ECsafe SEAFOOD

Priority environmental contamination in seafood: safety assessment, impact and public perception

Royal Flemish Academy of Belgium for Science and the Arts

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SEAFOOD SAFETY

NEW FINDINGS & INNOVATION CHALLENGES

Stakeholder Event & Open Science Meeting on Key Seafood Safety Developments by **ECsafeSEAFOOD**

ABSTRACTS BOOK

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Consumer needs and concerns Marine toxins in seafood and the environment Toxicity and modelling of seafood contaminants Evaluation of seafood monitoring data Rapid detection tools for environmental contaminants The future of seafood safety Communication outreach and education

Emerging approaches for future seafood safety

OP.20. Can seafood safety be compromised in the ocean of tomorrow?

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Anthropogenic activities have contributed to two environmental challenges: remarkable chemical contamination and dramatic climate change. Both stressors strongly affect marine ecosystems and are expected to worsen in the future, threatening marine species' welfare and survival, and ultimately consumers' health. Marine organisms inhabiting polluted areas are surrounded by a diversity of pollutants from different chemical groups (e.g. flame retardants, toxic elements, perfluorinated compounds). Some of these contaminants have been recently defined as substances of emerging concern since they currently lack regulation and their toxicological effects to both seafood species and humans still require further understanding. In this way, assessing possible implications of climate change is even more imperative. Hence, this work aims to assess the effects of climate change (warming and acidification) on the bioaccumulation and elimination of mixtures of emerging contaminants (dechloranes 602, 603 and 604, PFOS, PFOA, TBBPA and iAs), using commercially important bivalve species (*Mytilus galloprovencialis and Ruditapes philippinarum*) as biological models. Overall, PFOS revealed the highest bioconcentration factor, followed by TBBPA > PFOA > iAs. Despite variations associated to the behaviour and specific chemical properties of each compound, data showed that the bioaccumulation and elimination mechanisms of emerging contaminants are remarkably affected by both temperature and acidification. For instance, increased temperatures promoted higher bioconcentration of TBBPA, but also lower bioconcentration of PFOA and PFOS. On the other hand, acidification promoted the bioconcentration of PFOS, but impaired the bioconcentration of PFOA and iAs. Furthermore, when both climate stressors where combined, the bioconcentration of TBBPA and PFOA further increased, but further decreased for iAs. Finally, data also allowed concluding that 20 days of depuration is not enough for a complete elimination of most contaminants. This study evidenced the need to integrate climate change effects in future seafood risk assessment and to develop mitigation strategies, thus ensuring consumers safety.