

PARASITES CREATE ZOMBIE SNAILS

16

(6) When one organism pretends to be the food source for another organism in order to trick the second organism into eating it, this is called aggressive mimicry. Mimicry means to copy or imitate. In this case, *L. paradoxum* is using the snail to imitate a caterpillar.

(7) When the brood sac has been ingested by the bird, the larvae can break free and begin to grow into sexually mature adults. At this point they can reproduce and lay eggs within the bird's rectum. These eggs will be excreted by the bird in its poop. Another unsuspecting amber snail will eat the poop and unknowingly ingest the parasite eggs. The snail now

becomes the new host for the start of the next generation of *L. paradoxum* parasites.

(8) *L. paradoxum* is not the only parasite that uses mind control to turn its hosts into zombies. Many other parasites also use this effective survival strategy. For example, some parasitic wasps lay eggs within the bodies of some spiders. The eggs hatch into larvae which begin mind controlling the spider so that it starts spinning webs that will be perfect cocoons for the wasps. Though many parasites use mind control, very few use it in combination with aggressive mimicry, making *L. paradoxum* quite unique.

Article Questions

- 1) What two hosts are needed for the *L. paradoxum* parasite to complete its life cycle?
The parasite needs an amber snail and a bird to be its hosts.(1)
- 2) Number the following events in order from 1 to 9 to represent the life cycle of *L. paradoxum*. Step 1 has already been provided to guide you.
 - 6 Amber snail seeks out an open space during the day. (4)
 - 7 Bird spots amber snail eyestalks and eats them. (4)
 - 2 *L. paradoxum* eggs hatch and form sporocytes. (3)
 - 9 Bird poops out the eggs. (7)
 - 3 Sporocytes grow as they absorb food from the snail. (3)
 - 8 *L. paradoxum* larvae grow into sexually mature adults and lays eggs in bird's rectum.(7)
 - 1 An amber snail eats bird poop containing *L. paradoxum* eggs.
 - 5 Brood sacs, containing *L. paradoxum* larvae, grow in the snail eyestalks and pulsate. (3)
 - 4 Sporocytes tunnel through the snail's body to the eyestalks. (3)
- 3) Why does the *L. paradoxum* parasite cause the snail to stop producing eggs and sperm?
When the snail's reproductive abilities are inhibited, it can use more energy for finding food and eating. This provides the growing *L. paradoxum* sporocytes with more food.(3)
- 4) What is aggressive mimicry in the case of the *L. paradoxum* parasite?
Aggressive mimicry is when an organism pretends to be the food source (e.g. a caterpillar) of another organism (e.g. a bird) in order to lure the second organism (e.g. bird) into eating it.(6)
- 5) How does the *L. paradoxum* parasite change the snail's typical survival behavior?
It causes the snail to be active in the day, which it usually wouldn't be, and it causes the snail to seek open bright spaces that make it vulnerable to predators and desiccation.(4)
- 6) What two things happen to the amber snail after it has its infected eyestalks removed by a bird?
The snail's eyestalks will grow back and sperm and egg production resumes.(5)