

the **abdus salam** international centre for theoretical physics

SMR 1550 - 8

WORKSHOP ON THE USE OF RECEPTOR BINDING ASSAY (RBA) 1 - 5 September 2003

Co-organized by the International Atomic Energy Agency (I.A.E.A.)

Country Report: Malaysia Species, Events and Monitoring

Gires USUP

Marine Science Programme Faculty of Science and Technology Universiti Kebangsaan malaysia 43600 Bangi, Selangor, Malaysia

These are preliminary lecture notes, intended only for distribution to participants.

Country Report: Malaysia Species, Events and Monitoring

Gires Usup

Marine Science Programme, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor Malaysia



Malaysia

A tropical country with a relatively long history of PSPs (since 1976)

To date, some 500 cases, with 36 fatalities

Some evidence that PSP is gaining in importance



Species

Pyrodinium bahamense var. compressum

This continues to be the most important PSP species on the west coast of Sabah. All strains tested to date are toxic (STX, NEO, dcSTX, B1, B2).

Possibly present on the east coast of Sabah.





Species

Alexandrium tamiyavanichii



First caused toxicity in Sebatu in 1991. Very recently formed bloom on the east coast. Also found in Kota Kinabalu, Sabah



First caused toxicity in Tumpat in 2001. Six victims including one fatality.

Vector: *Polymesoda* sp., a benthic clam

Species

Alexandrium minutum





Found in Pulau Redang waters in July 2003. Previously unreported from tropical waters. Probably produces PSP toxins.



Very common in the waters around Penang Island. The 20 clones we have screened to date are not toxic.



New Alexandrium species described by Montressor et al. Found in Pulau Redang waters in July 2003. Toxicity still unknown.

Species

Alexandrium leei



Non-toxic



Possibly a new *Alexandrium* species. Found in Pulau Redang waters in July 2003. Toxicity still unknown.



Events

- *P. bahamense* blooms and shellfish toxicity annually on east coast of Sabah.
 Peaks in July-September
- Shellfish toxicity annually in Sebatu. Peaks in September-November
- No new toxicity reported from other sites
 No PSP in Sabah since early 90s

Monitoring and Management



Carried out by the Dept. of Fisheries Malaysia at three centers: Kuala Lumpur, Penang and Kota Kinabalu

Toxicity testing by the mouse bioassay

Only the Fisheries and Health departments can issue toxicity advisories

Facilities

- Kuala Lumpur: mouse, HPLC, RBA
 Penang: mouse, HPLC
 Kota Kinabalu: mouse, HPLC
- UKM partners with Dept. of Fisheries
 Mouse, HPLC, RBA (microplate, LSC)







Experience with RBA



Some results with RBA

Sample	Toxin content
<i>Polymesoda</i> sp. (week of event)	596 μg/100 g STX equivalent
<i>Polymesoda</i> sp. (3 weeks after event)	54 μg/100 g STX equivalent
<i>A. minutum</i> clones	12—19 fmol cell ⁻¹ STX equivalent

Training

- Sabah Dept. of Fisheries: HPLC in Kota Kinabalu
- Soon: HPLC and RBA in UKM
 - Dept. of Fisheries
 - Chemistry Dept.
 - Universities
 - Commitment to provide RBA training to Pakistan and Indonesia

Significant shellfish aquaculture



Blood cockles (*Anadara granosa*)

Green mussels

Bivalves other than cockles are mainly imported from New Zealand

The future and challenges

- Presence of several proven and potentially toxic species suggests PSP could become more important in future
- Locations where toxicity occurred are being monitored. In other locations, humans may be the first bioassay
- Commercial bivalve fishery still at infancy.
 Virtually all PSPs to date due to 'non-market' sources. More difficult to monitor and control
- Trained manpower and facilities still inadequate
- PSP (seafood toxicity) is a small issue compared to other diseases, e.g. dengue fever

Thank you The IAEA for including Malaysia in this workshop