

# TUNICATES OF CHARLOTTE HARBOR

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Every spring they appear in force, growing through the summer and then they seem to diminish in late fall. "They" are tunicates, affectionately known as sea squirts, sea pork and — well, not really sea bunnies, but I'll explain.

Tunicates are invertebrates, meaning they lack a backbone. Invertebrates are a very large and diverse group of organisms that include crabs, sea urchins, jellyfish, sponges, worms, spiders and insects, just to name a few.

Tunicates come in many shapes, sizes and colors. They can be solitary, colonial or pelagic (again, I'll explain). And, they are all marine organisms. There are no freshwater tunicates, but some species can be found in fairly low salinity brackish waters. All tunicates are filter feeders. As such, they all have two siphons. The first takes in water, particles are extracted as a food source and then the water is expelled out the second siphon. Tunicates get their name from their "tunic" or outer covering that protects them from predators. The tunic is made of cellulose, a long chain of linked sugar molecules. Cellulose is more common in plants and is the substance that gives wood its strength.

Solitary tunicates are commonly referred to as sea squirts, because if you squeeze them, they squirt water. Although referred to as solitary, these tunicates often form clumps; you can tell each tunicate from its neighbor because it will have its own set of siphons. Solitary tunicates are frequently found on mangrove roots, but they can be found on other structure as



*Solitary Tunicates—Photo Doug Rhees*



*Solitary Tunicates—Photo FSG*

well. In fact, last year I think every one of my bay scallop cage volunteers enquired about the strange gelatinous things growing on their cages. The ones they were finding on their cages were clear and actually quite pretty, at least compared to the rather bumpy, globular ones often found on mangrove roots. Some solitary tunicates are beautiful pinks and purples, but these are more frequently found offshore in clearer waters.

Colonial tunicates are made of hundreds of tiny individuals called zooids that act as a single organism. Zooids are individual animals that together form a composite group which share a common set of siphons. As such, they look like glossy blobs of various colors. You can see where one zooid ends and the next begins, forming a rather intricate pattern. In Charlotte Harbor we see lots of white, orange and black colonial tunicates. Colonial tunicates, usually the whitish ones, will often become encrusted on turtle grass blades (the wide-bladed seagrass common in our shallow waters).

Another common colonial tunicate, sea pork, is often found washed up on area beaches. Sea pork is a rubbery orange or pinkish flattened circular mass, usually about the size of your palm but sometimes more than a foot in diameter.



*Colonial Tunicates—Photo FSG*



*Colonial Tunicates on Seagrass blades—Photo FSG*

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### Did you know? – (from the Smithsonian Institute):

- ◆ There are ~2500 named tunicates
- ◆ Tunicates are cultivated and eaten in many countries including: Japan, Korea, Chile and France
- ◆ Many tropical species have a single celled algae living as symbionts (meaning both the algae and tunicate benefits) inside their tissues (just like the algae associated with many corals)
- ◆ Tunicates are the only animals that reverse their blood circulation
- ◆ Tunicates are the animal group most closely related to vertebrates (fish, birds, reptiles, amphibians and mammals)

Pelagic tunicates are the least frequently seen varieties. In fact, I have only seen them once in Charlotte Harbor (to be more specific, the lower Peace River). Most pelagic tunicates look like little linked-together circles, but the ones I saw looked like bunny heads, hence my reference to sea bunnies. Pelagic refers to creatures of open waters, and these tunicates, unlike the ones previously mentioned, are not attached to anything and drift with the current.



*Pelagic Tunicates—Photo FSG*

As filter feeders, tunicates benefit water quality by removing particulates and excess nutrients from the water. Good water quality is important to all marine life and us humans too, but water quality may not be the only way tunicates benefit us. Researchers have been studying various properties of tunicates and have learned that they may possess important anti-cancer properties. Specifically, a group of chemicals called “Palmerolides” found in the body tissues of an Antarctic tunicate species, is extremely active against melanoma, a potentially deadly skin cancer. But that’s not all: Scientists believe the cellulose found in tunicates could be used to help repair or even grow human muscle tissue. And just this year, researchers at the University of Bergen and Uni Research have found that a certain type of tunicate can be used as a renewable source of biofuel and fish food (for aquaculture).

So the next time you see a blobby, slimy growth on a piling or tossed up on the beach, don’t focus on it being gross-looking. Even a lowly tunicate has something to teach us — if we would only pay attention.

**Did you know?** – Most tunicates are hermaphrodites, meaning they possess both male and female sexual organs. They avoid self-fertilization by having the eggs and sperm mature at different times or by having the eggs and sperm reject each other. Tunicates reproduce by releasing sperm into the water column. The sperm then enters another tunicate through the siphon with incoming water, and the eggs are then fertilized.

### Sources:

*Science Daily, Nanoscale Whiskers from Sea Creatures Could Grow Human Muscle Tissue, March 12, 2011*

*Rocha, R. Tunicates are Cool. PPT. Smithsonian Institute*

*Scientific American, Biofuel Made From Marine Filter Feeders? Tunicates Usable As Source Of Biofuel, March 26, 2013*



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