

**13<sup>th</sup>** INTERNATIONAL  
**CONGRESS**  
OF THE SERBIAN SOCIETY  
**OF TOXICOLOGY**



**1<sup>st</sup> TOXSEE**  
**REGIONAL**  
**CONFERENCE**

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Present and Future of toxicology: Challenges and opportunities

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**10 - 12 May, 2023 Belgrade**

**electronic**

**ABSTRACT**  
**BOOK**

[www.toxsee2023.com](http://www.toxsee2023.com)

13<sup>th</sup> INTERNATIONAL  
CONGRESS  
OF THE SERBIAN SOCIETY  
OF TOXICOLOGY

&

1<sup>st</sup> TOXSEE  
REGIONAL  
Conference

10 - 12 May,  
2023 Belgrade



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Erasmus+ projekt  
u oblasti obrazovanja odraslih

## DEAR COLLEAGUES, DEAR FRIENDS,

We are delighted to greet you on the **13th International Congress of the Serbian Society of Toxicology & 1. TOXSEE Regional Conference - Present and Future of toxicology: challenges and opportunities**, organized in Belgrade from 10-12 May 2023.

Five years after our last international Congress we gathered in Belgrade, to further promote contemporary toxicology, in the broadest sense of meaning, as a response to the new challenges requiring innovative approaches and solutions, as it is understood in the third decade of the XXI century.

Initial concept, to blend the top scientific level in toxicology with the potentials of its' use in broad array of clinical and other domains, proved to be right. Line-up of more than 70 first class international and regional faculties as well as best Serbian scientists and toxicology professionals in all related domains fully justify the approach. Moreover, interest and presence of more than 250 colleagues from Serbia and region witness that our professional community has recognized the approach taken and shown vast interest.

The Serbian Society of Toxicology is committed to innovation and creativity in research and education, in cooperation with collegial associations and institutions in Serbia and abroad. As a regional leader, we developed and inaugurated the regional brand TOXSEE, with the idea to gather as much as possible expertise and know-how from the region and Europe, to capture knowledge, share experience and exchange practical skills with colleagues who deal with toxicology problems daily.

Time imposes on us the need to integrate science, top knowledge and daily practice in a quality and efficient way, to contribute to the better health of the society as a whole in the most purposeful manner. Therefore, a thematic and functional connections with domains of emergency medicine, general medicine, paediatrics, ecology, in addition to already standard toxicological disciplines i.e. clinical, forensic, occupational, and experimental toxicology have been enhanced.

We are glad to host you in a pleasant atmosphere of Belgrade in mid-May, to benefit from the attractive and dynamic program, exchange knowledge, and, equally important, to refresh existing and establish new contacts with colleagues and friends, while enjoying our hospitality and cherish the moment in one of the best partying cities of Europe.

### YOU ARE MOST WELCOME!!!



**Prof. dr Petar Bulat**

- President of the STC
- President of the 13th STC Congress

*Petar Bulat*



**Prof. dr Biljana Antonijević**

- President of the CSC
- of the 13th STC Congress

*B. Antonijević*



**Prof. dr Predrag Vukomanović**

- President of the COC
- of the 13th STC Congress

*P. Vukomanović*

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Present and Future of toxicology: Challenges and opportunities

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**10 - 12 May, 2023 Belgrade**

**CONGRESS**  
**PROGRAM**



## SCIENTIFIC COMMITTEE

Biljana Antonijević - Serbia / President

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Milena Kataranovski ..... Serbia

Zorica Bulat ..... Serbia

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Aleksandra Buha Đorđević ..... Serbia

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Andrea Pirković ..... Serbia

Branislava Srđenović Čonić ... Serbia

Milena Stošić ..... Serbia

## WEDNESDAY / 10<sup>th</sup> MAY

### PRE-CONGRESS MINI-SYMPOSIUM



HALL 1 ~ DONJI DORČOL

16:00-17:30

• **Danijela Đukić-Čosić**

Education of the general population about toxicity: MeeTox project

### OPENING CEREMONY



HALL 1 ~ DONJI DORČOL

18:00

~

18:15

### WELCOME ADDRESS

- **Prof. dr Petar Bulat**, *President of the Serbian Society of Toxicology*
- **Prof. dr Biljana Antonijević**, *President of the Scientific Committee*



### PLENARY SESSION

18.15-19:00

• **Akademician Prof. dr Vladimir Kostić**

MPTP-Benefits of one toxin

19:00-19:45

• **José E. Manautou**

Multidrug resistance protein-4 (Mrp4) at the intersection of the liver- adipose tissue axis

19:45 - 22:00

### WELCOME RECEPTION

## THURSDAY / 11<sup>th</sup> MAY



### PLENARY LECTURE



HALL 1 ~ DONJI DORČOL

Chairs: : Slavica Vučinić, Danijela Đukić-Čosić

9:00-9:40

• **Leonardo Trasande**

Endocrine disrupting chemicals: mainstream recognition of health effects and policy implications

9:40-9:45



DISCUSSION

9:45-10:00



Coffee break

## SCIENTIFIC SESSION

10:00

-

12:00

**IMPACT OF ENVIRONMENTAL  
POLLUTANTS ON HUMAN HEALTH:  
NEW CHALLENGES**

**Chairs:** Slavica Vučinić,  
Danijela Đukić-Čosić

**IS OCCUPATIONAL TOXICOLOGY  
TODAY PROFESSIONAL ONCOLOGY**

**Chairs:**  
Petar Bulat, Metoda Dodič Fikfak

HALL 1 ~ DONJI DORČOL

HALL 2 ~ SHONDA 4

10:00-10:20

• **Emanuela Corsini**

New insights on PFAS immunotoxicity

• **Petar Bulat**

Occupational toxicology in Serbia  
future directions of development

10:20-10:40

• **Pinar Uysal-Onganer**

Role of cadmium and nickel on  
selected microRNA expression  
in pancreatic ductal adenocarcinoma

• **Metoda Dodič Fikfak**

Exposure to asbestos and its effect  
on the health of workers in the  
Slovenian cement-asbestos industry

HALL 1 ~ DONJI DORČOL

HALL 2 ~ SHONDA 4

10:40-11:00

• **Aleksandra Buha Đorđević**  
Investing the role of exposome  
in human endocrine health:  
DecodExpo project results

• **Cveta Georgieva**

Aerosols and their organic extracts  
as a result of the utilization  
of alternative energy carriers -  
benefits and toxicological risk

11:00-11:20

• **Milena Kataranovski**  
Immunotoxicological  
effects of cadmium

• **Roberto Madeddu**

Cadmium and gemcitabine  
relationship in human pancreatic  
cancer cells

11:20-11:40

• **Kamil Musilek**  
Challenges and promises in reactivation  
of cholinesterases inhibited by  
organophosphorus agents

• **Stefan Mandić Rajčević**

Occupational exposure to nanomaterials:  
a new public health concern?

11.40-12.00

 DISCUSSION

 DISCUSSION

12:00-13:30

 LUNCH



**PLENARY LECTURE**



HALL 1 ~ DONJI DORČOL

Chairs: : **Slobodan Nikolić, Zorica Bulat**

13:30-14:10

• **Predrag Minić**

Ambient air pollution and respiratory morbidity in children

14:10-14:15

 DISCUSSION



14:20-16:20

## SCIENTIFIC SESSION

### FORENSIC TOXICOLOGY IN THE SERVICE OF LIFE

**Chairs:**

Slobodan Nikolić,  
Zorica Bulat

### CHILDREN IN THE WORLD OF CHEMICALS

**Chairs:**

Vladislav Vukomanović,  
Aleksandra Buha Đorđević

### YOUNG RESEARCHERS

**Chairs:**

Evica Antonijević Miljković,  
Dubravka Rašić

HALL 1 ~ DONJI DORČOL

HALL 2 ~ SHONDA 4

HALL 3 ~ SHONDA 2

14:20  
-  
14:40

• **Tomaž Zupanc**

Organization of the forensic toxicology service in Slovenia - disadvantages and advantages

• **Snežana Ristić**

Child poisoning in Serbia – 20 years of experience of the Institute for mother and child health care of Serbia "Dr. Vukan Čupić"

14:20  
-  
14:30

• **Katarina Baralić**

Three lines of evidence of the hepatotoxicity of a mixture containing phthalates and bisphenol A: in silico and two in vivo models

14:30  
-  
14:40

• **Dragana Vukelić**

Oxidative stress induced by low doses of lead: a subacute toxicity study in Wistar rats and benchmark modeling

14:40  
-  
15:00

• **Đorđe Alempijević**

Clinical forensic toxicology

• **Vladislav Vukomanović**

Verapamil poisoning

14:40  
-  
14:50

• **Katarina Živančević**

Neurotoxicity of lead, cadmium, mercury and arsenic low dosed mixtures relevant to environmental exposure

14:50  
-  
15:00

• **Dragica Božić**

Predicting toxic effects of an immunomodulator, Sulforaphane: bioinformatic analysis

HALL 1 ~ DONJI DORČOL	HALL 2 ~ SHONDA 4	HALL 3 ~ SHONDA 2
<p>15:00 - 15:20</p> <p>• <b>Aleksandra Repić</b>                      Psychoactive substances in wastewater</p>	<p>• <b>Vojislav Parezanović</b>                      Poisonings by psychoactive substances in children</p>	<p>15:00 - 15:10</p> <p>• <b>Đurđica Marić</b>                      The relationship between nickel exposure and thyroid dysfunction - results of a human biomonitoring study</p>
<p>15:20 - 15:40</p> <p>• <b>Vera Lukić</b>                      Paraffin molds of liver tissue as an alternative sample for toxicological analysis</p>	<p>• <b>Ivana Kitić</b>                      Poisoning of children with corrosive agents</p>	<p>15:10 - 15:20</p> <p>• <b>Nikola Stojilković</b>                      Effect of lead and polychlorinated- biphenyls mixture on sperm cells and serum level of testosterone in rats</p>
		<p>15:20 - 15:30</p> <p>• <b>Biljana Radović</b>                      Assessment of lead and polychlorinated biphenyls mixture toxic effects on redox status in rat kidneys</p>
		<p>15:30 - 15:40</p> <p>• <b>Nina Umičević</b>                      Oxidative stress induced by low doses of lead: a subacute toxicity study in Wistar rats and benchmark modeling</p>
<p>15:40 - 16:00</p> <p> DISCUSSION</p>	<p>15:40 - 16:00</p> <p> DISCUSSION</p>	<p>15:40 - 16:00</p> <p> DISCUSSION</p>
<p>16:00 - 16:20</p> <p> Coffee break</p>	<p>16:00 - 16:20</p> <p> Coffee break</p>	

16:20

-

18:00

## SCIENTIFIC SESSIONS

### DEBATE

Analytical toxicology is a powerful tool and a great challenge

#### Moderators:

Vesna Kilibarda, Dijana Đurović

### HALL 1 ~ DONJI DORČOL

### HALL 2 ~ SHONDA 4

### HALL 3 ~ SHONDA 2

16:20

-

16:40

• **Danica Đukić**

Toxicological analysis in forensic medicine: the importance of alternative samples

• **Jovana Putnik**

Acute kidney damage caused by bismuth succinate intoxication

16:20

-

18:00

• **Dijana Đurović**

Advantages and limitations of liquid and gas chromatography in toxicological analysis

16:40

-

17:00

• **Aleksa Leković**

Chirality of psychoactive substance

• **Gordana Kovačević**

Botulism in children - diagnostic challenges

• **Snežana Đorđević**

Liquid chromatography - a powerful weapon in the screening of drugs and psychoactive substances

17:00

-

17:20

• **Vladimir Živković**

Sodium-nitrite poisoning - forensic significance and interpretation of the results

• **Miloš Kuzmanović**

Von Munchausen syndrome - warfarin poisoning

• **Maja Vujović**

Gas Chromatography - The Application in Forensic Toxicology

17:20

-

17:40

• **Slobodan Nikolić**

Toxicological analysis of subdural hematoma - interpretation of results and forensic implications

• **Borko Gobeljčić**

Benzodiazepine poisoning in children - a five-year experience

17:40

-

18:00

DISCUSSION

DISCUSSION

9:00 ~ 18:00

POSTER SESSION 1

HALL ~ GALERIJA

18:00 - 19:30

SST Assembly

HALL 1 ~ DONJI DORČOL

20:30 - 23:00 GALA DINNER

RESTAURANT TRI ŠEŠIRA, SKADARLIJA

## FRIDAY / 12<sup>th</sup> MAY



### PLENARY LECTURE



HALL 1 ~ DONJI DORČOL

Chairs: : Biljana Antonijević, Miloš Stojiljković

9:00-9:40

• **Richard Brown**

Chemical risk assessment: change, challenges and controversy

9:40-9:45



DISCUSSION

9:45-10:00



Coffee break

## SCIENTIFIC SESSION

10:00  
-  
12:00

### NEW TRENDS IN TOXICOLOGICAL RESEARCH

Chairs: Biljana Antonijević,  
Miloš Stojiljković

HALL 1 ~ DONJI DORČOL

### CHALLENGES AND MODERN APPROACHES IN CLINICAL TOXICOLOGY

Chairs:  
Slavica Vučinić, Nataša Perković-Vukčević

HALL 2 ~ SHONDA 4

10:00-10:20

• **Miloš Stojiljković**

Novel experimental achievements in therapy of organophosphate intoxications

• **Niko Bekjarovski**

Six years after legalization of cannabis for medical use. Did we make a mistake?

10:20-10:40

• **Danijela Đukić-Čosić**

Opportunities and limitations of toxicogenomic data analysis – our experiences

• **Jasmina Jović-Stošić**

Toxicity of household products: experience of National Poison Control Centre

11:00-11:20

• **Ksenija Durgo**

Equivocal effect of bioactive compounds from plants

• **Hulya Turkan**

Latest knowledge on opioids polymorphism in pain management: The way forward

11:00-11:20

• **Marijana Ćurčić**

Quantifying interactions in the mixture toxicity studies - BDE-209 and cadmium

• **Nataša Perković-Vukčević**

Factors affecting benzodiazepines elimination, clinical features and outcome in elderly people acutely poisoned with benzodiazepines

11:00-11:20

• **Evica Antonijević Miljaković**

Enzyme immobilization as a strategy towards efficient and sustainable determination of cholinesterase inhibitors and reactivators

• **Marko Antunović**

Gabapentinoid abuse in Serbia - are we following the global trend?

11:40-12:00

 **DISCUSSION**

 **DISCUSSION**

12:00-13:30



**LUNCH**



**PLENARY LECTURE**



**HALL 1 ~ DONJI DORČOL**

Chairs : **Milena Kataranovski, Aleksandra Buha Đorđević**

13:30-14:10

• **Demetrios Kouretas**

Emerging concepts and challenges in nanotoxicology: the role of oxidative stress in nanomaterial - induced toxicity

14:10-14:15

 **DISCUSSION**

## SCIENTIFIC SESSION

14:20

-

16:20

### CHEMICALS ARE ALL AROUND US

**Chairs:** Milena Kataranovski,  
Aleksandra Buha Đorđević

### EMERGENCY/GENERAL MEDICINE

**Chairs:** Marko Ercegovac,  
Jasmina Jović Stošić

#### HALL 1 ~ DONJI DORČOL

#### HALL 2 ~ SHONDA 4

14:20-14:40

• **Nursen Basaran**

Adverse consequences of adulteration of herbal products

• **Marko Ercegovac**

Endogenous and exogenous intoxications in emergency neurology

14:40-15:00

• **Doris Marko**

Alternaria mycotoxins as a challenge for risk assessment

• **Dušica Gujaničić**

Poisoning by psychoactive substances - early hospital treatment in an emergency center

15:00-15:20

• **Dragica Brkić**

The status of pesticide active substances in the European Union and further perspectives of their withdrawal

• **Bojana Uzelac**

ECG changes in poisoning with drugs and other xenobiotics

15:20-15:40

• **Emilija Brdarić**

Gut microbiota as a target of toxic compounds

• **Marina Đikić**

Early hospital treatment of overdose with internist therapy: What is urgent and what is more urgent?

15:40-16:00

• **Melita Vidaković**

The various aspects of epigenetics in toxicology research

• **Dragana Trifunović Balanović,**  
• **Marija Lazarević**

General principles of emergency treatment of poisoning in a general medicine doctor's practice – challenges and impediments

16:00-16:20

 **DISCUSSION**

 **DISCUSSION**

16:20-16:40

 **Coffee break**

 **Coffee break**

## SCIENTIFIC SESSION

16:40

-

18:20

### VETERINARY/EXPERIMENTAL TOXICOLOGY

#### Chairs:

Vitomir Ćupić, Dragica Brkić

### ROUND TABLE - DISSEMINATION OF SCIENCE IN TOXICOLOGY

#### Moderators:

Marijana Ćurčić, Javier Esteban

HALL 1 ~ DONJI DORĆOL

HALL 2 ~ SHONDA 4

16:40

-

17:00

#### • Vitomir Ćupić

For and against the use of marijuana (cannabis) in veterinary medicine

17:00

-

17:20

#### • Paul Ziegler

Progress in ecotoxicity testing with duckweeds

17:20

-

17:40

#### • Saša Ivanović

Neurotoxic effect of Vipera ammodytes venom on the rat isolated diaphragm model

17:40

-

18:00

#### • Sunčica Borozan

Biomarkers of oxidative stress in the liver of rats treated with diazinon

18:00

-

18:20

#### • Dejana Ćupić Miladinović

Vitamin B1 as a potential antidote in the treatment of the Japanese quail intoxicated with chlorpyrifos

16:40

-

18:20

#### • Javier Esteban, Gonca Cakmak, Ksenija Durgo, Marijana Ćurčić

#### Topic 1 -

Toxicology dissemination by talks/radio/TV/Instagram

#### Topic 2 -

Internationalisation of the higher education in Toxicology

9:00 ~ 18:00

POSTER SESSION 2



HALL ~ GALERIJA

18.20-18.30 CLOSING CEREMONY



HALL 1 ~ DONJI DORĆOL



## FITOREMEDIJACIJA OTPADNIH VODA KAO MEHANIZAM ZA SMANJENJE BIOTOKSIČNOSTI ENDOKRINIH DISRUPTORA PREMA *ALIIVIBRIO FISCHERI*

Katarina Antić<sup>1</sup>, Marija Lješević<sup>1</sup>, Jelena Milić<sup>1</sup>, Milena Stošić<sup>2</sup>, Jelena Radonić<sup>2</sup>,  
Tatjana Šolević Knudsen<sup>1</sup>

**1** Institut za hemiju, tehnologiju i metalurgiju, Centar za hemiju,  
Univerzitet u Beogradu, Beograd, **Srbija**

**2** Univerzitet u Novom Sadu – Fakultet tehničkih nauka,  
Departman za inženjerstvo zaštite životne sredine i zaštite na radu, Novi Sad, **Srbija**

Eksperiment fitoremedijacije endokrinih ometača, bisfenola A i nonilfenola u model rastvoru, primenom biljne vrste *Eichhornia Crassipes*, sproveden je u laboratorijskim uslovima. Eksperiment je realizovan u vremenskom intervalu od 14 dana, pri čemu je četvrtog i četrnaestog dana uzorkovano po 2 L model rastvora. Biotoksičnost model rastvora sa redukovanim koncentracijama analita nakon fitoremedijacije procenjena je primenom testa detekcije akutne toksičnosti upotrebom Gram-negativnih bioluminiscentnih bakterija *Aliivibrio fischeri*.

Toksičnost je merena primenom liofiliziranog uzorka bakterija *Aliivibrio fischeri* u skladu sa standardom SRPS EN ISO 11348-3. U okviru merenja primenjene su BioFix® Lumi luminiscentne bakterije proizvođača Macherey-Nagel GmbH & Co., Düren, Germany. Primenom kalijum-hidroksida podešena je pH vrednost uzoraka model rastvora na 7,0±0,2. Potom, pomenuti uzorci model rastvora sa analitima razblaženi su na 50, 25, 12,5, 6,25 i 3,25% u odnosu na originalne koncentracije. Nakon toga natrijum hlorid je rastvoren u suspenziji kako bi se ostvarila koncentracija od 2% u odnosu na NaCl. Inokulum luminiscentnih bakterija pripremljen je u skladu sa standardom i dodat svakom uzorku pojedinačno. Nakon inkubacionog perioda od 30 minuta merena je luminiscencija bakterija primenom uređaja BioFix Lumi-10. Ostvareni rezultati su pokazali da je maksimalna inhibicija luminiscentnih bakterija ostvarena 4. dana u iznosu od 99,44% pri razblaženju suspenzije od 50%. Trend opadanja je bio prisutan, te je inhibicija luminiscentnih bakterija u okviru 14. dana iznosila 3,99% pri razblaženju suspenzije od 50%. Na osnovu ovih rezultata može se zaključiti da se smanjena toksičnost model rastvora bisfenola A i nonilfenola može postići nakon dve nedelje primene fitoremedijacije upotrebom biljne vrste *Eichhornia Crassipes*.

**KLJUČNE REČI:** biotoksičnost, *Aliivibrio fischeri*, endokrini ometači, fitoremedijacija otpadnih voda





## PHYTOREMEDIATION OF WASTEWATER AS A TECHNIQUE FOR REDUCING THE BIOTOXICITY OF ENDOCRINE DISRUPTORS TO *ALIIVIBRIO FISCHERI*

Katarina Antić<sup>1</sup>, Marija Lješević<sup>1</sup>, Jelena Milić<sup>1</sup>, Milena Stošić<sup>2</sup>, Jelena Radonić<sup>2</sup>,  
Tatjana Šolević Knudsen<sup>1</sup>

*1 Institute of chemistry, technology and metallurgy, Department of chemistry,  
University of Belgrade, Belgrade, Serbia*

*2 University of Novi Sad – Faculty of technical sciences, Department of environmental engi-  
neering and occupational safety and health, Novi Sad, Serbia*

A phytoremediation experiment using the plant species *Eichhornia Crassipes* in a model solution containing bisphenol A and nonylphenols was conducted in laboratory conditions over 14 days. Two liters of the model solution were collected on the fourth and fourteenth days. An acute toxicity detection test utilizing the Gram-negative bioluminescent bacteria *Aliivibrio fischeri* was used to evaluate the biotoxicity of the model solution samples during the phytoremediation method. Toxicity measurements were performed according to SRPS ISO 11348-3 standard using freeze-dried *Aliivibrio fischeri* bacteria. The bacteria used in the assays were BioFix® Lumi luminescent bacteria acquired from Macherey-Nagel GmbH & Co., Düren, Germany.

The pH of the model solution samples was adjusted to  $7.00 \pm 0.2$  using potassium hydroxide. The model solution samples were diluted to 50, 25, 12.5, 6.25, and 3.25% of the initial concentration. Then, sodium chloride was dissolved in the aforementioned solutions to obtain a 2% NaCl concentration. The luminescent bacteria inoculum was prepared and added to each sample. After 30 min of incubation, the luminescence of the bacteria was measured by a BioFix Lumi-10 toxicity analyzer. The results showed that the maximum inhibition of luminous bacteria was attained on the fourth day and equaled 99.44%, at 50% dilution. The inhibition of luminous bacteria showed a declining trend and on the 14th day reached 3.99%, at 50% dilution. According to these results, two weeks of phytoremediation utilizing the plant species *Eichhornia Crassipes* can reduce the toxicity of the model solution of bisphenol A and nonylphenols.

**KEYWORDS:** biotoxicity, *Aliivibrio fischeri*, endocrine disruptors, phytoremediation of wastewater



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## International Standard Book Number (ISBN)

*Assigned number*

**ISBN-978-86-917867-3-1**

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**PRESENT AND FUTURE OF TOXICOLOGY:  
CHALLENGES AND OPPORTUNITIES**

**10 - 12 May, 2023  
Belgrade**