

PROTIST WEB ALERT

Some Marine Protists of Ill-Repute

This web alert will describe several sites dealing with marine protists, including dinoflagellates, diatoms, algae, and their biological and ecological effects. Two sites about cyanobacteria and one about seaweeds are also included in this report in line with the "marine" theme.

Don't forget to send me (simpson@hhmi.ucla.edu) your favorite protist sites or any new sites you may have discovered.

Marine Biotoxins and Harmful Algal Blooms (<http://www.nwfsc.noaa.gov/hab/>)

It is a remarkable fact that phytoplankton, organisms responsible for controlling atmospheric greenhouse gas, carbon dioxide, and the basis of the marine food web, can also be the cause of many serious ecological and medical problems. Biotoxins produced by overgrowths of marine algae can be a serious threat to many higher organisms including salmon in aquaculture, humpback whales, dolphins, seabirds and also humans who consume contaminated shellfish. I was surprised to learn that virtually all coastal regions of the U.S. are now subject to a variety of harmful algal bloom events, possibly suggesting yet another effect of human overpopulation on natural ecosystems. This site from the Northwest Fisheries Science Center has information about these various protists and the problems they can cause. There are separate sites on marine biotoxins (<http://www.nwfsc.noaa.gov/hab/biotoxins.htm>), including such delights as paralytic and diarrhetic shellfish poisons, domoic acid poisons, brevetoxin (neurotoxic shellfish poison), and harmful algal blooms (<http://www.nwfsc.noaa.gov/hab/blooms.htm#spread>).

Very informative. I plan to ask my favorite seafood restaurant to check this site routinely.

The Harmful Algae (<http://www.redtide.whoi.edu/hab/>)

Another informative site dealing with algal blooms. The links include an introduction to algal blooms

(<http://www.redtide.whoi.edu/hab/whathabs/whathabs.html>), a photogallery of the protists involved and visible blooms (<http://www.redtide.whoi.edu/hab/rtphotos/rtphotos.html>), scanning EM micrographs of several diatom and dinoflagellates responsible for blooms (<http://www.redtide.whoi.edu/hab/species/species.html>), and information on human diseases caused by these organisms (<http://www.redtide.whoi.edu/hab/illness/illness.html>).

A nice site for people outside this field to learn about the problems.

Sites on *Pfiesteria*

Pfiesteria is a fascinating polymorphic dinoflagellate responsible for fish disease in estuaries, coastal areas and aquacultures in the United States from the mid-Atlantic to the Gulf Coast. The North Carolina University Center for Applied Aquatic Ecology has an informative site at <http://www.pfiesteria.org> which describes the complex life cycle (<http://www.pfiesteria.org/pfiesteria/lifecycle.html>), a photogallery of different stages of the organism (<http://www.pfiesteria.org/archives/images.html>), the possible neurotoxic effects on humans exposed to this organism (<http://www.pfiesteria.org/pfiesteria/himpact.html>), and on-going research.

*An interesting site from the State where *Pfiesteria* was discovered in 1988.*

The university of Maryland has another informative site on *Pfiesteria* in the Chesapeake Bay at <http://www.mdsg.umd.edu/fish-health/pfiesteria/>. There is even a list of hotlines to call to report fish lesions or request information before you go water-skiing (<http://www.mdsg.umd.edu/fish-health/pfiesteria/intro7.html>).

A site that provides valuable and reasoned information on a possible public health problem, proving that knowledge rather than hysteria is the best way to approach potential problems.

More Sites on Dinoflagellates

A site at the University of Calgary with a nice introduction to dinoflagellates (<http://www.geo.ucalgary.ca/~macrae/palynology/dinoflagellates/dinoflagellates.html>), including a "dinoflagellate menagerie" of fossil cysts (<http://www.geo.ucalgary.ca/~macrae/palynology/dinoflagellates/menagerie.html>), and a potentially quite valuable attempt to provide a type image repository of dinoflagellates (<http://www.geo.ucalgary.ca/~macrae/palynology/types/types.html>).

An interesting site with an emphasis on dinoflagellates in the fossil record.

A more general site from UC Berkeley at <http://www.ucmp.berkeley.edu/protista/dinoflagellata.html> describing the fossil record the life history and ecology, and the systematics.

A good site to begin your quest to learn something about dinoflagellates.

The Sewaweed Site

(<http://www.seaweed.ie/>)

An interesting site that deals with all aspects of seaweeds and marine algal biology. There are links to threaded discussions on algae, a useful listing of available culture materials, images of a variety of marine algae, and even a link to the International Seaweed Association. Also for those interested in growing your own Nori, there is a valuable site at <http://www.seaweed.ie/cultivation/NoriCultivation.html> (soy sauce must be provided however!).

Not exactly about protists, but nevertheless of some interest.

Cyanosite: a Webserver for Cyanobacterial Research

(<http://www.cyanosite.bio.purdue.edu/>)

As stated in the next, this is the "premier web site for cyanobacteria research", and has been on-

line since 1955 (a history of the site is actually provided together with the "vintage website" as well as some spooky webcounter data at <http://www.cyanosite.bio.purdue.edu/ocyanosite/hits/hits.html>). The site has links to an Image Gallery with over 200 micrographs, to experimental protocols, culture media recipes, and a directory of cyanobiologists with hyperlinked email address.

A good site both for outsiders and true cyanobiologists.

CyanoBase: The Genome Database for *Synechocystis*

(<http://www.kazusa.or.jp/cyano/cyano.html>)

User-friendly java-based or gif image-based clickable images of the genome are provided. Also a Blast server to search this genome for sequences. A novel Proteomic link is provided (<http://www.kazusa.or.jp/cyano/cyano2D/index.html>) that provides annotated images of 2D gels in addition to other information.

A valuable site for the molecular cyanobiologist.

Larry Simpson

HHMI-UCLA, 6780 MacDonald Research
Laboratories, 675 Charles Young Dr. S.,
Los Angeles, CA 90095-1662, USA

fax 1 310 206 8967
e-mail simpson@hhmi.ucla.edu