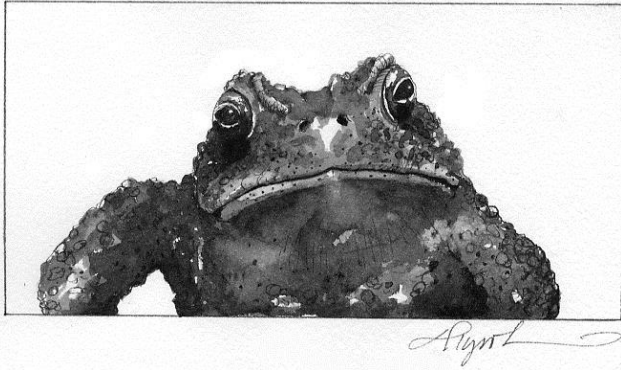


# The Outside Story



## Don't Mess with Anaxyrus By: Meghan McCarthy McPhaul

When my kids were toddlers, they discovered, quite happily, a toad in a damp corner of their sandbox, tucked into the shade beneath the small, triangular piece of wood that served as a seat. The toad seemed to spend most days there, probably waiting until dark to emerge and hunt bugs and slugs.

Thankfully, back then, we had a more mature dog who was wise in the ways of the world – not the goofy pup we have now, who I'm sure will learn the hard way not to eat toads. Many a clueless canine has clamped its mouth around an American toad – the species found most commonly in our region – only to be introduced to bufotoxins, a toad's best defense against being eaten.

Bufotoxins are named for the *Bufo* genus of toad. Although recent classification has placed the American toad in the *Anaxyrus* genus (*Anaxyrus americanus*), the animal certainly contains the toxins, both on its skin and concentrated in the bean-shaped parotoid glands located strategically

behind its eyes, just where a would-be predator is likely to bite down.

Ingested bufotoxins can cause excessive salivation, cardiac arrhythmia, difficulty breathing, and even seizures.

“What I see dogs do [after biting a toad] is froth at the mouth and try to lick the toxins out of their mouths,” said Jim Andrews, coordinator of the *Vermont Reptile and Amphibian Atlas* and a herpetology lecturer at the University of Vermont. “They seem to survive just fine, but it looks very unpleasant.”

Unpleasant enough that most wild animals won't even try to eat a toad. Of course, there are exceptions to every rule: skunks and raccoons will sometimes dine on toads, as will garter snakes, who seem unaffected by the toxins in the toads' skins.

Other species have found a way to avoid the toxins and still eat the toad: “Smart birds like crows and ravens kill the toad and eat them from the inside out, leaving the skin,” Andrews said.

While bufotoxins seem an effective defense against most things, American toads protect themselves in other ways, too. Their mottled brown coloring serves as camouflage, and they're able to change color slightly – darkening or lightening a shade or two – to better match the background wherever they're hiding.

Toads are also able to puff themselves up, therefore appearing more intimidating to predators. This also makes them harder for some predators to swallow, although the toad-eating hognosed snake is not deterred; it uses sharp teeth to puncture the puffed-up amphibians.

While the American toad's toxins are not particularly dangerous to people (though do avoid

touching your eyes or mouth after handling a toad), another of the animal's defenses may serve as a better deterrent to humans. As anyone who's ever picked up a toad likely knows, this defense tactic can be rather – well, wet.

“Toads, like all other amphibians, don't drink. They take in water through their skin,” said Andrews. “Toads have a pink area near their butt that is actually a capillary bed. They can take in water by sitting in a wet spot. When frightened, they will dump their stored water. I think it is both a method of cutting down on their mass for an escape, and also to startle the predator.”

Even before toads reach adulthood, they employ other defenses. Toads lay eggs in two long, gelatinous strings (one from each ovary). The eggs are dark on top and lighter below so they blend into their surroundings when viewed from either direction.

When the tadpoles hatch into shallow water in springtime, their skins already contain defensive chemicals. The tadpoles swim in a dense swarm with a cloudy appearance to confuse predators. And although they may have hundreds or thousands of siblings – and live in a breeding pond containing many, many thousands of other soon-to-be toads – the tadpoles can recognize their kin and often swarm together, assisting each other in foraging.

The toads that are leaving our garden this time of year for secure winter quarters are far from the tiny tadpole stage. We're happy to see them, but we know better than to pick them up. And we hope the dog sticks to chasing squirrels (which are much too fast for her to catch) and leaves the toads and their toxins alone.

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