 100g of fresh weight in red ripe tomatoes and for lycopene the values vary from 19.1 to 23.5 mg/kg of fresh weight. The study shows that Lady Rosa F1 cultivar has the highest quality comparative with Amanda F1 and Menhir F1.*

**P.VI.8. STUDIES REGARDING THE EFFECT OF MULCHING  
WITH TRANSPARENT FILM IN GREENHOUSES OF MATCA  
VEGETABLE AREA ON QUALITY OF TOMATOES**

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**Keywords:** mulching, transparent film, cold greenhouse, tomato, quality

*A study was carried out to determine the effect of mulching with transparent film compare to no mulching on quality of cv. AMANDA F1 tomato fruits (Lycopersicum esculentum Mill.) in cold greenhouses in vegetable area of Matca. Total nitrogen, total phosphate, total potassium, microelements, acidity, C vitamin, soluble glucide and lycopene were determined during the harvest period. The study shows that mulching had a positive effect on fruit quality.F1.*

# **STUDENTS SCIENTIFIC SESSION**

## **S.O.1. CONSUMPTION OF FOOD PRODUCTS CONTAINING TRANS FATTY ACIDS AND HUMAN HEALTH ASPECTS – A LITERATURE REVIEW**

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**Keywords:** *Trans* fatty acids (TFAs), food consumption, human health.

*Trans fatty acids (TFAs) are formed during the partial hydrogenation of vegetable oils, and can be found in deep-fried fast foods, bakery products, packaged snack foods, margarines, and crackers (IFST, 2007). Studies revealed that an increasing dietary intake of TFAs increases the risk of coronary heart disease (CHD) (Mozaffarian et al., 2009; Motard-Belanger et al., 2008), and can also affect early human development (Sheila, 2006). Studies have also implicated TFAs in increasing the risk and incidence of diabetes (Odegaard et al., 2006; Ghafoorunissa, 2008) and cancer (Voorrips et al, 2002; Shannon et al, 2007). Given the facts, arose the need to significantly reduce or to virtually eliminate industrially produced TFAs from the food supply and to replace them with healthy cis-unsaturated fatty acids (R. Uauy et al., 2009). In some countries, regulatory approaches to reduce population intake of TFAs include mandatory labeling of TFA content of foods and mandatory regulation of food standards. In 2006, the FDA ruled that the nutrition labels for all conventional foods and supplements must indicate the content of TFAs. The methods used for the determination of this content are based on infrared spectroscopy or on gas liquid chromatography. The aim of this literature review is to investigate the latest results on TFA research and to discuss some key points concerning human health impact of TFA consumption.*

## S.O.2. COMPARATIVE QUALITY ANALYSIS OF ROMANIAN TRADITIONAL AND HAND-MADE JAMS VERSUS INDUSTRIAL ONES

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**Keywords:** quality, traditional, hand-made, industrial, jam.

*In recent years, on Romanian food market appeared a multitude of traditional and hand-made brands, as a reaction to the increased demand for healthy, additives-free food. Many of them were advertised as high-quality products, incomparable to industrial ones.*

*This work tried to verify how accurate commercials and producers' opinions are, thus it has been analyzed and compared the quality indicators of 10 different types of jams: 5 traditional and hand-made jams versus 5 industrial. The complex quality was split, according to authors' subjective perspective, into five components: packaging and labeling quality, hygienic quality, nutritional quality, sensitive quality and health preserving quality. For each of the components were defined criteria and, following detailed evaluations and analysis, assigned scores: in points (scale 1-5) and percentage. Finally, considering the scores, the jam brands were classified based on comparative analysis.*

*The study is a practical example, useful for food companies - in positioning their own products versus competitors' - and authorities, in their efforts to evaluate the real quality of Romanian market's products.*

### S.O.3. INHIBITION OF B-GLUCOSIDASE AND CARBOXIMETHYLCELLULASE ACTIVITY

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**Keywords:** inhibition,  $\beta$ -glucosidase, carboximethylcellulase

*The conversion of lignocellulosic materials to biofuel involves an enzyme-catalyzed hydrolysis of the cellulose and hemicellulose components to fermentable sugars. A way to improve the conversion yield is to limit as much as possible the action of inhibitors. During industrial hydrolysis these substances may be derivated from lignocellulosic biomass, microbial activities or pre-treatment. The effects of several metal ions, EDTA and polyphenols were investigated related to their inhibitory effect on  $\beta$ -glucosidase and carboximethylcellulase activity. The highest inhibitory activity was obtained for  $Hg^{2+}$ , while 1 and 5mM EDTA showed no inhibitory effect. Phenolic compounds activity on  $\beta$ -glucosidase and carboximethylcellulase was assessed using caffeic acid. The results showed strong inhibition on cellulose hydrolysis, depending on mass ratio and pH.*

**S.O.4. EFFECT OF MINIMAL PROCESSING OPERATIONS ON  
THE SHELF-LIFE AND QUALITY CHARACTERISTICS OF  
ROMANIAN LETTUCE**

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**Keywords:** minimally processed food, lettuce, shelf life

*Fresh produce is more susceptible to disease organisms because of the high respiration rate after harvesting. In this study, the influence of minimally processing operations was evaluated. The aim was to characterize lettuce from different suppliers, to highlight the differences occurred and to prolong its shelf life by reducing the microbial contamination. In particular, the effect of minimally processed lettuce was characterized by following physiochemical, microbiological and sensory assessment to determine the color, texture, aroma and smell, both at baseline and throughout the storage period.*

## S.P.1. MONITORING THE HYGIENE AND THE MICROBIAL QUALITY INDICATORS OF THE WHITE BREAD ON THE FLOW PRODUCTION

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**Keywords:** GHP, sanitation tests, microaeroflora, bread safety

*As parts of its global strategy to decrease the burden of foodborne diseases, the WHO (World Health Organization) actively promotes safe food handling behaviors to ensure food and water safety during food handling and preparation. Particular attention must be given to minimizing microbial hazards on the whole food chain especially on the flow production.*

*In order to obtain safety bread products it requires continuous monitoring of the bakery unit by a properly implemented HACCP (Hazard Analysis and Critical Control Points) in order to quickly identify potential sources of bacteriological contamination and to minimize its effects on human health. The HACCP system is based on the implementation and compliance with the GHP (Good Hygienic Practices) and GMP (Good manufacturing Practices) pre-operational programs. Hygiene refers to the set of practices perceived by a community to be associated with the preservation of [health](#), healthy living and safety food products. This practice is a requisite for plant installations and quality assurance system of food or food additives in the manufacturing, processing, compounding, packaging, transporting, storing and selling of food in order to ensure the safety, sanitation and quality of food.*

*For this study there have been taken significant number of samples: sanitation swabs collected from working surfaces and production equipment (108 samples), sanitation swabs taken from employee's hands (360 samples), microaeroflora tests (36 samples), sanitation swabs collected from packaging polypropylene materials (12 samples) and also there were analyzed finished bakery products (188 samples) and the results are presented.*

**S.P.2. BIOTECHNOLOGY APPLIED TO IMPROVE  
HANDLING OF HYBRID SUNFLOWER (*HELIANTHUS ANNUUS*  
L.) "JUSTIN"**

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**Keywords:** *Helianthus annuus* L., hybrid sunflower, micropropagation

*Like many other plant species grown for species *Helianthus annuus* and methods "in vitro" make outstanding contributions to overcoming the limits faced by technology culture in this species. First, paying attention to the rapid multiplication of biological material genetically pure and while that is free from diseases and pests. The apical sunflower meristematic zones have capacity, and survived in artificial conditions, but the plants multiplication and regeneration depends on a variety of autonomous factors, endogenous hormones levels and general conditions of culture (exogenous phytohormones, light and temperature) who play a major role.*

*By using as inoculum a relatively large shoots (0.5-1 cm) is secured a 100% survival of the culture, because the leaves and caulinar tissues is supporting from below and serve as sources hormonal and other factors essential in the initial stage. However, using a biological material homogeneous physiological optimal condition, ensures to obtain cultures with higher growth potential.*

*The experimental work from this paper has focused on developing a rapid and efficient protocol for micropropagation of sunflower hybrid early varieties named Justin, who is then a reference work for anyone interested in obtaining planting material through unconventional methods necessary to improve plants from genus *Helianthus*.*

*Our observations about phytohormones effect on development of sunflower explants from hybrid Justin grown "in vitro" have led to the conclusion benzilaminopurina concentration of 1 mg / l in the presence of low concentrations naphthyl acetic acid (0.1 mg/l) is optimal for stimulating hormone supplement preformed shoot bud and to develop long-term multiple shoots, fit to be included in the next stages of the micropropagation process, such as rhizogenesis induction.*

### S.P.3. RESEARCH ON CONSUMER BEHAVIOR RELATED TO ORGANIC PRODUCTS

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**Keywords:** organic food, consumer preferences, consumer behavior

*The aim of this study was to investigate market opportunities for organic foods from consumer perspective. It focuses in particular on an assessment of the Romanian consumer attitudes and their perception of food in terms of organic food.*

*The research was conducted using the survey through interviews face-to-face type, which was conducted in Bucharest, from March to April 2010. The population studied consists of people between 18 and 65 years, in urban areas. Research sample size is 1252 respondents validated all responses. Participants were selected to be the main decision makers for household purchases and to learn organic products nationally representative sample with an error of  $\pm 5\%$ . Data analysis was performed using SPSS 17.0.*

*In the present study, the goal consisted in validation scale analysis of 30 elements on consumer attitudes to organic food market by demonstrating the loading of each item in relation to the score scale and elimination of items that contribute to more than one factor. Elements of the factor analysis scores were used in cluster analysis to identify market segments.*

*The organic products market is based on the loyal consumers groups who realize and appreciate the sensory characteristics and nutritional products on the environment.*

*This study revealed both positive and negative aspects of consumer behavior of organic and green product concept and the impact it has in Romania and can be used to redirect marketing strategies.*

#### S.P.4. A STUDY OF FOOD LIPIDS

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**Keywords:** food lipids, fatty acids, total fat intake

*Among the food compounds, lipids form a special group because they have an essential role in the biology of cells, tissues, organs and the whole organism. Lipids are necessary for proper metabolism and health. Lipids are molecules such as fatty acids and their derivatives (including tri-, di- and monoglycerides and phospholipids) and also steroid metabolites such as cholesterol. Lipids may be solid or liquid at room temperature, depending on their structure and composition. There are recent studies that suggest that both fatty acid composition of lipids in food, and the total fat intake affects the heart and vascular system, the immune system and the nervous system. Some hypotheses indicate that differences in geometry between various types of unsaturated fatty acids, and differences between saturated and unsaturated fatty acids, could have an important role in biological processes and in the construction of different biological structures (such as cell membranes).*

*The first attempts to obtain a replacement for butter date from 1870. After 1920, partially hydrogenated vegetable oils have increasingly become a significant part of the human diet. The current paper presents the various types of lipids found today in food and the theoretical and practical implications of the use of the technologies for processing vegetable oils in the food industry.*

## S.P.5. SAFETY ISSUES ON HAM TECHNOLOGY: A COMPARISON BETWEEN OHMIC HEATING AND TRADITIONAL THERMAL PROCESSING

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**Keywords:** HACCP, risk assessment, safety ham, ohmic treatment, traditional thermal processing.

*Nutrition is the basis of life for food and this affects both physical, as well as psychical human performances.*

*Among various methods proposed to ensure hygienic food production, HACCP is the one which gained the votes of most relevant international bodies. Perhaps a more appropriate translation of HACCP should be "hazard analysis and critical control points to prevent them by means of control". By assessing the potential risks that may affect food quality or a productive process, H.A.C.C.P. makes it possible to prevent contamination and / or reduce to an acceptable level of potential risks inherent in the productive process or the finished product.*

*The basic principle of EU food safety policy is to apply an integrated approach, such as "farm to fork", covering all sectors of the food chain. The main objective of any organization is profit-driven and it is obvious that this can be achieved only by obtaining an ever-increasing market share. To this purpose strategy followed is based on the company's ability to provide customers products of a higher quality level, which differ from those of competitors and are thus preferred on the market.*

*The aims of this work is to bring a contribution to studying the impact of HACCP application in product realization of ham by using classical thermal treatment and ohmic method on a company with a production capacity of 5 tons of meat products/ day.*

*This work argues HACCP positive influence on the system's management by:*

- integration of modern risk analysis procedures and the concept of prevention in terms of consumer health protection in the existing management system;*
- compliance with legal requirements;*
- a higher level of product safety to ensure a lower-risk product;*
- significant improvement of communication and increased trust from the customers, suppliers and supervisors sides;*
- development of safe and effective processes for the purposes of food safety manufacturing;*
- prevent problems that may arise from harmful food;*
- possibility of becoming competitive on domestic and international markets;*
- contribute to reducing the number of non-compliant products and redresses.*

## S.P.6. MONITORING THE HYGIENE ON THE PRODUCTION FLOW AND QUALITY INDICATORS OF THE ROMANIAN SIBIU SALAMI PRODUCT

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**Keywords:** GHP, sanitation tests, microaeroflora, physic-chemical analysis, Sibiu salami quality.

*In the food chain, from farm to fork, food products can be weaken or spoiled, if there are not provide adequate technological processing. Depending on the specific food and its features, a number of preservation techniques such as refrigeration and different packaging systems can be used. The concept of monitoring the physical and chemical indicators in refrigerated storage on the technological process of obtaining the product appeared as a result of consumer demand to keep fresh product and deliver it with minimal loss of nutritional quality and achieve a high product shelf life so that its distribution to consumers to be feasible. This concept is based on a combination of several important factors to ensure the quality of animal products, such as temperature, water activity, pH, the use of preservatives, modified atmosphere packaging, etc. The intelligent use of these combined factors to ensure storage stability and to maintain the quality and nutritive value of food of animal origin does not affect their physiological structure.*

*The food management system developed should indicate the responsibility, authority and interrelationships of all personnel who manage perform and verify work affecting the performance of such systems. It is important to have all food industry employees educated and trained in relevant food safety practices, beyond basic food handler training.*

*The aim of this work was to study the physic-chemical changes of the packed and unpacked samples of Sibiu Salami during storage under refrigeration conditions. Also the sanitation indicators were analyzed along the Sibiu Salami production line and the results are given.*

## S.P.7. RESEARCH AND IMPLEMENTATION OF HACCP SYSTEM ON THE SMOKED SALMON FILLET PROCESSING UNIT

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**Keywords:** smoked salmon, HACCP system, fish product safety, quality analysis

*The Hazard Analysis Critical Control Point (HACCP) is an important management tool that can be used by operators for ensuring safety of products and efficient processing. It is based on the identification of risks, minimizing those risks through the design and layout of the physical environment in which high standards of hygiene can be assured, sets measurable standards and establishes monitoring systems. This clear monitoring system enables product quality of smoked salmon fillet at all stages, from receiving, processing and storage to delivery, which offers the possibility of undertaking corrective and preventive actions and causes immediate responses to permanent changes in the market.*

*It is important that the collection, collation and evaluation of scientific and technical data be carried out by a multidisciplinary team. Ideally, a team should consist of people with the appropriate level of expertise together with those having a detailed knowledge of the process and product under review. The scope of the HACCP plan should be identified and should describe which segments of the food chain are involved and the general classes of hazards to be addressed. The HACCP plan presented meets the requirements of legal provisions and practice in strict accordance with the possibilities and resources available within the company.*

*Instrumental analysis results (physic-chemical and microbiological), correlated with sensory analysis (appearance, taste, smell) performed over all processes, from receipt to delivery, have shown that quality issues can not be shown without a strict control of the process, potential contamination being accurately identified and envisaging appropriate measures for removing of it.*

*The aim of this study was to try and it's succeeded in achieving a coherent quality instrument that can be functional and easy to apply in concrete conditions of production technology of smoked salmon fillets. This approach will always ensure the company are producing and manufacturing a guaranteed product to customers.*

## S.P. 8 STUDIES ON KILLER PROPERTIES OF WINE YEAST ISOLATED FROM DEALURILE BUJORULUI VINEYARD

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**Keywords:** wine yeast, killer profile, Dealurile Bujorului vineyard

*The killer characteristic of certain yeasts consist in the ability to produce and excrete into medium a protein toxin harmless to man, but capable of killing all sensitive yeasts in the ecosystem. Introduction of a killer strain or a strain which is insensitive to killer toxin into fermentations can be used to prevent contamination with undesirable microorganisms.*

*Twenty-nine yeast strains isolated from Dealurile Bujorului Wine Region (Romania) have been isolated and identified in order to be analyzed for their oenological characteristics. After preliminary fermentation testes and physico-chemical analysis, seven strains have been retained for their valuable properties for wine0making.*

*One of the criteria in the screening program was the detection of the killer phenomenon of this strains as well as the sensitivity of the new isolates to known Killer strains. Two types of Killer strains were used: K<sub>1</sub> type (*Saccccharomyces cerevisiae* 9744c, *Saccccharomyces cerevisiae* 1070/c and *Saccccharomyces cerevisiae* X 208) and K<sub>2</sub> type (*Saccccharomyces cerevisiae* SMR<sub>4</sub>). The sensitive strain tested for detection of Killer character was a collection strain *Saccccharomyces cerevisiae* 17/17.*

*All the new isolates from Dealurile Bujorului Region were resistant to the killer strain *Saccccharomyces cerevisiae* SMR<sub>4</sub>, but sensitive to K<sub>1</sub> type strains. Moreover, with an exception, none of the new isolates were Killer (they were not able to inhibit the growth of *Saccccharomyces cerevisiae* 17/17). The strain proved to be Killer was also the most valuable strain from oenological point of view.*

## S.P.9 MOLECULAR CHARACTERIZATION OF *PENICILLIUM* ISOLATES BY PCR ITS-RFLP

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**Keywords:** PCR ITS-RFLP, identification, *Penicillium*, grapes

*Penicillium* genus, an important contaminant of grape, is able to biosynthesis volatile molecules (mainly geosmin), which induce off-odours in musts and wines not appreciated by the consumers.

In the present study, 13 *Penicillium* strains isolated from Romanian vineyards were identified at species level by PCR-ITS RFLP. The combination of three endonucleases *SduI*, *HinfI* and *MseI* was successful differentiated *P. corylophilum* (2 strains), *P. raistrickii* (2 strains), *P. expansum* (1 strain), *P. oxalicum* (1 strain) and *P. thomii* (1 strain). A fourth enzyme (*HpyI88I*) was added to complete discrimination *P. chrysogenum* (3 strains) from *P. crustosum* (3 strains).

Additionally, no variation was observed between those RFLP patterns of fungal isolates described in this study and reference species characterized previously. This method will be validated using other reference strains and microorganisms isolated from grape berries.

## S.P.10. RESEARCH ON LABORATORY SCALE DISINTEGRABILITY OF SOME BIO-COMPOSITE MATERIALS

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**Keywords:** bio-composites, disintegrability, packaging materials

*Biodegradable products are products that undergo biodegradation. In theory, biodegradable products, or BPs for short, are the perfect solution for reducing a large percentage of the waste products that pollute our environment.*

*This paper presents the results of laboratory work, for a period of 90 days, after has been determined the degree of disintegration of some composite packaging materials.*

*The disintegration degree of packaging materials is representing one of the task within FORBIOPLAST (Forest Resource Sustainability through Bio-Based-Composite Development), a collaborative Large-scale research project, funded by the European Commission under the 7th Framework Programme (FP7).*

*The trial presented here consisting of 9 bio - composite samples which were investigated under aerobic composting conditions in a laboratory scale test according to SR EN 14806 (2006) "Packaging – Preliminary evaluation of the disintegration of packaging materials under simulated composting conditions in a laboratory scale test."*

*This test method evaluates the degree of disintegration of the materials in the laboratory, under similar conditions of an intense aerobic composting process and the results are presented in order to further selection of the tested materials for different applications.*

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**Participants list**

<b>No.</b>	<b>Participant</b>	<b>Affiliation</b>	<b>Presentation code</b>
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4.	BĂDĂRĂU Carmen Liliana	National Institute of Research and Development for Potato and Sugar Beet, Brasov, Romania	O.I.1; P.I.9, P.VI.4; P.VI.5
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**4<sup>th</sup> International Symposium of Biotechnology  
10 – 11<sup>th</sup> November 2011, Bucharest, Romania**

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21.	DANAILA GUIDEA Silvana	France University of Agronomic Sciences and Veterinary Medicine, Faculty of Biotechnologies, Romania	P.I.2; P.I.3.; P.III.20; S.P.2
22.	DIMITROV Ivan	Shumen University "Ep. K.Preslavski", Bulgaria	P.I.4; P.I.5
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26.	DUMITRASCU Loredana	Dunarea de Jos University Galati, Romania	P.V.3
27.	ENACHE Monica	University of Agronomic Sciences and Veterinary Medicine, Faculty of Biotechnologies, Romania	S.P.4
28.	GAGEANU Adrian	University of Agronomic Sciences and Veterinary Medicine, Faculty of Horticulture, Romania	P.I.8
29.	GEANA Elisabeta-Irina	National R&D Institute of Cryogenics and Isotopic Technologies – ICSI Rm. Valcea, Romania	P.V.4
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44.	MATEI Florentina	University of Agronomic Sciences and Veterinary Medicine, Faculty of Biotechnologies, Romania	P.I.8; P.I.12; S.P.8; S.P.9
45.	MITELUT Amalia	University of Agronomic Sciences and Veterinary Medicine, Faculty of Biotechnologies, Romania	O.III.3; O.IV.3; P.III.11; P.III.12; P.V.8; S.O.1; S.O.3; S.P.5; S.P.6; S.P.10 O.I.3; O.I.4
46.	MUHAMMAD Sajjad	USAMV Bucharest, Romania	O.III.3; P.III.11; P.III.12; P.V.5; P.V.11; S.P.3; S.P.6 P.I.9
47.	NEDESCU CONSTANTIN	ACE Pharma CRO International, Romania	
48.	NICULITA Petru	University of Agronomic Sciences and Veterinary Medicine, Faculty of Biotechnologies, Romania	
49.	NISTOR Andreea	National Institute of Research and Development for Potato and Sugar Beet, Brasov, Romania	P.I.9
50.	NUNES Estela	Santa Catarina West University - UNOESC, Videira, Brazil	O.IV.2
51.	PARFENE Georgiana	FACULTATEA STIINTA SI INGINERIA ALIMENTELOR, UNIVERSITATEA DUNAREA DE JOS, GALATI, Romania	P.III.8; P.III.10
52.	PANAGOPOULOU-GHIDURUS Mihaela	University of Agronomic Sciences and Veterinary Medicine, Faculty of Biotechnologies, Romania	P.V.11
53.	PETROVA Mariya	Institute of Plant Physiology and Genetics, Bulgarian Academy of Sciences, Bulgaria	P.I.10; P.I.11
54.	POHRIB Costel	SC MARCOSER SRL Matca, Galati	P.VI.7; P.VI.8
55.	POPA Mona Elena	University of Agronomic Sciences and Veterinary Medicine, Faculty of Biotechnologies, Romania	O.III.3; O.III.4; O.III.5; O.IV.3; P.I.3; P.III.11; P.III.12; P.III.16; P.V.6; P.V.7; P.V.8; S.O.1; S.O.2; S.O.3; S.O.4; S.P.1; S.P.3; S.P.4; S.P.5; S.P.6

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56.	PRICOP Eugenia Mihaela	Biochemistry Department, Faculty of Food Science and Engineering, University „Dunarea de Jos” of Galati, 111 Domaneasca St, 800201 Galati, ROMANIA	O.III.5
57.	POPESCU Dan	Univ. BIOTERREA Bucharest, Romania	P.III.13
58.	RADU Nicoleta	University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania	P.III.14; P.IV.7
59.	RADULESCU Georgeta	ICCF	P.I.12
60.	RAPA Maria	SC INCERPLAST SA, Romania	P.V.8
61.	RAYKOV Svylen	Shumen University “Ep. K.Preslavski”, Bulgaria	P.I.5; P.I.6; P.I.13
62.	REBENCIUC Ioana	Universitatea Stefan Cel Mare, Suceava, Romania	P.V.1; P.V.9
63.	RYCHLIK Tomasz	Poznan University of Life Sciences, Poland	O.III.6; P.III.4; P.III.6; P.VI.1
64.	STANCU Mihaela Marilena	Institute of Biology Bucharest of Romanian Academy, Department of Microbiology, Romania	P.IV.9
65.	STANCIUC Nicoleta	Dunarea de Jos University of Galati	P.V.3
66.	TAMBA-BEREHOIU Radiana	University of Agronomic Sciences and Veterinary Medicine, Faculty of Biotechnologies, Romania	P.III.16
67.	TASHEVA Krasimira	Institute of Plant Physiology and Genetics, Bulgarian Academy of Sciences, Bulgaria	O.I.2; P.I.14
68.	TOMA Radu	University of Agronomic Sciences and Veterinary Medicine, Faculty of Biotechnologies, Romania	P.III.20; S.P.1
69.	TIBOLLO Simone	University of Parma, Department of Public Health-Section of Hygiene, Parma, Italy	P.V.10
70.	TURTOI Mira	University of Agronomic Sciences and Veterinary Medicine, Faculty of Biotechnologies, Romania	P.III.18; P.V.11
71.	UNGUREANU Camelia	University Politehnica of Bucharest, Romania	P.III.17
72.	VARGA Mioara	University of Agronomic Sciences and Veterinary Medicine, Faculty of Biotechnologies, Romania	P.III.18; P.V.11
73.	VISAN Luminita	University of Agronomic Sciences and Veterinary Medicine, Faculty of Biotechnologies, Romania	P.III.19; P.III.20; S.P.2