

Status of Shellfish Toxicity in Singapore

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Introduction

No incidence of shellfish toxicity related to red tide has been recorded in Singapore to date. Toxic dinoflagellates, fatal to humans, have not been detected in Singapore's waters. Only one species of dinoflagellates, *Cochlodinium catenatum*, has been found to be dominant in some of the phytoplankton blooms reported. This species has been confirmed to be nontoxic to humans by mouse bioassay using the Association of Analytical Chemists' method.

The occurrence of blooms locally has been found to be associated with either high water temperature ($>30^{\circ}\text{C}$) or low salinity (<28 ppt) or both, and peak densities coincided with neap tides when mixing of offshore and coastal waters was minimal. The bloom is usually patchy and is concentrated mainly in the upper 2-m layer of the water.

Toxicity to fish and mammals has not been detected or recorded. Nontoxic problems, caused by the bloom, for fish include asphyxiation, oxygen supersaturation at the surface (≈ 10 ppm oxygen), and high pH (>9.0). Farmed fish that are affected are mainly the fast-swimming pelagic ones, such as snappers (*Lutjanus* spp.), yellowfin jack (*Caranx ignobilis*), black pomfret (*Formio niger*), and white pomfret (*Pampus chinensis*).

The Primary Production Department, with the assistance of the Pharmacology Department, monitors the waters and mussels in the fish farming areas along Johore Strait (waterway separating Singapore from West Malaysia) for paralytic shellfish poisoning (PSP) on a fortnightly basis. Results from all tests have so far been negative. Depuration studies, using a UV-sterilizing system, has been carried out on green mussels (*Perna viridis*) with the sanitation aspect in view rather than shellfish toxicity.