HARMFUL ALGAL BLOOMS IN MALAYSIA

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Outline

Nov 2012-2013
Protracted blooms of *Pyrodinium bahamense* in the west coast of Sabah

Feb 2014
A phenomenal bloom of *Karlodinium australis* associated with fish kill

Apr 2014
A shift in bloom organisms in the west coast of Sabah
November 2012-2013

PROTRACTED BLOOMS OF *PYRODINIIUM BAHAMENSE* IN THE WEST COAST OF SABAH
Protracted blooms of *P. bahmanse*

- November 2012: Sabah Fisheries Dept. detected high PST in shellfish samples from the west coast of Sabah.
- January 2013: Two teenagers died.
- February 2013: A woman died.
- Total of 43 PSP cases were reported.

*Pyrodinium bahamense*
Sampling activity

January 2013 and June 2013:
Sampling trips were conducted by the team after the PSP outbreak in Kota Kinabalu, Sabah. Plankton samples collected were observed and toxin analysis performed.
February 2014

A PHENOMENAL BLOOM IN THE WEST JOHOR STRAIT THAT ASSOCIATED WITH MASS MORTALITY OF NET CAGE-CULTURED FISHES
• Fish kill incident happened, started on Feb 11, 2014; became more serious on the following three subsequent days.
• It last for at least two weeks.

- Feb 11  Fish kill incident started.
- Feb 14-16 Massive fish kills reported in the press.
- Feb 20-23 Field sampling conducted.
Type of affected finfish cultured in net cages:

- Red Snapper (*Lutjanus* sp.)
- Estuary Cod (*Epinephelus coioides* Hamilton)
- Seabass/Siakap (*Lates calcarifer* Bloch)
- Paddletail Snapper (*Lutjanus gibbus* Forsskål)
- Fourfinger Threadfin (*Eleutheronema tetradactylum* Shaw)
Sampling area

No. of net cages farm: 8-9
Cell composition

Cell density of *Karldinium* on 21st February at West Johor Strait:

$1-2.3 \times 10^6$ cells L$^{-1}$
The unarmored dinoflagellate

*Karlodinium australe*

- Cell length: 22.5 ± 2.1 μm
- Cell width: 16.2 ± 1.9 μm
- Nucleus: irregular-rounded, anterior
- Chloroplast: >10 irregularly distributed peripherally
Molecular Evidence

- Strong support with its’ closest sister species, *K. armiger*

- Molecular distance in range of 3.7-3.8% compared to *K. armiger*

- ≥ 6% compared to other species.

- CBCs found between sister taxa.
Fish Necropsy

- protruding eyes/reddening of the iris,
- discolored and skin sloughing,
- damaged gills, slightly brownish cast
- fins reddened at the base,
- Human skin irritation, itchiness and swelling
A SHIFT IN BLOOM ORGANISMS IN THE WEST COAST OF SABAH

April 2014
Shift in Bloom Organisms

- Early Apr 2014: Red tides was observed along the west coast of Sabah.
- Investigations were undertaken.
Noctiluca blooms

Photo courtesy of A. Puyong (SFD)
Sampling activity

April 2014:
Sampling trip was undertaken in Kota Kinabalu, Sabah. Plankton samples collected were observed.
• Organisms identified:

*Cochlodinium polykrikoides*

*Gonyaulax*
A new toxigenic *Pseudo-nitzschia* species

*PSEUDO-NITZSCHIA KODAMAE*
3. Results

3.1. Morphology

In this study, two species of *Pseudo-nitzschia* were described based on electron microscopy observation. Morphological diagnostic characteristics of both species are presented and compared below.

3.1.1. Pseudo-nitzschia kodamae sp. nov. S.T. Teng, H.C. Lim, C.P. Leaw and P.T. Lim

The cells are linear and symmetrical in valve view, with a transapical axis of 2.6 ± 0.3 µm and an apical axis of 71.2 ± 11.2 µm (Fig. 2A and B, Table 2). Apices are short and round
**Pseudo-nitzschia kodamae**

- A new toxigenic species of *Pseudo-nitzschia* from Malaysian water was characterized.
- First confirmation of a DA-producing diatom from Malaysia.
Significant Achievement

List of publications (Journal papers):


