

Invasive species spreads offshore

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Slimy sea squirts puzzle scientists

By Beth Daley, Globe Staff, 11/21/2003

Goopy colonies of a foreign animal called a sea squirt have carpeted a 6.5-square-mile swath of Georges Bank, raising deep fears among biologists that the invader could hurt marine life in one of the most productive fishing areas in the world.

Last year, federal scientists saw only a few small patches of the gelatinous sea squirts on Georges Bank. But on a research voyage earlier this month, they video-recorded dense mats of the animal on the seabed, encrusting scallops in a formation fishermen say looks like fast-spreading pancake batter.

Until now, scientists say, Georges Bank has been relatively free of the infestations of non-native creatures that have choked many coastal areas. They worry the squirts may be smothering scallops or making the bottom inhospitable to fish eggs, such as those of cod, that need the gravelly sea floor to protect them from predators.

"It's a remarkable discovery -- and disturbing," said Jim Carlton, a Williams College professor who studies invasive marine species. "We've been comfortable all these years saying the great fishing banks have a lot of issues and a lot of problems, but invasive species were not on the menu. It's a slap hand to forehead; we didn't expect it."

Scientists are just learning about the squirts and don't exactly know the damage they'll wreak, but if examples of other invasive species are any indication, they may have a lot to worry about. One of the most cited examples of the havoc of invasive species is the European zebra mussel that arrived in the Great Lakes in the 1980s and has gone on to some 20 states, overrunning native species and choking the intake valves of power plants, causing more than \$150 million in damage.

No one knows where the sea squirts originated, although experts suspect they are native to the Pacific Ocean and arrived here in the 1980s, possibly hitchhiking in a ship's ballast or in a shipment of aquaculture oysters.

The squirts, named because they squirt water if lifted out of the ocean, belong to a group of animals called tunicates. Their morphology suggests Alfred Hitchcock-style horror: they can colonize on docks or pilings, accumulating into lobes that can stretch 3 feet down into the water to feed. They can reproduce sexually and asexually, so even a tiny fragment can form an entirely new colony elsewhere, essentially creating clones and clones of itself.

"It's a super-organism and can rearrange itself," said Larry Harris, a marine biologist at the University of New Hampshire. So little is known about the sea squirt on Georges Bank, researchers don't even

know yet if it can kill off the scallops it appears to be smothering. New England already has its share of invasive species, brought here purposefully or accidentally. Englishmen introduced sparrows to the United States because they wanted familiar songbirds nearby. The thick green seaweed that forests the region's coastline likely arrived on a ship's hull.

But until now, most marine invasive species have tended to be restricted close to shore. The deeper, colder offshore ocean has been less friendly to visitors. There are only a few recorded instances of invasive offshore species, such as a sea slug population that has taken hold off the West Coast.

The cream-colored squirts were found on the northern edge of Georges Bank, about 160 miles off Cape Cod in a fairly shallow area, just over 150 feet deep.

Yesterday, however, fishermen seemed almost baffled by all the attention the tiny animals are getting from scientists, noting that they have been pulling up the animal for years, often in scallop beds that were previously closed to fishing. They said they have even used it as a firm sponge, wiping off dirty oilskins.

"You find fistfuls of the stuff on scallops," said Jim Kendall of New Bedford Seafood Consultants, which represents fishermen. He said there is some worry among fishermen the squirts are killing scallops, but there has been no widespread proof. "If you break it apart it works just like a sponge. We used to talk about marketing the stuff."

Scientists, however, said there are native species of sponges, dubbed "monkey dung" by fishermen, that could be confused with the new invaders. They say the invasive species would break up if used as a sponge.

While local attention is focused on its bad habits, sea squirts elsewhere in the world are drawing more positive attention. Many species that emit chemicals to keep prey away are seen by pharmaceutical companies as potentially holding medicinal secrets -- a Spanish company is in clinical trials for a cancer drug derived from a tropical squirt. And as unlikely as it may sound, the siphon-feeding animals are closely related to people: A common sea squirt native to New England was recently found to share 80 percent of its genes with humans.

Scientists here, however, are starting with the basics for the invasive sea squirt, trying to understand its life cycle, where else it lives and how it is spreading. The discovery is also forcing some officials to rethink a plan to prevent invasive species from coming into coastal waters by requiring ship ballast water to be transferred out at sea -- in the general area where the offshore squirts were found.

"These squirts are spreading dramatically," said Page Valentine, a US Geological Survey geologist studying the squirt who was on the research cruise a few weeks ago. "We need to know more about this animal."

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