

California's Most Wanted HAB Species

Listed below are the top nine species in California that researchers and health officials look for because they are very toxic or they pose greater threats to human and marine life.

Dinoflagellates

- Akashiwo sanguinea
- Alexandrium catenella
- Cochlodinium spp.
- Dinophysis
- Heterosigma spp.
- Lingulodinium polyedrum
- Prorocentrum spp.

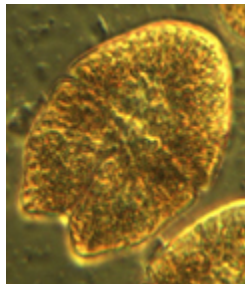
Diatoms

- Pseudo-nitzschia

Other

- Phaeocystis

1. *Akashiwo sanguinea*



Order: Gymnodiniales

Family: Gymnodiniaceae

Description: Unarmored, flattened cells that have a large central nucleus and numerous chloroplasts.

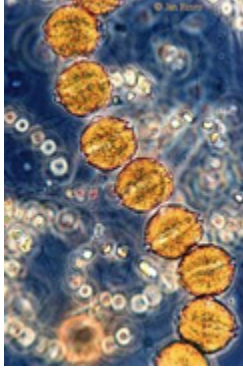
Cell Size: Length μm and Width μm

Distribution: Found in temperate to tropical and coastal waters.

Toxin: Unknown

Syndrome: None; however, large blooms may either take up all the oxygen in the water or produce a foam that is harmful to other marine organisms in the area. In November 2007, a red tide caused by this dinoflagellate released sticky foam that resulted in many seabirds deaths because their feathers were no longer waterproof. [See CeNCOOS Report](#), [View a Video](#)

2. *Alexandrium catenella*



Order: Gonyaulacales

Family: Goniodomataceae

Description: Has spherical shells with armored plates that usually form a chain. Single cells are rounder and chains consist of 2, 4, or 8 cells.

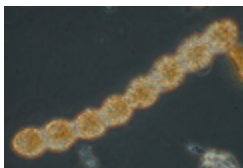
Cell Size: Length 20-48 μm and Width 18-32 μm

Distribution: Found throughout cold temperate and tropical waters, particularly in the Pacific Ocean. It can affect areas from the west coast of North America (any where from California to Alaska), Chile, Argentina, western South Africa, Japan, Australia, and Tasmania. In 1927, hundreds of people in California were affected by saxitoxin after getting shellfish poisoning.

Toxin: Produces a neurotoxin called saxitoxin that causes paralytic shellfish poisoning (PSP).

Syndrome: Paralytic shellfish poisoning (PSP) usually occurs after eating contaminated shellfish. Symptoms will include numbness, tingling, fever, rash, sleepiness, difficulty walking, uncoordinated muscle movements, and burning of the mouth. More severe cases involve being not able to breathe and death. Health officials are very conscious of these issues and carefully monitor and test mussels, oysters, and clams for toxins, which can also accumulate in salmon, sea otters, and whales.

3. *Cochlodinium* spp.



Order: Gonyaulacales

Family: Goniodomataceae

Description: Has small, oval, unarmored cells that can either form chains or remain single cells.

Cell Size: Length 60-80 μm and Width 20-40 μm

Distribution: Found in warm, temperate and tropical waters; usually in northern Atlantic waters along the east coast of North America and is widely found throughout the Pacific Ocean and the coasts of Japan and Korea. It was first reported in the Caribbean Sea along the coast of Puerto Rico. Since then it has been reported in California for the past 80 years, but recent blooms are occurring in San Diego and Monterey Bay.

Toxin: Produces an unknown toxin that kills finfish and salmon, causing great economic loss for

commercial fishing.
Syndrome: Unknown

4. *Dinophysis*



Order: Dinophysiales

Family: Dinophysiaceae

Description: Is an armored, planktonic dinoflagellate

Cell Size: Length μm and Width μm

Distribution: Has worldwide distribution and can usually be found in cold, temperate northern waters.

Toxin: Produces okadaic acid and dinophysistoxins that cause diarrhetic shellfish poisoning (DSP) after consuming contaminated shellfish. The illness does not lead to death as most victims are able to recover within a few days.

Syndrome: Diarrhetic shellfish poisoning affects the stomach and intestinal tract, which may lead to vomiting, nausea, diarrhea, and abdominal pain. Other symptoms include chills, headache, and fever.

5. *Heterosigma*



Order: Raphidomonadales

Family: Raphidophyceae

Description: Has spherical to more circular cells that are slightly flattened; flagella rotates and is about the same size as the cell

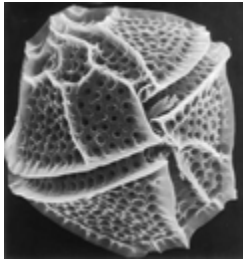
Cell Size: Length 8-22 μm and Width 6-14 μm

Distribution: Found along the Atlantic and Pacific coasts

Toxin: Produces brevetoxins that is responsible for killing lots of finfish and may be toxic to a variety of other marine organisms

Syndrome: None

6. *Lingulodinium polyedrum*



Order: Gonyaulales

Family: Gonyaulacaceae

Description: Has armored, bioluminescent, polyhedral-shaped cells that have prominent ridges outlining the cell; has the ability to form cysts until environmental conditions are favorable.

Cell Size: Length 40-54 μm and Width 37-53 μm

Distribution: Found in warm temperate to tropical waters; usually forms red tides along the coast of California particularly southern California and in the Adriatic Sea. A large red tide was reported in the fall of 2005 and stretched from San Diego to Ventura.

Toxin: Produces Yessotoxin, which is often connected with fish and shellfish mortality.

Syndrome: Unknown; but it often discolors the water, forming a noticeable reddish-brown bloom.

7. *Prorocentrum* spp.



Order: Prorocentrales

Family: Prorocentraceae

Description: Has armored, teardrop-shaped cells that are often found in coral rubble and sand

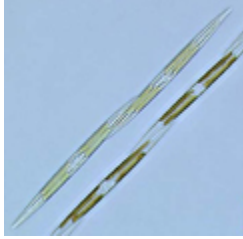
Cell Size: Length 20-50 μm and Width 35-70 μm

Distribution: Found worldwide, sometimes forming brown tides in cold temperate to tropical waters such as the Caribbean Sea and Indian Ocean.

Toxin: May produce okadaic acid, which leads to diarrhetic shellfish poisoning (DSP)

Syndrome: Diarrhetic shellfish poisoning affects the stomach and intestinal tract, which may lead to vomiting, nausea, diarrhea, and abdominal pain. Other symptoms include chills, headache, and fever.

8. *Pseudo-nitzschia*



Order: Bacillariales

Family: Bacillariaceae

Description: Has skinny, elongated cells that overlap at the ends; usually forms chains that consist of about 20 cells or less.

Cell Size: Length 40-175 μm and Width 2-8 μm

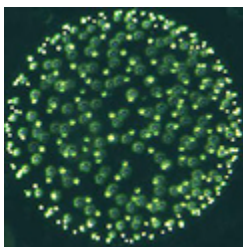
Distribution: Found throughout the world; very widespread in Washington, Massachusetts, Maine, California, and Oregon.

Toxin: Produces Domoic acid, which is a neurotoxin that causes Amnesiac Shellfish Poisoning (ASP). Domoic acid accumulates in shellfish such as crabs, clams, and mussels that eat this phytoplankton. As a result, people who eat infected shellfish usually get ASP. Domoic acid was first detected in California in 1991 in Monterey Bay when over a hundred seabirds died because they ate infected shellfish.

Syndrome: Amnesiac Shellfish Poisoning can cause death to marine mammals, seabirds, and humans. It affects the digestive system and causes nausea, vomiting, abdominal cramps, and diarrhea. Furthermore, it can affect neurological damage, and result in dizziness, headache, seizures, disorientation, memory loss, difficulty breathing, and coma.

Additional info at [MBARI website](http://www.mbari.edu)

9. *Phaeocystis*



Order: Prymniales

Family: Phaeocystaceae

Description: Can be found as a floating colony of cells that is surrounded by a layer of slimy mucus or it can exist as a single cell.

Cell Size: Varies depending on whether it's a colony or not

Distribution: Found in the temperate and polar regions

Toxin: None, but it does produce dimethylsulphide

Syndrome: None; however, large blooms may produce foam that harms seabirds and other marine organisms as well as may play an important role in cloud formation and climate regulation.

Additional Links:

Find more specific information about each species at the [Southern California Coastal Ocean Observing System](#)

[Look at Southern California's HAB Map](#)

Find blogs, water quality graphs and descriptions at the [Santa Cruz Plankton Weekly](#)

Find up-to-date water quality, weather, and HAB data for Monterey Bay at the [UCSC SCOOP page](#)

How have these HAB species impacted one part of California? Find out at our [Time Traveling in Monterey Bay](#) page