



"ANGEL KANCHEV" UNIVERSITY OF RUSE
UNION OF SCIENTISTS - RUSE

РУСЕНСКИ УНИВЕРСИТЕТ "АНГЕЛ КЪНЧЕВ"
СЪЮЗ НА УЧЕНИТЕ - РУСЕ



57th Annual Science Conference
of Ruse University and Union of Scientists - Ruse
**NEW INDUSTRIES, DIGITAL ECONOMY,
SOCIETY - PROJECTIONS OF THE FUTURE**

57-ма годишна научна конференция
на Русенски университет и Съюз на учените – Русе
**НОВИ ИНДУСТРИИ, ДИГИТАЛНА ИКОНОМИКА,
ОБЩЕСТВО – ПРОЕКЦИИ НА БЪДЕЩЕТО**



**SESSIONS SCHEDULE & ABSTRACTS
ПРОГРАМА & РЕЗЮМЕТА**

**25-26.10.2018
BULGARIA**

ПРОГРАМА

02.11.2018 г.

09:30 – 16:00ч.
Хотел Cartoon - до рецепция
Регистрация на участниците в конференцията

11:00 ч.
КОНФЕРЕНТНА ЗАЛА LCR

Откриване, Приветствия 11:00 ч.	
ПЛЕНАРНИ ДОКЛАДИ 11.15-13.00	Използване на гроздовите люспи като функционална съставка в хлебопекарната индустрия <i>проф. д-р Ливиу Гачеу</i> Трансилвански Университет, Брашов, Румъния
	Фармацевтичната биотехнология - принципи, постижения и бъдеще <i>д-р Надежда Михайлова</i> Русенски университет "Ангел Кънчев" Филиал Разград, България
14.00-17.00	Заседание на секция "Химични технологии" зала LCR Заседание на секция "Биотехнологии и хранителни технологии" - зала LCR
19:00 ч.	Вечеря за участниците в конференцията Ресторант „Папараци“ - вход с куверти
03.11.2018г.	9.30-11.30 Постер сесия - секция "Химични технологии" зала LB
	9.30-11.30 Постер сесия - секция "Биотехнологии и хранителни технологии" - зала LB
	11.30 Награждаване на авторите на най-добрите доклади от двете секции с кристален приз "THE BEST PAPER" Закриване на конференцията

02.11.2018

Section "Chemical Technologies "
Sectional reports: 02.11. 2018 14.00-15.15 – room LCR
Session Chair: Miluvka Stancheva

FRI-LCR-1-CT(R)

- Purification of Burgas lake through zeolit type clinoptilite
Todor Mihalev, Gergana Peeva
- Synthesis and study of Ni-doped willemite ceramic pigments
Tsvetalina Ibreva, Tsvetan Dimitrov, Irena Markovska
- From formamide to nucleic acid monomers and amino acids by using v energy sources
Venelin Enchev, Ivan Angelov, Nadezhda Markova, Nina Stoyanova, Slavova, Ivayla Dincheva, Evgeny Krasavin, Mikhail Kapralov, Lato Avramov

Section " Biotechnologies and Food Technologies "
Sectional reports: 02.11.2018 15.30-17.00 – room LCR
Session Chair : Nastia Ivanova

FRI-LCR-1-BFT(R)

- Phytochemical evaluation and antibacterial effect of the succulent *Graptoparaguayense* E. Walther
Nadezhda Markova, Maya Zaharieva, Hristo Najdenski, Ivayla Dincheva, Badjakov, Petia Genova-Kalu, Venelin Enchev
- Assessment method for hygienic design in food industry. Water drains water saving study case
Liviu Gaceu, Oana Bianca Oprea, Nicoleta - Raisa Samoila
- Sensory evaluation and rheological behavior of yogurts prepared from goat
Cristina Popovici, Mihaela Adriana Tita, Renata Brinza

03.11.2018

Section "Chemical Technologies "
Poster session: 03.11. 2018 09.30-11.30 – room LB
Session Chair: Tsvetan Dimitrov

SAT-LB-2-CT(R)

- Estimation of adsorption ability of rice husks based bio-char for nickel removal from aqueous solutions
Velyana Georgieva, Lenia Gonsalvesh, Mariana Tavlieva, Ganka Kolchev
- Synthesis of 1-amino and 1-nitroso derivatives of 2',3'-dihydro-spiro[imidazolidine-4,1'-indene]-2,5-dione
Neyko Stoyanov, Marin Marinov
- Composite coatings based on chrome with various carbon modifications
Evgenii Vinokurov, Roman Grafushin, Vera Makhina

FROM FORMAMIDE TO NUCLEIC ACID MONOMERS AND AMINO ACIDS BY USING VARIOUS ENERGY SOURCES

Prof. Venelin Enchev, DSc

Assoc. Prof. Ivan Angelov, PhD

Assist. Prof. Nadezhda Markova, PhD

Assist. Prof. Nina Stoyanova,

Assist. Prof. Sofia Slavova

Institute of Organic Chemistry with Centre of Phytochemistry,
Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria

E-mail: venelin@orgchm.bas.bg (Venelin Enchev), nadya@orgchm.bas.bg (Nadezhda Markova), nstoyanova@orgchm.bas.bg (Nina Stoyanova), sofia@orgchm.bas.bg (Sofia Slavova), ipangelov@gmail.com (Ivan Angelov)

Assist. Prof. Ivayla Dincheva, PhD

Agrobiointitute, 8 Dragan Tsankov Blvd., 1164 Sofia, Bulgaria

E-mail: ivadincheva@yahoo.com

Prof. Evgeny Krasavin, DSc, Corr. Member Russ. Acad. Sci.

Assist. Prof. Mikhail Kapralov

Joint Institute for Nuclear Research, Joliot-Curie 6, 141980 Dubna, Russia

E-mail: krasavin@jinr.ru (Evgeny Krasavin), mast@mail.ru (Mikhail Kapralov)

Prof. Latchezar Avramov, DSc

Institute of Electronics,

Bulgarian Academy of Science, 72 Tsarigradsko chaussee blvd., Sofia 1784, Bulgaria

E-mail: latchezar.avramov@gmail.com

Abstract: Determining the conditions allowing an efficient one-pot synthesis of the largest possible panel of prebiotic compounds may shed light on the plausible scenario in which the processes that started life might have occurred. We report experiments describing the syntheses taking place from formamide. The warming of formamide at 170°C and 180°C in vacuo yielded large panels of different compounds: purine and nucleobases (adenine, cytosine and uracil), amino acids (glycine, alanine), hypoxanthine, pterine, urea and urocanic acid. After that to model the Solar Wind radiation, these probes were irradiated at 25°C with 170 MeV protons generated by the Phasotron facility of the Joint International Nuclear Institute (Dubna, Russia) as the absorbed dose was 6 Gy. New panel of compounds: timine, 2-methylpurine, 6-methylpurine, 4-methylcytosine and one nucleoside, 6-carboxamido-9-β-D-ribofuranosylpurine, were detected. The mechanisms of the reactions of nucleobases, urea and amino acids formation from formamide were simulated at SCS-MP2 ab initio level.

Acknowledgements: Funding of this work by the National Science Fund, under Grant DN09/7/2016 is gratefully acknowledged.

Keywords: Formamide, Prebiotic compounds

FRI-LCR-1-BFT(R)

FRI-LCR-1- BFT(R)-01

**PHYTOCHEMICAL EVALUATION AND ANTIBACTERIAL EFFECT OF
THE SUCCULENT GRAPTOPETALUM PARAGUAYENSE E.WALTHER**

Assist. Prof. Nadezhda Markova, PhD

Institute of Organic Chemistry with Centre of Phytochemistry,
Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria
Tel.: +35929606197
E-mail: nadya@orgchm.bas.bg

Assist. Prof. Maya Zaharieva, PhD

Cor.-Mem. Prof. Hristo Najdenski, DSc

Department of Infectious Microbiology, The Stephan Angeloff Institute of Microbiology,
Bulgarian Academy of Sciences, 26 Akad. G. Bonchev Str., 1113 Sofia, Bulgaria
E-mail: zaharieva26@yahoo.com, hnajdenski@abv.bg

Assist. Prof. Ivayla Dincheva, PhD

Assoc. Prof. Ilian Badjakov, PhD

AgroBioInstitute, Plant Genetic Resources Group,
8 Dragan Tsankov blvd., 1164 Sofia, Bulgaria
E-mail: ivadincheva@yahoo.com, ibadjakov@gmail.com

Assoc. Prof. Petia Genova-Kalu, PhD

National Reference Laboratory "Rickettsia and tissue cultures",
National Centre of Infectious and Parasitic Diseases, Sofia, Bulgaria
E-mail: petia.d.genova@abv.bg

Prof. Venelin Enchev, DSc

Institute of Organic Chemistry with Centre of Phytochemistry,
Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria
E-mail: venelin@orgchm.bas.bg

Abstract: Due to the increase of antibiotics resistance, there is an urgent need to develop new and innovative antimicrobial agents. Plants have long been investigated among the potential sources of new agents. They contain many bioactive compounds that can be of interest in therapy. Because of their low toxicity, there is a long practice of using dietary plants in the treatment of infectious disease in the world's traditional medicine. It is known that some members of the Crassulaceae family exhibit antiseptic and antibacterial properties. There is information about several health benefits of the succulent plant *Graptopetalum paraguayense* E. Walther (GP), a species of the same plant family: pancreatic damage and diabetes, ovalbumin-induced asthma, hypertension, alleviation of hepatic disorders, anti-colon cancer activity etc. However, there is no information in the literature on the anti-conjunctivitis, antiviral and antibacterial activity of *Graptopetalum paraguayense* E. Walther.

The proposed research is pioneering and is part of project focused on the development of unified theoretical and experimental approaches for active components isolation and antimicrobial activity evaluation of *Graptopetalum paraguayense* E. Walther. The aim of our study is to evaluate in vitro antibacterial effect and cytotoxicity of *Graptopetalum paraguayense* E. Walther (Crassulaceae) extracts.

To study the components of *Graptopetalum paraguayense* the GC-MS analyzes were performed on the extracts obtained from lyophilized GP leaves. The three main groups of organic compounds were identified by GC-MS analysis in the plant: lipids A (fatty acids, sterols and terpenoids), polar metabolites B (aminoacids, hydroxycarboxylic acids, sugars, and sugar alcohols) and phenolic acids C.

The cell lines Lep, RD64 and green monkey kidney cell line (Vero) were used for cytotoxicity assay (MTT-test) of the whole aqueous extract and the three main fractions. Minimal inhibitory concentrations (MICs) were determined on six bacterial strains according to ISO 20776/1-2006. The biofilm inhibitory effect was evaluated using the protocol of Stepanovic (2000). The cell redox activity of treated bacterial cells was measured after reduction of a terazolium salt.

The aqueous extract of *Graptopetalum paraguayense* E. Walther as well as fractions C and A have not cytotoxic effect on RD64, Lep cells and Vero cell line. The MIC values ranged between 0.63 and 2.5 mg/ml. The ethylacetate fraction C was characterized by the highest antibacterial effect and strongest reduction of the bacterial metabolic

SAT-LB-P-1-CT(R)-08

STRUCTURAL FEATURES OF CHALCONES AS ANTIPARASITIC AGENTS

Assist. Prof. Nadezhda Markova, PhD

Assoc. Prof. Daniela Batovska, PhD

Prof. Venelin Enchev, DSc

Institute of Organic Chemistry with Centre of Phytochemistry,
Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria

E-mail: nadya@orgchm.bas.bg, danibat@orgchm.bas.bg, venelin@orgchm.bas.bg

Shweta Sinha, MSc

Prof. Rakesh Sehgal, MD

Department of Medical Parasitology, Post Graduate Institute of Medical Education
and Research, Chandigarh, India

E-mail: sinhashweta.27@gmail.com, sehgalpgi@gmail.com

Abstract: The proposed research is important in the era of increasing drug resistance of parasites such as *Plasmodium*, *Leishmania*, *Giardia* etc, which are, a substantial cause of mortality and morbidity in the world, especially in poor and developing countries. A series of 24 selected chalcones were initially synthesized and submitted to in vitro screening for their activities against the following protozoas: *Plasmodium falciparum* (causing malaria), *Giardia lamblia* (causing giardiasis) and *Trichomonas vaginalis* (causing trichomoniasis). The cytotoxicity profile of HeLa cell line was evaluated through MTT viability assay and the selectivity index (SI) was calculated. The compounds synthesized are in four different groups depends of the substituents in two molecule moieties A and B (A-CH=CH-CO-B). The results revealed that all the chalcones displayed antiparasitic activity against *P. falciparum*, *G. lamblia* and *T. vaginalis*. The most active compound against *P. falciparum* is chalcon with 3',4',5'-Trimethoxy- and 3,4-Dimethoxyphenyl-substituents in A and B, respectively. This chalcon was found to be a lead compound with the highest potency ($IC_{50} = 0.11 \mu\text{g/ml}$), as compared to licochalcone ($IC_{50} = 1.43 \mu\text{g/ml}$) and with high selectivity index of 83.93. The IC_{50} values of all compounds were in the range 0.10-0.40 $\mu\text{g/ml}$ for MRC-2 (chloroquine sensitive) and 0.14-0.55 $\mu\text{g/ml}$ for RKL-9 (chloroquine resistant) strains of *P. falciparum*. Chalcon with 2',5'-Dimethoxy- and 4-CF₃- substituents in A and B, respectively was found to be most active against *T. vaginalis* ($IC_{50} = 7.7 \mu\text{g/ml}$) while the indolyl chalcon with 4'-Iodo-substituent in A is the most active compound against *G. lamblia* ($IC_{50} = 4.8 \mu\text{g/ml}$).

Quantum-chemical calculations at B3LYP/MIDI level were used to study the molecular geometry and electronic structure of the selected derivatives. The energy gap between the highest occupied molecular orbital (HOMO) and lowest unoccupied molecular orbital (LUMO), HOMO-LUMO gap ($\Delta HOMO-LUMO$), total dipole moment and number of electrons have been calculated using the theoretical computations to reflect the chemical reactivity and kinetic stability of compounds.

Keywords: Chalcones, in vitro, DFT, antiparasitic activity.

Acknowledgements

We acknowledge the financial support of the Bulgarian Fund for Scientific Research under Grant DHTC/India 01/5.