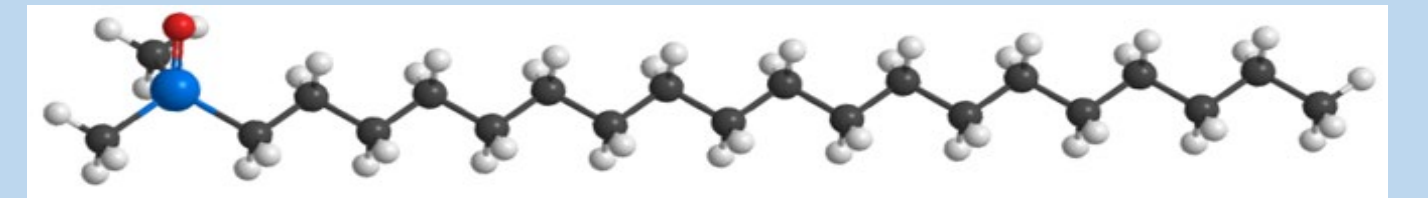


Integrated Metallomics Approaches in Marine Systems: Environmental Quality, Trophic Transfer and Human Health Implications

I. Kalantzi¹, M. Tsapakis¹, S.A. Pergantis², G. Panagou¹, M. Kapsi¹, D. Chatzivasileiou¹

¹Institute of Oceanography, Hellenic Centre for Marine Research (HCMR), Gournes - Pedidos, Heraklion, 71003, Greece

²Environmental Chemical Processes Laboratory, Department of Chemistry, University of Crete, Voutes Campus, Heraklion, 70013, Greece



Bioaccumulation and trophic transfer of metals in the marine environment and organisms

Food Chemistry 141 (2013) 680-694

Contents lists available at ScienceDirect

Food Chemistry

journal homepage: www.elsevier.com/locate/foodchem

Metals and other elements in tissues of wild fish from fish farms and comparison with farmed species in sites with oxic and anoxic sediments

Science of the Total Environment 640 (2018) 329-338

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

Metals and elements in sardine and anchovy: Species specific differences and correlations with proximate composition and size

Aquaculture 503 (2019) 175-185

Contents lists available at ScienceDirect

Aquaculture

journal homepage: www.elsevier.com/locate/aquaculture

Elemental distribution in the different tissues of brood stock from Greek hatcheries

Mediterranean Marine Science

Indexed in WoS (Web of Science, ISI Thomson) and SCOPUS

The journal is available on line at <http://www.medit-mar-sc.net>

www.hcmr.gr

DOI: <http://doi.org/10.12681/mms.29426>

Sardine and anchovy as bioindicators of metal content in Greek coastal waters

Biogeosciences, 9, 2497-2507, 2012

www.biogeosciences.net/9/2497/2012/

doi:10.5194/bg-9-2497-2012

© Author(s) 2012. CC Attribution 3.0 License.



The role of the seagrass *Posidonia oceanica* in the cycling of trace elements

C. Sanz-Lázaro^{1,2,3}, P. Malesa⁴, E. T. Apostolaki^{5,2}, I. Kalantzi², A. Maria¹, and I. Karakassis²

- ☐ Metals exhibit habitat- and species-specific accumulation patterns
 - ☐ Trophic transfer varies across benthic and pelagic pathways
- Representative results:
- ✓ Fish tissues: metal accumulation reflects both environmental exposure and physiology
 - ✓ Benthos: sediments act as both sink and secondary source of metals
 - ✓ Seagrass: *Posidonia oceanica* integrates long-term metal exposure

Aquaculture 465 (2016) 209-222

Contents lists available at ScienceDirect

Aquaculture

journal homepage: www.elsevier.com/locate/aquaculture

Assessment of the use of copper alloy aquaculture nets: Potential impacts on the marine environment and on the farmed fish

Science of the Total Environment 470-471 (2014) 742-753

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

Metals in benthic macrofauna and biogeochemical factors affecting their trophic transfer to wild fish around fish farm cages

Science of the Total Environment 764 (2021) 142843

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

Fish farming, metals and antibiotics in the eastern Mediterranean Sea: Is there a threat to sediment wildlife?

Marine Pollution Bulletin 182 (2022) 114015

Contents lists available at ScienceDirect

Marine Pollution Bulletin

journal homepage: www.elsevier.com/locate/marpolbul

Intensive marine finfish aquaculture impacts community structure and metal bioaccumulation in meso-zooplankton

Environmental Science and Pollution Research (2024) 31:28139-28152

<https://doi.org/10.1007/s11356-024-32910-0>

Trajectories of trace element accumulation in seagrass (*Posidonia oceanica*) over a decade reveal the footprint of fish farming

Victoria Litsi-Mizan^{1,2}, Ioanna Kalantzi², Manolis Tsapakis², Spiros A. Pergantis³, Ioannis Karakassis¹, Eugenia T. Apostolaki²

Human risk assessment through the consumption of fish and seafood

Food Chemistry 194 (2016) 659-670

Contents lists available at ScienceDirect

Food Chemistry

journal homepage: www.elsevier.com/locate/foodchem

Metals in tissues of seabass and seabream reared in sites with oxic and anoxic substrata and risk assessment for consumers

Food and Chemical Toxicology 123 (2019) 113-124

Contents lists available at ScienceDirect

Food and Chemical Toxicology

journal homepage: www.elsevier.com/locate/foodchemtox

Metals in sardine and anchovy from Greek coastal areas: Public health risk and nutritional benefits assessment

Katerina Sofoulaki^{1,2,3}, Ioanna Kalantzi^{1,2,3}, Athanasios Machias⁴, Spiros A. Pergantis⁴, Manolis Tsapakis⁵

- ☐ Seafood consumption links marine contamination to human exposure.
 - ☐ Risk-benefit approaches integrate toxicity and nutritional value.
- Representative results:
- ✓ Dietary exposure scenarios improve public health relevance.
 - ✓ Evidence supports informed seafood consumption guidelines.

Aquaculture 613 (2020) 743440

Contents lists available at ScienceDirect

Aquaculture

journal homepage: www.elsevier.com/locate/aquaculture

Metals in organisms cultivated in IMTA systems at Mediterranean Fish Farms: risk and benefit assessment

Dimitra Chatzivasileiou¹, Anastasios Baltadakis¹, Panagiotis D. Dimitriou¹, Iordanis Magiopoulos¹, Stefania M. Manolaki², Spiros A. Pergantis³, Manolis Tsapakis⁴, Ioannis Karakassis⁵, Ioanna Kalantzi^{1,2,3}

Εκτίμηση κινδύνου και οφελών για την υγεία του ανθρώπου από την κατανάλωση εκτρεφόμενων ψαριών από την Ελληνική Υδατοκαλλιέργεια: Μέταλλα και ιχθυοστοιχεία

Marine and Inland Waters Research Symposium 2022

ELEMENTAL CONTENT OF COMMERCIAL AND NON-COMMERCIAL FISH FROM THERMAIKOS GULF: NUTRITIONAL BENEFITS AND PUBLIC HEALTH RISKS

Kalantzi I², Vetsis E², Pergantis S.A³, Kokokiris L⁴ and Karakassis I²

Speciation analysis of metals

JOURNAL OF ENVIRONMENTAL SCIENCES 54 (2017) 880-887

Available online at www.sciencedirect.com

ScienceDirect

JES

www.elsevier.com/locate/jes

www.jec.ac.cn

Arsenic speciation in fish from Greek coastal areas*

HPLC-ESI-MS/MS for the determination of Arsenolipids in fish: A new form of arsenic for improved risk assessment

Detailed Arsenolipid Determination in BCR Reference Material using HPLC with high-resolution mass spectrometry and ICP-MS

M. Kapsi¹, K. Marmatakis², I. Kalantzi¹, M. Tsapakis¹ and S. Pergantis²

- ☐ Total metal content alone is insufficient for risk assessment.
 - ☐ Speciation reveals toxicologically relevant chemical forms.
- Representative results:
- ✓ Arsenic speciation differentiates dietary risk among fish.
 - ✓ HPLC-ICP-MS enables high-resolution metal form identification.
 - ✓ Metallomics bridges exposure with biological relevance.

Metallobiomolecule profiling in gilthead seabream and European seabass blood serum by online SEC – ICP – MS

Georgia Panagou¹, Ioanna Kalantzi², Ioannis Fakrads³, Manolis Tsapakis² and Spiros A. Pergantis¹

¹Department of Chemistry, University of Crete, Heraklion, Greece

²Institute of Oceanography, Hellenic Centre for Marine Research, Heraklion, Greece

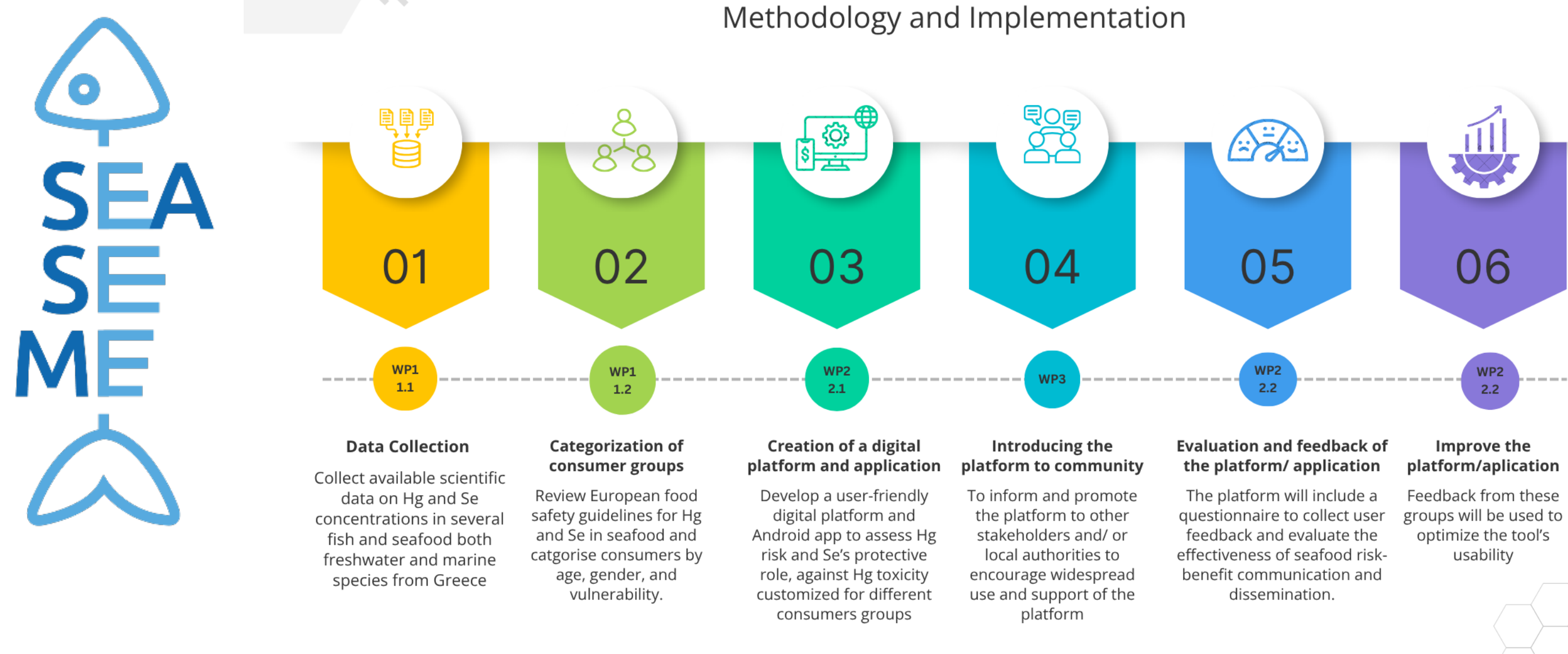
³Institute of Marine Biology, Biotechnology and Aquaculture, Hellenic Centre for Marine Research, Heraklion, Greece

Fish tissue multielement metallobiomolecule profiling method and its application to four commercially important fish species

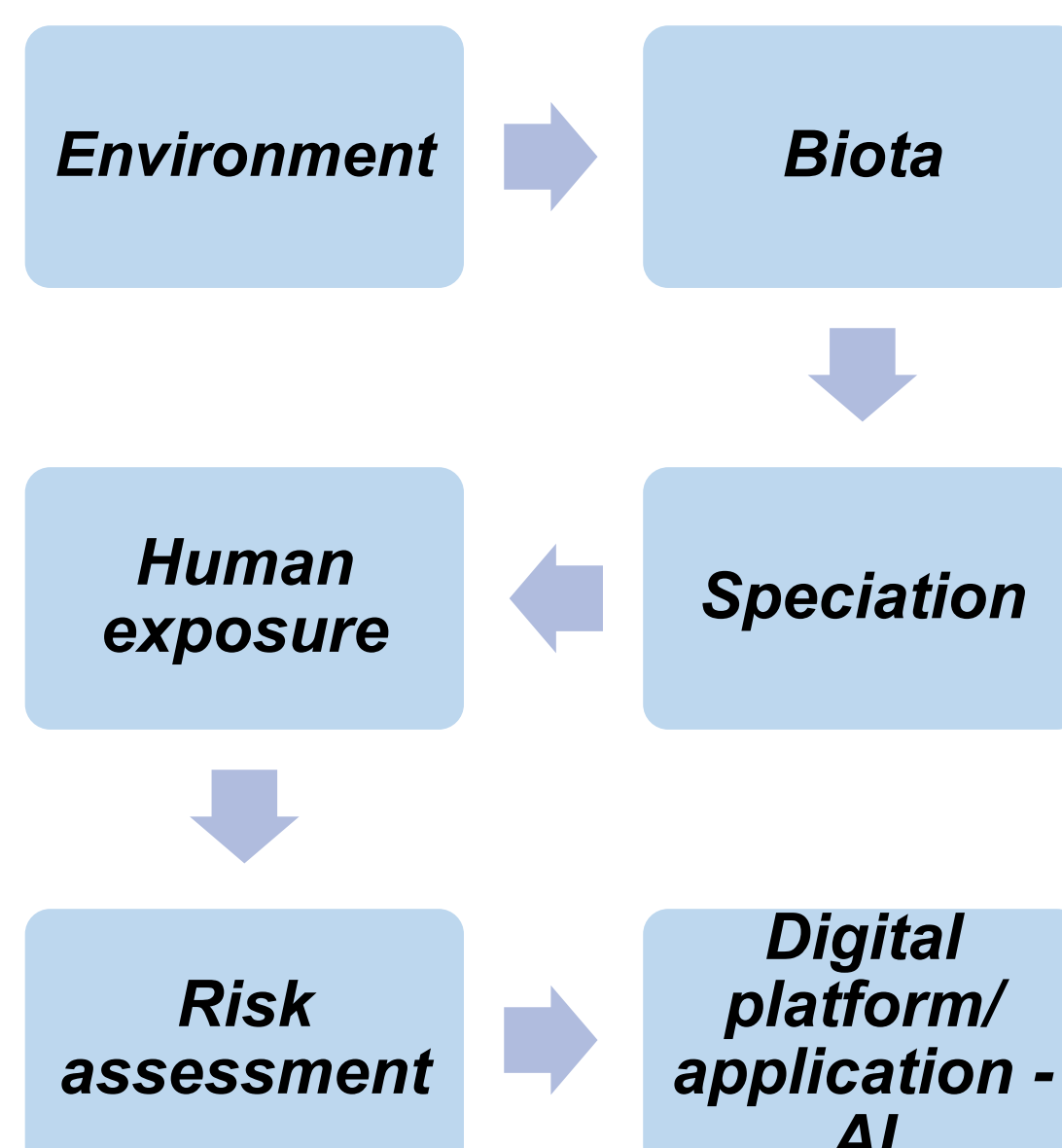
G. Panagou¹, I. Kalantzi², M. Tsapakis² and S. A. Pergantis¹

SEASEME: SEAFOOD TOXICITY PLATFORM: KNOWING YOUR MERCURY – SELENIUM INTAKE. ARE YOU SAFE?

Methodology and Implementation



Integrated Conceptual Framework:



Metallomics-based approaches provide robust, science-driven tools for environmental quality assessment and human health protection



Acknowledgements

Part of the research projects were supported by METAFRISKS funded by the H.F.R.I. under the "2nd Call for HFRI Research Projects to support Post-Doctoral Researchers" (Project Number: 692). The project "SEASEME" is implemented in the framework of H.F.R.I.'s 6th Call of "Science and Society" Action entitled "Current Nutritional Awareness" (H.F.R.I. Project Number: 29377).

