



**Strong-arm
Charm**

Giant Pacific Octopus *Enteroctopus dofleini*

First, there was Leisure Suit Larry, a giant Pacific octopus (*Enteroctopus dofleini*) at the Seattle Aquarium. Larry liked to grope his keepers, living up to the “all over me like an octopus” stereotype. Then there was Emily Dickenson, who shyly hid behind the backdrop of her tank, a space barely two inches wide. “She seemed determined to be a two-dimensional octopus,” says Roland Anderson, a biologist at the aquarium who has been studying giant Pacific octopuses for 30 years. And lastly, there was Lucretia ... Lucretia McEvil to be exact, who trashed her tank like a rockstar.

Unfortunately, most of what we know about giant Pacific octopuses comes only from observing them in captivity at places like the

Seattle Aquarium. And one of those observations, made by Anderson many years ago, was that aquarium workers gave names to only three types of animals, those with, shall we say, *charisma*—seals, sea otters and the giant Pacific octopuses. As witnessed by inclusion of the octopus in this otherwise cute and furry group—as unlikely as that may seem for an invertebrate, let alone a shell-less mollusk—the giant Pacific octopus has got it ... whatever “it” is.

CHARISMATIC MEGAFAUNA

A tiny part of their charisma may be their size. As their name implies, the giant Pacific octopus is the largest octopus in the world, bar none. The largest giant Pacific octopus had an



The giant Pacific octopus can change color and texture to hide from predators and, some think, express feelings.



Ocean Conservancy Supports Marine Protected Areas

Ocean Conservancy is a strong advocate for new and more expansive Marine Protected Areas (MPAs), sometimes likened to underwater parks where marine plants and animals can thrive unimpeded by human impacts. We were a driving force behind a network of MPAs that will stretch along the entire 1,100-mile California coast, areas that are home to the giant Pacific octopus.

arm span of 30 feet and was estimated to weigh 600 pounds. Anderson compares that octopus to 7' 6" basketball player Yao Ming. Both skew the curve, but neither tells us much about the average size for their species, he says. An average giant Pacific octopus actually weighs about 40 to 50 pounds, with arms measuring about six feet in length—a giant, but on a human scale.

The giant Pacific octopus ranges the Pacific Ocean from California, north across the Aleutian Islands and south to Japan. Lacking commercial appeal, in U.S. waters most giant Pacific octopuses caught are caught by accident. On the whole, however, the population worldwide is believed to be stable. Anderson surveys the local Seattle population annually in a mid-winter with the help of dozens of volunteer divers. The survey routinely turns up a pair under the aquarium’s own pier.

QUICKSILVER LIVES

Another aspect of their charm may be the quicksilver nature of the lives they lead. Giant Pacific octopuses live just three to five years. This is a fast-growing creature. Anderson reports that on average, a giant Pacific octopus gains weight at nearly three percent each day. He also says that about half of what the octopuses eat—in the wild they favor small crabs and scallops—is turned into body mass.

A giant Pacific octopus comes to grips with its surroundings, whether pier or prey, using its eight arms and over 2,000 suckers. A female giant Pacific octopus has 280 suckers on each arm, arranged two rows. >

Creature Feature

Each sucker contains thousands of chemoreceptors. That's right, this octopus tastes with its suckers. So important are the suckers to the giant Pacific Octopus that over half of its neurons are found, not in its brain, but in its arms. In males, part of its third right arm—yes, octopuses can tell right from left—becomes a sexual organ at maturity. It is that arm that will deposit a sperm packet, up to three feet long, into the female.

"There is no safe sex for a male giant Pacific octopus," says Anderson. After fertilizing a female, a male gets a bit dotty. He stops eating and forgets that hiding in his den is somewhat important to his continued survival. Those that aren't instantly eaten by sharks or seals will die in a matter of months.

The expectant female, on the other hand, holes up in a cave or other den. She hangs long strings of eggs from the ceiling, and may wall the den entrance with rocks. She will tend the eggs fanatically for months,

squirting fresh water on them with her funnel, picking off algae growths and never leaving the den, even for food. Her demise is much the same as her mate's. When the eggs hatch into tiny, rice-grain-size versions of their parents, she will die.

A COLORFUL EXISTENCE

It's a short, but colorful life ... quite literally. The giant Pacific octopus can change color, and even the

texture, of its skin to hide from predators and, some think, to express feelings. Anderson notes, however, that how well a fellow octopus gets the message is not known as giant Pacific octopuses are decidedly colorblind. At rest, they are gray but they can shift shades of brown and red in a fraction of a second, much faster than the animal world's most famous color-changer, the chameleon, which can take several seconds to change color.

The giant Pacific octopus has no less than three hearts to circulate its turquoise, copper-based blood. (Well hello, Mr. Spock. A human's red-tinted blood uses an iron-based protein to carry oxygen.) One heart circulates blood through the body. The other two pump blood to the gills.

DONUT BRAIN

A giant Pacific octopus's brain is donut-shaped and encircles its throat. It has a brain-to-body ratio comparable to birds and mammals, and superior to, or at least brainier than, fish and reptiles.

As fascinating as this creature is physically, its intellect is no doubt a factor in its appeal. A giant Pacific octopus can learn simple mazes, respond to specific shapes and patterns, and navigate by landmarks while foraging. When Anderson handed a female giant Pacific octopus named Billye a childproof medicine bottle with raw herring inside, she removed the lid in 55 minutes. With practice, she got it off in five.

Those distinct and diverse "personalities," however, seem to be the main source of the giant Pacific octopuses' charisma. Anderson and his research partner Jennifer Mather were the first to describe the octopuses' "unique pattern of

Creature Feature



©Brandon Cole

©Brandon Cole

The expectant female holes up in a den, hanging long strings of eggs from the ceiling.

individual behavior that remains consistent over time and in a variety of circumstances" as a "personality" in a paper published in a major psychology journal. Some scientists, though, object strongly to the term, saying that it credits the octopuses with human traits that they simply don't have.

We're fine with that assessment; just don't tell Larry, Emily or Lucretia. Especially, not Lucretia. 🍷



©Brandon Cole

Each of its 2,000 suckers contains thousands of chemoreceptors—the giant Pacific octopus can taste through its arms.

CREATURE FEATURE