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Sinistral Snails

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"Will you walk a little faster?" said a whiting [fish] to a snail, "There's a porpoise close behind us, and he's treading on my tail. The further off from England the nearer is to France-- Then turn not pale, beloved snail, but come and join the dance".

--Alice's Adventures in Wonderland [The Lobster-Quadrille, st. 1 & 3]

While watching my college class work through a lab exercise, I was glancing at a key of aquatic macroinvertebrates. That's a mouth full isn't it?

Aquatic, of course, means that they live in water. Macro means large, but not huge. It really means you don't need a microscope to see them.

The 'them' are invertebrates. Invertebrates have skeletons on the outside unlike vertebrates, like us, that have skeletons on the inside. I jokingly tell my students that when you step on a bug (an invertebrate), it goes crunch-squish. When you step on a vertebrate, it goes squish-crunch.

However, there are some invertebrates that wouldn't go crunch-squish. With names like long-solid, spike, and pink heelsplitter; some of the mollusks can be tough customers.

The ones mentioned above are mussels native to the Midwest. Besides mussels, the Phylum Mollusca includes limpets, clams, and snails which brings me back to the invertebrate key.

You see, we often catch aquatic invertebrates here at Stillman when school classes come to do pond study. Animated critters such as crayfish and dragonfly larvae attract most of the attention. Although, the tiny (less than an inch long) clams and snails the students find do hold a certain appeal.

Left Turn Lane

I was in the mollusk section of the key when I was given the following

choice: shell sinistral or shell dextral. No, this is not a choice between evil and coordinated shells, rather it is a choice between left-handed and right-handed shells. This begs the question: how can organisms that only have one muscular foot (used for locomotion) be either left-handed or right-handed?

O.K., take a look at the illustrations. If you hold the snail from the top, at its point, and see the opening facing you on the left; you are holding a sinistral snail. If the opening is on the right, you've found a dextral snail.

I have a confession to make. I never noticed the difference until glancing through the key. This spring, though, I'm going to take notice when the kids find snails. Why?

These snails are indicators of water quality. Both types of snails are somewhat tolerant of pollution. However, as the degree of pollution increases, you'll be left with left-handed snails.

No, one type of opening doesn't collect more pollutants than the other. It turns out that right-handed snails use an internal gill to transfer dissolved oxygen out of the water. Since polluted water has lower amounts of dissolved oxygen, gilled snails will have a difficult time surviving.

Left-handed snails use a breathing cavity that is similar to a lung. Not surprisingly, these snails come to the surface to periodically fill this cavity. The thin tissue that lines the cavity filters out the oxygen and delivers it to the snail. (Remember, 78% of our air is made up of nitrogen.) Obviously, lunged snails are better equipped to survive in oxygen-poor waters.

There are other interesting differences between these two categories of snails. Most lunged snails are hermaphroditic while most gilled snails have separate sexes.

While self-fertilization is possible for hermaphroditic snails, they generally mate with another individual. As zoologist and author Robert A. Wallace wrote, "As a group, snails have the most bizarre sex lives of any animal." I think we'll just leave it at that.

Both left and right-handed snails lay their eggs in the spring. The number of eggs ranges from a few to hundreds. Lunged snails lay more eggs than gilled snails. The eggs resemble a small glob of clear mucus with dots inside. We often find these clinging to sticks or leaves during our pond study classes.

Tough Going

When the going gets tough, that is, when a shallow pond either dries up or freezes to the bottom, the pollution-tolerant lunged snails are able to hibernate in the mud. Their life cycle is generally through in a year or less while most gilled snails live from 2 - 5 years.

Given the number of things that eat them, it is surprising that snails live as long as they do. A partial list of their predators includes fish, reptiles, waterfowl, and amphibians as well as other invertebrates such as crayfish, leeches, water beetle larvae, and dragonfly larvae.

Snails, as those of you who have had an aquarium know, feed on algae plus decaying plant and animal matter.

Now that we've learned about snails, is there anything we can learn from snails? I'll leave that to John Donne who wrote the following doggerel to Sir Henry Wotton.

And seeing the snail, which everywhere doth roam,
Carrying his own house still, still is at home;
Follow-- for he is easy paced-- this snail,
Be thine own palace, or the world's thy gaol [jail].

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