



Fooled You!

Insects like ants, butterflies and wasps use tricks to keep predators away

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The butterfly suns herself with her wings open, gathering warmth and energy. Her proboscis—a long, black appendage that serves as the butterfly’s mouth—reaches out to take nectar from a flower. Her orange and black markings make it easy to identify her as a monarch butterfly. It is early fall and she is gathering what she needs to make the 2,000-mile journey south to Mexico. She will

rest there all winter before returning to lay her eggs.

The monarch’s eggs will make an important journey after she lays them: from caterpillar to chrysalis (the stage where monarchs prepare for transformation) to butterfly.

The female monarch flutters her wings and moves on to another flower, constantly moving to avoid predators. She has outmaneuvered several predators during her life. Her bright orange markings certainly tell a tale.

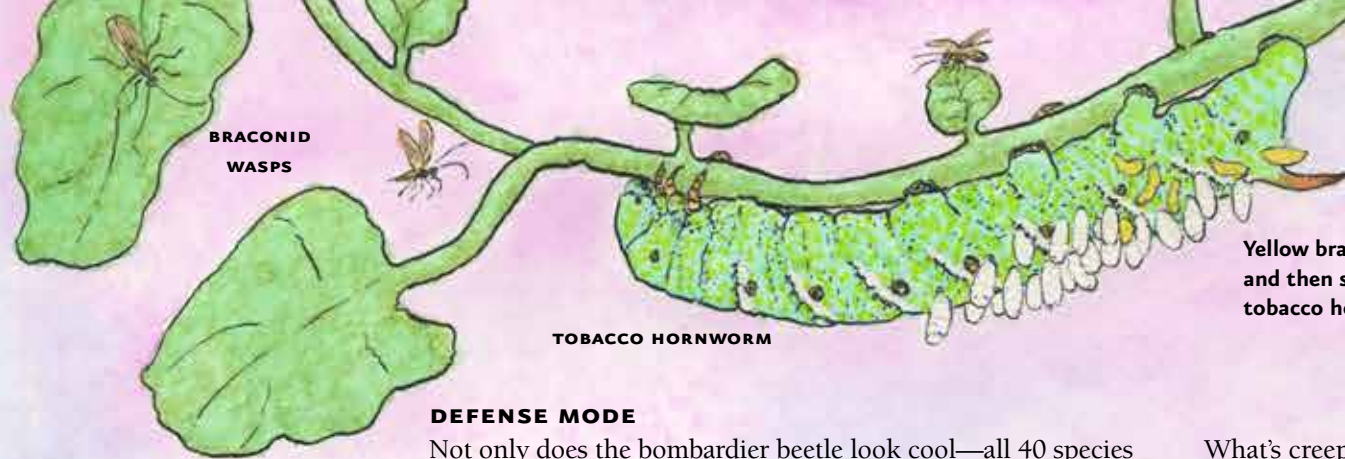
INSECTS ARE EVERYWHERE

Insects can be found burrowing beneath the ground, flitting from flower to flower and walking between pieces of bark. There are predators and prey, just like the rest of the animal kingdom. With over 1 million species, insects have very special adaptations, which are physical changes that help them survive.

The monarch butterfly’s bright colors warn predators to stay away. Predators would become sick if they ate a monarch butterfly. “I’m poisonous! Don’t eat me.” The monarch butterfly becomes poisonous to other creatures by eating the milkweed plant when it is a caterpillar. Other insects, like the velvet ant, also use bright coloration as a warning. A velvet ant has a nasty stinger, so its colors tell predators, “I’ll hurt you if you try to eat me.”

Mimicry is another trick that some insects use to survive. Mimicry is when a creature can look like another organism or object. For example, a female tiger swallowtail butterfly tricks predators into staying away by adapting to resemble the black colors of a pipeline swallowtail butterfly, which is distasteful to its predators.

Other ways insects avoid predators include playing dead, camouflaging with their surroundings, secreting or oozing sticky fluids, being stinky, blending in so perfectly they look like another object, armor and speed. Some methods are creepier than others, and ones that most humans don’t want to come up against.



Yellow braconid wasp larvae emerge and then spin white cocoons on the tobacco hornworm.

DEFENSE MODE

Not only does the bombardier beetle look cool—all 40 species of the insect in the United States have blue elytra (wing coverings) and reddish head and limbs—but they have a cool weapon: their butts! Inside that wonderful butt, the bombardier beetle has two chambers filled with liquids that when combined near the opening of the beetle’s abdomen create a chemical that emerges at 212 degrees Fahrenheit. The beetle deploys this liquid when in danger, like if an unlucky predator decides to eat it. The result can be an explosion in the predator’s stomach, allowing the beetle to safely emerge.



What’s creepier than a beetle firing a 212-degree chemical out of its butt to ward off predators? Perhaps a braconid wasp. Braconid wasps are a parasitic species that lay their eggs in other insects. A female wasp lays her eggs in a particular insect species—tobacco hornworms are favorites of these wasps in North Carolina. The resulting larvae feed under the hornworms’ skin until they are ready to pupate—or turn into adult wasps. At this point, the pupae emerge from the dead caterpillar’s skin in white cocoons, allowing the young wasps to fly away.

Now, just like a human’s body, some insects also can fight off parasites and other things meant to harm them. The braconid wasp, though, has another step to her invasion when she lays her eggs. Upon injecting the eggs into the host species, the females also plant a virus that turns off the host’s defenses, which allows her eggs to grow to adulthood.

Ants, wasps, beetles and other insects have cool adaptations. You might consider them gross or disgusting, but they are definitely effective!

BLENDING IN ACTIVITY

Caddisfly larvae live in streams, rivers, lakes, ponds, spring seeps and temporary waters. As adults they live in a variety of land habitat. When they emerge from their eggs, the larvae spin silk to create a casing for them to live in while they gather enough food to enter the next phase of their metamorphosis, growing their wings and becoming adults. In order to not stand out to fish that find them a tasty treat, the larvae use twigs, rocks and whatever they can find to help camouflage their casing. Try this activity below to see how well your caddisfly can blend in.

FIRST ASK AN ADULT TO HELP GATHER THESE MATERIALS:

- Materials:**
- Paper towel roll
 - Trowel
 - Scissors
 - Water
 - Bucket

Head outside with your paper towel roll, which will be the casing that protects your caddisfly. Use your bucket and trowel to gather materials around you to camouflage your paper towel roll; gather whatever you need to blend in with your surroundings. When you are finished, take your paper towel roll and hide it outside. Then ask a friend to try to find it and see how long it takes. Anything less than three minutes, try again!

Get Outside

Some bug defenses may be downright creepy, but these insects have spent millions of years adapting to become the best bugs they can be. Going outside probably won’t allow you to see some of these defenses, because you don’t want to get in the way of that beetle spray and timing a wasp’s hatching in a hornworm would be tricky. The best way to see how animals have adapted to surviving in their environments is going outside and observing camouflage or mimesis, which is when animals become an object to blend in. Stick bugs are a great example of this. You can also spot bright coloration, stinky smells and armor on many different species. Just go outside and sit quietly and look around for what you can see.

CADDISFLY LARVA
(*Glossoma* sp.)

