ABSTRACT BOOK

SETAC SciCon

SETAC Europe 30th Annual Meeting

Open Science for Enhanced Global Environmental Protection

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Society of Environmental Toxicology and Chemistry Europe (SETAC Europe)

ABSTRACT BOOK
SETAC Europe 30th Annual Meeting

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This book compiles the abstracts from the platform and poster session presentations at the 30th Annual Meeting of the Society of Environmental Toxicology and Chemistry - Europe (SETAC Europe), conducted as a virtual conference, from 3–7 May 2020.

The abstracts are reproduced as submitted by the author and accepted by the Scientific Committee. They appear in order of abstract code and alphabetical order per presentation type. The poster spotlight abstracts are included in the list of poster abstracts. The presenting author of each abstract is underlined.

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SOCIETY OF ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY

In the 1970s, no forum existed for interdisciplinary communication among environmental scientists, biologists, chemists, toxicologists, managers, engineers or others interested in environmental issues. The Society of Environmental Toxicology and Chemistry (SETAC) was founded in North America in 1979 to fill the void, and quickly saw dynamic growth in the Society's membership, meeting attendance and publications.

A unique strength of SETAC is its commitment to balance the scientific interests of government, academia and business. The Society by-laws mandate equal representation from these three sectors for officers of the World Council and Geographic Unit Boards of Directors and Councils, and in the composition of committees and other society activities. The proportion of members from each of the three sectors has remained nearly equal over the years.

The Society is concerned about global environmental issues. Its members are committed to Environmental Quality Through Science®, to timely and effective communication of research, and to interactions among professionals so that enhanced knowledge and increased personal exchanges occur. Therefore, SETAC publishes two globally esteemed scientific journals and convenes annual meetings around the world, showcasing cutting-edge science in poster and platform presentations. Because of its multidisciplinary approach, the scope of the science of SETAC is broader in concept and

application than that of many other societies.

SETAC's growth is reflected in the founding of geographic units around the world. SETAC Europe was established in 1989 as an independent organisation, followed by SETAC Asia-Pacific in 1997 and SETAC Latin America in 1999. In 2002, the four existing organisations joined together under the governance of the SETAC World Council. SETAC Africa is the most recent geographic unit, which was adopted in 2012. As evidence of international acceptance of the SETAC model and of the great interest at the local level, regional chapters and branches have emerged in a number of countries.

SETAC publishes two journals: Environmental Toxicology and Chemistry (ET&C) and Integrated Environmental Assessment and Management (IEAM). Environmental Toxicology and Chemistry is dedicated to furthering scientific knowledge and disseminating information on environmental toxicology and chemistry, including the application of these sciences to risk assessment. Integrated Environmental Assessment and Management focuses on the application of science in environmental decision-making, regulation, and management, including aspects of policy and law, and the development of scientifically sound approaches to environmental problem solving. Together, these journals provide a forum for professionals in academia, business, government, and other segments of society involved in the use, protection, and management of the environment for the enhancement of ecological health and human welfare.

SETAC books provide timely in-depth reviews and critical appraisals on scientific subjects relevant to understanding a wide range of contemporary topics pertaining to the environment. These include any aspect of environmental chemistry, toxicology, risk assessment, risk management, or environmental policy.

SETAC has two administrative offices, in Pensacola, Florida, USA, established in 1992, and in Brussels, Belgium, established in 1993.

haemocytes subpopulations in *M. edulis* was also identified using flow cytometry. Granulocytes and hyalinocytes were recorded as the main population composed by cells with a high and intermedia internal complexity and larger size, while a smaller population composed of blast-like cells was characterized by a smaller size and complexity. In a second step, haemocytes' basal functional, physiological and immunological responses were evaluated in terms of haemocyte mortality, cell viability, reactive oxygen species (ROS) formation, cellular and mitochondrial membrane potential and lipid peroxidation (LPO) using flow cytometry. Results obtained showed that in general hyalinocytes exhibited higher oxidative (ROS formation and LPO), metabolic and membrane activities (cellular and mitochondrial), followed by granulocytes and blast-like cells. Overall, the methodological approach used in this study was successful in differentiating the different morphological, biochemical and physiological characteristics of mussel haemocytes subpopulations. In addition, these results will serve as a first step to develop fast, accurate and reliable biological endpoints for use in environmental hazard assessment covering a wide array of cellular functions in *M. edulis* haemocytes.

6.02P.9
Effects on marine planktonic species under temperature changes and oxyfluorfen exposure
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The exponential increase of human population demands an over usage of fertilizers and pesticides in agriculture practices to supress the food production needs. Still, the excessive use of these compounds can comport deleterious effects to the ecosystems (e.g. biodiversity losses) and damage to the public health. Herbicides are highly used and have the ability to bioaccumulation on primary producers with proliferation along the trophic chain. Oxyfluorfen is a fluorine-based herbicide that acts by inhibition of protoporphyrinogen (PP) oxidase (PPO). The oxyfluorfen application has increased, since nowadays these non-selective and of broad-spectrum herbicide is seen as an alternative to control the glyphosate resistant weeds. The PPO activity inhibition and consequent accumulation of PP in the chloroplasts with leakage to the cytosol lead to a great production of single oxygen. Hydrogen of the unsaturated lipids is extracted, lipid radicals are produced and a chain reaction of lipid peroxidation begins, resulting in damage on cell membrane, occurring fast disintegration of organelles and cells and in last state the cell death. Few studies are dedicated to the evaluation of the oxyfluorfen effects on a set of species. Thus, this work pretends to evaluate the effects of temperature variations and oxyfluorfen exposure on the sensitiveness of two marine species, a diatom *Thalassiosira weissflogii* and a copepod *Artemia franciscana*. Acute bioassays were performed during 96h to the diatoms and 48h to the copepods, both at 15ºC, 20ºC and 25ºC. The organisms were exposed to a range of 8 concentrations (1-18 µg/L and 0.05-1.2 mg/L, respectively) plus a negative and a solvent control. Lethal concentrations were determined to both species and to different temperatures (*T. weissflogii*: LC_{50}(15ºC)=2.31(1.44-3.17) µg/L; LC_{50}(20ºC)=3.22(2.60-3.84) µg/L; LC_{50}(25ºC)=8.74(7.98-9.49) µg/L; *A. franciscana*: LC_{50}(15ºC)=1.107 (0.942-1.383) mg/L; LC_{50}(20ºC)=1.019(0.708-1.939) mg/L; LC_{50}(25ºC)=0.853(0.548-1.832) mg/L). Results show the diatoms are more tolerant to oxyfluorfen under higher temperatures, whereas the brine shrimp present an opposite, trend. Main conclusions are that with the raise of temperature, and under chemical stressors, primary producers seem to be more tolerant than primary consumers with severe consequences to the trophic chain and to ecosystem water quality in cases of long exposure.

Marine and Freshwater Pelagic and Benthic Harmful Algal Blooms: Toxins Production, Detection, Fate, Effects, Monitoring and Management (P)

6.03P.1
Early detection of cyanotoxin threat in freshwater bodies by quantitative PCR
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Increased frequency of cyanobacterial blooms, caused by rising temperatures and eutrophication, is creating a growing need for reliable methods for early cyanotoxin threat detection in water bodies. Current methods are time-consuming and sensitive to taxonomic inconsistencies. On top of that, they only enable detection of potentially toxin-producing cells when they have already multiplied to a relatively large number. To develop a tool for earlier detection of potentially toxic cyanobacterial strains, we are using qPCR to target genes involved in crucial parts of cyanotoxin synthesis. Detection and quantification of these genes, if incorporated in regular monitoring, might serve as an early warning in case of increased potential for cyanotoxin production. Toxins and genes of interest in this study are microcystins (mcyE), saxitoxins (sxtA) and cylindrospermopsins (cyrJ). The analyses will be carried out on 28 phytoplankton and 23 phytobenthos samples from 15 different freshwater bodies in Slovenia. This way we will include also understudied benthic cyanobacteria and their ability to produce toxic metabolites. Results will be compared with taxa list obtained by traditional microscopic identification methods and with cyanotoxin content evaluated by LC-MS/MS. The study has a potential to prepare the ground for improving current monitoring programs by complementing them with highly sensitive molecular methods. This can provide more in-depth information about dynamics of toxic cyanobacterial populations in water bodies and thus help with adopting appropriate mitigation strategies.

6.03P.2
Experimental approach to understand aerosolization mechanisms of toxins produced by the microalga Ostreopsis cf. ovata
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Blooms of the benthic dinoflagellate *Ostreopsis* cf. *ovata* have been related to mild but acute respiratory symptoms on people exposed to marine aerosols in some Mediterranean and Brazilian beaches. These disorders have been attributed -but not proven yet- to palytoxin (PLTX) analogues (ovatoxins -OVTX- and isobaric palytoxin -isoPLTX-) produced by *Ostreopsis*. However, these compounds have been seldom found in the aerosol and when detected it was not associated to human health impacts. To shed light on the mechanisms of toxin production and transfer to the atmosphere five laboratory experiments were run using an aerosol generation tank with microbial communities obtained during the peak of an *Ostreopsis* bloom.Seawater and aerosol samples were analyzed for i) toxin concentration (with an UHPLC system coupled to a Q–Exactive Orbitrap Fourier–Transform Mass Spectrometer (FTMS) equipped with a heated–electrospray ionization source (H-ESI) operating in positive ion mode using a Hypersil GOLDTM C18 column (100 mm x 2.1 mm id., 1.9 µm particle size) packed with totally-porous silica particles, under a gradient elution of acetonitrile:water (0.1% formic acid) mobile phase), and ii) offline spectroscopic analysis performed by nuclear magnetic resonance (NMR).Toxins were detected in seawater samples and in atmospheric aerosol generated in all experiments. Unexpectedly, higher toxin concentrations (49-69 pg·Lair–1) were found in the aerosols generated by bubbling relatively low *Ostreopsis* cells abundances and toxins in the water (respectively, ca. 105 cells·L–1, 4 x 106 pg·Lwater–1), compared to the ones (3-4 pg·Lair–1) obtained on higher biomass abundance experiments (1 x 106 cells·L–1 and 2 x 108 pg·Lwater–1, respectively). The toxin profile in the air contained OVTX-a and b only, while other forms (OVTX-c, d, e and isoPLTX) were also present in the water. Moreover, NMR analysis showed different composition of the particulate organic carbon in the water (*Ostreopsis* cells and accompanying microbiota) and bubble bursting aerosols, suggesting selectively transfers of organic compounds from seawater into the atmosphere. High foam content was also observed in the water surface of the tank. Overall, these experiments constitute a first step to understand the ecophysiogical microalgae responses to bubble bursting as well as the complex air-sea dynamics in the surface microlayer likely regulating aerosol production and diffusion of the marine toxins in the atmosphere.

Modern Approaches to Assessment and Management of PFAS: A Science-Policy Dialogue (P)

6.04P.1
Environmental Sources, Analyses, Chemistry, Fate & Transport of Per- and Polyfluoroalkyl Substances - Workgroup Summary, Output, Conclusions and Implications from the 2019 SETAC Focused Topic Meeting
S. Korzeniowski, FluoroCouncil; M. Mills, U.S. Environmental Protection Agency / Office of Research & Development; J. Guelfo, Texas Tech University / Civil, Environmental, and Construction Engineering
The overall objectives of the SETAC focused topic meeting (FTM; August 2019) were two-fold: 1) to review new and emerging information on PFAS chemical classification and grouping, environmental chemistry, detection technology, fate and transport, exposure potential, human health toxicity, and ecological toxicity and 2) to harness the expertise of eminent scientists from around the globe with the goal of developing a risk assessment approach that considers mechanistic (including computational) approaches for extrapolating exposure and effects across different scenarios/species and compounds within environmental pathways for exposure. This workgroup included several presentations and a subsequent breakout group that identified fundamental aspects of the current state of the science, critical knowledge gaps, and future research needs. The major

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