

Tiny Jellyfish with a Big Sting

SCIENTISTS INVESTIGATE WHERE TOXIC INVADERS CAME FROM *by Véronique LaCapra*



Lubov Petrova, Primorsky Aquarium

Clinging jellyfish in waters near Vladivostok, Russia, are known to cause severe sting reactions. But in recent years, clinging jellies with stings that cause similar symptoms suddenly started being reported off Cape Cod, Mass., and nearby regions.

People who want to know where their ancestors came from can sometimes find answers hidden in their DNA. Annette Govindarajan also uses DNA—to map the origins of a venomous stinging jellyfish that is becoming more prevalent off the coast of the northeastern United States.

“I feel like I’m solving a mystery,” said Govindarajan, a biologist at Woods Hole Oceanographic Institution.

These so-called “clinging” jellyfish are small—no bigger than a quarter—and ringed by as many as 90 threadlike tentacles. Unlike most jellyfish, which prefer open water, clinging jellies stay close to shore, using adhesive pads on their tentacles to latch onto seagrasses and seaweeds. Long assumed to be native to the North Pacific Ocean, the jellyfish are now relatively common along the Atlantic coast too.

Most are relatively harmless. But in the Sea of Japan, a variety of clinging jellyfish is notorious for toxic stings that cause a wide range of symptoms—severe pain, difficulty breathing, and even hallucinations—that can persist for up to five days.

A non-stinging variety of clinging jellyfish was first recorded in the U.S. Northeast in 1894, on Cape Cod, Mass., but they all but disappeared from New England in the 1930s following an eelgrass die-off.

Then, beginning in 1990, painful interactions with clinging jellyfish suddenly started being reported on Cape Cod. Was this a new clinging jellyfish invasion, wondered Govindarajan? And if so, where had this stinging variety come from?

To try to find out, she worked with WHOI Research Specialist Mary Carman, Marat Khaidarov and Alexander

Semenchenko from the Russian Academy of Sciences in Vladivostok, Russia, and John Wares from the University of Georgia to collect samples of clinging jellyfish from four distinct regions: the northwestern and northeastern Pacific, and the northwestern and northeastern Atlantic.

Govindarajan analyzed the jellyfish’s DNA to identify unique sequences of genetic information. She discovered a genetic match between the stinging jellyfish from Russia and jellyfish along the U.S. East Coast. But puzzlingly, she didn’t find an exact match between the Russian stingers and the known stingers from Cape Cod.

Govindarajan is delving deeper to draw a clear connection between the genetics of the clinging jellies and their toxic stings.

“Our initial results were based on one gene,” Govindarajan said. “I’m now using an approach with hundreds of markers that allows me to see connections between jellyfish populations with greater resolution.”

She hopes her research will reveal where the stinging jellyfish came from—to help keep them from spreading even more.

“With this study, we answered some questions but also opened up many others,” Govindarajan said. “That’s part of the scientific process. The more I get into it, the more fascinated I get.” ▲

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