Every day, the organisms were fed, mortality and reproduction were checked. At the end of the 21 days of exposure, the daphnids were dried for 48 hours at 40°C. Dried samples were adhered with double-sided tape to the edge of glass slices in order to study metal biodistribution by X-ray fluorescence spectrometry (µXRF). After 21 days of exposure, no mortality was recorded regardless of the treatment. La combined exposure delayed the first brood by 1.13 ± 1.26 days and Gd dietary and combined exposures led to a decrease of 15.8 ± 13.2 and 21.9 ± 17.9 neonates by living organisms respectively. Lanthanum seemed to uniformly accumulate in the gut regardless the condition of exposure. Gd accumulated in the hindgut after dietary exposure. Waterborne exposure permitted a more diffused biodistribution in the tissues of the organisms while the combined exposure led to a diffused distribution of the metal in tissues and in the intestinal tract. These findings highlight the relevance of dietary exposure for long-term toxicity.

4.11.P-Tu374 Chaoborus punctipennis larvae to monitor rare earth elements contamination in lakes from two mining area

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Over the last decades, the mining exploration of Rare Earth Elements (REE) for high-technology industry has quickly increased, which leads to their diffusion and accumulation in aquatic environments as emergent contaminants. The use of sentinel species to assess REE contamination in such ecosystems is necessary for the development of ecological risk assessment tools. *Chaoborus punctipennis* larvae have been proposed as candidates to reflect the level of lake contamination of Cd, Se and Ni, but we do not know about their potential use for REE contamination. We aimed to evaluate the usefulness of these larvae to inform us of the REE distribution in lake water as well as to identify the environmental factors that can modulate the bioaccumulation of these contaminants. To do that, water and larval samples of *C. punctipennis* were collected between 2019 and 2021 from 15 lakes located in the Rouyn-Noranda (Quebec) and Sudbury (Ontario), two Canadian mining regions. The concentrations of organic matter, major cations, anions and metals including REE were measured in 0.45 µm - filtered water to estimate metal speciation. Also, REE concentrations in larvae were determined by ICP-MS/MS. Depuration experiments (72h) and adsorption essays were conducted in parallel of REE measurements. Our results show spatial heterogeneity of REE concentrations in the studied lakes with significant concentration gradients (maximum [REE]/minimum [REE] ratio) in water (La: 273; Ce: 232) and in whole-body bioaccumulation (∑ETR: 151; La: 654; Ce: 487). According to our results, depuration is not a necessary step in this species for all the REE. The percentages of REE measured as adsorbed on *C. punctipennis* varied from 47% (Ce) to 75% (Pr), being globally higher than those internalized. For the relationship between water concentration and bioaccumulation, significant correlations are observed between REE concentrations in water and those in larvae when REE free ion concentrations (and not total REE concentrations) are considered. These results show that chemical speciation plays an important role in the bioavailability of REE in lakes. Improved relationships are observed when different competing factors (e.g., Al, Fe) are included in such regressions. This information provides a better understanding of REE interaction with aquatic organisms, which is essential for monitoring studies of REE given their increased used in new technologies.

4.12 Reducing Marine Pollution and the Role of Ocean Governance on the Road to Sustainability

4.12.T-01 Assessing Characteristics, Uses, and Potential Environmental Impact of Plastic Remediation Technologies

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Plastic pollution is a global environmental issue. Remediation technologies to prevent or clean up plastic pollution are currently being deployed in households, on land, freshwater, and marine ecosystems. However, there is a critical need to classify, assess and regulate these technologies. In this study, we reviewed the scientific literature and web on plastic remediation technologies, created an overview of these devices, and investigated their characteristics (e.g., field of application, targeted plastic size). Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, we conducted, on the electronic database Scopus, a systematic literature review on plastic remediation technologies. In addition, using similar search terms, we have performed a non-systematic Google search. From the systematic review, we observed a growing interest on plastic remediation technologies demonstrated by 34 out of 61 scientific studies published in the last three years. Of these 61 publications, 55 discussed plastic clean-up technologies. By merging the results of the systematic and non-systematic reviews, we created an overview of 124 plastic clean-up and prevention technologies with 29 of their key traits. Similarly to the result of the systematic review, the interest is currently on plastic clean-up technologies, which represent 93.5% of the technologies listed in our overview. Although clean-up technologies can have multiple fields of application, our results indicate that 60% of the 124 technologies, can be used in inland waterways, indicating that the attention is, to date, on the collection of plastic before it reaches the open ocean. Based on these results, we investigated the strengths, weaknesses, opportunities, and threats (SWOT) of this group of technologies. Our SWOT analysis indicates that regulations are needed when deploying a clean-up system, especially due to the environmental effect of these technologies on ecosystems. Despite the challenges, plastic clean-up technologies offer fundamental opportunities, from the more evident removal of plastic waste to raising awareness of plastic pollution, creating new job opportunities, and collecting data. Plastic remediation technologies are essential elements in the fight against plastic pollution. Therefore, their regulation is imperative to ensure a balance between the benefits and the potentially negative consequences.

4.12.T-02 An Effect Assessment of Chemical Contaminants from the Salmonid Aquaculture Industry

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