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UNH Researchers: Oyster Thief Is Here To Stay

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Codium fragile, also called the "oyster thief", is an invasive green seaweed that has established populations in the Gulf of Maine. Photo credit: Larry Harris, UNH

DURHAM, N.H. – No one is exactly sure how invasive green seaweeds found their way to the Seacoast or where they came from, but despite their population fluctuations, they are likely here to stay.

University of New Hampshire researchers are learning more about the species to determine its origins and economic and ecological impacts on the region's fish and shellfish populations.

*More commonly known as the "oyster thief," the green seaweed *Codium fragile* (subspecies *fragile*) has the ability to attach to hard substrates like rocks or shells and its buoyancy carries the shells --and shellfish -- with the waves and often up on land. In regions where *Codium* has attached to bottom substrates, it has displaced native kelp species that are important habitat for juvenile fish.*

Codium is capable of surviving in a wide range of temperatures, and if pieces of the seaweed break off and drift, they can re-establish elsewhere to spread the population, explains Anita Klein, associate professor of biological sciences at UNH.

*With funding from the National Sea Grant College Program and the N.H. Agricultural Experiment Station, Klein is working with UNH colleagues Art Mathieson, Kelly Cullen and Larry Harris to document *Codium's* current distribution, determine its origins and model the economic impacts the species might have on the region.*

*Codium has existed in the northwest Atlantic since the 1950s. Populations near the Seacoast were relatively small until the 1980s, when they began to spread south from Boothbay Harbor, Maine, and north from the Cape Cod Canal. Locally, the Isles of Shoals and Cape Neddick are two regions that have been hit hard by the *Codium* invasion, professor of plant biology Mathieson says. Areas that were once large beds of native kelp species are now home to the giant green seaweed.*

*Although it is suspected that *Codium* came from the Sea of Japan, genetic tests were necessary to confirm its origin. Klein conducted genetic analyses based on DNA extracted from the seaweed chloroplasts. The results confirmed that all green seaweed species collected in the Gulf of Maine were the same invasive species, but the tests were not refined enough to determine the species' origin.*

Klein says using genes from the seaweed's nucleus might be the key to help detect fine-scale genetic differences to answer that question and to determine if the species is being continuously introduced.

"Tracking where an invasive species comes from allows us to potentially stop other new introductions," says Klein.

According to projected economic impacts calculated by associate professor of natural

resources Kelly Cullen, a continued expansion of *Codium* could have a multi-million dollar effect on the regional shellfish economy.

However, recent field studies, including rapid assessment surveys, of some northwest Atlantic sites indicate that *Codium*'s populations are decreasing in some areas, while expanding in others. Regions that were entirely covered by *Codium*, like the Isles of Shoals, are now interspersed with other plant species. Areas near Prince Edward Island that hosted an abundance of *Codium* a decade ago now must be visually scoured to detect any sign of the invasive seaweed. This change, Klein said, has been very unexpected.

Larry Harris, professor of biological sciences, explains that *Codium*, like many other invasive species, became a dominant species for a number of years and soon assimilated into the ecology where other species learn to adapt to compete and interact with the new invasive species. The change in *Codium* abundance is likely due in part to this. But, he cautions, this species is not going to disappear altogether, but rather it will probably persist indefinitely.

"The whole ecosystem isn't the same anymore after they are introduced," Harris said. "The notion of restoring a system to its natural state is a pipe dream. You cannot restore a system that is full of introduced species."

For more information on about *Codium fragile*, please visit www.codium.unh.edu.

The University of New Hampshire, founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea and space-grant university, UNH is the state's flagship public institution, enrolling 12,200 undergraduate and 2,200 graduate students.

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Codium fragile, also called the "oyster thief", is an invasive green seaweed that has established populations in the Gulf of Maine.
Credit: Larry Harris, UNH