CALIFORNIA DEPT.OF PUBLIC HEALTH



Marine Biotoxin Monitoring Report

May 2020

Technical Report No. 20-19

INTRODUCTION:

This report contains results from the California Department of Public Health (CDPH) monitoring programs for shellfish toxins and associated toxinproducing phytoplankton. Toxin concentration ranges are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA), the latter associated with the syndrome called Amnesic Shellfish Poisoning. Estimates are provided for the distribution and relative abundance of Alexandrium, the dinoflagellate that produces PSP toxins, and Pseudo-nitzschia, the diatom that produces domoic acid. This report also contains summary information for any guarantine or health advisory in effect during the reporting period. Finally, lists of participating agencies and volunteers for each monitoring effort are provided.

Northern California Summary: Paralytic Shellfish Poisoning

Alexandrium was observed at only two northern California locations in May (Figure 1). Low numbers of this dinoflagellate were observed in samples from the inner Humboldt Bay sentinel station near Indian Island (May 4 and 8) and the Santa Cruz Wharf (May 5, 21, and 23).

Low concentrations of PSP toxins were detected in



Low numbers of *Alexandrium* were observed in northern and southern California sites during May.

mussel samples from the outer Humboldt Bay sentinel station on May 11, 18, and 26 (39, 39, and 38 μ g/100 g, respectively) and at Hunter Rock in Del Norte County on May 28 (37 μ g/100 g; Figure 2).

Domoic Acid

Pseudo-nitzschia was observed at most sites between Del Norte and Monterey counties in May (Figure 1). This distribution was similar to observations in April, however there was a slight increase in the percent composition of this diatom at some sites compared to the previous month. *Pseudo-nitzschia* remained common in outer Tomales Bay throughout the month (35% on May 25), with moderate cell

(Continued on page 2)

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) Only known toxin-producing species (e.g., *seriata* complex for *Pseudo-nitzschia*) are represented on the maps; (iii) All toxin data are for mussel samples, unless otherwise noted; (iv) All samples are assayed for PSP toxins; DA analyses are performed as needed (e.g., on the basis of detected blooms of the diatoms that produce DA); (v) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.



Figure 1. Toxic phytoplankton distribution in northern California.

(Continued from page 1)

mass, increasing in the mid-bay on May 18 (10%). This diatom also remained common at the Drakes Bay sentinel station (15% on May 6). Increases in the percent composition of *Pseudo-nitzschia* were observed at the Bodega Harbor sentinel station (12% on May 19) and the Santa Cruz Wharf, where it remained common for most of the month; the highest percentages observed at the latter site were 20% and 18% on May 9 and 21, respectively. Cell numbers were low at all other sites along the northern California coast.

A low level of domoic acid (2.8 ppm) was detected in a mussel sample from Davenport Landing (Santa Cruz County) on May 25; all other mussel and oyster samples were below the reporting limit. Razor clam samples from Del Norte and Humboldt counties continued to contain concentra-

> tions of domoic acid that exceeded the alert level (Figure 2). volunteer Ken Graves, with permission from the California Department of Fish and Wildlife (CDFW), collected razor clams from Crescent Beach on May 8. Of eight clam samples, seven contained domoic acid, with three samples exceeding the 20 ppm alert level (25, 32, and 35 ppm). On the same date CDFW collected 10 razor

(Continued on page 4)



May 2020



Figure 2. Distribution of shellfish biotoxins in northern California.

(Continued from page 2)

clams from Crescent City, South Beach. All 10 samples contained toxin, with eight samples exceeding the alert level. Domoic acid levels ranged form 21 to 37 ppm in these samples. Although domoic acid toxicity remains a concern in razor clams from Del Norte County, these results reflect a continued downward trend in the magnitude of toxin concentrations.

CDFW also collected six razor clam samples from Clam Beach in Humboldt County on May 10. All samples contained domoic acid, with four of the six clams exceeded the alert level (25, 46, 74, and 75 ppm). Domoic acid concentrations in the remaining two samples were just below the alert level (13 and 15 ppm).

Santa Rosa

Santa Cruz

Non-Toxic Species

Diatoms dominated the phytoplankton assemblage along the Northern California coast in May. *Bacteriastrum* was common to abundant at sites in Del Norte County and was also common at the Santa Cruz Wharf. *Chaetoceros* was abundant in samples from Noyo Harbor (Mendocino County) and throughout Tomales Bay (Marin Coun-

ty). *Chaetoceros* was also common in samples from Marina Bay in Richmond (inside San Francisco Bay) and Stillwa-



Sana Cruz Pt. Dume Redondo Beach Pier Terminal Island Orange Catalina Island Orange Agua Hedionda Lagoon San Diego La Jolla, Scripp's Pier Windansea Beach San Diego Harbor Shelter Island



A chain of Pseudo-nitzschia threaded through a chain of Chaetoceros.

Figure 4. Distribution of shellfish biotoxins in southern California.

(Continued from page 4)

ter Cove (Monterey County). *Thalassiosira* was also common to abundant at the Marina Bay site and *Eucampia* was common at the Santa Cruz Wharf.

Southern California Summary: Paralytic Shellfish Poisoning:

Alexandrium continued to be observed at scattered sites along the southern California coast (Figure 3). Low numbers of this dinoflagellate were ob-

served in samples collected offshore of Diablo Cove (May 26) and in mid Morro Bay (May 28) in San Luis Obispo County, at Avalon Bay, Catalina Island (May 21), and at the U.S. Navy Pier in San Diego Bay (May 6).

PSP toxins were not detected in any shellfish sampled in May (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed at several sites between San Luis Obispo and San Diego counties in May (Figure 3). This diatom was common in the mid-bay region of



Morro Bay (May 11) and at Goleta Pier in Santa Barbara County (May 7).

Domoic acid was not detected in any mussel or oyster samples collect-

(Continued on page 6)

The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public's health is threatened.

For Information on Volunteering:

For Recorded Biotoxin Information Call:

Email <u>redtide@cdph.ca.gov</u> or call 510-412-4635

(800) 553 - 4133

(Continued from page 5)

ed in May (Figure 4).

Non-Toxic Species

The dinoflagellate *Lingulodinium polyedrum* dominated most of the southern California coast in May.

L. polyedrum was common to abundant at sites between Santa Barbara to San Diego counties. This dinoflagellate accounted for 96% of the phytoplankton assemblage in a sample from inside San Diego Bay (May 10). The highest cell masses observed, in decreasing order, were in samples from: Scripps Pier in La Jolla (May 4), Agua Hedionda Lagoon (May 6), and the Windansea Beach in La Jolla (May 4).

QUARANTINES:

The annual mussel quarantine began on May 1. This quarantine applies to the sport-harvesting of mussels along the entire California coast, including all bays and estuaries.

The CDFW closure of the razor clam fishery remains in effect due to the continued presence of dangerous levels of domoic acid in razor clams from beaches in Humboldt and Del Norte counties.

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concenTable 1. Program participants collecting phytoplankton samples.

AGENCY	#	AGENCY	#
DEL NORTE COUNTY		Tolowa Dee-ni' Nation	1
Tolowa Dee-ni' Nation	1	Yurok Tribe Environmental Program	1
HUMBOLDT COUNTY		Pacific Shellfish	4
MENDOCINO COUNTY		CDPH Volunteer (Kristin Gordon)	3
SONOMA COUNTY		CDPH Marine Biotoxin Program	2
MARIN COUNTY			
CDPH Marine Biotoxin Program	1	Hog Island Oyster Company	7
CONTRA COSTA COUNTY		CDPH Marine Biotoxin Program	4
SAN FRANCISCO COUNTY			
SAN MATEO COUNTY			
The Marine Mammal Center	1	U.C. Santa Cruz	1
SANTA CRUZ COUNTY			1
CDPH Volunteer (Nacho Martin)	6	U.C. Santa Cruz	4
MONTEREY COUNTY		Marine Pollution Studies Laboratory	1
Monterey Abalone Company	1	Pacific Grove Museum of Natural History	4
SAN LUIS OBISPO COUNTY			
CDPH Volunteers (Skip Rotstein)	2	Grassy Bar Oyster Company	4
Tenera Environmental	1	U.C. Santa Barbara	1
SANTA BARBARA COUNTY		U.C. Santa Barbara	10
VENTURA COUNTY		None Submitted	
LOS ANGELES COUNTY			
CDPH Volunteers (Cal Parsons)	1	City of L.A. Environmental Monitoring Division	1
Los Angeles County Health Department	1	Los Angeles Water Keeper	2
ORANGE COUNTY		Back Bay Science Center	3
SAN DIEGO COUNTY			
CDPH Volunteers (Carol Niotta, Randy Dick)	2	Carlsbad Aquafarms, Inc.	2
Scripps Institute of Oceanography	4	U.S. Navy Marine Mammal Program	5

trate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins can produce a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms can be followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure

(Continued from page 6)

to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness.

These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in seafood species such as crab, lobster, and small finfish like sardines and anchovies.

Sportharvesters should only collect shellfish from areas that are not affected by a current health advisory or quarantine. Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.

Table 2. Program participants collecting shellfish samples.

COUNTY	AGENCY	#
Del Norte	CDPH Volunteer (Ken Graves)	8
	California Department of Fish and Wildlife	10
	Tolowa Dee-ni' Nation	2
	Yurok Tribe Environmental Program	1
Humboldt	California Department of Fish and Wildlife	6
	CDPH Volunteer (Georgina Wood)	1
	Humboldt County Environmental Health Department	1
	Pacific Shellfish	8
Mendocino	Mendocino County Environmental Health Department	1
Sonoma	CDPH Marine Biotoxin Program	3
Marin	CDPH Marine Biotoxin Program	1
	CDPH Volunteers (Jamie Sutton, Rand Dobleman)	2
	Hog Island Oyster Company	8
	Tomales Bay Oyster Company	4
San Francisco	None Submitted	
San Mateo	CDPH Marine Biotoxin Program	1
Santa Cruz	CDPH Volunteer (<i>Nacho Martin</i>)	2
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Company	4
Santa Barbara	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	4
Ventura	None Submitted	
Los Angeles	Los Angeles County Health Department	3
	Southern California Marine Institute	1
Orange	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarm, Inc.	2
	CDPH Volunteer (Steve Crooke)	1

If you are having difficulty accessing this document, please contact CDPH at 1-800-553-4133 to request this information in an alternate format.

Phytoplankton Gallery



The diatom Thalassiosira.



The diatom Bacteriastrum.



The *Lingulodinium polyedrum* bloom initiated in April continued through May along the southern California coast between Santa Barbara and San Diego counties.