

FLOW: Amigos de Bolsa Chica Citizen Science Program

Plankton Collection and Identification Report

Date: 04/26/13 Time: 2:35 PM

Collectors: Judy H., Chuck D., Belen C., Joana T. (analysis also performed by Margaret C., and Donna S.)

Tide: ebb (going out) last high: 11:45 AM

Secchi: N/A

Temp.: 20°C

Salinity: 35 ppt

pH: 8-8.4

Nitrates: 0 ppm

Phosphates: 0.25 ppm

Ammonia: 0.25 ppm (close to 0.25 ppm)

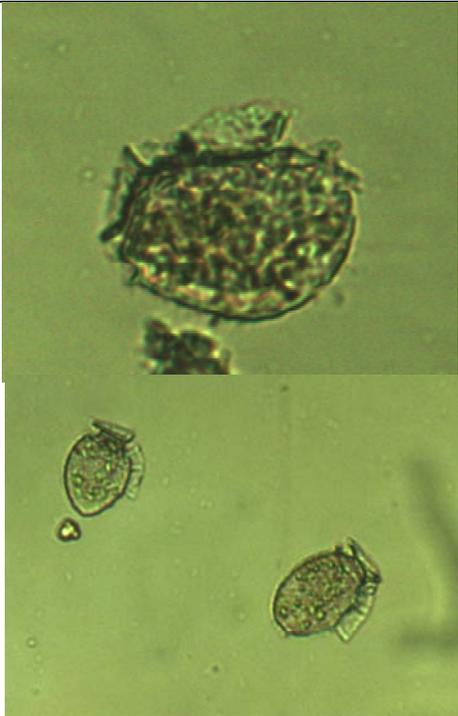
Weather/ wind: Sunny/ clear; strong onshore wind (20-25 knots NW)

Summary:

We collected plankton at the Tidal Inlet this afternoon without problems (despite the strong onshore wind. We then went back to the Visitor Center where we measured nutrients and pH and we observed samples under the microscope: Joana and Belen were in charge of microscopy; others worked on chemical parameters. This was by far the most diverse sample we have seen since the beginning of this monitoring program in March. There were very few chains of the potentially harmful genus of diatom *Pseudo-nitzschia* spp. in the water, and an incredible variety of both diatoms and dinoflagellates (see complete list at the end of the report). *Prorocentrum micans*, *Ceratium* spp. and *Dinophysis acuminata* were the most abundant dinoflagellates (concurrent blooms?).

Nutrients and pH were within expected ranges (this water was collected when the tide is going out so it makes sense that ammonia and phosphates are a bit above 0 ppm).

Here are a few species and genera of plankton that we observed, identified and photographed under the microscope today. (See complete list of organisms observed at the end).



Dinophysis acuminata

Dinophysis acuminata is marine, planktonic dinoflagellate species. It is a potentially toxic species that may produce ocaidic acid and blooms of this species have been associated with DSP events. It is commonly found in coastal waters of the northern Atlantic and Pacific Oceans. The most extensive blooms have been reported from the summer and fall months in many parts of the world.

The abundance observed in today's sample was medium to high and we observed a great range in sizes and shapes (length ranged between 40 and 70 μm and width ranged between 30-50 μm) which indicates that this population is currently going through the sexual cycle and probably means that this bloom has reached its peak (see Reguera and Gonzales-Gil, 2001).



Dinophysis caudata

Dinophysis caudata is an armoured, marine, planktonic dinoflagellate species. It is a bloom-forming species associated with massive fish kills. It is commonly found world-wide in subtropical and tropical neritic waters. *D. caudata* is a cosmopolitan planktonic species. *D. caudata* is common in temperate to tropical neritic waters.

Red tides associated with mass mortality of fish has been reported in the Gulf of Thailand and Seto Inland Sea in Japan.

The abundance of *D. caudata* in today's sample was very low.



Polykrikos cf. schwartzii

Polykrikos schwartzii is a marine athecate dinoflagellate. It is heterotrophic and therefore lacks chloroplasts. *P. schwartzii* occurs in colonies of 2, 4, 8 or 16 individual units called zooids. Each zooid is closely connected to its neighbor, sharing a cell membrane. This species is mainly coastal and estuarine. *P. schwartzii* is common in coastal waters throughout the world except for polar seas. It is mostly confused for *P. kofoidii* hence, exact distribution is not known. It is also often seen in surface sediments from tropical to sub-arctic coastal regions. *P. schwartzii* is mostly seen in summer and autumn. High abundance of *P. schwartzii* cysts is used to indicate high nutrients.

The abundance of *Polykrikos* sp. in today's sample was very low.



Ceratium divaricatum var. *balechii*

Distribution of *Ceratium divaricatum* is wider than previously documented (mainly because of previous misidentifications): the North Pacific Ocean, from British Columbia in Canada to temperate or subtropical waters of Mexico, and then is interrupted to reappear again in coasts of Peru and Chile, and also in coasts of the Benguela area, the South-west Atlantic Ocean. In tropical and equatorial areas of the Pacific Ocean, a more delicate form occurs: *Ceratium divaricatum* var. *balechii*. *C. divaricatum* var. *balechii* may be relatively abundant, even producing non-toxic red tides, in various spots along coasts of the Pacific Ocean (Canada to Mexico). It appears to be a neritic form, with high sensibility to changes in water temperature, and presumably associated to upwelling areas. *Ceratium divaricatum* was reported as "common to abundant between San Mateo and Sonoma counties by the end of the month of September of 2011.

The abundance of *C. divaricatum* in today's sample was medium-high.



Prorocentrum micans (3 specimens)

P. micans is a marine bloom-forming dinoflagellate. This is a cosmopolitan species in cold temperate to tropical waters. Although *P. micans* is capable of forming extensive blooms, it is usually considered harmless. It may excrete substances that inhibit diatom growth, but apparently these substances do not enter the food chain or affect organisms at higher trophic levels.

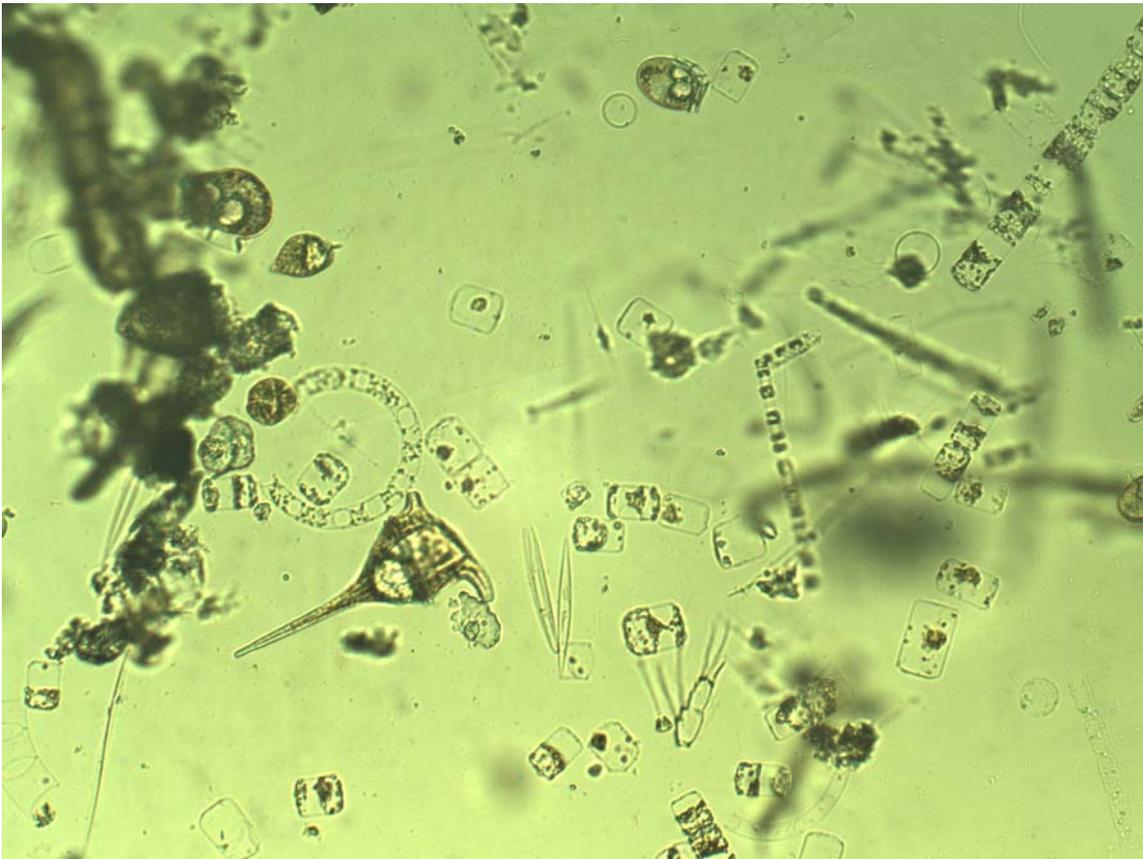
The concentration of *P. micans* observed in today's sample was high (characteristic of a bloom)



Noctiluca scintillans

Noctiluca scintillans is an unarmored (no hard shell), marine planktonic dinoflagellate species. This large and distinctive bloom forming species has an associated with fish and marine invertebrate mortality events. *Noctiluca scintillans* is a strongly buoyant planktonic species common in neritic and coastal regions of the world (cosmopolitan). It is also bioluminescent in some parts of the world. *N. scintillans* red tides frequently form in spring to summer in many parts of the world often resulting in a strong pinkish red or orange discoloration of the water (tomato-soup). Blooms have been reported from Australia, Japan, Hong Kong and China where the water is discolored red. In Indonesia, Malaysia, and Thailand (tropical regions), however, the watercolor is green due to the presence of green prasinophyte endosymbionts. This large cosmopolitan species is phagotrophic, feeding on phytoplankton (mainly diatoms and other dinoflagellates), protozoans, detritus, and fish eggs.

The concentration and relative abundance of *N. scintillans* in today's sample was very low



This photo illustrates the great variety of genera and species present in today's sample.

Plankton ID	
04/26/13	Conc/ Rel. Abundance
<i>Pseudo-nitzchia</i> spp.	Low
<i>Asterionella</i> sp.	Low
<i>Chaetoceros</i> spp.	Medium
<i>Bacteriastrum</i> sp.	Medium-high
<i>Eucampia</i> sp.	Low-Medium
<i>Rhizosolenia</i> cf.	Low-Medium
<i>Melosira</i> sp.	Low-Medium
<i>Navicula</i> sp.	Low
<i>Nitzschia</i> sp.	Low
<i>Thalassionema</i> sp.	Low
<i>Ditylum</i> spp.	Low
<i>Skeletonema</i> spp.	Low-medium
<i>Protoperdinium</i> sp.	Low-medium
<i>Ceratium furca</i>	Medium-high
<i>Ceratium lineatum</i>	Medium-high
<i>Ceratium divaricatum</i> <i>var. balechii</i>	Medium-high
<i>Prorocentrum micans</i>	High (bloom?)
<i>Polykrikos</i> cf. <i>schwartzii</i>	Low
<i>Oxytoxum</i> sp.	Low
<i>Dinophysis acuminata</i>	Low- medium
<i>Diniophysis caudata</i>	Low