Algal blooms and eating sport-caught fish

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Algal blooms - rapid increases in algae in marine (or freshwater) systems – have been associated with excess nutrients in runoff, especially following storm events. Many algal blooms cause discoloration of the water – think "red tides" - but only those that are made up of certain phytoplankton that produce toxins can be harmful.

One such toxin is domoic acid (DA), which can cause gastrointestinal and neurological problems for people who are exposed to it. In extreme cases, DA can cause amnesia, leading to the syndrome's designation as "amnesic shellfish poisoning" (ASP).

The first documented cases of ASP occurred in 1987, when more than 100 people were poisoned after eating mussels on Prince Edward Island on the Canadian Atlantic coast. The presence of DA was first recognized in California in 1991 when more than 100 Brown pelicans and Brandt's cormorants in the Monterey Bay area died from DA poisoning. In 1998, the first marine mammal deaths linked to DA poisoning occurred locally. In these and other cases, the animals died after eating anchovies and sardines contaminated with DA – suggesting that "amnesic shellfish poisoning" may be a misnomer for the problems caused by DA toxins.

People are most likely to be exposed to DA toxins through the consumption of contaminated seafood, depending on what parts and how much of the fish they consume. In contrast to some other naturally occurring toxins (e.g., ciguatoxin, which comes from some reef algae), DA tends to remain primarily in the 'viscera' or 'guts' of the fish, with very little accumulating in the 'muscle tissue' or 'meat'. Although there are protections for consumers of commercially caught fish, safeguards for angler-caught fish are limited to broadly targeted seafood advisories.

Researchers from UC Santa Cruz and the UC Cooperative Extension Sea Grant Program recently conducted a study to determine whether local anglers are at risk of exposure to DA toxins by consuming their catch. During 2007-2008, the team measured DA in 11 commonly caught fish species, and surveyed anglers at the Santa Cruz Wharf about their fish consumption patterns. In contrast to the relatively wet years leading up to the study, very few harmful algal blooms (HABs) occurred during the study period. Still, the researchers detected DA in the viscera of seven species of fish commonly consumed by anglers during or soon after DA-producing HABs. Very little, if any, DA was detected in the meat.

Although more than half of the anglers surveyed reported eating their catch, most ate only the meat; only a very small fraction (less than 3%) reported not removing viscera before eating the fish. These results suggest that Santa Cruz Wharf anglers are at low risk of exposure to DA toxins from consumption of wharf-caught fish, particularly when there are few major runoff events. Still, concerns remain about the cumulative impacts of low-level exposure and, perhaps more importantly, how exposure might change under wetter weather conditions.

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