

EMEC 22

22nd European Meeting on
Environmental Chemistry

BOOK of ABSTRACTS

5 – 8 December, 2022,
Ljubljana, Slovenia



Univerza v Ljubljani
Zdravstvena fakulteta



ASSOCIATION OF
CHEMISTRY AND THE
ENVIRONMENT





University of Ljubljana
Faculty of Health Sciences



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Environmental Chemistry**

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**Book of Abstracts: 22nd European Meeting on Environmental Chemistry
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ENVIRONMENTAL CHEMISTRY
PROGRAMME**

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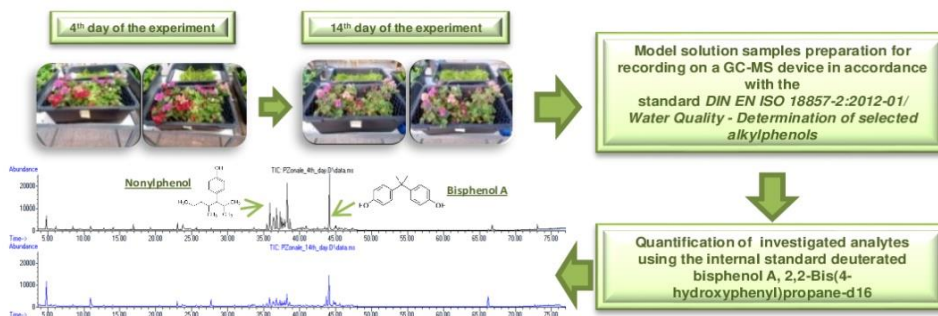
Session Topic	Poster Title	Presenting Author	Board Number
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Phytotoxicity of Endocrine Disruptors Nonylphenol and Bisphenol A in *Pelargonium Zonale*

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Introduction

The phytotoxicity of individual plant species utilized in phytoremediation systems must be assessed in order to improve the systems [1]. This study investigated the phytotoxicity of endocrine disruptors Nonylphenol and Bisphenol A in the plant species *Pelargonium Zonale*.

Materials and methods

The research was conducted over a 14-day period in a model solution under laboratory settings. Greenhouse conditions were reproduced, with a temperature ranging from 20 to 30 °C and an air humidity of 45 %.

The model solution, which consisted of 20 L of tap water and 2 L of Hoagland's solution with a pH of 6.8, was placed in plastic trough. The plastic trough was then filled with 1 kg of *Pelargonium Zonale* seedlings secured with a metal mesh to ensure semi-submerged conditions. Finally, the model solution was spiked with 2 mg each of Nonylphenol, Tech. and Bisphenol A, 99+ %, standard solutions made by Sigma-Aldrich, diluted in 3 mL of Methanol. Aeration was added into the system utilizing a Champion CX-0098 air pump on the third day of the experiment. After the experiment was set up, 2 L of model solution was sampled on the fourth and fourteenth days.

The model solution samples were prepared for analysis on a GC-MS device in accordance with the standard DIN EN ISO 18857-2:2012-01. The investigated analytes were quantified using the internal standard *deuterated bisphenol A, 2,2-Bis(4-hydroxyphenyl)propane-d16*.

Results

Following the completion of the 14-day experiment, the efficiency of removing the Bisphenol A from the model solution using the plant species *Pelargonium Zonale* was 74 %, while the efficiency of removing Nonylphenol was 67 %. The course of reduction of the concentrations of the analysed analytes during the experiment is detailed in **Table 1**.

Table 1. Reduction of the concentrations of the analysed analytes during the experiment

	C _{BPA} [mg L ⁻¹]	C _{NP} [mg L ⁻¹]
0. day	0.091	0.091
4. day	0.030	0.046
14. day	0.024	0.030

On the final day of the experiment, phytotoxicity characteristics such as leaf speckling, leaf margin necrosis (browning) and chlorosis (yellowing), leaf cupping, plant stunting, and even mortality of a few seedlings were observed.

Conclusion

The experiment demonstrated a considerable degree of phytotoxicity as well as a high success rate in reducing the concentrations of Bisphenol A and Nonylphenol utilizing the plant species *Pelargonium Zonale*, whose optimization for the goal of application requires additional testing.

References

[1] J.-M. Kim, J. Ha, K.-H. Kim, T. Lee, J. Heo, J. Jung, J. Lee, S. Kang (2021) *Journal of Pesticide Science*, 46(2), 168-172.



EMEC22 – 22nd European Meeting on Environmental Chemistry took place in Ljubljana, Slovenia between the 5th and the 8th of December 2022. It was organised by the Faculty of Health Sciences, University of Ljubljana, Slovenia, on behalf of the Association of Chemistry and the Environment (ACE).

This period is traditionally reserved for EMEC conferences – previous conferences took place all over Europe:

2021 Novi Sad, Serbia | 2020 cancelled due to Covid19 | 2019 Lodz, Poland | 2018 Clermont Ferrand, France | 2017 Porto, Portugal | 2016 Inverness, UK | 2015 Torino, Italy | 2014 Brno, Czech Republic | 2013 Budva, Montenegro | 2012 Moscow, Russia | 2011 Clermont Ferrand, France | 2010 Portorož, Slovenia | 2009 Limoges, France | 2008 Girona, Spain | 2007 Inverness, UK | 2006 Brno, Czech Republic | 2005 Belgrade, Serbia | 2004 Bari, Italy | 2003 Plymouth, UK | 2002 Geneva, Switzerland | 2001 Dijon, France | 2000 Nancy, France

The main objectives of EMEC conferences are to bring together scientists, senior and early-career, working in the field of environmental chemistry and related disciplines to report on the latest advances in their fields in the form of oral and poster presentations and rich scientific discussions. Social events between the scientific sessions provide a great opportunity to develop networks among researchers.

EMEC22 included a rich scientific programme, including sessions on Solid matrices, Water, Atmosphere, Sustainable development, and One health. Additionally, social events – Get together, Gala dinner, tours to Bled, Ljubljana and Ljubljana Castle, as well as Early-Career Researcher workshop and social, provided ample opportunity for informal friendly and scientific exchanges, and hopefully long-lasting friendships and collaborations. This Book of Abstracts contains abstracts of works presented in oral and poster presentations at EMEC22, as well as abstracts of renowned plenary speakers and cutting-edge keynote lectures.