Task Team Biotoxin Detection, Management & Regulation (TT-BDMR)

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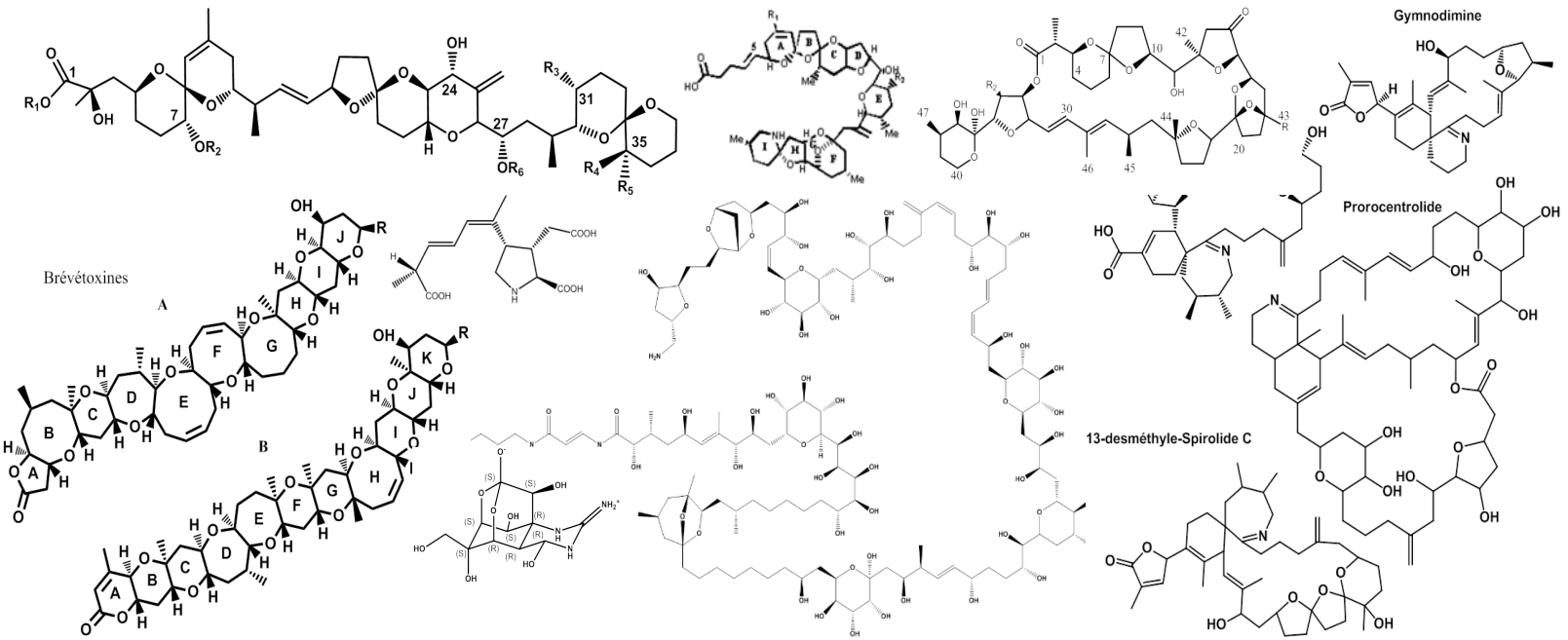


ToRs as decided in 2023

- IAEA, WHO and other regulatory bodies
- FAO technical guidance documents
- Exchange & robust science
- Risk evaluation for freshwater cyanobacterial toxins in seafood
- Advise other IPHAB Task Teams on toxicology, incl. emerging toxins
- Progress on coordinated activities : database on toxins
- Training workshops for toxin detection, monitoring, and management
- Guidance on mitigation (EWS, safeguarding shellfish during HAB-events, HAB-destruction, and shellfish detoxification)
- Priorities for research, capacity development, and engagement with regulatory bodies
- Contribute to the HAB-S Ocean decade proposal
- Identify priority actions that require funding (discussion)

IAEA, WHO and other regulatory bodies

- **A meeting was held with the IAEA during ICHA 2023 in Hiroshima to explore possible collaborations and contributions. IAEA was to inform Task Team Ciguatera of potential contributions.**
  - **Workshop in Cuba last week on bHAB/toxin detection**

- **Several national Codex representatives contributed to Codex Alimentarius actions on ciguatera, incl. FR**

FAO technical guidance documents

- **No formal progress on this part.**

- **Informal inquiries have been made for the creation of an FAO Reference Centre for Algal Toxins, which could support this activity. Ifremer (FR) is considering hosting such a Centre and currently seeking funding for it (proposal close to submission to FAO, funding is being sought by Ifremer, AFD and other regional bodies).**

Contributions and robust science

- **The task Team Chair was invited to national HAB-meetings in the UK (June, 2023) and Ireland (October, 2023) to present on IPHAB activities, scientific challenges in HAB-science and the UN Ocean Decade Action HAB-Solutions.**
- **Task team members contributed to the review of papers on algal and cyanobacterial toxins submitted to the proceedings of the ICHA 2023 conference in Hiroshima, Japan.**
- **A task team member was invited and gave a plenary lecture at the Joint PSA/ISOP/ISEP meeting from 28 July to 1 August 2024, Seattle, WA, USA. This presentation also presented the work on the IOC Toxins database to these three scientific communities. (Hess P. "Harmful microalgae and their metabolites – diversity and bioactivity, from an anthropocentric to an ecological viewpoint and back again")**

Risk evaluation for freshwater cyanobacterial toxins in seafood

- **Task team members participated in the United States Interstate Shellfish Sanitation Conference (ISSC) Biotoxin Committee efforts to address a request regarding whether the US National Shellfish Sanitation Plan (NSSP) should include freshwater harmful algal blooms and toxins that mix with estuarine and ocean shellfish growing waters. The Biotoxin Committee produced a document detailing the discussion and recommendation related to this request. At this time, the Biotoxin Committee does not recommend specific proposals for freshwater harmful algal blooms or their toxins to be considered for the NSSP. Instead, the Biotoxin Committee recommended the ISSC Executive Board foster and/or fund scientific research and technical assistance to fill the outstanding knowledge gaps that would need to be addressed prior to considering NSSP requirements specific to freshwater HABs or their toxins.**

Coordination activities – Advise to other task teams

- **Co-coordination of TT Ciguatera**

- **The task team replied to a request of Task Team Taxonomy for an additional member relevant to dinoflagellate life cycle science (cysts): Kenneth Mertens was recommended and retained by the task team Taxonomy as a member.**

- **No other formal requests were received by the Task Team Biotoxins**

What are emerging toxins ?

The terms “emerging microalgae” or “emerging toxins” are not well defined. It is clearly known that most microalgae have been evolving since tens (if not 100s) of millions of years ago, so how can we talk about emerging ones? Emerging toxins can be defined as those that have been recently discovered but for which no risk evaluation has yet been carried out or is inconclusive, or for which risk evaluation has been carried out but not yet implemented by risk management and/or regulation. Also, toxins produced by algae emerging in areas where they have never been reported before or in aquatic organisms in which they have never been reported before are considered as emerging toxins.

According to the first view of unregulated toxins for which risk evaluation is pending or inconclusive or risk management and regulation have not yet been implemented, several groups of cyclic imine toxins can be classified as emerging (spirolides, pinnatoxins, portimines…). Also ovatoxins are still pending risk evaluation for respiratory effects as well as formal risk management actions and international regulations, even though initial risk assessment for foodstuffs suggests a significant risk.

According to the second view of emergence in different areas or species, for example, tetrodotoxins (TTXs) have been known for a long time in pufferfish and are regulated in Japan in this commodity but have recently been reported in and are not regulated in shellfish as a commodity; hence TTXs are considered as emerging in shellfish. Similarly, even though ciguatoxins are known to have existed in tropical areas for a long time (several centuries), they maybe considered as an emerging group in subtropical areas (as a function of range extension of the producing organisms to higher latitudes related to climate change).

Coordination activities – Toxin database

IPHAB Toxins Home Export Login

IOC-UNESCO Toxins database

Welcome to the IOC-UNESCO Toxins database. This database contains reference information about toxins - some of which are associated with Harmful Algal Events.

Toxin

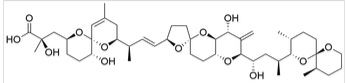
Toxin name, or abbreviation

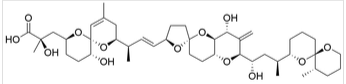
Progenitor or vector

Search More filters

Azaspiracid
1 Toxin

Azaspiracid
Azaspiracid 1

Okadaic acid

Dinophysistoxin-1
C45H70O13

Okadaic acid

Dinophysistoxin-2
C44H68O13

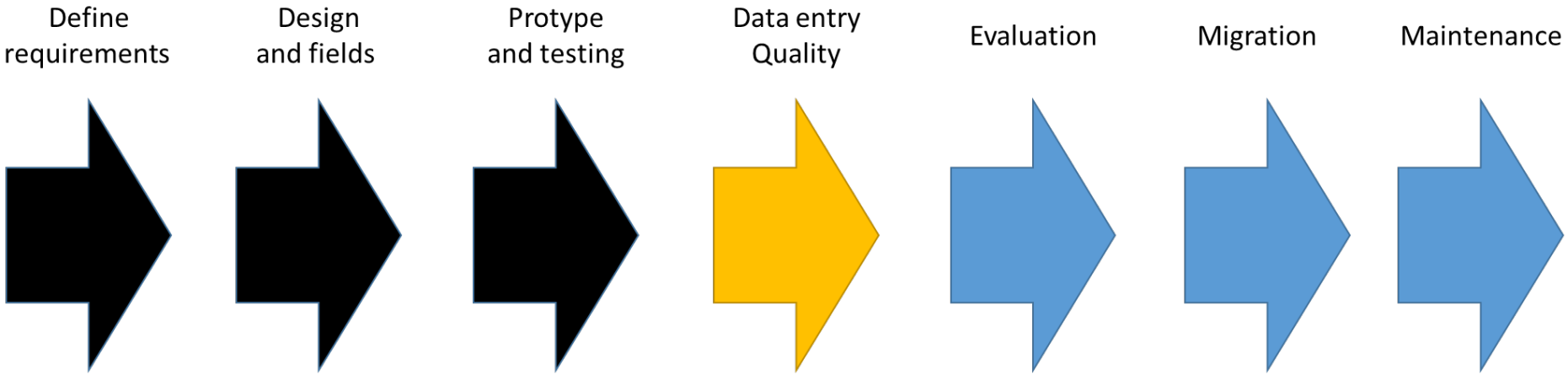
Domoic Acid
1 Toxin

Domoic Acid
Domoic acid

Coordination activities – Toxin database

FOURTEENTH SESSION OF THE IOC INTERGOVERNMENTAL PANEL ON HARMFUL ALGAL BLOOMS

Prepare a comprehensive list of toxins, sources, algal vs shellfish metabolites, references, accepted names/abbreviations, etc. that would link the Taxonomic Reference List of Harmful Microalgae would be housed on the IOC site



Toxin database - Milestones

- March 2023 - First demonstration of a toxin (DSP) completed out in all sections, task distribution initiated and discussion on an in-person meeting.
- May 2023 - Completion of toxin data entry guide.
- June 2023 - meetings with editors to provide guide for data entry, review task distribution list, plan for November International Harmful Algae Conference in Hiroshima.
- August 2023 - First 60-day milestone for data entry reached with 33 toxins initiated in the database.
- October 2023 - Second 60-day milestone reaching increasing data entry and transition prioritization of a representative toxin in each class.
- November 2023 - A closed session meeting for data managers to address issues for data entry, potential changes to database structure, and discuss a future 2024 workshop. A physical meeting of the task team was held during the ICHA in Hiroshima, Japan. A poster on the database was also presented at ICHA 2023 in Hiroshima, Japan.
- An open workshop was held at ICHA23 to reach out to a wide variety of potential users with an in-person tour of the database and feedback discussion to understand their needs for the database.

Toxin database – 28 toxin groups listed

(in red for regulated toxins in seafood, in blue for regulated in drinking water)

Anatoxin	0
Azaspiracid	18
BMAA	1
Brevetoxin	0
Ciguatoxin	3 (C-CTXs)
Cylindrospermopsin	3
Domoic acid	1
Gamierdiscus toxins	
Goniodomin	0
Gymnocin	0
Gymnodimine	8
K. brevisulcata toxins	
Lyngbyatoxin	1
Maitotoxin	8
Microcystin	321
Nodularin	9
Okadaic acid	10
Palytoxin	11
Pectenotoxin	14
Pinnatoxin	0
Polycavernosides	0
Portimine	0
Prymnesin	0
Saxitoxin	5
Spirolide	0
Sterolysins	1
Tetrodotoxins	13
Yessotoxin	12

Toxin database – next steps

- Improvement list has been establisehd and has been communicated to IOC (awaiting action of IODE personnell or funding)
- In-person workshop to complete database in « Hackaton-format » (requires funding)

Training workshops

- Bernd Krock (DE, editorial task team member), participated as an expert to the IAEA Workshop on Harmonisation and Standardisation for Marine Algal and Toxin Surveillance Sampling, Toxin Analysis, and Quality Control Standards in Varadero, Cuba (10-14 March 2025), 22 international trainees mostly from developing countries.

Guidance on mitigation (EWS, safeguarding shellfish during HAB-events, HAB-destruction, and shellfish detoxification)

- Attended National HAB workshops in UK, IE FR to advocate HAB-Solutions regional (EU) needs for interactions with industry (June & October 2023, October 2024)
- The UN Ocean Decade Action HAB-Solutions was formally endorsed in November 2023, and presented at the UN in June 2024, see point 10.
- GLOBALHAB-endorsed workshop held in China, December 2024, exchange with orgamizers for chemistry component : attended by task team support
- Task team members attended the US HAB – Industry Dialogue webinars

Suggested areas for future research efforts

- **In addition to HABs causing food poisoning and fish kills, there are an increasing number of reports on HABs causing direct effects in beachgoers and other coastal users (e.g. fishermen), see also Chomérat et al., 2022 (https://www.ncbi.nlm.nih.gov/pubmed/35877754); and Gorse et al., 2025 (https://doi.org/10.1038/s44321-025-00197-4). Risk evaluation and guidance for risk management of water quality is required to mitigate the impacts of such HABs.**

UN Ocean-decade action

- Three presentations were made at the Twenty-fourth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea (18 – 21 June 2024) and reported to the IPHAB community at large via a note in Harmful Algal News, please check page 14 of Issue 76 of Harmful Algae News for more details. https://www.e-pages.dk/ku/1579/
- Attended National HAB workshops in UK, IE FR to advocate HAB-Solutions regional (EU) needs for interactions with industry (June & October 2023, October 2024)
- The UN Ocean Decade Action HAB-Solutions was formally endorsed in November 2023, and presented at the UN in June 2024, see point 10.

What's next ? Activities that require funding

Toxin database website

- **An in-person meeting of the as many editing group members is required to advance significantly on the toxin database. This could be achieved if many participants plan to attend ICHA Chile and IPHAB could sponsor 3-4 nights expenditure**
- **Revision of the database is required and would benefit from 5-10 k€ of programming input (quotes to be obtained)**

Development of a technical guidance document on HAB & toxin management and mitigation

- Preparation of a **background document**
- Organization of an **Expert Meeting**
- Production of a **Technical document**
- **Funding is needed to support organization cost (consultant + expert travel costs)**

Proposed ToRs for 2025-2027

1. Establish and maintain regular contact with IAEA, WHO, and other regulatory or advisory bodies; follow-up on finalization of methodological annex of Codex standard 292-2008, in particular with reference to TEFs to clarify regulatory status of individual toxin analogs,
2. Contribute to the development of a *Technical Guidance for the development and implementation of biotoxins monitoring and management* to complement other relevant documents such as the "Joint FAO-WHO Technical guidance for the development of the growing area aspects of bivalve mollusk sanitation programmes", the "Joint FAO-WHO Report on ciguatera poisoning", and the "Joint FAO/IOC/IAEA Technical guidance for the implementation of early warning systems for harmful algal blooms", as identified by different stakeholders,
3. Establish and maintain regular contact with relevant scientists and scientific organizations to ensure that the latest and most robust science is available to the Task Team in discharging its responsibilities,
4. Establish contact with national, regional and global risk evaluation agencies to evaluate the risk of freshwater cyanobacterial toxins in seafood,
5. Advise other Task Teams on aspects of toxinology, including emerging toxins, as requested,
6. Progress the development of the toxin database as a web-based tool for crosslinking knowledge on HAB organisms and toxins, e.g. through a physical workshop (seek funding and organize workshop)
7. Communicate and disseminate information on training workshops (e.g. through the website or *Harmful Algal News*) and participate, as requested, in the organization of training workshops for toxin detection, monitoring and management,
8. Develop a concerted (inter-agency) effort and seek opportunities to get this effort funded on drafting guidance on mitigation (EWS, safeguarding shellfish during HAB-events, HAB-destruction and shellfish detoxification),
9. Recommend to IPHAB-XVII on revised priorities for research, capacity development and engagement with regulatory bodies to address the most pressing issues and threats posed by HAB toxins in the marine environment;
10. Contribute to the HAB-S Ocean decade proposal to integrate toxin detection, management & regulations into integrated and co-developed mitigation solutions for reducing HAB impacts.

THANK YOU FOR YOUR ATTENTION