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Exploring Our Little Corner of the World with the Galiano Naturalists

by Pam Frier

It's rough being a barnacle: it doesn't get around much; it eats with its feet; and it spends the greater part of its life with its head glued to a rock. Nonetheless, for a creature with so little get-up-and-go, it has a remarkable story to tell. Stefani Hewlett Paine recounts the trials – and triumphs – of this little fellow's life in her book, *Beachwalker: Sea Life of the West Coast*.

I say "fellow" but that's up for grabs. Barnacles are hermaphrodites, they can adapt to the demands of any relationship. And that's a very good thing because – ask any boater – when a barnacle eventually settles down it's loathe to move. Its neighbours today will be its neighbours for life so it's important to hit it off with the folks next door. In fact, the survival of the species depends on it. But before the barnacle can get down to the joyful business of making baby barnacles it's got some growing up to do.

As a happy-go-lucky, free-swimming infant (called a *nauplius*) its sole preoccupation is to eat and molt. At this tender age it looks like a very tiny replica of its crustacean relatives, the crab and the lobster: it has 3 pairs of appendages, 2 pairs of antenna, one eye and a ravenous appetite. Feasting on phytoplankton on the water's surface, the baby barnacle packs on weight and goes through seven fairly rapid-fire phases of molting until it has blossomed into a strapping (1/100 inch) juvenile with a pair of hinged shells. At this stage – the *cypris* stage – it's beginning to look very grown up and it's ready to set up home. Which is when its built-in glue-gun comes into play.

They're glue *glands*, actually. And because they are located near its head, the young barnacle finds itself in a rather awkward position: upside down. Which is where he'll remain for the rest of his natural life (anywhere from 1 to 7 years). This arrangement necessitates further anatomical refinements. Its leg-like appendages, for instance, are now redundant. So, ever the innovator, the barnacle improvises: legs become ladles, handy scoops for gathering food from the plankton-rich waters around it. Meanwhile, as these renovations are proceeding, other glands are oozing shell-building material. When the construction is complete, it will be a volcano-shaped edifice consisting of four fused upright plates with two additional pairs of moveable top plates which function like a kind of sliding door: when the weather turns nasty, or a predator threatens, the barnacle has only to slam its door shut and sit tight till the danger passes.

Its shell's cramped confines house all the equipment necessary to life including a stomach, an anus, and what Paine refers to as the barnacle's "awe-inspiring" reproductive gear. A barnacle in male-mode doesn't have a lot of options when mating time rolls around: just a captive group of like-minded barnacles in the immediate neighbourhood. So he makes do. Happily, he has the wherewithal – and the reach – to extend his largesse over an impressively large area. And he will succeed in fertilizing as many as ten thousand eggs in the process! Not bad for a guy who's stuck at home with a handful of ladles for legs.

Another astonishing fact about this strange little creature is the tenacious sticking capacity of its glue. Fossil barnacles that attached themselves to shells 20 million years ago are still attached today – with the strength of 1,000 pounds per square inch! Nothing can dislodge them. No acids, no

solvents, not the fieriest heat or the coldest cold. Man has tried to replicate this wonder glue, and failed. If he's working on the barnacle-style, stand-on-your-head reproduction technique, Stefani Hewlett Paine doesn't say. (Paine's book, *Beachwalker*, is available from the Galiano Conservancy Library.)

THE GALIANO NATURALISTS are a group of curious explorers who enjoy observing, marveling, and sharing information about the natural world around us. Come join us. (galianonaturalists@gulfislands.com)

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Natural Mysteries

June's mystery was: How do seeds know which way to grow? In the dark moist soil, a seed splits and a root pushes its way out. Let's say that because of the way the seed happened to fall, the root starts growing straight out sideways. But then it finds its way down, down towards the center of the earth. How? The process is called *gravitropism*, and it works like this. Plant cells have tiny starch grains, called *statoliths* (literally "position stones") that settle slowly to the bottom of the cell, like a pebble dropped into a big bowl of French custard. When the statoliths accumulate on the bottom of cells near the edge of the root, they stimulate a hormone, *auxin*, which inhibits the elongation of nearby cells. The cells along the top of the root, not so inhibited, keep on elongating. It's like braking one wheel of a car while the opposite one keeps rolling; the car veers to the side. And so the root bends. The root bends downward until the statoliths settle evenly at the very tip and the hormones settle down. Then the root cells elongate equally, pushing the root straight down.

This month's Natural Mystery: When it rains, do wet birds have trouble flying? Have an answer? Send your thoughts to galianonaturalists@gulfislands.com. Have a Natural Mystery of your own? Let us know, and we'll try to answer it.