

ECsafeSEAFOOD

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

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RE Restricted to a group specified by the consortium (including the Commission Services)	
CO Confidential, only for members of the consortium (including the Commission Services)	

Table of Contents

1. Summary	3
2. Special issue I: Non-regulated environmental contaminants in seafood: Contributions of the ECsafeSEAFOOD EU project	3
3. Special issue II: European seafood safety	6

1. Summary

To raise awareness of the existence of the EU funded ECsafeSEAFOOD project, its objectives, partners and intended impacts, several dissemination activities have taken place since the beginning of the project. The publication of peer reviewed scientific is an effective way of raising awareness and sharing information is envisaged.

Since the beginning of the project, two special issues were submitted for publication in a peer-reviewed scientific journal:

- The first special issue (SI) within the project entitled “Non-regulated environmental contaminants in seafood: Contributions of the ECsafeSEAFOOD EU project” was published in November 2015 in the journal Environmental Research. This SI includes 16 manuscripts on the topic of safety issues related to non-regulated priority chemical contaminants in seafood. It focuses on evaluating the impact of these contaminants (including endocrine disruptors, pharmaceutical and personal care products, metal species, biotoxins from harmful algal blooms, marine litter and associated chemicals) on public health. From the 16 submitted manuscripts, only one manuscript which was not a result of the ECsafeSEAFOOD project was included in the SI (this manuscript was considered appropriate by the editor-in-chief).
- With the amount of high quality scientific output being produced in the project, a second special issue (SI) was proposed for publication in Food and Chemical Toxicology journal entitled "European seafood safety". For this SI, 17 potential manuscripts were suggested by partners for publication on the new ECsafeSEAFOOD findings and outputs. From the 17 manuscripts, 14 articles were submitted. These are now in the review process. It is expected that the review process will be closed by February 2017 and that the second special will be published by April 2017.

2. Special issue I: Non-regulated environmental contaminants in seafood: Contributions of the ECsafeSEAFOOD EU project

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Corresponding author: Dr. Antonio Marques

First author: Dr. Antonio Marques

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Guest editorial

Non-regulated environmental contaminants in seafood: Contributions of the ECsafeSEAFOOD EU project



Seafood is recognised as a high-quality, healthy and safe food, and is one of the most important commodities consumed worldwide. However, seafood, like other types of food, can also be a source of harmful environmental contaminants with potential to impact human health. Availability of safe and high-quality food is a growing public concern and research plays a very important role in ensuring consumer confidence in this sector. Therefore, assessing the presence of regulated and non-regulated contaminants in seafood as a result of environmental contamination is of crucial importance for ensuring food safety and reducing human health risks.

The European Commission and European Member States have recognised that there is insufficient knowledge available for the assessment of consumer safety aspects related to non-regulated environmental contaminants in seafood. Consequently, the EC's Marine Strategy Framework Directive (MSFD) highlights the need to implement monitoring schemes for contaminants of concern throughout Europe.

Environmental Research is committed to rapidly disseminating studies on the impact of environmental agents on human health, and this Special Issue reports on the scientific contributions the ECsafeSEAFOOD project consortium has been making to the assessment of levels of contaminants of emerging concern in seafood using multidisciplinary approaches.

This Special Issue highlights the relevance of creating databases to gather crucial and useful information for improving contaminant diagnostics and seafood risk assessment. Such information will be of interest to food safety authorities and food diagnostic firms, as well as the seafood and aquaculture industries. A European database on emerging contaminants created in the project is intended to provide data and objective information to inform policy makers in elaborating their guidelines, and to help funding authorities in identifying deficits in seafood contaminant research. Special emphasis has been put on setting up a detailed monitoring scheme to determine the prevalence of selected contaminants (e.g. cyclic imines, ciguatoxins, perfluoroalkyl substances, pharmaceuticals, endocrine disrupting compounds, methyl mercury, inorganic arsenic, microplastics, musk fragrances and UV-filters) in seafood from contaminated coastal areas in Europe and America so that collected data can be evaluated and interpreted at national and European level. Detailed data on contaminant concentrations in food and the environment are interpreted. Some articles address specific countries or provide a comparative analysis between different geographical areas. Taken as a whole, the results clearly identify contaminants of emerging

concern and provide the necessary support to propose future monitoring schemes and legislation.

This Special Issue also provides information on the development of new tools to assess the risks of seafood contaminants, including the development of risk indexes and probabilistic tools, where the effects of food processing, cooking and bioaccessibility/bioavailability of contaminants along the digestive tract will be taken into account. Consumer surveys were carried out to gain an understanding of consumer health risk-benefit perceptions for seafood in different European countries, as well as to evaluate consumer awareness of and attitudes towards marine environmental contamination. Policy makers, consumers and the food industry were also consulted to identify the current information gaps and needs related to seafood safety. On each aspect, challenges, achievements, lessons learnt and related recommendations are given.

Results featured in this special issue and further results expected in the ECsafeSEAFOOD project include:

- sensitive and rapid screening methods for targeted contaminants of emerging concern, such as antibiotics (chloramphenicol and sulphonamides) and marine algal toxins (azaspiracids and tetrodotoxin), which will be suitable for screening large numbers of samples and are ready for uptake by different end-users such as food safety and environmental agencies, and research and monitoring laboratories;
- information on the effects of cooking in processing procedures on different contaminants;
- details of the effects of global warming on bioaccumulation and elimination of contaminants;
- the dynamics of toxin producing microalgae in the environment;
- outcomes of assessments of contaminant transfer between the environment and marine biota;
- information about the toxicological impact of the contaminants and hence their effect on public health;
- evaluation of exposure of consumers to contaminants of emerging concern, including marine toxins;
- assessment of the use of macroalgae to remove environmental contaminants (phycoremediation);
- an online tool for health professionals, consumers and food producers and processors, which can be used as part of mitigation strategies to minimise potential risks for consumers.

This body of knowledge can be used by local and European food safety authorities to implement measures to help prevent adverse health effects due to contaminant consumption. It can also

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Special Issue: Non-regulated environmental contaminants in seafood: Contributions of the ECsafeSEAFOOD EU project

Guest Editors: António Marques, Jorge Diogène and Sara Rodriguez-Mozaz

- 1 **Guest Editorial: Non-regulated environmental contaminants in seafood: Contributions of the ECsafeSEAFOOD EU project**
António Marques, Jorge Diogène and Sara Rodriguez-Mozaz
- 3 **Memorial Professor Avreljija Cencia**
Tomaz Langerholc
- 4 **Marine environmental contamination: public awareness, concern and perceived effectiveness in five European countries**
Silke Jacobs, Isabelle Sioen, Stefaan De Henauw, Yves Rosseel, Tanja Calis, Alice Tediosi, Martí Nadal, António Marques and Wim Verbeke
- 11 **Consumers' health risk–benefit perception of seafood and attitude toward the marine environment: Insights from five European countries**
Silke Jacobs, Isabelle Sioen, Zuzanna Pieniak, Stefaan De Henauw, Ana Luisa Maulvault, Marieke Reuver, Gabriella Fait, German Cano-Sancho and Wim Verbeke
- 20 **Insights from an international stakeholder consultation to identify informational needs related to seafood safety**
Alice Tediosi, Gabriella Fait, Silke Jacobs, Wim Verbeke, Diana Álvarez-Muñoz, Jorge Diogene, Marieke Reuver, António Marques and Ettore Capri
- 29 **Environmental contaminants of emerging concern in seafood – European database on contaminant levels**
Griet Vandermeersch, Helena Maria Lourenço, Diana Alvarez-Muñoz, Sara Cunha, Jorge Diogène, German Cano-Sancho, Jens J. Sloth, Christiaan Kwadijk, Damia Barcelo, Wim Allegaert, Karen Bekaert, José Oliveira Fernandes, Antonio Marques and Johan Robbens
- 46 **A critical view on microplastic quantification in aquatic organisms**
Griet Vandermeersch, Lisbeth Van Cauwenberghe, Colin R. Janssen, Antonio Marques, Kit Granby, Gabriella Fait, Michiel J.J. Kotterman, Jorge Diogène, Karen Bekaert, Johan Robbens and Lisa Devriese
- 56 **Occurrence of pharmaceuticals and endocrine disrupting compounds in macroalgae, bivalves, and fish from coastal areas in Europe**
D. Álvarez-Muñoz, S. Rodríguez-Mozaz, A.L. Maulvault, A. Tediosi, M. Fernández-Tejedor, F. Van den Heuvel, M. Kotterman, A. Marques and D. Barceló
- 65 **Co-occurrence of musk fragrances and UV-filters in seafood and macroalgae collected in European hotspots**
S.C. Cunha, J.O. Fernandes, L. Vallecillos, G. Cano-Sancho, J.L. Domingo, E. Pocurull, F. Borrull, A.L. Maulvault, F. Ferrari, M. Fernandez-Tejedor, F. Van den Heuvel and M. Kotterman
- 72 **Toxic elements and speciation in seafood samples from different contaminated sites in Europe**
Ana Luisa Maulvault, Patrícia Anacleto, Vera Barbosa, Jens J. Sloth, Rie Romme Rasmussen, Alice Tediosi, Margarita Fernandez-Tejedor, Fredericus H.M. van den Heuvel, Michiel Kotterman and António Marques
- 82 **Longitudinal measures of perfluoroalkyl substances (PFAS) in serum of Gullah African Americans in South Carolina: 2003–2013**
Matthew O. Gribble, Scott M. Bartell, Kurunthachalam Kannan, Qian Wu, Patricia A. Fair and Diane L. Kamen
- 89 ***Ostreopsis cf. ovata* dynamics in the NW Mediterranean Sea in relation to biotic and abiotic factors**
Olga Carnicer, Carles Guallar, Karl B. Andree, Jorge Diogène and Margarita Fernández-Tejedor

(Contents continued on inside back cover)



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3. Special issue II: European seafood safety

Special issue Proposal

Food and Chemical Toxicology

Lisbon, 01 March 2016

Dear Dr José Luis Domingo Roig
Editor-in-Chief
Food and Chemical Toxicology

The European Consortium (FP7 ECsafeSEAFOOD; www.ecsafeseafood.eu) is currently developing innovative research on Emerging Environmental Contaminants in Seafood.

Limited information is available for chemical contaminants for which no legislation or limits set by seafood authorities exist. In order to increase seafood safety to consumers, ECsafeSEAFOOD aims to assess safety issues related to non-regulated priority chemical contaminants and evaluate their impact on public health (including endocrine disruptors, pharmaceutical and personal care products, metal species, biotoxins from harmful algal blooms, marine litter and associated chemicals). The project is relevant for the Marine Strategy Framework Directive (MSFD) and especially for the aspects regarding contaminants in seafood, which will be useful to determine the Good Environmental Status of EU waters.

Since the amount of high quality scientific output being produced in the project is enormous, on behalf of the consortium I kindly suggest a Special issue integrating the current findings and revision of available literature on the different topics.

The suggested title of the special issue is:
“Contaminants of emerging concern in seafood: Contributions of the ECsafeSEAFOOD project for consumers safety assessment”

The suggested Guest Editors would be:

- António Marques (IPMA, Portugal; Project coordinator): amarques@ipma.pt
- Kit Granby (DTU, Denmark; Risk assessment): kgra@food.dtu.dk
- Sara Rodríguez-Mozaz (ICRA, Spain; Chemical contaminants): srodriguez@icra.cat

Please see below the suggestions of input composed by 18 potential manuscripts that could be delivered within 3 months, subjected to peer-revision and delivered for publication until August 2016.

I hope you will find our contribution of interest to such a prestigious Journal as Food and Chemical Toxicology.

Sincerely yours,

António Marques
(Coordinator of ECsafeSEAFOOD project)

Number	Title	Corresponding author	SI
1	Bioaccessibility of toxic and essential elements in raw and cooked commercial seafood species available in European markets	Ricardo N. Alves IPMA, Portugal	submitted
2	Bioaccessibility and bioavailability assessment of PFOS, venlafazine and α -HBCD in commercial seafood	Ana Luisa Maulvault IPMA, Portugal	not submitted
3	Effect of culinary treatment in the bioaccessibility of contaminants of emerging concern in European commercial seafood	Ricardo Alves IPMA, Portugal	submitted
4	Effect of fat trimming and processing of seafood on the content of contaminants	Rie R. Rasmussen DTU, Denmark	submitted
5	The carryover of contaminants from feed to salmon (<i>Salmo salar</i>) and the influence of microplastic	Kit Granby DTU, Denmark	submitted
6	Bioaccessibility of bisphenol A in canned seafood	Sara Cunha ICETA, Portugal	submitted
7	A human health risk assessment for methylmercury via the seafood diet in five European countries	Silke Jacobs UGent, Belgium	submitted
8	In vitro bioavailability and toxicity of cadmium, arsenic and methylmercury studied in intestinal cell models	Tomaz Langerholic UM, Slovenia	not submitted
9	Bioavailability in vitro methodologies for food benefit-risk assessment - a review of available data	Tomaz Langerholic UM, Slovenia	submitted
10	Occurrence and toxicity of musks and UV filters found in the marine environment	Tomaz Langerholic UM, Slovenia	submitted
11	Occurrence of halogenated flame retardants in commercial seafood species available in European markets.	Ethel Eljarrat CSIC, Spain	submitted
12	Fast methodologies for the determination of a broad set of antibiotics in aquatic organisms	Sara Rodríguez-Mozaz ICRA, Spain	submitted
13	Surface plasmon resonance immunosensor for class determination of sulfonamides antibiotics in fish and seafood	Marinella Farre CSIC, Spain	not submitted
14	Toxic effects of perfluorinated compounds at human cellular level and on a model vertebrate	Sandra Rainieri AZTI, Spain	submitted
15	Phycoremediation of persistent contaminants by macroalgae	Sara Cunha ICETA, Portugal	submitted
16	A novel liquid-chromatography- electrospray tandem mass spectrometry method for trace quantification of tetrabromobisphenol A and bisphenol a in seafood and seaweeds	Sara Cunha ICETA, Portugal	not submitted
17	FishChoice, an online tool to minimize the risks of emerging pollutants through seafood consumption	José Luis Domingo URV, Spain	submitted
18	Human exposure to 19 brominated compounds through seafood consumption in Catalonia (Spain)	Eva Pocorull, URV, Spain	submitted