

Volume 62 of PROCEEDINGS includes the papers presented at the scientific conference RU & SU'23, organized and conducted by University of Ruse "Angel Kanchev" and the Union of Scientists - Razgrad. Series 10.2. contains papers reported in the Biotechnologies and Food Technologies section.

Book	Code	Faculty and Section
Agrarian and Industrial Faculty		
1.1.	FRI-8.303b-1-AMT&ASVM	Agricultural Machinery and Technologies, Agrarian Science and Veterinary Medicine
	FRI-1.202-1-MR	Maintenance and Reliability
	FRI-9.2-1-THPE	Thermal, Hydro- and Pneumatic Equipment
	FRI-19.206-1-EC	Ecology and Conservation
	FRI-16.203-1-ID	Industrial Design
1.2.	THU-SSS-AMT&ASVM	Agricultural Machinery and Technologies, Agrarian Science and Veterinary Medicine
	THU-SSS-MR	Maintenance and Reliability
	THU-SSS-THPE	Thermal, Hydro- and Pneumatic Equipment
	THU-SSS-EC	Ecology and Conservation
	THU-SSS-ID	Industrial Design
Faculty of Mechanical and Manufacturing Engineering		
2.1.	FRI-1.317-1-MEMBT	Mechanical Engineering and Machine-Building Technologies
2.2.	TUE-1.417-SSS-MEMBT	Mechanical Engineering and Machine-Building Technologies
Faculty of Electrical Engineering Electronics and Automation		
3.1.	FRI-10.326-1-EEEA	Electrical Engineering, Electronics and Automation
3.2.	FRI-2G.303-1-CCT1	Communication and Computer Technologies 1
	FRI-2G.302-1-CCT2	Communication and Computer Technologies 2
3.3.	THU-10.326-SSS-EEEA	Electrical Engineering, Electronics and Automation
	THU-2G.303-SSS-CCT	Communication and Computer Technologies
Faculty of Transport		
4.1.	FRI-KC.H2-1-TMS	Transport and Machine Science
	SAT-KC.H2-1-TMS	Transport and Machine Science
4.2.	FRI-20.21-2-SITSTL	Sustainable and Intelligent Transport Systems, Technologies and Logistics
4.3.	MON-5.21-SSS-TMS	Transport and Machine Science
Faculty of Business and Management		
5.1.	FRI-2B.412-1-EM1	Economics and Management 1
	FRI-2G.404-1-EM2	Economics and Management 2
	SAT-2B.412-1-EM1	Economics and Management 1
5.3.	THU-2G404-SSS-EM	Economics and Management
5.4.	FRI-2G.510-1-ESIS1	European Studies and International Security 1
	FRI-2G.510-1-ESIS2	European Studies and International Security 2
8.2.	FRI-1.322-1-SW	Social Work
Faculty of Natural Sciences and Education		
6.1.	FRI-1.414-MIP	Mathematics, Informatics and Physics
6.2.	FRI-2G.305-1-PP	Pedagogy and Psychology
6.3.	FRI-2G.309-1-LL	Linguistics and Literature
	FRI-12.23-1-AS	Art Studies

6.4.	FRI-2G.307-1-ERI	Education - Research and Innovations
	SAT-2G.307-1-ERI	Education - Research and Innovations
6.5.	FRI-1.407-SSS-PP-01	Pedagogy and Psychology
6.6	FRI-2G.308-SSS-LLA	Linguistics, Literature and Art Science & History, Ethnology and Folklore
6.7	FRI-2.203-SSS-MIP-01	Mathematics, Informatics and Physics
Faculty of Law		
7.1.	FRI-2B.313-1-L	Law Studies
	SAT-2B.313-1-L	Law Studies
7.2.	FRI-2B.312-1-NS	National Security
7.3.	WED-2B313-SSS-L	Law Studies
Faculty of Public Health and Health Care		
8.1.	FRI-2K.201-1-HP	Health Promotion
8.3.	FRI-2G.104-1-HC	Health Care
8.4.	FRI-2G.309-1-MCDA	Medical and Clinical Diagnostic Activities
8.5.	THU-K.101-SSS-HP	Health Promotion
	THU-2.101-SSS-HC	Health Care
	THU-2Г.105-SSS-MCDA	Medical and Clinical Diagnostic Activities
Quality of Education Directorate		
9.1.	FRI-2.104-1-QHE	Quality of Higher Education
Razgrad Branch of the University of Ruse		
10.1.	FRI-LCR-1-CT(R)	Chemical Technologies
	SAT-LCR-P-2-CT(R)	Chemical Technologies (Poster session)
10.2.	FRI-LCR-1-BFT(R)	Biotechnologies and Food Technologies
	SAT-LCR-P-2-BFT(R)	Biotechnologies and Food Technologies (Poster session)
10.3.	TUE-SSS-CT(R)	Chemical Technologies
	TUE-SSS-BFT(R)	Biotechnologies and Food Technologies
Silistra Branch of the University of Ruse		
11.1.	FRI-110-1-PPM(S)	Pedagogy; Psychology and Methodology of training in...
	FRI-229-1-P(S)	Philology
	FRI-216-1-TS(S)	Technical Sciences
11.2.	FRI-239-I-PMT(S)	Pedagogy and Methodology of Training in...
	FRI-229-I-H(S)	Humanities
	FRI-216-I-TS(S)	Technical Sciences

The papers have been reviewed.

ISSN 1311-3321 (print)

ISSN 2535-1028 (CD-ROM)

ISSN 2603-4123 (on-line) Copyright © authors

The issue was included in the international ISSN database, available at <https://portal.issn.org/>.

The online edition is registered in the portal ROAD scientific resources online open access

PROGRAMME COMMITTEE

- **Prof. Amar Ramdane-Cherif**
University of Versailles, France
- **Assoc. Prof. Manolo Dulva HINA**
ECE Paris School of Engineering, France
- **Prof. Leon Rothkrantz**
Delft University of Technology, Netherlands
- **Assoc. Prof. Antonio Jose Mendes**
University of Coimbra, Portugal
- **Prof. Ville Leppanen**
University of Turku, Finland
- **Assoc. Prof. Marco Porta**
University of Pavia, Italy
- **Prof. Douglas Harms**
DePauw University, USA
- **Prof. Zhanat Nurbekova**
L. N. Gumilyov Eurasian National University, Nur Sultan, Kazakhstan
- **Prof. Mirlan Chynybaev**
Kyrgyz State Technical University, Bishkek, Kyrgyzstan
- **Prof. Ismo Hakala, PhD**
University of Jyväskylä, Finland
- **Prof. Artur Jutman, PhD**
Tallinn University of Technology, Estonia
- **Prof. RNDr. Vladimir Tvarozek, PhD**
Slovak University of Technology in Bratislava, Bratislava, Slovakia
- **Assoc. Prof. Ing. Zuzana Palkova, PhD**
Slovak University of Agriculture in Nitra, Nitra, Slovakia
- **Andrzej Tutaj, PhD**
AGH University of Science and Technology, Krakow, Poland
- **Prof. Valentin NEDEFF Dr. eng. Dr.h.c.**
“Vasile Alecsandri” University of Bacău, Romania
- **Cătălin POPA, PhD**
“Mircea cel Bătrân” Naval Academy, Constantza, Romania
- **Prof. dr Larisa Jovanović**
Alfa University, Belgrade, Serbia
- **Prof. dr hab. Edmund LORENCOWICZ**
University of Life Sciences in Lublin, Poland
- **Assoc. Prof. Ion MIERLUS - MAZILU, PhD**
Technical University of Civil Engineering, Bucharest, Romania
- **Prof. Dojčić Vojvodić PhD**
Faculty of Philosophy, University of Novi Sad, Serbia
- **Prof. Alberto Cabada**
University of Santiago de Compostela, Faculty of Mathematics, Santiago de Compostela, Spain
- **Kamen Rikev, PhD**
Institute of Slavic Philology, Maria Curie-Skłodowska University in Lublin, Poland
- **Prof. Ricardo Gobato, PhD**
Secretariat of State of Parana Education and Sport (SEED/PR), Laboratory of Biophysics and Molecular Modeling Genesis
- **Prof. Fatima Rahim Abdul Hussein, PhD**

- University of Misan, College of Basic Education, English Department, Iraq
- **Prof. Liqaa Habeb Al-Obaydi, PhD**
English Department, College of Education for Human Science, University of Diyala, Iraq
 - **Dra. Clotilde Lechuga Jiménez, PhD**
Social Science Education, Education Science Faculty (Teatinos Campus), University of Malaga, Spain
 - **Prof. Dr. Mehmet Şahin, PhD**
Mersin University, Faculty of Education, Department of Curriculum and Instruction, Turkey
 - **Prof. Igor Kevorkovich Danilov, DSc**
Yuri Gagarin State Technical University of Saratov, Russia
 - **Prof. Aleksander Valentinov Sladkowski, DSc**
Silesian University of Technology, Poland
 - **Prof. Vera Karadjova, PhD**
“St. Kliment Ohridski” University – Bitola, Faculty of tourism and hospitality – Ohrid, Republic of North Macedonia
 - **Prof. Aleksandar Trajkov, PhD**
“St. Kliment Ohridski” University - Bitola, Faculty of tourism and hospitality – Ohrid, Republic of North Macedonia
 - **Prof. Petar Pepur, PhD**
University of Split, Croatia
 - **Prof. Korhan Arun, PhD**
Namik Kemal University, Tekirdağ, Turkey
 - **Prof. Yuliya Yorgova, PhD**
Burgas Free University, Bulgaria
 - **Jelena Stankovic, PhD**
University of Nis, Serbia
 - **Prof. Dr. Diana E. Woolfolk Ruiz**
CETYS University, Mexico
 - **Prof. Gerhard Fiolka, PhD**
University of Fribourg, Switzerland
 - **Prof. Haluk Kabaalioglu, PhD**
Yeditepe University, Turkey
 - **Prof. Silva Alves, PhD,**
University of Lisbon, Portugal
 - **Hanneke van Brugge, DHC mult**
Appeldoorn, The Netherlands
 - **Prof. Elena Torina**
Tula State Pedagogical University "L. N. Tolstoy", Tula, Russia
 - **Prof. Violeta Jotova**
Direction Pediatrics at St. Marina University Hospital - Varna, Bulgaria, Chair ESPE Postgraduate Qualification Committee
 - **Prof. Tanya Timeva, MD, PhD**
Obstetrics and Gynecology Hospital "Dr. Shterev", Sofia, Bulgaria
 - **Prof. Kiril Stoychev, PhD,**
Institute of Metal Science, Equipment and Technologies “Acad. A. Balevsci” with Haydroaerodinamics centre – BAS, Bulgaria
 - **Assoc. Prof. Mark Shamtsyan, PhD**
Technical University, Saint Petersburg, Russia
 - **Assoc. Prof. Oleksii Gubenia, PhD**
National University of Food Technologie, Kiev, Ukraine
 - **Prof. Olexandr Zaichuk, DSc**

Ukrainian State University of Chemical Technology, Dnepropetrovsk, Ukraine

- **Prof. Eugene Stefanski, DSc**
Samara University, Russia
- **Assoc. Prof. Tatiana Strokovskaya, PhD**
International University of Nature “Dubna”, Dubna, Russia
- **Prof. DSc. Petar Sotirow**
Maria Curie-Sklodowska University of Lublin, Poland
- **Prof. Papken Eghiasar Hovsepian**
Sheffield Hallam University, Sheffield, UK
- **Assoc. Prof. Krassimir Dochev Dochev, PhD**
University of Portsmouth School of Engineering, UK
- **Mariana Yordanova Docheva, PhD**
University of Portsmouth School of Engineering, UK
- **Assoc. Prof. Ivan Antonov Lukanov, PhD**
University of Botswana, Faculty of Engineering and Technology, Gaborone, Botswana
- **Assoc. Prof. Petko Vladev Petkov, PhD**
Research Associate Cardiff University, UK
- **Prof. Stepan Terzian DSc**
Bulgarian Academy of Science, Bulgaria
- **Prof. Gabriel Negreanu, PhD**
University Politehnica of Bucharest, Romania

ORGANISING COMMITTEE

◆ **ORGANIZED BY: UNIVERSITY OF RUSE (UR) AND
UNION OF SCIENTISTS (US) - RUSE**

◆ **ORGANISING COMMITTEE:**

• **Chairperson:**

Acad. DTSc Hristo Beloev, DHC mult.
Rector of UR, Chairperson of US - Ruse

• **Scientific Secretary:**

Prof. Diana Antonova, DSc
dantonova@uni-ruse.bg, 082/888 249

• **THEMATIC FIELDS:**

- **Agricultural Machinery and Technologies, Agrarian Sciences and Veterinary Medicine**
- **Maintenance and Reliability**
- **Thermal, Hydro- and Pneumatic Equipment**
- **Ecology and Conservation**
- **Industrial Design**
Assoc. Prof. Plamen Manev, PhD
pmanev@uni-ruse.bg, +359 82 888 485
- **Pedagogy; Psychology and Methodology of training in...;** (27.10.23, Silistra)
Assoc. Prof. Evgenia Goranova, PhD,
egoranova@uni-ruse.bg
- **Philology** (27.10.23, Silistra)
Assoc. Prof. Rumiana Lebedova, PhD
rlebedova@uni-ruse.bg
- **Technical Sciences** (27.10.23, Silistra)
Assoc. Prof. Konstantin Koev, PhD,
kkoev@uni-ruse.bg
- **Chemical Technologies** (03-04.11., Razgrad)
- **Biotechnologies and Food Technologies** (03-04.11., Razgrad)
Prof. Tsvetan Dimitrov
conf_rz@abv.bg, +359 887 631 645
- **Mechanical Engineering and Machine-building Technologies**
Prof. Ivelin Ivanov, PhD
ivivanov@uni-ruse.bg, +359 82 888 472
- **Electrical Engineering, Electronics and Automation**
Assoc. Prof. Boris Evstatiev, DSc
bevstatiev@uni-ruse.bg, +359 82 888 371
- **Communication and Computer Systems**
Assoc. Prof. Galina Ivanova, PhD, giivanova@uni-ruse.bg, +359 82 888 855
Assoc. Prof. Adriana Borodzhieva, PhD, aborodzhieva@uni-ruse.bg, +359 82 888 734

- **Transport and Machine Science**
Assoc. Prof. Simeon Iliev, PhD
spi@uni-ruse.bg, +359 82 888 331
- **Sustainable and Intelligent Transport Systems, Technologies and Logistics**
Prof. Velizara Pencheva, PhD
vpencheva@uni-ruse.bg, +359 82 888 558, +359 82 888 608
- **Economics and Management**
Pr. Assist. Prof. Miroslava Boneva, PhD, mboneva@uni-ruse.bg, +359 82 888 776
Pr. Assist. Prof. Elizar Stanev, PhD, eastanev@uni-ruse.bg, +359 82 888 557
- **European studies and International Security**
Prof. Vladimir Chukov, DSc,
vchukov@uni-ruse.bg, 0889 768745
- **Mathematics, Informatics and Physics**
Prof. Tsvetomir Vasilev, PhD
tvasilev@uni-ruse.bg, +359 82 888 475
- **Education - Research and Innovations**
Assoc. Prof. Emilia Velikova, PhD, evelikova@uni-ruse.bg, 0885 635 874
Pr. Assist. Prof. Ralica Vasileva-Ivanova, PhD, rivanova@uni-ruse.bg, 0884 109 719
- **Pedagogy and Psychology**
Assoc. Prof. Valentina Vasileva, PhD, rk-ppi@uni-ruse.bg, 0898 407 577
Assoc. Prof. Galina Georgieva, PhD, zrk-ppi@uni-ruse.bg, 0889 951 920
- **History, Ethnology and Folklore**
Assist. Prof. Veselka Radeva, PhD
vradeva@uni-ruse.bg, 082888437
- **Linguistics, Literature and Art Science**
Assoc. Prof. Velislava Doneva, PhD,
doneva_v@uni-ruse.bg, 0886 060 299
- **Health Promotion**
Assoc. Prof. Stefka Mindova, PhD
smindova@uni-ruse.bg, +359 882 895 149
- **Social Work**
Pr. Assist. Prof. Ana Popova, PhD
apopova@uni-ruse.bg, +359 889 874 219
- **Medical and Clinical Diagnostic Activities**
Pr. Assist. Deniza Trancheva, MD, PhD
dtrancheva@uni-ruse.bg, +359 82 888 410
- **Health care**
Assoc. Prof. Tsveta Hristova, PhD
tshristova@uni-ruse.bg, +359 878 389 793
- **Law**
Assoc. Prof. Elitsa Kumanova, PhD
ekumanova@uni-ruse.bg, +359 884 980 050
- **National Security**
Assoc. Prof. Milen Ivanov, DSc
poligon@abv.bg, +359 82 888 736
- **Quality of Higher Education**
Prof. Ivanichka Serbezova, PhD, iserbezova@uni-ruse.bg
Daniela Todorova, dtodorova@uni-ruse.bg, +359 82 888 378

• **REVIEWERS:**

Prof. Grygorii Deinychenko, DSc
Prof. Antonina Dubinina, DSc
Professor Oleksandr Gavva, DSc
Professor Galyna Polischuk, DSc
Professor Volodymyr Telychkun, PhD
Prof. Venelin Enchev, DSc
Prof. Stefan Stefanov, PhD
Prof. Irena Markovska, PhD
Prof. Stanka Damianova, DSc
Prof. Neyko Stoyanov, PhD
Assoc. Prof. Rositsa Titorenkova
Assoc. Prof. Mark Shamtsyan, PhD
Assoc. Prof. Olexandr Zaichuk, DSc
Assoc. Prof. Olena Karasyk, PhD
Assoc. Prof. Olena Khomenko, PhD
Assoc. Prof. Oleksii Gubenia, PhD
Assoc. Prof. Cristina Popovici, PhD
Assoc. Prof. Liviu Gacheu, PhD
Assoc. Prof. Miluvka Stancheva, PhD
Assoc. Prof. Temenujka Haralanova, PhD
Assoc. Prof. Tsvetan Dimitrov, PhD
Assoc. Prof. Iliana Kostova, PhD

Biotechnologies and food technologies

Content

1. FRI-LCR-1-BFT(R)-01	12
Storage stability, antioxidant and antilipid activity of seed extract from Pinot noir grape	
<i>Yavor Ivanov</i>	
2. FRI-LCR-1-BFT(R)-02	13
Application of alginate	
<i>Darina Georgieva</i>	
3. FRI-LCR-1-BFT(R)-03	14
Survey on informed food choices	
<i>Stanka Damyanova, Iliana Nikolova, Iliana Kostova</i>	
4. FRI-LCR-1-BFT(R)-04	19
Additives in food products	
<i>Stanka Damyanova, Iliana Kostova, Iliana Nikolova</i>	
5. SAT-LCR-P-2- BFT(R)-01	24
Trends in the sales of food supplements and OTC products	
<i>Mariya Koleva, Momchil Lambev</i>	
6. SAT-LCR-P-2- BFT(R)-02	29
Effect of blackcurrant press flour on the main characteristics of bread	
<i>Toncho Kolev</i>	
7. SAT-LCR-P-2- BFT(R)-03	36
Molecular diffusion coefficient of tannins in ethanol extracts of white oregano (<i>Origanum heracleoticum</i> L.) cultivated in Bulgaria	
<i>Ira Taneva, Violeta Paskova, Krasimira Dobрева</i>	
8. SAT-LCR-P-2- BFT(R)-04	42
Thermodynamic and kinetic investigation of sunflower O/W emulsions with addition of citral	
<i>Vanya Gandova</i>	
9. SAT-LCR-P-2- BFT(R)-05	51
Characteristics of drinking water from the region of Sliven	
<i>Vanya Prodanova-Stefanova</i>	
10. SAT-LCR-P-2- BFT(R)-06	56
Chemical composition of processed fennel fruits and their application in feed mixtures. 1. Protein and aminoacids	
<i>Milen Dimov, Milena Nikolova</i>	
11. SAT-LCR-P-2- BFT(R)-07	63
Dietary fiber content of wheat bread enriched with non-traditional types of flour	
<i>Dana Stefanova, Denka Zlateva</i>	
12. SAT-LCR-P-2- BFT(R)-08	69
Different ways to produce biogas	
<i>Ivan Angelov, Venko Beschkov</i>	

13.	SAT-LCR-P-2- BFT(R)-09 Chitosan – obtaining and application <i>Martina Pencheva</i>	75
14.	SAT-LCR-P-2- BFT(R)-10 Alginate general characteristics and properties <i>Darina Georgieva, Iliana Nikolova</i>	83
15.	SAT-LCR-P-2- BFT(R)-11 Technological characteristics of grapes and wine from the introduced white wine clones Albana P4 and Prosecco ESAV 19 <i>Tatyana Yoncheva, Zdravko Nakov</i>	90
16.	SAT-LCR-P-2- BFT(R)-12 Microbiological characteristic of mineral, mountain and spring waters from Bulgaria <i>Nedialka Valcheva, Iliana Kostova, Iliana Nikolova</i>	99
17.	SAT-LCR-P-2- BFT(R)-13 Comparative physicochemical analysis of mineral, mountain and spring waters from Bulgaria <i>Nedialka Valcheva, Iliana Nikolova</i>	104