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**on Harmful Algal Blooms**

Rome, 27-29 March 2023

Item 4.6.2 of the Provisional Agenda

**PROGRESS REPORT OF THE IOC REGIONAL WORKING GROUP ON HARMFUL ALGAL BLOOMS IN THE WESTERN PACIFIC (WESTPAC-HAB)**

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**Harmful Algal Blooms in the Western Pacific**

**(WESTPAC-HAB)**

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*IPHAB-XVI, Rome, 27-29 March 2022*

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• Mitsunori Iwataki (University of Tokyo, Japan)

• Kazumi Wakita (Tokai University, Japan; Principal Investigator (co-chair))

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• Po Teen Lim (University of Malaya, Malaysia; Principal Investigator (co-chair))

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• Aletta Yñiguez (University of the Philippines, Philippines)

• Elsa F Furio (National Fisheries Research and Development Institute, Philippines)

• Sandric Chee Yew Leong (National University of Singapore, Singapore)

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• Doan Nhu Hai (Institute of Oceanography, Vietnam)

• Nguyen Van Nguyen (Research Institute of Marine Fisheries, Vietnam)

**Background and long-term objectives**

Harmful algal blooms (HABs) are natural phenomena of microalgal (or macroalgal) proliferation, which cause problems on fisheries and human health. The project Harmful Algal Blooms in the Western Pacific (WESTPAC-HAB) is a regional group and a network for HAB researchers to mitigate negative impacts caused by HABs, with the following long-term objectives:

• Understanding biological and chemical nature, population dynamics and environmental effects of harmful algae and their bioactive products;

• Prevention of ill consequences caused by HABs, through providing scientific knowledge useful for establishment of reliable cost- and load-effective management systems including monitoring and research.

**Major activities**

WESTPAC-HAB has carried out various HAB related activities contributing to member states and international communities, such as assistances in identification of causative species of newly emerged HAB events, assistances in capacity building (HAB training course), sharing regional information of targeted HAB species (workshop and publication), and sharing knowledges of regional HAB records with international communities (publications).

•Contribution to the UN Ocean Decade: Organized the seminar with the title “Fostering transformative HAB sciences for societal applications” at the UN Decade of Ocean Science for Sustainable Development Regional Kickoff Conference for the Western Pacific and Adjacent Areas in November 2021, shared with GlobalHAB and uploaded to its website.

・Science to Community: Scientific findings provided to the public through interviews broadcasted on the TV news, websites (NHK world in English), and newspapers (M. Iwataki, Japan).

・HAB species identification: Species identification of newly occurred HAB species in this region, *Karenia selliformis* in Russia (2020) and Japan (2021), under collaboration of WESTPAC-HAB members. The species caused big fish kill in northern Japan became the biggest economic loss caused by HABs in Japan.

・HAB phylogeography and associated fisheries damage compiled: Phylogeography and associated fisheries damage of the harmful raphidophyte *Chattonella* were compiled in East and Southeast Asia under a collaboration of researchers from 10 member states of WESTPAC region (Lum et al. 2021).

・Sharing scientific knowledge and advances on HAB: A regional HAB session were convened in hybrid mode during the Xiamen Marine Environmental Science Symposium with contribution of more than 40 papers.

• Assistances in local HAB training course: For the national HAB training courses physically held in Brunei and in Malaysia in 2022, project members supported the event by providing resource persons and training materials.

• Sharing regional HAB information with international communities: Historical records of HABs in this region were compiled in Southeast Asia and East Asia, and the knowledge was shared with international HAB communities (Global HAB Status Report).

・Sharing regional HAB information: Information of recent HAB species occurrences have been shared in WESTPAC-HAB members, e.g., *Karenia mikimotoi* (Thailand), *Cochlodinium fulvescens* in Malaysia, as well as the bloom of *Karenia selliformis* in Russia and Japan.

• Steering committee members meeting: Near future activities possible in the pandemic situation were discussed and identified, at the online meeting held in September 2021.

**Outputs and outcomes**

Through the activities such as the workshop, training course and collaborative research during the intersessional period, we obtained following outputs and outcomes:

・Incubator was organized with attendance of 77 participants from 9 WESTPAC member states. Challenges and future works of WESTPAC-HAB program identified.

・Knowledge and understanding of the public on the newly occurred HAB species in the region and its impact to the society raised. Iwataki et al. (2022) published and Orlova et al. (2022) reported newly occurred HAB species in this region.

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* New dinoflagellates and raphidophytes were discovered and described under WESTPAC collaboration (e.g., *Chattonella malayana*, *Chattonella tenuiplastida*, *Heterocapsa borneoensis*, *Heterocapsa iwatakii*, *Heterocapsa limii*) (Hanifah et al. 2022; Lum et al. 2022).

・Sakamoto et al. (2021) and Yñiguez et al. (2021) papers were published which summarize information of HAB occurrences in East and Southeast Asia using HAEDAT data. Iwataki, Yñiguez, and some members contributed to the paper of Hallegraeff et al. (2021), which summarize HAB occurrences in the world using HAEDAT data. Lum et al. (2021) was published with participation of co-authors from 10 WESTPAC countries which summarizes occurrences and distribution of Chattonella in the WESTPAC region.

• Local researchers trained with knowledges on local HAB species (Local HAB training courses in Malaysia and Brunei).

**Problems encountered**

During the intersessional period (May 2021–Feb 2023), collaborative research with international travel has been limited due to the covid-19 pandemic. For the preparation of historical HAB records, we faced the restriction of HAB information availability due to data ownership by different member states. Lack of data in database hampered the effort to understand long term changes of HABs events especially due to climate changes in all member states.

**Objectives to be achieved for the next intersessional period**

We will put further effort to mitigate the negative impacts caused by HABs in this region, by sharing HAB information (workshops), capacity buildings (training courses), and international collaborative research, all of which aims at contributing to UN Decade of Ocean Science for Sustainable Development. The project will strengthen regional and global networking, develop and improve information and research skills on HABs, through the activities listed in ‘Planned activities’ with detailed objectives and expected outputs/outcomes.

**Three key thematic areas of actions**

Developed and shared information on regional HAB issues and causative species will be utilized to actions toward mitigation of negative impacts by HABs for seafood safety (toxic HABs) and security (fish killing HABs) in the region. Several HAB species were newly detected and identified, and new species were described. These outputs/outcomes are mainly related to the key thematic areas of the WESTPAC, i.e., ii) Marine biodiversity and conservation, seafood safety and security and also contributing to “A Safe Ocean” of the UN Decade of Ocean Science for Sustainable Development.

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