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Exploring Our Little Corner of the World with the Galiano Naturalists

by Pam Freir

Working Undercover to Change the World

What common, garden-variety creature has no eyes, no lungs, no bones, five hearts and a brain so minuscule that, were it removed, its owner wouldn't know it had gone missing?

By the way, this brain-challenged oddity also happens to pose a very real threat to Garry Oak meadows – and possibly even our extensive stands of Douglas fir – here in Southern BC. Yet, this is a critter so indispensable to our life here on earth that Charles Darwin (a fellow naturalist) had this to say on its behalf:

“...it may be doubted if there are any other animals which have played such an important part in the history of the world as these lowly organized creatures.” An impressive testimonial to a most unlikely hero: the earthworm.

Among the many varieties of segmented worms, or *annelids*, the earthworm represents the stripped-down, no-frills, super-streamlined version. It is also, from a worm's eye point of view, a pretty sophisticated, highly-evolved member of the family.

A cross-section of an earthworm's infrastructure would reveal a cunningly engineered arrangement of body parts: The brain – if you can spot it – is a rudimentary one. This is not a major handicap because your average worm is rarely called upon to solve complex puzzles or make earth-shattering decisions. The main function of the earthworm's brain is to sense light, a

response that, in the absence of eyes, is performed by a network of light-sensitive cells in the worm's skin. So if an earthworm wants to wiggle into the sun or burrow down in the dark, he's got the brains for the job.

He's got a mouth, an esophagus, a crop, gizzard and intestine – all the equipment required to ingest and digest a meal. Just below the earthworm's five hearts is a little bundle of glands, calciferous glands, which monitor and regulate the amount of calcium that enters the system. Excess calcium is a chronic problem when you live on a diet of dirt. There is no explanation for the presence of five hearts. Maybe it's a sort of life-insurance mechanism: if one heart gives out, another kicks in. Or maybe this is nature's definition of a guy who's all heart.

Correction: “guy” isn't entirely accurate. Because earthworms, like snails and slugs, are hermaphroditic, they can perform double duty. Specific segments of the worm's body are assigned specific roles. There are male bits and female bits so two lust-lorn worms simply have to cozy up, side by side, so that the complimentary equipment is correctly aligned. During this intimate interlude each worm secretes a band of mucus around its body. It is this ring of slime that carries the eggs from the female end of things to the sperm waiting in the wings down the line. The fertilized eggs, thus “shrink-wrapped”, are sent sliding up the earthworm's body and over its head to be deposited in the soil. The mucous packaging, which is self-sealing, functions as a cocoon until the eggs hatch and the baby worms wiggle out into the world to get the latest dirt.

It is this simple process of ingesting dirt and ejecting waste (a worm's droppings are called castings) that moved Darwin to deliver the accolades he did. A tunneling earthworm acts like a miniature, highly

efficient plough, allowing air and water to permeate the soil so roots can hold fast and take up the nutrients required for life. Much of the nourishment required by growing things is provided by the worms' castings: calcium, nitrogen, magnesium and phosphorous – the very ingredients essential for a healthy, flourishing ecosystem.

The earthworm is nature's own tiny, perfect fertilizer-dispensing machine and the work it performs is prodigious. Every year, on a single acre of cultivated land, earthworms can deliver 16,000 pounds of castings-enhanced, mineral-enriched soil.

But what's good for the garden could prove lethal to our forests. Worms don't belong in the forest. But they're there, in ever-increasing numbers, in forested areas on Vancouver island. Seventeen different species have been identified – all of which are invasive. These are worms from far-off places, that were probably introduced generations ago in ballast from ships and on plants imported by early settlers. Worms don't move all that fast on their own. But they are practiced hitch-hikers so man, with his vehicles, has aided and abetted this alien invasion.

In the forest, worms burrow beneath the tree roots and gobble up the life-sustaining leaf decay (duff) on the forest floor. They change the chemical composition of the soil while plants and animals struggle to adapt. Nobody is entirely sure what the impact of these forest worms will be, how long it will take to manifest itself, or how to eradicate the threat if we had to.

The earthworm, with its awesome capacity to both enhance life and eliminate it, has been called our "eco-system engineer". An impressive job-description for a humble worker with a dispensable brain.

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Natural Mysteries

Last month's mystery was: What is that white, sudsy stuff that accumulates along stream edges? The foam found in streams is usually natural. When small aquatic organisms (such as algae) die and decompose, they release fatty acids, which are similar to additives found in common soap products. Runoff from soils also has these fatty acids. These natural "soaps" reduce the surface tension of water ("surface tension" is the cohesiveness of water, the micro-force that gives a drop of water its round shape), and when wind or currents stir air into the water, fine bubbles and forth can form. This natural foam has a somewhat earthy or fishy aroma, and it breaks down rather quickly. Foam from soil runoff is usually a dirty brown color. In contrast, if you see foam in the stream that has a perfume scent, is more than a few inches high, looks like bubble bath, and doesn't break apart easily, detergent may be in the stream.

This month's Natural Mystery: Eew! Spittle bugs are disgusting. Why do they make that horrible spittle on grass stems?

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.

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. How? Just send us an email at galianonaturalists@gulfislands.com. Visit our website at <http://gulfnet.sd64.bc.ca/GalianoNaturalists.html>.