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Abstract Book

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Society of Environmental Toxicology and Chemistry Europe (SETAC Europe)

ABSTRACT BOOK
SETAC Europe 29th Annual Meeting

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This book compiles the abstracts from the platform and poster session presentations at the 29th Annual Meeting of the Society of Environmental Toxicology and Chemistry- Europe (SETAC Europe), conducted at the Messukeskus Helsinki, Expo and Convention Centre, Helsinki, Finland, from 26–30 May 2019.
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

there is some evidence that nanoplastics can enter living cells and bioaccumulate. The objective of this study is to experimentally determine at which size threshold plastic particles may be able to cross the walls of the digestive tract of living organisms, and thus enter cells and bioaccumulate. A test is performed with one-week old adult *Daphnia magna individuals*, in glass beakers with 100 ml ASTM medium and polystyrene nanoparticles of 20, 50, 100, 200, 500, 1000 nm diameter, labeled with Fluorescein. The test is performed in duplicate. The approximated concentration of particles in the test medium ranges from about 10^6/ml (1000 nm diameter particles) to about 10^{11}/ml (20 nm diameter particles). The animals are exposed for 48 hours (three specimens) and 96 hours (three specimens) in order to allow the ingestion of plastic particles in sufficient amounts and to be translocated to other tissues and organs inside the animal. *D. magna* are fed with *Pseudokirchneriella subcapitata*. The specimens collected after 48 hours and at the end of the experiment are sacrificed and fixated with formalin. The presence of plastic particles in the digestive tract and in tissues is examined with Confocal Laser Scanning Microscope (CLSM) to evaluate the bioaccumulation capability of different plastic particles. The results of this study may contribute to the development of a more relevant definition to assess the risks of nanoplastics for ecosystem's and human health

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What's on the outside matters - surface charge and transformations affect toxicity of polystyrene nanoparticles to C. elegans

C.L. Schultz, Centre for Ecology and Hydrology; J. Baas, D. Spurgeon, Centre for Ecology & Hydrology

With increasing concern about the occurence of plastic particles in the environment, the need to identify the physicochemical properties influencing their toxicity has been recognised. Whether materials at the nanoscale are released as particulates or occur through the weathering of larger plastics once in the environment, they are subject to (further) transformations in waste streams and natural systems. Initially, such processes likely occur at the particle surface through the attachment of molecules present in these systems, thus altering the interactions at the bio-nano interface. Investigating particles with varying surface coatings may shed light on the influence of such interactions on observed toxic effects. In this study, we tested the toxicity of 50nm polystyrene nanoparticles with different surface charges on life history traits of the nematode *Caenorhabditis elegans*. Exposures were carried out from egg and nematode lifespan, growth and reproduction measured over time. Differences in the toxic effects of the pristine materials were established. Positively charged (amine coated) particles were found to exert the greatest toxicity, followed by the neutral (unfunctionalised) particles, whereas negatively charged (carboxyl coated) particles did not influence nematode fitness at the tested concentrations. Further, the aim of this study was to understand how the absolute and relative toxicity of nanomaterials with different starting characteristics change once they have been aged in soil pore waters, in particular how environmental transformations may lead to a convergence of observed toxicities as compared to those of pristine forms under standard laboratory test conditions. To address this, in addition to the assays with "pristine" particles, exposures will be conducted with nanoparticles incubated in pore waters extracted from a field soil for a week prior to testing. Dynamic energy budget toxicity (DEBtox) modelling will be applied to analyse toxic responses with regard to resource allocation. The DEBtox approach uses time resolved data to derive toxicity parameters, e.g. the no effect concentration, which can be used to compare the effects of particle surface properties within each test condition as well as across the pristine and aged exposures. Together, this data will be used to provide insights into the influence of surface coatings and changes thereof in natural systems on nanoplastic toxicity and associated processes.

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Poster spotlight

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Fate and Effects of Metals: Advances in Metals Risk Assessment and Regulatory Guidance (III)

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MONITOOL: new tools for monitoring the chemical status in transitional and coastal waters under the Water Framework Directive

I. Mentxaka, FUNDACION AZTI / Marine Research; B. White, DCU Water Institute, Dublin City University / Chemical Sciences; I. Amouroux, Cellule ARC-IFREMER / Département Biogéochimie et Ecotoxicologie; M. Belzunce Segarra, AZTI Foundation / Marine Research; P. Bersuder, Centre for Environment, Fisheries and Aquaculture Science (Cefas); A. Bettoschi, Department of Medical Sciences and Public Health; T. Bolam, Marine Research Division, AZTI-Tecnalia; M. Caetano, IPMA I.P.; I. Carvalho, M.M. Portela Correia dos Santos Romao, Centro de Química Estrutural, Instituto Superior Técnico; J. Franco, AZTI Foundation / Marine Research; J. Gonzalez, S. Guesdon, IFREMER, Département Biogéochimie et Ecotoxicologie; J. Larreta, AZTI Foundation / Marine Research Unit; B. Marras, Department of Medical Sciences and Public Health, University of Cagliari; B. McHugh, Marine Institute; D. Merkel, Scottish Environmental Protection Agency; V. Millán Gabet, Departamento de Agua, Instituto Tecnológico de Canarias; N. Montero, Department of Medical Sciences and Public Health, University of Cagliari; M. Nolan, DCU Water Institute, School of Chemical Sciences; O. PERCEVAL, French National Agency for Water and Aquatic Environments / Research and Development Directorate; f. Regan, Dublin City University / Chemical Sciences; C. Robinson, Marine Scotland Science / National Health and Environmental Effects Research Laboratory; M. Rodrigo Sanz, Departamento de Agua, Instituto Tecnológico de Canarias; J. Rodríguez, AZTI Foundation; N. Rosa, IPMA, Portuguese Institute for Sea and Atmosphere; M. Schintu, University of Cagliari / Dipartimento di Sanità Pubblica, Medicina Clinica e Molecolare

1. Introduction MONITOOL[1] is a European project formed by 17 Partners covering the Atlantic region from the Canary Islands to the Scottish Highlands and Islands, and one Partner from the Mediterranean region. The main driver of this project is to respond to European Water Framework Directive (WFD)(2000/60/EC) demands for the assessment of the chemical status (CS) of transitional and coastal waters. The WFD establishes that the CS of water bodies must be determined by the comparison of the concentrations of priority substances with Environmental Quality Standards (EQSs), mainly based on the collection of spot water samples. Diffusive Gradient in Thin Films (DGT), and passive samplers (PS), in general, are already widely used in investigative monitoring and there is an interest in their use in the context of the WFD. The main barrier hindering the regulatory acceptance of PS is the lack of appropriate EQS: EQSs in water are defined in the dissolved fraction, preventing the use of DGT-labile concentrations. Thus, the overall objective is to adapt the already existing EQSs for water to those for DGTs, enabling their use for regulatory monitoring. 2. Materials and methods In 2018, two campaigns were carried out in winter (rainy season) and in summer (dry season); simultaneous deployment of DGTs and high-frequency collection of spot water samples were carried out. The sampling campaigns were performed in 4 selected sites (transitional and coastal sites) in each of the 8 European regions (32 sites in total). At the estuarine sites, water samples were taken every day in high and low tide during the DGT deployment period (5 days). All partners used the same DGT supplier and followed the same sampling and analysis protocol. Physico-chemical parameters in water were measured every sampling day. Priority metals (Cd, Ni, Pb) and other specific metals (Al, Ag, Cu, Cr, Co, Fe, Mn, Zn) were analysed in waters and in the DGT resins. **3. Preliminary results** From winter campaign, 230 seawater samples and 140 DGT samples from the 8 consortium regions were analysed. Physico-chemical data and metal concentration results are being collected in a common data base. Preliminary statistical analysis were applied to first results to study relationships between metal concentrations in DGT and in spot water samples. In a final step, suitable EQS for DGTs will be calculated based on the statistical relations obtained previously. [1]https://www.monitoolproject.eu/

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Evaluation of Effects Based Methods for Regulating Metals in Aquatic Ecosystems

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The European Union is currently evaluating the use of Effects Based Methods (EBMs) as part of a more integrative strategy for regulating a number of substances of concern under the Water Framework Directive. This paper evaluates the use of thirteen EBMs that have potential for being applicable for the regulation of metals. Each EBM was evaluated with respect to three criteria: a) metal specificity and sensitivity; b) sensitivity to other classes of toxicants; and c) the strength of the relationship between effects measured by the EBM and effects observed at higher levels of biological organization, such as the individual or population level. The evaluation concluded that none of the EBMs evaluated met all three criteria. The current EU approach of regulating metals is based on Environmental Quality Standard (EQS) assessments (where necessary and where possible, corrected for bioavailability). This approach is sensitive only to metals and has strong links to effects at the individual and population level. It does not, however, consider the integrated effects of metal mixtures on aquatic systems. Given the lack of suitable EBMs for metals, one recommendation would be the continued development of bioavailability models for predicting the toxicity of metal mixtures. Such bioavailability-based metal-mixture models may be the most effective way to achieve the goal of a more holistic approach for regulating metals in aquatic ecosystems.

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Correcting for metal bioavailability in European freshwaters: where do the data come from to make this happen?

I.A. Wilson, A. Peters, G. Merrington, wca; A.C. Ryan, Windward Environmental LLC; B.A. Stubblefield, Oregon State University / Environmental and Molecular Toxicology

In this presentation we will outline the process and outputs from a project in which we have collated and assessed data collected by member states for freshwaters across Europe from which bioavailability correction can now be

Bruneau, A. Chatel, Catholic University of the West / UBL, Mer Molécules Santé; C. Mouneyrac, Université Catholique de lOuest / UBL, Mer Molécules Santé
The Seine estuary plays an important ecological and socio-economic role but is also the most stressed estuary in France. The northern mudflat of the Seine estuary is continuously subjected for long time to complex environmental stressors, such as chemical pollution and physical modifications such as harbor construction (*e.g.* the construction of "Port 2000" from 2001 to 2005). To assess the potential effect of those stressors (both natural and anthropogenic), in the last decade, monitoring programs focused on the integrative quality assessment of this vulnerable natural habitat using the endobenthic worm *Hediste diversicolor* as sentinel species (*e.g.* The National French Program of Ecotoxicology "PNETOX"). It seems now a necessity to collect and compare data from anterior programs in order to evaluate the environmental status of this site as well as the relevance of indigenous populations as an appropriate environmental quality tools. In this context, the aim of the present study was to compare potential links between individual fitness (growth, allometric relationships, energy reserves, reproduction status) and population changes (density, biomass and populations dynamics endpoints) in worms (*H. diversicolor*) seasonally collected during "the Port 2000" construction (2002-2004) and fourteen years after (2018). The modal decomposition of size distribution frequencies revealed that during the first period (2002-2004), *H. diversicolor* populations were characterized by a unique cohort and consequently, a single-modal recruitment of juvenile worms. In contrast during 2018, population analysis demonstrated the existence of two simultaneous cohorts and a bi-modal recruitment. Worms density was generally lower in 2003 and 2004 as compared to current (2018) density whereas an inverse pattern was observed for biomass. Individual growth parameters (L3 and weight) did not show any significant differences between sampling periods. Allometric relation-ships and energy reserves comparisons between the two studied periods are actually in progress. Preliminary results, issuing from linking individual fitness to populations changes could be indicate an amelioration of the environmental quality of the Seine estuary northern mudflat after the combined stress episode (2002-2004). The overall results demonstrate the relevance of using *H. diversicolor* population's endpoints for the environmental assessment of estuarine ecosystems in a combined stressors context.

TU043
Nutrient pollution determines membrane lipid profile of coral responded to ambient warming
C. Tang, National Museum of Marine Biology and Aquarium / Department of Biology; C. Lin, National Taiwan University / Institute of Environmental Health; W. Wang, National Sun Yat-Sen University / Department of Marine Biotechnology and Resources
Thermal stress causes mass coral bleaching and mortality. Nutrient pollution altering coral physiology increases the risk of health. Membrane lipids constitute the basic structural element to create cell a dynamic structure according to the circumstance. Characterizing the lipid profile of coral responded to environmental factors could give an insight into the mechanism of effect. Glycerophosphocholine profiling of the coral Seriatopora caliendrum responded to warming conditions (28–32?) under different nitrate loadings (0.05–0.5 mg/L as N) was performed using a lipidomic methodology. The symbiotic alga-related physiological factors of the coral were altered by increased nitrate, warming stimulation and the interaction. Warming-induced lipid variations in the coral were well modeled based on the incubated temperature according to the nitrate loading. Based on the physicochemical properties, the commonly changed lipids logically indicated a membrane accommodation relating to ambient warming and the induced photophysiological change in the coral. The changed lipids specific to the exposure loading of nitrate suggested a cause increasing the health risk of the coral. Although the increased nitrate alone did not induce a pronounced change in lipid metabolism of the coral, in conclusion, the effect was identified while acts with a warming condition.

TU044
ECORISK2050: Effects of global change on the emission, fate, effects and risks of chemicals in aquatic ecosystems.
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By 2050, the world population will reach nine billion people and three quarters of the global population will live in cities. The development path to 2050 will be marked by shifts in land-use and weather patterns, and by changes in the way water and food resources are obtained and managed all over the world. These global changes (GCs) will affect the emissions, environmental transport pathways and fate of chemicals, and thus affect the exposure of the natural environment to chemicals. Future changes may also alter the sensitivity of ecosystems to chemical exposure. Therefore, the ECORISK2050 project brings together a world leading and interdisciplinary consortium of universities, research institutes, industry and regulatory and governmental authorities to deliver a cohort of Early Stage Researchers (ESRs). The coupled training goals and research objectives of the project are: (1) to assess how the inputs of chemicals from agriculture and urban environments and their fate and transport are affected by different environmental conditions, including those of specific EU regions, and how this will change under GC scenarios in order to assess the likely increase in chemical risks to human and ecosystem health; (2) to identify potential adaptation and mitigation strategies that can be implemented in the short and medium term, to abate unacceptable changes in risks, and use the GC scenarios to propose robust implementation pathways, and (3) to develop a set of tools for use by industry and policy makers, that allow the impacts of a range of GC-related drivers on chemicals risks to be assessed and managed. The project will deliver the next generation of scientists, consultants and industry and governmental decision-makers who have the knowledge and skill sets required to address the changing pressures that chemicals emitted by agricultural and urban activities pose to aquatic systems on the path to 2050 and beyond.

TU045
Anionic Herbicides: Using IAM chromatography to determine if acute effect concentrations to aquatic organisms are below baseline-toxicity
S. Droge, University of Amsterdam/IBED Institute / IBED
Many herbicides are acidic compounds, the most notorious one probably 2,4-D (pKa 2.7, logD7.4 -0.8, soil half life 34d). Several of these herbicides have relatively long aerobic half-lifes in soil, extending the PMT limit of >40 days. Due to the low pK_a, these herbicides are present predominantly in their anionic form in most environmental systems. This makes these compounds highly mobile. Of course, herbicides are meant to be specifically toxic to certain types of plants they are meant to control. As such, many anionic herbicides fit the criteria of PMT compounds. For the strict regulation dossiers of pesticides, these compounds are widely tested for toxicity to non-target species, particularly covering several taxa of aquatic organisms. It makes sense that many herbicides could be toxic to algae, but to what extent are they toxic to invertebrates and fish? All organic chemicals, including ionogenic compounds, have a baseline toxicity that is induced at a critical accumulate level in cell membranes, called the critical membrane burden (CMB). Ideally, a herbicide is specifically toxic to certain plant species, and exert no specific toxicity to any non-target organism other than the baseline toxicity any organic chemical presents (alone or in a mixture). In this study, we evaluated the affinity of 10 anionic herbicides to bind to cell membranes (K_{MW}) using a chromatographic column coated with immobilized phosphoplipids (IAM-HPLC). Using the obtained K_{MW}, the narcotic effect concentration ($LC_{50,narc}$) was predicted based on a critical narcotic cell membrane burden of 50-200 mmol/kg. The $logK_{MW,IAM}$ values were orders of magnitude higher than logD values. The predicted baseline $LC_{50,narc}$ values closely correspond for many herbicides to acute LC_{50} for daphnids and fish, while algae are effected by 1-4 orders of magnitude lower. This distinguishes the herbicide specificity. Exception is dinoseb, a known uncoupler of oxidative phosphorylation, which shows even higher toxicity to fish that to algae. This evaluation may inform regulators on the non-specificity of anionic herbicides to non-target organisms beyond a logD approach. It additionally relates to the potential pressure of the compound to the total toxicant stress of chemical mixtures in contaminated environments.

Towards a Sustainable Development of River-Sea Systems (RSS) and Coastal Areas (P)

TU046
MONITOOL: New tools for monitoring the chemical status in transitional and coastal waters under the Water Framework Directive
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Clinica e Molecolare
In highly dynamic systems, such as transitional and coastal waters, establishing their chemical status is challenging. MONITOOL is an exciting European project consisting of 16 Partners covering the Atlantic region from the Canary Islands to the Scottish Highlands and Islands, which aims to address this complex analytical challenge, responding to European Directive [1] demands for the assessment of the chemical status of transitional and coastal waters. Diffusive Gradient in Thin Films (DGT), and passive samplers (PS), in general, are already widely used in investigative monitoring and there is an increasing interest in their use for the environmental assessment of water bodies, within European policies requirements. The main barrier hindering the regulatory acceptance of PS for compliance checking is the lack of appropriate Environmental Quality Standards (EQS). EQSs for metals are defined in the dissolved fraction, preventing the use of DGT-labile concentrations for the establishment of the chemical status of water bodies. The MONITOOL Project aims to define suitable EQS to allow for the use DGT devices [2] for the monitoring of these priority metals in a regulatory context. DGT design allows for the continuous accumulation of metals *in situ*, and subsequent quantitation via methods such as ICP-MS. While many of the chemical aspects of the devices have been well studied [3], effects of environmental physicochemical parameters on the functionality of the devices has not been examined in detail. Five-day deployments of DGT devices, alongside spot sampling and physicochemical parameter measurement, will be conducted in both wet and dry seasons in coastal and transitional waters of the North Atlantic coast. The first sampling campaigns were performed during winter 2017/2018 in 4 selected sites (transitional and coastal sites) in each consortium region (8 regions). All partners followed the same protocol for sampling and analysis to minimize the operational variability. Priority metals (Cd, Ni, Pb) and other specific metals (Al, Ag, Cu, Cr, Co, Fe, Mn, Zn) were analysed in waters and in the DGT resins. Statistical analysis is being applied to study relationships between metal concentrations in DGT and in spot water samples. Suitable EQS for DGTs will be calculated on basis the statistical relations obtained previously. This will permit a better implementation of the Water Framework Directive in variable systems like transitional and coastal waters.

TU047
The exposure of glyphosate and copper affect growth and reproduction on Daphnia exilis: a study transgenerational
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Currently, contamination of waters with glyphosate and copper is a worldwide problem; this is originated from agricultural, mining, and industrial activities. Although glyphosate is classified as an herbicide of reduced toxicity, several studies have demonstrated the occurrence of this pesticide at environmentally relevant concentrations, and toxic effects to aquatic biota have also been documented. Copper is an essential micronutrient at low concentrations; however, at high levels, it becomes toxic; this metal is also used as a biocide. Most chronic toxicological test guidelines only evaluate the toxic effects within one generation; however, negative effects could appear across generations, mainly when different toxics act jointly. We aimed to determine the transgenerational effects produced by mixtures of glyphosate and copper on the American cladoceran *Daphnia exilis*; measured endpoints were population growth, fecundity, metabolic biomarkers, and the size of the progeny. LC_{50}'s of both toxicants were determined. In the chronic toxicity studies *D. exilis* was exposed to the following mixtures of glyphosate (mg L^{-1}) and copper (mg L^{-1}): $LC_{0.05}$ (1.04 and 2.45); $LC_{0.5}$ (3.09 and 1.24); LC_5 (3.83 and 1.45) and LC_{10} (4.31 and 1.57), respectively. Experiments were performed during 21 d for each generation, at 25°C, 16:08 photoperiod, feeding with *Pseudokirchneriella subcapitata* ($8x10^5$ cells mL^{-1}). Survivorship, accumulated progeny and the number of clutches in the parental generation (F_0) were significantly higher than the values observed in F_1. Age of first reproduction was significantly different between F_0 and F_1 in the combinations $LC_{0.05}$ and $LC_{0.5}$. The concentration of lipids in *D. exilis* exposed to the mixture of glyphosate and copper in F_0 and F_1 was not significantly different in all the tested concentrations; nevertheless, carbohydrates content in F_1 was significantly increased respect to F_0 in $LC_{0.5}$ and LC_5. There was a reduction in the proteins content in F_1 compared to F_0, only in $LC_{0.5}$. The size of neonates varied among treatments and broods in F_0 and F_1; in F_0, some clutches were affected by the mixture of xenobiotics, especially in the $LC_{0.05}$ and LC_5 treatments. The mixture of glyphosate and copper significantly increased toxic effects on *D. exilis* in the F_1 generation, probably because in F_0 the cladocerans could develop resistance mechanism to tolerate toxicity, that influenced the response of progeny in the second generation.

TU048
Demographic transgenerational effects of glyphosate in the cladoceran Daphnia curvirostris
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Glyphosate is an herbicide extensively used around the world. Although it is supposed to be biodegraded in some weeks, the active ingredient, as well as the adjuvants and other compounds in the commercial formulations, can produce toxic effects in the hydrobionts, temporally and in their future generations, modifying the structure and function in the aquatic ecosystems. Cladocerans are an important component of the freshwater zooplankton, as it is a fundamental link between primary producers and secondary consumers. The toxic response to pollutants in the progeny of exposed parents is not normally investigated in routine toxicity tests, notwithstanding negative, transgenerational damages could be expected. This study was aimed to determine the transgenerational effects produced by the herbicide glyphosate, as the commercial formulation FAENA®, and as active ingredient (AI) in *D. curvirostris*, evaluating demographic responses. We determined the 48-h acute toxicity of FAENA and AI, then five sublethal concentrations were chosen ($LC_{0.01}$, $LC_{0.1}$, LC_1, LC_5, and LC_{10}) for the exposure of *D. curvirostris*, from neonates to adults, in two generations (F_0 and F_1), during 21 days; to determine the modification in the response to the toxicants in the F_1 generation, simultaneous replicates with individuals of the same clutch were not exposed to glyphosate (recovery phase, F_{1R}). Assessed demographic parameters were survivorship, total progeny, the age of first reproduction, number of clutches, and inter-clutch time; the size of neonates in each clutch and that of adults at the end of experiments were also measured. The LC_{50} in *D. curvirostris* was 5.85 mg L^{-1}; however, the LC_{50} for AI was higher than 100 mg L^{-1} and was not experimentally determined. Demographic parameters were significantly affected in F_0 when cladocerans were exposed to FAENA, but with AI there were no differences between F_0 and F_1. In F_1 and F_{1R}, a reduced effect in the demographic parameters was observed, possibly because the organisms acquired mechanisms of resistance, despite in F_{1R} the individuals were grown in fresh culture medium without toxicants. The results demonstrated transgenerational effects in *D. curvirostris*. Also, we confirmed that the toxicity of glyphosate is caused by the ingredients in the commercial product FAENA, although it is not possible to identify the joint effect of the active ingredient with the assessed endpoints.

TU049
Examining American alligators as sentinels of toxic trace element exposure
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Toxic trace element exposure occurs through anthropogenic release of naturally occurring elements such as arsenic (As), cadmium (Cd), lead (Pb), and mercury (Hg), making them ubiquitous across the globe. Detrimental exposures can occur through ingestion of contaminated food sources; thus, many nations have consumption advisories in place; however, not all communities abide. As a result, populations that include a large proportion of marine species in their diet, including subsistence hunting communities, are routinely exposed to concentrations above advisory limits. To effectively monitor environmentally-driven trace element concentrations, and consequently the potential exposure in humans, sentinel species are needed that are more accessible than the marine mammals currently used as proxies. Due to the unique environmental conditions of the southeastern Atlantic coast of the United States, accumulation of Hg in this region is greater than most other locations in the country. There are also point sources of As, Cd, and Pb in this region. Upper trophic level predators in this region exhibit elevated concentrations of Hg and other contaminants. In this study, concentrations of As, Cd, Pb, Hg and six other trace elements (Al, Ni, Cu, Zn, Se, Mo) were examined in American alligators (*Alligator mississippiensis*) from seven sites along the southeastern Atlantic coast. The observed concentrations for the four toxic elements (As, Cd, Pb, and Hg) were comparable to those reported in humans, with Hg spanning the broadest range. The similarity in As, Cd, Pb, and Hg concentrations between alligators and humans observed in this study underscores how alligators can serve as a useful sentinel species for toxic element exposure.

TU050
Toxicity of the Antifouling Biocide Sea-Nine 211 (DCOIT) to Neotropical Marine Invertebrates
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The antifouling biocide 4,5-dichloro-2-n-octyl-4-isothiazolin-3-one (DCOIT), commercially known as Sea-Nine 211, came up to replace organotin based paints, which were banned in 2008. The toxicity of SeaNine has been recorded to various species of different trophic levels, but there are no studies evaluating its toxicity to neotropical species. The present study aims to evaluate the toxicity of SeaNine to the following neotropical species: *Perna perna* (Bivalvia), *Echinometra lucunter* (Echinodermata), and *Artemia salina* (Anostraca). The effects of DCOIT on the embryonic development of *E. lucunter* and *P. perna* were evaluated by exposing in vitro fertilized eggs to seriate dilutions of DCOIT (0.01 to 100 μg/L for *E.*