

Purple (Purple? Yes, Purple) Snails

by Peggy Williams

Imagine walking along the beach in Key West and suddenly finding a sea full of violet-colored shells floating in on the tide and literally turning the sand purple. This happened to a pioneer shell collector, Charles T. Simpson, in 1883. Of course, Key West wasn't as large as it is today and there wasn't any competition on the beach, but he was able to fill his handkerchief, hat, and pockets with literally thousands of shells (he had 2000 perfect specimens when he got back to the ship) that had come to the beach overnight. (However, the animals still in the shells secreted a purple dye and he had to throw away his clothing!)*

Where did they come from?

This family of shells, the Janthinidae, are pelagic, which means they live their entire life floating in deep ocean waters far from land. The raft of shells must have grazed the beach at Key West that night, stranding all those animals. The mass of shells might have been as large as 200 nautical miles in length, as one colony has been reported.

How do they do it?

The Janthinas (sometimes spelled Ianthina and sometimes pronounced "yanthina") build themselves a raft of bubbles by capturing air from the surface of the water with their foot. Mucus forms a bubble and a mass of bubbles provides enough lift to keep the shell on the surface of the water. If the raft is broken up, the shell sinks and the animal dies.

What do they eat out there in the ocean?

Floating around on the open ocean, the animals look for food in the shape of jellyfish prey. But not just any jellyfish - they relish the *Physalia*, or Portuguese Man-Of-War, which is deadly to touch, the *Porpita*, or Blue Button, which has a chitinous disk with the texture and buoyancy of styrofoam to help it float, and the *Velella*, or By-the-Wind-Sailor, which has a floating "sail" allowing it to tack with the wind. A pair of snails can consume a 4-inch Man-of-War in less than a day. They will eat other organisms, and in a pinch, each

other. Janthinas are blind, and apparently locate their prey by scent.

All of these prey animals are also purple. Why?

They live in the deep blue sea, and the dark purple color is cryptic in that environment, making them difficult for sea birds to find. But the largest shell, *Janthina janthina* is two-toned. The spire of the shell is light lavender, while the lower half is deep purple. The animal lives upside-down on its bubble raft, with dark color uppermost and the pale spire cryptic against the sun-brightened surface to a fish predator below looking upwards. Besides fish and birds, Janthina are also in danger of being consumed by other molluscs, nudibranchs that live in rafts of floating wood or sargasso weed. The purple "dye" that Janthina secretes is probably foul-tasting and serves to discourage predators.

How do they get together to make more Janthinas?

The technical terminology for their mating system is "Protandric hermaphroditism". This means they are born as males and develop later into females. Fertilization is internal, but the male lacks a penis, so instead of directly mating, the male releases sperm in a large, feathery, mobile carrier that wiggles its way through the water in search of a snail in its female stage. Some of the members of this group then lay their eggs under bubble rafts, though the most common one, *Janthina janthina*, broods its eggs inside its body until tiny shells emerge and make their own rafts.

What else lives out there with Janthina?

Just as barnacles are often found on the surface of shells in the bay, there is a pelagic barnacle that may attach to Janthina, barnacles of the genus *Lepas*, or Goose-necked Barnacles. Sometimes you find these on logs that have floated for a long time, attached by their long, leathery "neck". Unlike other barnacles, which are filter feeders, *Lepas* seems to eat jellyfish, too. Another blue/purple

shell-less mollusc, *Glaucus*, can swim and happily consumes Portuguese Man-Of-War.

Where can I find some Janthinas?

There are seven or eight species worldwide, but the largest and most common is *Janthina janthina*, which ranges all around the globe in the temperate zone. To find some you could look on beaches around the world where currents like the Gulf Stream might carry them. You might find them on the Atlantic Coast as far north as Massachusetts but most probably (in the US) in southeast Florida and the Keys. You might even find them in the Gulf of Mexico or as far afield as Australia.



*Read more of this story in *The Best of the Nautilus, A Bicentennial Anthology of American Conchology*, ed. R Tucker Abbott, 1976. American Malacologists.

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