

Plankton Identification

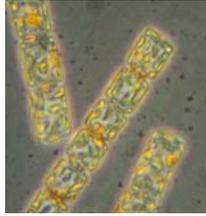
Diatoms



Asterionellopsis (1)



Attheya



Detonula



Guinardia



Odontella (1)



Odontella (2)*

Common Coastal Species

Puget Sound and Coastal Species



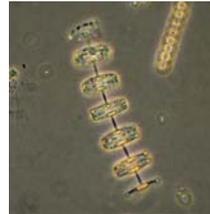
Chaetoceros (1)



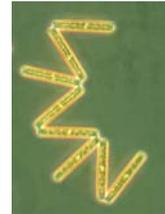
Coscinodiscus



Rhizosolenia



Thalassiosira (1)



Thalassionema



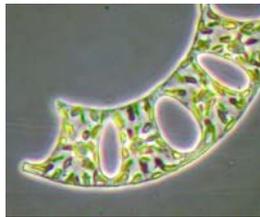
Ditylum



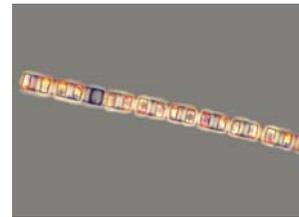
Chaetoceros (2)*



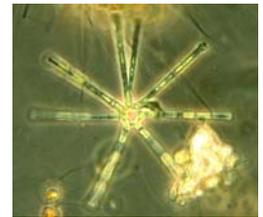
Thalassiosira (2)*



Eucampia



Skeletonema

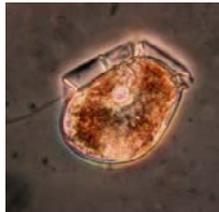


Asterionellopsis (2)*

Dinoflagellates



Noctiluca



Dinophysis



Protoperdinium



Ceratium



Prorocentrum (1)



Prorocentrum (2)*

Toxic Species Found in Washington



The dinoflagellate genus *Alexandrium* produces a variety of toxins which cause Paralytic Shellfish Poisoning (PSP). Shellfish filter feed, meaning they pump sea-water and eat phytoplankton. As they digest *Alexandrium*, toxin is released into their digestive system and then distributed into their tissues.



Domoic acid is produced by diatoms in the genus *Pseudo-nitzschia*, needle-like cells that form chains by overlapping their tips. It is the only diatom currently identified as producing a marine biotoxin. Not all species of *Pseudo-nitzschia* produce domoic acid, nor do they produce it consistently.



In addition to marine toxins, the salmon farming industry in Washington State has suffered large losses due to the golden-brown algae *Heterosigma akashiwo*. *Heterosigma akashiwo* is a bloom forming organism associated with massive finfish deaths in temperate waters worldwide.

* Another example of the same genus of this organism.

Plankton Identification

Marine algae come in a variety of sizes and forms. The small, microscopic plant-like organisms are often referred to as microalgae or **phytoplankton**, which like land plants, contain **photosynthetic** pigments such as chlorophyll and need sunlight and inorganic **nutrients** to grow.

Diatoms

Perhaps the most varied, beautiful, and geometrically intricate of all the phytoplankton are the diatoms. Diatoms have a rigid **silica** shell (and hence require silicate as an essential nutrient) composed of two interlocking parts. Unlike dinoflagellates, diatoms do not propel themselves up and down in the water column, but are dependent on oceanic currents for transport. After diatoms die, their silica shells are either dissolved back into the seawater or sink to the bottom and eventually become diatomaceous earth. Diatoms can either be solitary or colonial (forming chains or groups of cells), and many have distinctive shapes or structures which help them stay afloat.

Dinoflagellates

Dinoflagellates typically have one or two **flagella** (whip-like tails) that can move them up or down in the water column. They are either naked or have complex outer shells or armor plating called **theca**, made of carbohydrate material in a variety of shapes and sizes. Dinoflagellates' ability to move up or down, called **vertical migration**, is thought to assist them in gaining access to nutrients or light as needed, and so they can optimize their position in the water column.

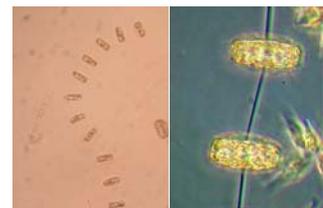
Why are some species toxic and others not?

Out of the thousands of phytoplankton species identified, only a few dozen can produce biotoxins. Toxins apparently benefit these algae in some way: some species produce toxin consistently, while some, like *Pseudo-nitzschia*, only appear to produce toxin under certain environmental conditions. Some of the most important questions that researchers face are determining the structure and function of toxic compounds in harmful species, and the conditions under which they produce toxins.

Why do the ones I see look different?

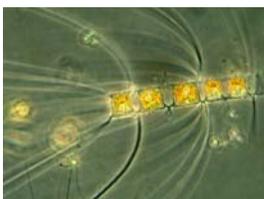
Answer One: Magnification

Your microscope may be set to a different magnification than the ones that took these pictures. Below are three sets of plankton magnified to 160x and 400x to show the difference that magnification can make. What is the magnification of your microscope?



Answer Two: Same genus, but different species

Phytoplankton are so small that we can't always tell the difference between species using a regular light microscope. Below are four different species of *Chaetoceros*—how are they similar? How are they different?



Answer Three: Size

Plankton size can depend on stage of life, growing conditions and food supply.