



GLIDING THROUGH LIFE: THE SNAIL

What comes to mind first when you hear the word *snail*? Probably you thought about how slowly snails move and the slimy trail they leave behind. And, of course, snails carry that protective shell wherever they go. People who fancy aquariums often keep a few snails in their



tanks, so they automatically think of water snails when the subject comes up. In fact, of the 80,000 or so different kinds of snails (and their relatives the slugs) living on Earth today, only a small minority live on land.

The truth is that most people know very little about snails and seldom pay them any attention...unless they are chomping on garden flowers or vegetables. Snails, like every other creature, have many interesting structures and behaviors that help them survive and do their "job."

Snails are members of a phylum of soft-bodied animals called **mollusks**. Other mollusks include clams, mussels, oysters, squids, and octopuses. None of the mollusks has an internal skeleton. Snails and slugs are very similar, except that slugs do not have shells. Both of them move by gliding along on their **foot**, which is the muscular bottom surface of their bodies. For this reason they are called **gastropods** (*gastro* means stomach or belly, *pod* means foot). If you look closely at the bottom of a snail's foot through a clear plastic cup, you will see the rippling motion of the "belly foot" as the snail glides along.

THE SNAIL'S BODY

Most snails have a spiral **shell**. Because snails are firmly attached to their shell, it is not possible for them to creep out and look for larger quarters. As snails grow, they



continue to enlarge their shells by laying down new shell material around the opening. The shell is made mostly of calcium carbonate, so a snail's diet must include a lot of calcium for new shell.

The land snail has a **head** with a **mouth** and two pairs of **tentacles**. The two larger tentacles are positioned high on the top of its head, looking a bit like horns. These have primitive eyes on their tips. A snail cannot see images with these eyes, the way we do, but can tell whether it is light or dark. These same tentacles also have nerve cells that are sensitive to smells. Like all of the snail's other body parts, the tentacles are made of soft tissue. They can be pulled back into the snail's head completely if they are threatened.

The smaller pair of tentacles is directed downward to sense the ground underfoot for food, evidence of other snails, and the quality of the surface. The many nerve cells in the tentacles and around the edge of the foot are sensitive to touch, textures, and chemicals. Just as with humans, the snail's nervous system allows it to determine what its surroundings are like. When the snail is threatened, it can retract the smaller tentacles into its head as well, and if further harassed, it can pull its whole head and foot completely into its shell for protection.

Land snails breathe by drawing air into a breathing chamber through an **air pore**. The air pore is a small opening on the right front part of the body just behind the head. You can see it when the foot is fully extended from the shell. The breathing chamber is a space inside the body that serves the same function as lungs.

The breathing chamber is lined with blood vessels. Blood in the vessels can get rid of

carbon dioxide and pick up oxygen. The snail's heart pumps the blood to every cell in the snail's body. The cells take oxygen from the blood and give up the waste gas carbon dioxide. If you shine a flashlight through the shell of a snail, you can usually see the pumping heart.

Snails are cold-blooded or **ectothermic** (*ecto* means outside, *therm* means temperature). This means their body temperature is the same temperature as their surroundings. Ectothermic animals tend to slow down and become less active as the temperature goes down. Snails are quite active at 5–30°C (40–85°F).



FEEDING

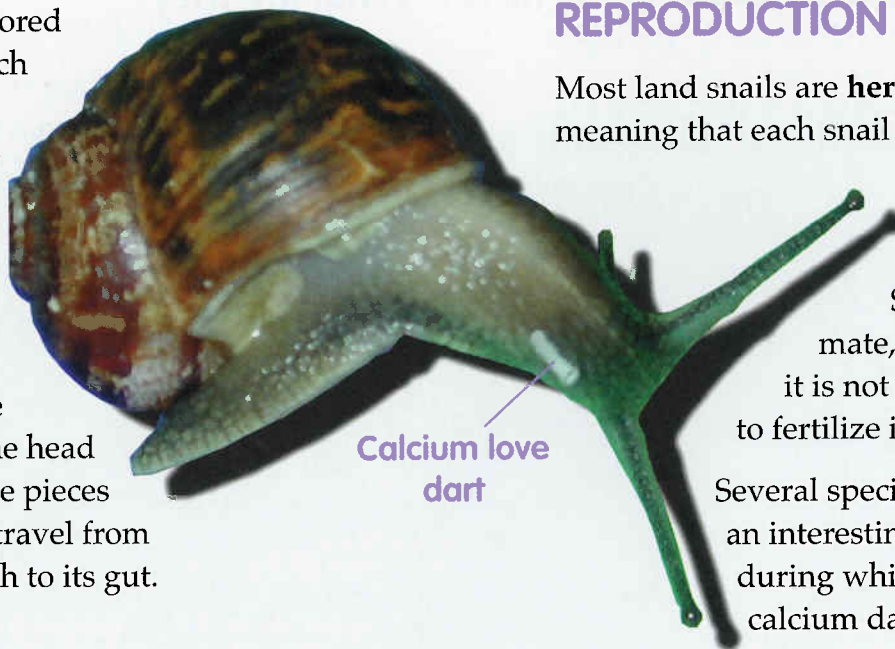
Land snails will eat a wide variety of leaves, fruit, and other plant material. They are very unpopular with gardeners because the gardener's prized plants are just another meal. The snail's mouth is on the bottom side of its head. It eats by pressing its mouth against the intended meal and scraping the food material to bits with its specialized filelike tongue, called a **radula**. If you use a hand lens to observe a leaf that a snail has been eating, you can often see

the scrape marks made by the radula. If you have water snails in an aquarium, you might be able to see the marks on the sides of the aquarium where the snail has scraped off algae with its radula.

Snails don't usually drink plain water, but instead get their water from moisture in the food they eat. Therefore, it is important that snails have fresh plant material, like lettuce, spinach, or carrots, to make sure they get their water.

Snails also need a source of calcium in their diet, so that they can produce new shell material as they grow. Normally they get calcium from the leaves and other plant material they eat, but if the opportunity comes up, they will also eat chalk, egg shells, and sea shells, which contain large amounts of calcium.

When a snail eats, the food goes into its **crop**, where it is ground up. This is the first part of digestion. From there the food passes through the intestines, where nutrients are extracted. Finally the indigestible leftovers pass out the anus. If you feed a snail light-colored food, such as oatmeal, you can look through the skin from the top of the head to see the pieces of food travel from its mouth to its gut.



HABITS & HABITATS

Snails leave a trail of mucus wherever they travel. Land snails are most active at night, if a snail's pace can be called active. A typical snail moving at a fast clip can travel only about 6 meters (20 feet) in an hour. Still, even at that rate, a snail can cover 60 meters (200 feet) in an evening. When the Sun comes up, snails head for cover, perhaps under some dead leaves or in some damp, dark nook. In dry weather, a snail might seal itself to a smooth surface with mucus, and wait for the next night.

Snails need a moist environment. If the weather is hot and the ground is dry, the snail may go into a deep resting state called **estivation**. The snail will pull inside its shell and seal the opening to a solid surface with mucus. This sealed chamber will hold moisture and keep the snail isolated from predators, parasites, and diseases. This state is similar to hibernation, but estivation is triggered by dry conditions rather than by cold.

REPRODUCTION

Most land snails are **hermaphroditic**, meaning that each snail is both male and female.

Every snail has eggs and sperm. Snails do have to mate, however, because it is not possible for a snail to fertilize its own eggs.

Several species of snails have an interesting mating ritual during which they jab small calcium darts into each other.

The “love darts” can penetrate deeply, sometimes hitting the internal organs. After being darted, the two snails move next to each other and each snail transfers sperm to the other.

After mating, a snail lays up to 100 BB-sized eggs under a leaf or rock, or just under the surface of the soil. Two to four weeks later they hatch, looking like tiny adults. Soon the shell hardens and away they glide, looking for something to eat. Land snails usually live for only a year or two.



Think Questions

1. Why are snails and slugs called gastropods?
2. How many senses do snails have? What are they?
3. What do snails do when they get cold?
4. What do snails do when their habitat gets dry?
5. Discuss the reproductive behavior of snails.