The Outside Story

Stinkin' Jim

By: Susie Spikol

I have always admired turtles and their armored ways; how they bask in the sun and retreat when the world is too much. Last summer, through the perseverance of a nine-year-old boy, I found myself holding a small, golf-ball-sized turtle. It had a pointed snout that had two white lines stretching above and below its eye and an olive-brown carapace with a garden of algae growing on it.

Evan had captured this treasure from a local pond. We were using dip nets and strainers and our trays were already filled with dragonfly nymphs, aquatic snails, log cabin caddisfly larvae, and diving beetles. Intent on catching the silver-scaled minnows that schooled around our feet, Evan stalked the edge. He was like a great blue heron, his net like a bill, poised high and ready for a quick jab into the water. He caught two minnows and then made this lucky scoop, pulling up the small brown turtle. Our trays were forgotten as everyone crowded around.

I held the petite turtle by the shell so my twenty students could see it. It was feisty, waving its head back and forth, its mouth trying to clasp on my fingers. That's when it happened. A waft of noxious odor filled our tight circle. Scrunched faces looked around accusingly. "Who's got the bad gas?" asked one girl, among a rising tide of *ewwws.* "The turtle" I answered, delighting in their reaction.

The diminutive eastern musk turtle, *Sternotherus odoratus*, secretes a small but powerfully odorific yellow liquid that has earned it several nicknames, including "stinkpot" and "stinking Jim." The kids pronounced it to be like really bad armpit odor. As a connoisseur of strong nature smells, I prefer to describe it as musky.

The scent glands, which are located near its front legs where the plastron and carapace join, are scientifically known as Rathke's glands, and are not unique to this little stinker. Other turtles have them too, including snapping turtles and some sea turtles: hawksbill, ridley, and green turtles. Nor are they unique to turtles; these same glands enable the garter snake to musk you when you pick it up.

In 1977, Dr. Thomas Eisner and his colleagues from Cornell University determined that stink of the stinkpot comes from phenylacetic and 3-phenylpropionic acids, notorious in the chemical world for their offensive odors. The odor is detectable in water, on land, and in the air. Eisner's study proved that these phenylalkanoic acids are indeed deterrents to some predators. However, musk turtles are capable of releasing only a few milligrams of its smelly super power. Compared to a skunk which can produce a virtual bomb of odor, its foul mist traveling up to 20 feet away and carrying

for a mile or more, the eastern musk turtle's odor defense is like a water gun with a leak.

According to Sean Sterrett, a wildlife ecologist and a postdoctoral research fellow at the University of Massachusetts-Amherst and the Massachusetts Cooperative Fish and Wildlife Research Unit, the eastern musk turtle stench is a smoke screen or, in this case, a stink screen. It's an aposematic signal, as opposed to an actual weapon. An aposematic signal is a way animals warn predators of their dangerous nature – think of the black and yellow of a wasp, or the rattle of a rattlesnake's tail. The musk turtle is banking on predators associating the bit of bad smell with danger.

The fact that the musk turtle's aposematic signal is an odor as opposed to a something visual makes sense for an aquatic nocturnal reptile. The chemical nature of the odor works in water, and provides a non-visual warning signal to predators at night.

According to Sean Sterrett, the musk is not just defensive. Recent research suggests that the musk might be a chemosensory cue for courtship and reproduction. Clearly, there is much more to learn about the eastern musk turtle, and perhaps in the little circle of students who stood on the edge of Norway Pond, transfixed by their own little stinkpot, there might be the makings of new turtle researcher. To me, as their teacher, that would be the sweet smell of success.

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