

Check your understanding



1 What are some common behaviors induced by zombie-making fungi in insects?

Answer Many zombie-making fungi make their insect hosts move differently, climb high on a plant or other surface, and bite down on to that surface. Being higher up ensures a good dispersal of spores.

2 What have zombie-making fungi evolved to achieve when they manipulate the insects' behavior?

Answer Every pathogen wants to spread. Zombie-making fungi have developed unique strategies to do that. They manipulate their hosts' behavior in such a way that will enhance spore dispersal. Thus, these fungi can better spread and colonize new hosts.

3 Behavior manipulation is a form of adaptation. Can you think of other examples in Nature?

Answer Answers will vary greatly. Some examples include:

- Migration – some birds, fish, insects and others travel long distances seasonally to find good breeding grounds and food resources.
- Camouflage – many animals have evolved coloration that helps them blend in with their environment, ensuring they are not seen by predators.
- Hibernation – some animals hibernate during bad conditions so that they use scarce resources slowly.
- Marine animals have various adaptations to live in water, like fins and gills.

4 Zombie-making fungi and insects have a parasite-host relationship. Can you think of other parasite-host relationships?

Answer Malaria parasite and humans. Fleas and mammals. Ticks and mammals/birds/reptiles/humans. Tapeworms and animals (including humans). Any virus-human relationship. Head lice and humans.

How do some fungi turn insects into zombies?

TEACHER'S KEY
UPPER READING LEVEL

5 There is a fictional TV series and video game where a zombie-making fungus, *Cordyceps*, rapidly mutates to infect humans turning them into "zombies". Why is this impossible?

Answer

Unlike in "The Last of Us", in the real world zombie-making fungi have co-evolved for millions of years alongside their respective hosts. They are so specialized that they can't break the species barrier among other insects, let alone humans. They have evolved mechanisms that target the exact species' anatomy and physiology. Moreover, human immune systems and nervous systems are a lot more complex.

Climbing, or summitting behavior, is quite common among manipulated insects. Why do you think that is?

Answer

A higher position makes it easier for the fungal spores to spread further using the wind.