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FREQUENTLY ASKED QUESTIONS

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ON

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“RED TIDE”

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**Marine Biotoxins
Laboratory**



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**Fisheries Resources Management
Division**

What is Red Tide?

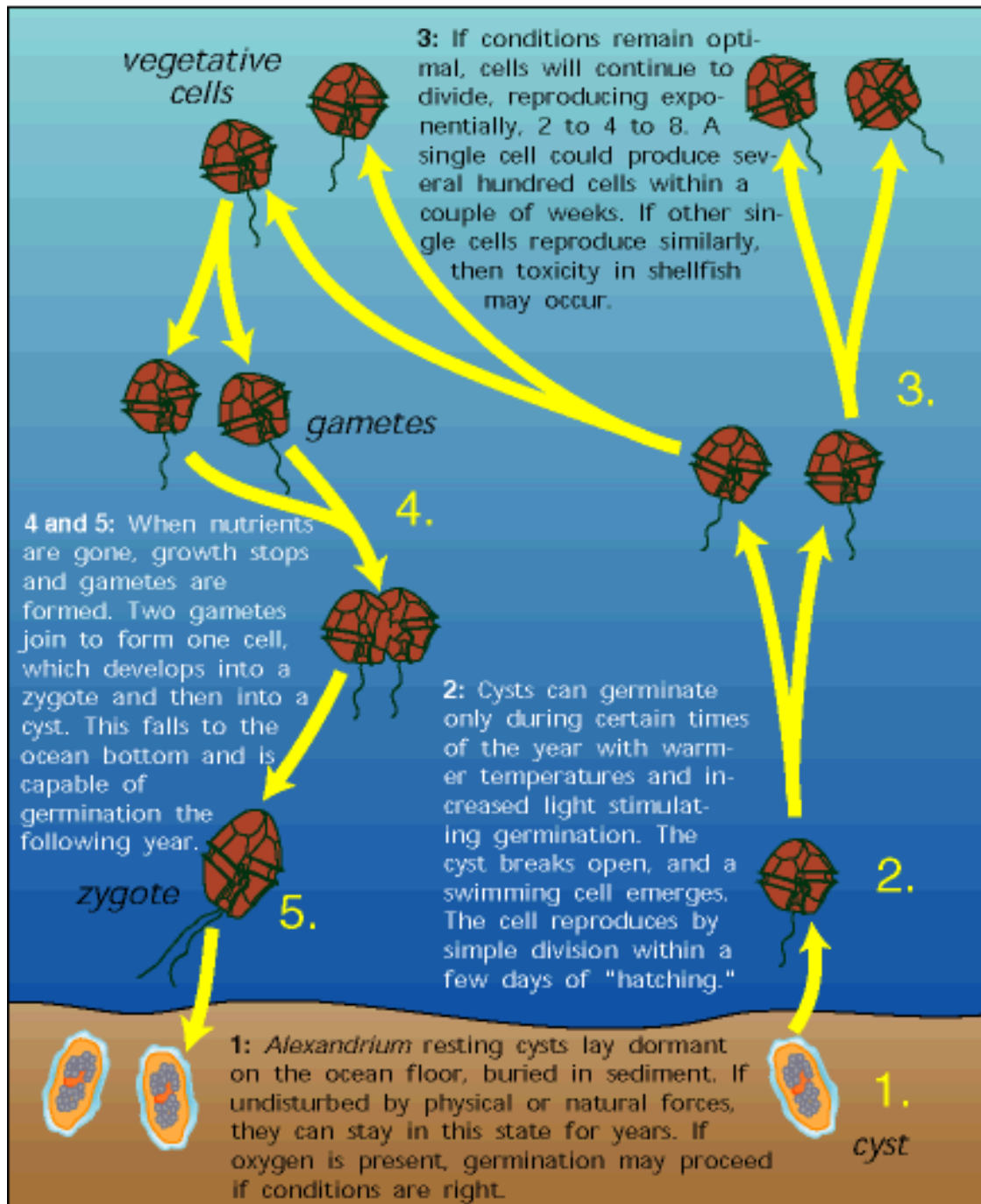
Red tide is a term used to describe coastal phenomenon in which the water is discolored by high algal biomass or concentration of algae. The discoloration may not necessarily be red in color but it may also appear yellow, brown, green, blue or milky, depending on the organisms involved. It may either be harmful or harmless. Some red tides are considered harmless when there is no harmful impact on the environment, living organism and humans as well. Almost always red tides are harmful since they cause harm to the environment, living organisms and to humans. Some cause mass mortality of fish or fish kills and some produce potent toxins that are of public significance. They cause poisoning syndromes such as PSP, ASP, DSP, NSP and Ciguatera Poisoning.

What causes red tide?

Red tide occurs when an algae rapidly increases in numbers to the extent that it dominates the local planktonic or benthic community. Such high abundance can result from explosive growth, caused, for example, by a metabolic response to a particular stimulus (e.g., nutrients or some environmental condition like a change in water temperature), or from the physical concentration of a species in a certain area due to local patterns in water circulation. Blooms are caused by environmental conditions that promote explosive growth. Factors that are favorable to the rapid increase include warm sea surface temperatures, and high nutrient content. The similarity of these alga and heterotrophs often makes it difficult to identify the precise cause of a harmful algal bloom, and to predict its impact on the affected ecosystem.

How a Toxic Algal Bloom Occurs

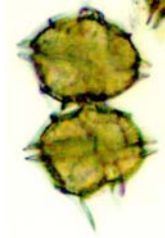
The life cycle of one cell



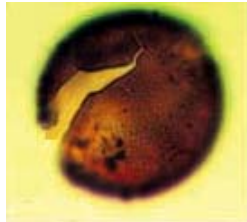
What species of dinoflagellates produced PSP toxins in the Philippines?

In the Philippines, the known species of PSP toxin-producing dinoflagellates are:

a. *Pyrodinium bahamense* var. *compressum*;



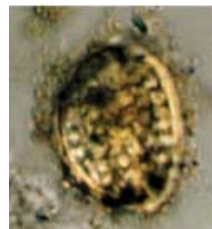
b. *Gymnodinium catenatum*;



c. *Alexandrium tamiyavanichii*; and



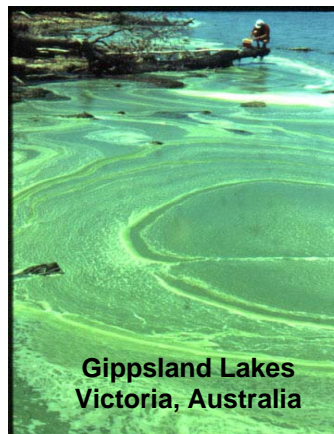
d. *Alexandrium minutum*.



but the most notable one is due to *Pyrodinium bahamense* var. *compressum*.

Do red tides occur anywhere else?

Yes, red tides occur globally. Even in developed countries like USA, Canada, Japan, France, Spain, New Zealand, etc. are not spared from this menace. In the Philippines, red tide has invaded 22 coastal waters of the country between 1983 and 2004. Currently there are only six (6) coastal areas that are still under shellfish ban due to the presence of red tide toxins and organisms.



Can red tide be predicted and controlled?

Currently, red tides cannot be predicted, but researchers are investigating the possibility. At present, methods to control red tides are still limited in scope and remain largely untested in major blooms since it is premature to conclude whether control methods are feasible, applicable and advisable due to lack of knowledge on the side effects of those methods and research studies are needed to validate the methods.

What seafoods are unsafe to eat from waters affected by red tide?

Filter-feeding shellfish which include clams, cockles, oyster, mussels and scallops from red tide affected coastal areas are



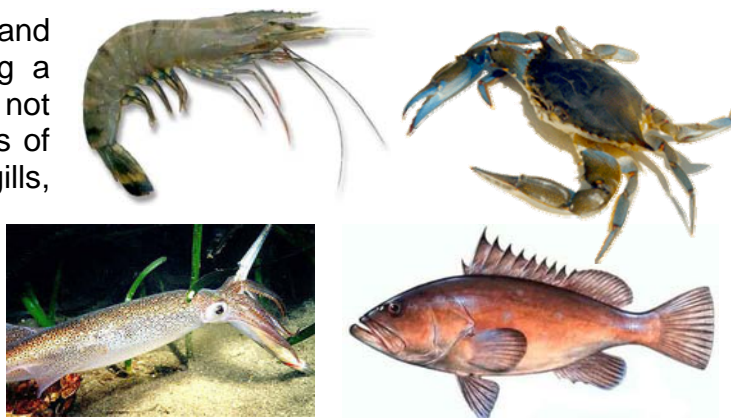
unsafe to eat. Shellfish are particularly prone to toxin contamination as they feed by filtering microscopic food out of the water, and if toxic planktonic organisms are present, they are filtered from the water along with other nontoxic foods. Whelks,



moon snails and other univalves can also accumulate dangerous levels of toxin during red tide as they feed on contaminated shellfish. Acetes or alamang from red tide affected waters are also not safe for consumption.

Is it okay to eat fish, crabs, or shrimps during red tide?

Yes. Fish, squids, crabs and shrimps can be eaten during a red tide because the toxin is not absorbed in the edible tissues of these animals, however, the gills, viscera and internal organs of fish must be removed before cooking. Eating distressed or dead fish, and other aquatic animals in areas affected by red tide is discouraged because the reason for the animal's strange behavior or death cannot be absolutely known. It could be something unrelated to red tide.



What happens if toxic shellfish are consumed?

In the Philippines, the most common shellfish poisoning syndrome is paralytic shellfish poisoning (PSP). Eating toxin contaminated-shellfish can cause paralytic shellfish poisoning (PSP) in humans. PSP is caused by saxitoxin, which is produced by toxic dinoflagellates, and is one of the most potent toxins.

After ingestion, this poison immediately affects the nervous system, with symptoms usually occurring within 30 minutes. Severity depends on the amount of toxin ingested. Initial reactions are tingling of the lips and tongue, which spreads to the face, neck, fingertips and toes. Headache, dizziness and nausea follow. These symptoms maybe mistaken for drunken conditions and are further aggravated by alcohol consumption. In severe cases, muscular paralysis and respiratory difficulty may occur within five (5) to twelve (12) hours. Fatalities from respiratory paralysis have been reported.

How are PSP cases treated?

There is no antidote and direct treatment for PSP. Treatment is symptomatic and varies with the severity of symptoms, which include pumping the stomach, inducing vomiting and charcoal hemoperfusion (a process involving the pumping of arterial blood through an activated charcoal filter to remove the poison). Alkaline fluids such as sodium bicarbonate are also thought to be helpful in treating symptoms, as the toxin is unstable in alkaline conditions. Artificial respiration may be required if patients exhibit respiratory stress.

What precautions should individuals take to prevent PSP?

Individuals should pay close attention to Red Tide Advisory and under no circumstances should individuals harvest, market and consume shellfish from any areas under shellfish ban due to red tides. Toxic shellfish taste and appear no different from nontoxic shellfish and cooking does not destroy the red tide toxin. Testing is the only way to determine if shellfish contain unsafe levels of toxin.

Is it safe to swim during a red tide?

Yes, swimming is safe for most people. However, red tide can cause some people to suffer from skin irritation and burning eyes. Use common sense. If you are particularly susceptible to irritation from plant products, avoid red tide water. If you experience irritation, get out of the water and wash thoroughly. Do not swim among dead fish because they can be associated with harmful bacteria.

What's being done to prevent contaminated shellfish from reaching the market?



Red Tide Monitoring Program has been in placed to determine toxicity in shellfish and toxic algae in seawater samples. The [Bureau of Fisheries](#) and some Local Government Units conduct regular monitoring of the coastal waters of the country. Toxin levels in shellfish are analyzed by mouse bioassay method. The Philippines' regulatory level for PSP toxin is forty (40) microgram per 100 grams of shellfish meat. When shellfish toxicity exceeds the regulatory level, BFAR Director issues shellfish advisory, which declares shellfish, ban in red tide affected areas. During shellfish ban harvesting, marketing and consumption of shellfish are prohibited. Concerned LGUs and government agencies coordinate and collaborate in the implementation of the ban thus preventing contaminated shellfish from reaching the market. When blooms subside, shellfish purify themselves of the toxin, and when testing indicates a return to safe levels, the areas are reopened. BFAR Director also issues bimonthly Shellfish Bulletin, which provides information on the status of the coastal waters of the country with regards to toxic red tide.



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