Research Reveals that Lobsters Avoid Sick Neighbors

Ever tried to avoid a coworker who comes into the office with a runny nose and the sniffles? Turns out that lobsters can do you one better.

A new study by researchers at Old Dominion University and VIMS shows that Caribbean spiny lobsters, normally gregarious creatures that live together in underwater caves, will avoid other lobsters that are infected with a lethal virus called PaV1. They do so weeks before the sick lobsters show any obvious outward signs of disease.

The research, by ODU scientist and lead author Mark Butler, ODU postdoctoral student Donald Behringer, and VIMS scientist Jeff Shields, appeared in the May 25th issue of the prestigious international journal *Nature*.

"This is the first record of healthy animals avoiding diseased members of their own species in the wild," says Shields.

The researchers suspect that healthy lobsters are using their exquisite sense of smell to detect and avoid diseased neighbors, just like they do to choose mates, feed, and establish dominance hierarchies.

A Caribbean spiny lobster (Panulirus argus) *near the NOAA underwater habitat Aquarius, Key Largo, Florida Keys National Marine Sanctuary. Photo by Dr. Mark Patterson.*

Butler, Behringer, and Shields have been studying the PaV1 virus in wild lobsters for several years, in an attempt to better understand the disease, how it spreads, and how it might affect the commercial exploitation of the species. The Caribbean spiny lobster *(Panulirus argus)* is a popular seafood item that is commercially fished throughout its range, with the bulk of landings from the Florida Keys.

Behringer first noticed the PaV1 virus while drawing blood during a separate study of how lobsters molt. He noticed that the blood of many lobsters was milky rather than clear, as in healthy lobsters.

During subsequent field studies, the researchers noticed that infected lobsters only rarely shared shelters with other lobsters, even though healthy lobsters generally prefer to live together in dens.

To test whether this could be explained by healthy lobsters avoiding diseased neighbors, they set up a laboratory experiment in which healthy and diseased lobsters were given a choice between an empty den and one containing either a healthy or a diseased individual.

What they found was telling—healthy lobsters avoided dens containing diseased lobsters, preferring instead to share dens with other healthy lobsters. Diseased lobsters did not discriminate between dens, regardless of whether the animal inside was sick or well.

Other evidence from the laboratory and field shows that avoidance of diseased neighbors likely helps curb the spread of disease in the wild. When healthy juvenile lobsters are confined in the lab with lobsters infected with the virus, more than 60% of them succumb within 80 days. The rate of infection in wild populations in Florida is only 7%. The avoidance of sick neighbors likely explains the difference.

The ability of healthy lobsters to detect and avoid infected, though not as yet infectious, neighbors provides an important evolutionary advantage, says Shields. Lobsters that have this ability are more likely to survive, breed, and pass on the trait to their offspring.

Art Auction Raises $60K for VIMS

The 2006 VIMS Art Show and Auction featured the works of world-renowned marine conservationist and artist Dr. Guy Harvey, along with items donated by numerous local artists and businesses. The auction, which was organized by co-chairs Bootsie McCracken, Candy Campbell, and Ginny Lascara, netted more than $60,000 for VIMS programs, twice as much as the 2005 auction. This year's recipients of auction proceeds include the CBNER-RVA Middle School Marine Science Project, graduate-student research support at VIMS' Eastern Shore Laboratory, and a fisheries genetics project to track the invasion route of the non-native marine snail *Rapana venosa*.

The 2006 VIMS Art Show and Auction featured the works of world-renowned marine conservationist and artist Dr. Guy Harvey (R), who has worked closely on several projects with VIMS fisheries scientist Dr. John Graves (L). Harvey earned the first-ever "Lifetime Achievement Award" from the International Game Fish Association in 1998. In 2004, his 13-episode, made-for-television fishing series "Portraits from the Deep," *aired on the Outdoor Life Network. His new one-hour documentary* "Billfish: A Challenge for Survival" *is currently airing on PBS. Photo by Bob Carroll.*

Art Show and Auction Committee chairs Candy Campbell (L) and Bootsie McCracken (R) watch the auction unfold.

Marine Science Day "Paper Parade"

Participants in the "Paper Parade of Marine Life" (L to R: a blue crab, jellyfish, and horseshoe crab) stroll through the VIMS campus during the Institute's Marine Science Day open house on Saturday, May 20th. The annual event drew an estimated 1,800 children and adults to Gloucester Point for a fun and educational day that allowed visitors to examine high-tech science equipment, tour a laboratory, collect and observe aquatic animals in the York River, and discover the importance of wetlands in VIMS' Teaching Marsh. Cooking demonstrations, mini-lectures, and "hands-on" activities took place throughout the day, and a Children's Center provided lots of fun, hands-on activities for the younger set. Marine Science Day is supported by donations from Chesapeake Bank, Dominion, Ferguson Enterprises, Gloucester-Mathews Gazette-Journal, John & Julie Dayton, Kanawha Land Company, Ken Houtz Chevrolet-Buick, Southside Bank, The Owens Foundation, Wanchese Fish Company, and the York Chapter of the Chesapeake Bay Foundation.