



# ZOMBIES

## in the Natural World

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Halloween brings to mind colorful fall leaves, costume parties, candy corn, carved pumpkins and... Zombies. No, not walking dead people but zombie behavior in the natural world.

### "Zombees"

If you see honeybees leave their hives at night, when they are "blind" without the sun's UV rays and polarized light, or in winter when they could die from the cold, or wandering around on the ground in circles, apparently not able to fly, they may have been parasitized by *Apocephalus borealis*, a phorid fly native to North America which was previously known to parasitize bumble bees and paper wasps. The female fly injects eggs into the abdomen of honeybees, which causes the erratic behavior. Eventually, maggots burst out from the bees like an insect version of the film, *Alien*. Dead bees are found surrounded by phorid pupae and pupal casings. It is thought that infected bees may leave the hive in order to protect the rest of the colony. For more information, see the following link: <https://www.zombeewatch.org/>

### Mind Controlling Fungus Infects Ants

One example of the many mind-controlling parasites in nature is the body-snatching fungus, *Ophiocordyceps unilateralis*, which can turn carpenter ants in tropical rain forests into zombies that do its bidding. Once the ants are infected, they are directed by chemicals to travel long distances to find low leaves of plants that are optimal for the fungus to reproduce.

The ant is made to grasp a leaf with its mandibles while the fungus feeds on the ant's body. Once the ant is dead, a long stalk grows out of its head which shoots spores in all directions in order to infect more ants. Up to four different species of this fungus have been found to grow out of other parts of the ant's body.

### Frozen Frogs Come back to Life

During the winter, wood frogs take shelter under leaves and then freeze and thaw according to their surroundings. Special nucleating proteins cause the water in their blood to freeze first. This ice sucks the water out of their cells while the liver produces large amounts of glucose which packs the cells and keeps them from collapsing. The frogs go into a state of suspended animation. Inside the cells there is thick, sugary syrup while all the water outside the cells is frozen. When the water thaws, the blood starts flowing, and, in about 20 minutes, the heart starts to beat. The frog soon starts to breathe and hops off.

### Gypsy Moth Caterpillars Become Hormonal Slaves to Virus

Gypsy Moth Caterpillars are often infected by Baculoviruses and the egt gene in the virus has been found to be the cause of their altered behavior after infection. The caterpillars usually stop feeding during their molts, but the gene turns off the molting process which leads the caterpillars to stay out in the open at the top of trees and continue eating until they turn into a sac of virus. The virus then drips onto caterpillars below them and infects them with the virus.

Can humans be manipulated by viruses? When we get the flu or a cold, we cough a lot. Is it possible that this is just a symptom or is the virus using us to spread and reproduce itself? There are stranger things happening in nature. So on Halloween night when you go to bed, rest assured that vampire bats will not fly into your bedroom and morph into Count Dracula. Pleasant dreams.



## Spooky Read

*Wicked Plants*, and  
*Wicked Bugs*  
by Amy Stewart