Identification of Springtime Diatoms of the Raritan Bay, NJ

The Monmouth County Department of Health

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Photographs and slideshow by Becky Cosgrove, Environmental Lab Director

These Diatoms were identified and captured digitally in samples submitted to the Monmouth County Health Department Environmental Laboratory. The samples were collected on March 12th 2007. *Skeletonema costatum* was estimated to dominate the composition followed by *Dactyliosolen fragilissimus*. More photos to follow as we collect them!

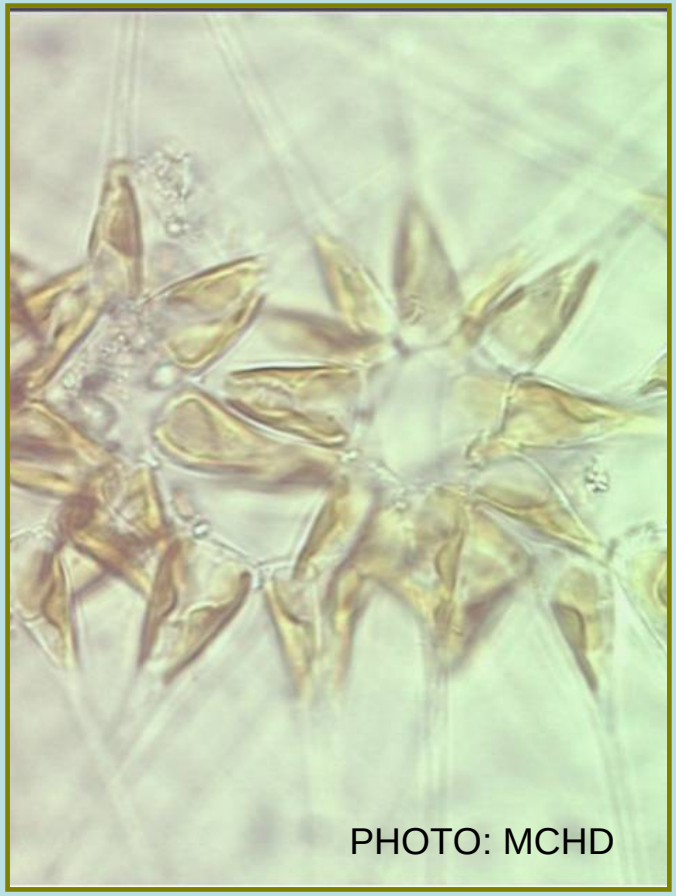
Asterionellopsis glacialis

- *Asterionellopsis glacialis*

Synonym(s): *Asterionella glacialis* Castracane 1886 , *A. japonica* Cleve

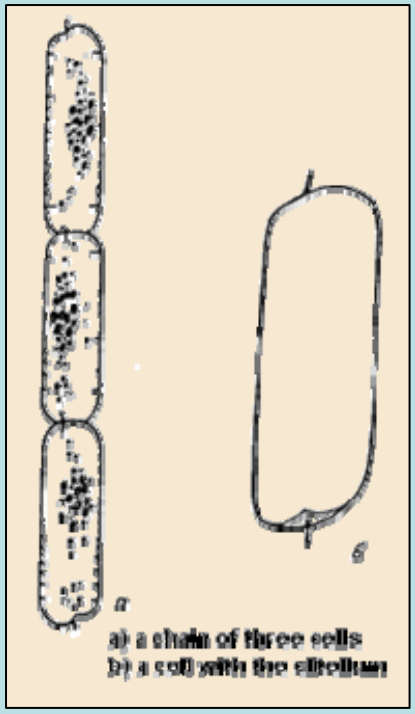
- Cells 30 - 150 um long

- Cells united at base to form star shape colony



Dactyliosolen fragilissimus (synonym: *Rhizosolenia fragilissima)*

- hair-like colonies of cylindrical cells
- each valve has a small spine, or process (green arrow), which fits into a depression on the adjacent valve



Dactyliosolen fragilissimus

Flyover photos courtesy of NJDEP

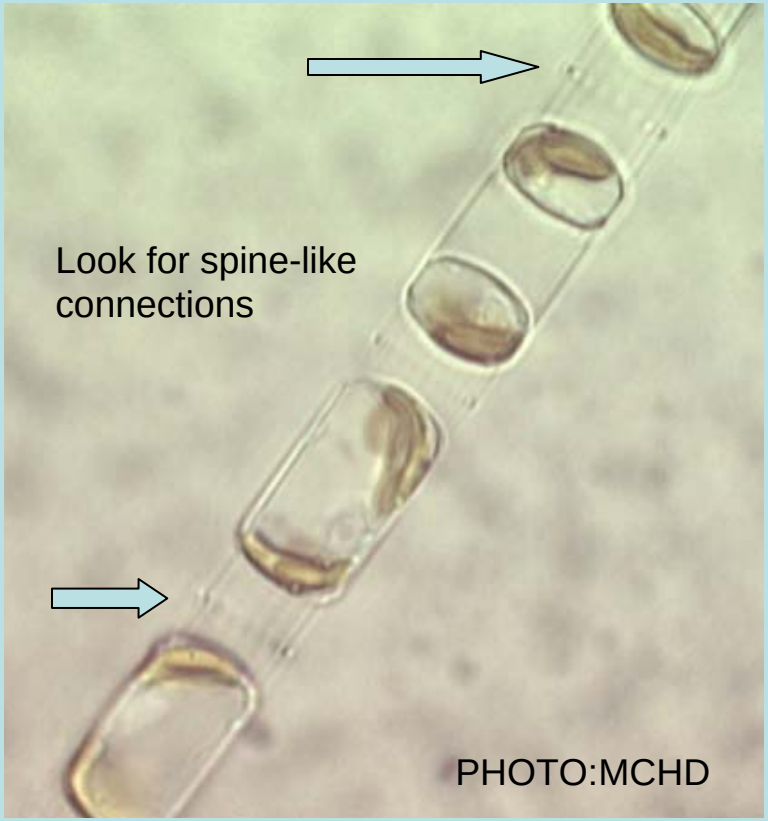
An algae bloom was reported to the NJDEP on or near to May 26th 2007. The bloom was reported as brown foam and discolored ocean water from around Sandy Hook to the Manasquan Inlet, as well as Sandy Hook and Raritan Bays. During the day the DEP hotline received numerous complaints of brown, foamy, smelly water in areas of Monmouth County, in Raritan Bay and along the beaches in Long Branch and Allenhurst. The bloom was headline news for a week as the unseasonably hot May weather on the Memorial day weekend focused attention on the beaches. By June 1st the bloom appeared to be dissipating, state officials said. The algae was identified by the Monmouth County Department of Health Environmental Laboratory as *Dactyliosolen fragilissimus,* a diatom that is well known to form large free-floating masses. The original description of this species is attributable to Ehrenberg (1843) who placed it in the genus Rhizosolenia. Regardless of the name, many species of "*Rhizosolenia*" exhibit interesting features related to their evolutionary ecology, including cyanophyte symbioses, positive buoyancy, and the formation of vertically migrating, multi-species mats. It is somewhere below the nutricline (where concentrations of dissolved nutrients such as nitrate and phosphate are maximized) where the mats migrate to, to pick up nitrate.

Ditylum brightwelli

- A large diatom
- Cells appear rounded but are actually prism shaped
- Cells have numerous chloroplasts (cell organelle containing photosynthetic pigments)
- Each valve has one large, straight central spine with a ring of smaller spines (blue arrow points to smaller spines)
- Common with wide distribution but seldom abundant

Skeletonema costatum

- Cells cylindrical or oblong with rounded ends
- Cell size can vary within a given sample and seasonally (Marshall 1986)
- Cells in chains connected by marginal spines to form straight filaments
- Very common and abundant



Thalassiosira rotula

- Cells are disc shaped, united by a central thread
- This girdle view resembles tinker toys

One cell of *T. rotula*
in valve view

PHOTO:MCHD

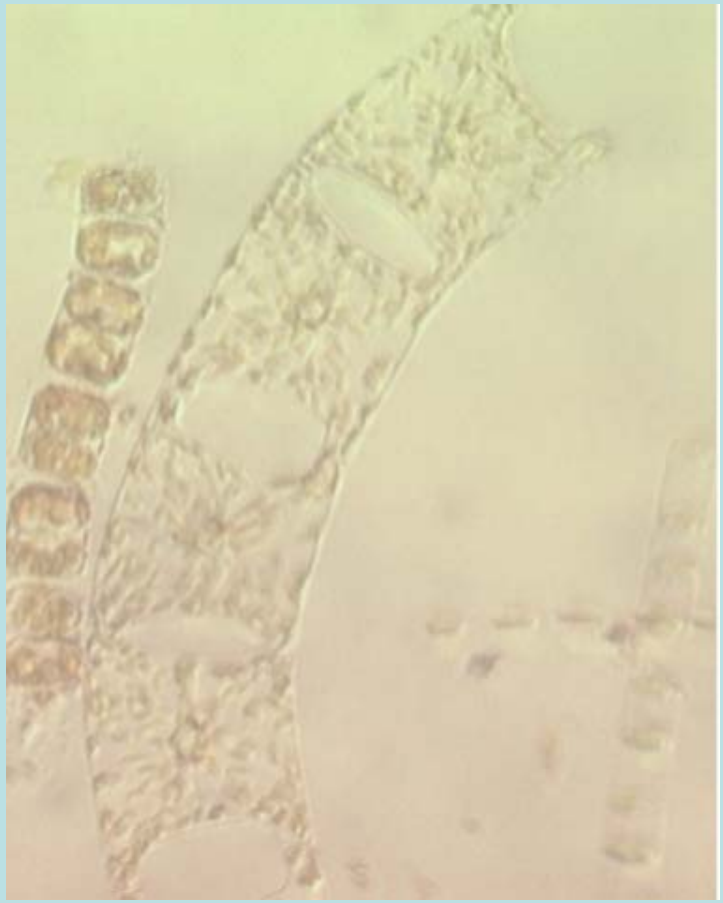
One chain was photographed, above, by merging 9 individual images to capture the length of the chain

Thalassiosira nordenskioeldii

- Cells short, rectangular and appear octagonal due to beveled or rounded corners
- Cells united in chains by fine thread
- Marginal spines are also present (are visible but faint, at blue arrows)

Eucampia zodiacus

- strongly curved, long chains forming a flattened helix
- blunt processes at outer cell margin connect adjacent cells
- distribution is worldwide
- usually in low concentrations



Chaetoceros sp.

- Chaetoceros diatoms are a large and highly variable group that comprises about 400 identified species.
- chains of varying lengths
- occasionally cells are solitary
- cells constructed like a box with a lid. From above, they are rounded, but from the side they are rectangular.
- *Chaetoceros* spp. always carry outward brushes that point from the corners of the cell
- In chained colonies, the brushes touch the base of the neighboring cells
- The species photo is, or, is near to, *C. decipiens*.