

Deadly, and Dressed to Kill By Morgan Barnes

Imagine: you are a diamondback rattlesnake, basking in the sun and enjoying your day without a care, because you have incredibly potent venom, and you can kill pretty much anything that wants to hurt you. Most importantly, you know that everyone else knows you have this venom, so they won't bother you! If you're a venomous animal, it doesn't do you much good unless other animals know you have venom, and aren't afraid to use it. Don't worry, nature has a solution.



A white-marked tussock moth caterpillar, with distinctive warning coloration. These caterpillars can cause rashes in humans, and are unpleasant to eat for predators. Photo by Morgan Barnes

Aposematism, often called “warning colors”, is a strategy that various animals use to advertise to predators and potential attackers that it would be a bad idea to attack and/or eat them. The most important component of this strategy is advertising signals that are easily perceivable by potential predators. These signals can be visual (often coloration), odors (think the skunk), sounds (like the rattlesnake!), or other noticeable characteristics.

In order for this strategy to be effective, predators must encounter individuals of the aposematic species often enough that they recall the unpleasant experience of eating one. Over time, these signals benefit both the predator and prey species, as the prey species obviously prefers to avoid being eaten, and the predator species prefers to spend time hunting less harmful prey.

Possibly the most well-known example of warning colors are the poison dart frogs, which are tropical species of frogs that are incredibly brightly colored, and also incredibly poisonous if eaten. But species here in our backyards show off these warnings too!

The famous monarch butterfly eats the leaves of the toxic milkweed plant as a caterpillar, and stores the toxic compounds in its body. When a bird eats the monarch butterfly, the taste is so foul the bird will often vomit the butterfly rather than finish the meal. The contrasting orange and black wings of the monarch are very distinctive, and would-be predators learn to avoid them quickly.

Another commonly seen local species that exhibits aposematism is the rattlesnake. While rattlesnakes do have identifiable coloration, their “warning” is their

distinctive tail-rattling sound. Rattlesnakes have hollow segments of keratin (the same material as our hair and fingernails) that make a rattling sound when vibrated against one another. Rattlesnakes are venomous, and can deliver a lethal bite if provoked.

However, rattlesnakes must use precious energy to create their venom, and would prefer not to use it at all. And although a bite from a rattlesnake is generally fatal to its would-be predators, that doesn't mean the rattlesnake wouldn't be injured in the attack. Therefore, the rattling warning sound allows for the rattlesnake to let predators know it would be best to stay away, without expending much energy.

While it is much more common for insects, reptiles and amphibians to exhibit aposematism, some mammals do it as well! The most well-known of these is the skunk, whose warning colors of strongly contrasting black and white advertise their ability to spray very unpleasant smelling liquid at attackers. This chemical defense takes up to 10 days to regenerate, so skunk would prefer not to use it. Their memorable coloration makes it easy for potential predators to steer clear, and avoid the odious spray.

Warning coloration and other types of aposematism are effective methods for venomous, poisonous, and other hard-to-eat species to avoid confrontations with predators. Next time you see a skunk, or a rattlesnake, or a particularly spiny looking caterpillar, remember: they know they can hurt you, but they're nice enough to let you know, so don't bother them!