

# DNA tests could help predict, prevent harmful algal blooms

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A paper published in the current issue of the *International Journal of Environment and Pollution*, explains how a DNA test can be used to detect harmful algal blooms across the globe. The approach outlined could help reduce the economic impact on fisheries, recreational activities, and aquaculture sites, such as salmon and shellfish farms, and pearl oyster farms. It could also help decrease the outbreaks of food poisoning due to contamination of seafood by the toxins some of these algae produce.

Senjie Lin, an Associate Professor of Molecular Ecology in the Department of Marine Sciences, at University of Connecticut, explains that the geographic extent, frequency, intensity, and economic impact of harmful algal blooms have increased dramatically in recent decades throughout the coastlines of the world. It is possible, he suggests, that this increase is partly due to greater awareness and better monitoring technology.

However, factors such as climate change and increasing levels of pollution are more likely to blame for algal bloom occurrences. Ironically, says Lin, aquaculture operations themselves are often the cause of algal blooms because of the large mass of concentrated waste products from cultured animals.

Algae include cyanobacteria, dinoflagellates, diatoms, raphidophytes, haptophytes, and various other species many of which produce potent toxins. Some, however, are hazardous simply because of the unusually

high biomass they produce along a coastline, lake, or other body of water. It was recently estimated that annual economic losses due to algal blooms in the USA alone runs to tens of millions of dollars.

"To minimize economic and environmental impacts, an early warning detection system is needed," says Lin. He has reviewed the two molecular biology techniques that are most commonly used to detect harmful algae, with the putatively toxic dinoflagellate *Pfiesteria piscicida* as a case study.

Lin's paper provides practical information on the technical aspects of using biological markers - DNA or RNA - to detect the algae quickly and easily without the need for highly sophisticated methods or equipment. Crucial to success is the development of a portable device that could be used on board research vessels or fishing vessels equally as well.

Source: Inderscience Publishers

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