

Grateloupia turuturu:

A Red Seaweed Invading Long Island Sound



(Above) A *Grateloupia* blade feels slimy to the touch, and when reproductive, somewhat grainy. This red seaweed can be found growing in a few locations in eastern Long Island Sound to about six or eight feet in depth. Photo: N. Balcom, Connecticut Sea Grant

(Below) Pressed blades of *Grateloupia* Photo: N. Balcom, Connecticut Sea Grant



(Above) Numerous new blades are visible growing on the larger blade of *Grateloupia*. This seaweed reproduces readily in a number of ways, one of the characteristics of a successful invader. Photo: N. Balcom, Connecticut Sea Grant

The first recorded North American population of the red alga or seaweed, *Grateloupia turuturu*, was in outer Narragansett Bay, Rhode Island, in 1994. Ten years later, *Grateloupia* was discovered in Long Island Sound at Millstone Point in Waterford, Connecticut, during the long-term bi-monthly monitoring program conducted by the Environmental Laboratory of the Dominion Millstone Power Station. It was also found off Montauk, New York, around the same time.

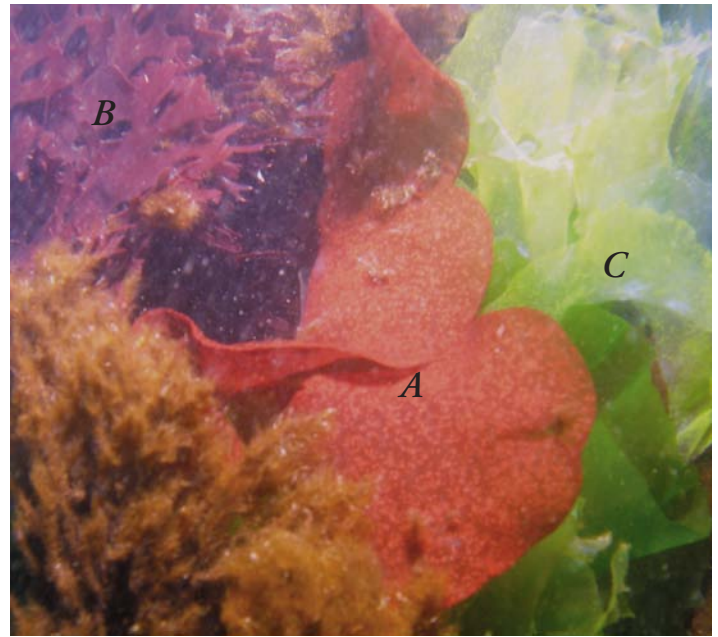
APPEARANCE: This red seaweed is a large perennial, with flat blades that are deep red, burgundy, or maroon in color, and a holdfast for grasping on to firm surfaces. Blade color tends to be lighter in the summer months and a darker color in the colder winter months. It can grow to several feet in length. In Long Island Sound, it is found in shallow subtidal waters, 3-8 feet in depth at high tide. New blades appear year-round. The alga reproduces both vegetatively from the edges of its blades, and by spores (comparable to a plant's seeds) that settle after being in the plankton and produce small round discs that send up many upright "shoots" which in turn can produce tens of thousands of additional spores. *Grateloupia* has many characteristics of a successful invader, including fast growth and high reproductive output, and grows well in nutrient-enriched waters like Long Island Sound.

WHY IT IS PROBLEMATIC: *Grateloupia turuturu* is native to the Asian Pacific, particularly the warm temperate shores of Japan. The increase in average water temperature in Long Island Sound over the past 25 years moves local environmental conditions closer to the optimal growth environment for *Grateloupia*. Preliminary observations suggest that *Grateloupia* may be overlapping Irish moss (*Chondrus crispus*), in distribution, and thus is competing with this native red alga for important resources like space, light, and nutrients. (continued next page)

Chondrus serves as habitat for blue mussels and other invertebrates, as well as algal epiphytes that provide food for crustaceans. *Grateloupia* could cause a shift in the seaweed species present in Long Island Sound, if it displaces Irish moss and possibly even other red algae. It has the ability to cover 100% of the habitat it invades, and it thrives in disturbed locations, on cobble, and around docks.

HOW DID IT GET HERE? Molecular as well as morphological analyses to date suggest that the population in Long Island Sound is identical to that in Narragansett Bay. However, it is unclear how *Grateloupia* arrived in Long Island Sound. Ballast water used to stabilize ocean-going vessels, ship hulls, and shellfish shipments packed in seaweed are all possible pathways by which this red alga may have been transported around the world from its native waters.

HOW TO RECOGNIZE IT: Several other red algal species in the Sound, some of which are native species, look similar to *Grateloupia*, and it is easy to confuse them. One distinguishing characteristic of *Grateloupia* is that it is slimy to the touch (as opposed to feeling wet and slippery like brown kelp); however, it can also feel grainy and rough when it is reproductive. It grows in shallow, intertidal waters, while most red algae inhabit deeper subtidal waters. Its blades are thicker than those of the nori species, *Porphyra* sp., while the “digits” of dulse, *Palmaria palmata*, always extend from a single base. Although seaweed collecting is not encouraged, you can examine thin cross-sections of a blade under a dissecting scope, and use the appearance of the medulla or central tissue (akin to the “filling” in a sandwich cookie) as a clue to which species it is. *Grateloupia* has a layer of clear criss-crossing filaments in the center while *Palmaria* has circular openings or structures evident.



(Above) An underwater shot of *Grateloupia* (A) shows it living in close proximity to another red alga, Irish moss or *Chondrus crispus* (B), and the green alga, sea lettuce or *Ulva lactuca* (C). Photo: J. Mercer, University of Connecticut



(Above) Comparison cross-sections of blade tissue of two red seaweeds, *Grateloupia turturu* (top) and *Palmaria palmata* (bottom). Photos: R. Gladych, University of Connecticut

YOU CAN HELP: Scientists and resource managers are interested in tracking the spread of this invasive red seaweed throughout Long Island Sound. If you think you have found *Grateloupia* growing in the water, **please do not collect it**. Instead, make note of the date, time, exact location (including coastal landmarks to help indicate where it is off the beach), water depth where the seaweed was found, status of the tide at the time (high, low, flooding, ebbing), a general description of the seaweed, and if possible, take a digital image. Send this information to Nancy Balcom (below). Your information will be reviewed, and if warranted, a researcher will go to the site to ascertain whether the seaweed is *Grateloupia*.

For more information on *Grateloupia turturu* in Long Island Sound:

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Interested in learning more about local seaweeds?
Contact Connecticut Sea Grant to purchase a copy of
Seaweeds of Long Island Sound by Margaret Van Patten
www.seagrants.uconn.edu/publ.htm#lis

For more information on invasive species
in Long Island Sound:
www.seagrants.uconn.edu/LISINV.HTM

