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11.

What are the most commonly asked questions about worms?

Are you one of the thousands of people who have mixed reactions towards worms? Do you feel revulsion towards these moist wriggly creatures at the same time that you are fascinated by them? Are you somewhat curious, but don't want to learn too much about them? Then this chapter is for you.

Can a worm see?

Contrary to the popular cartoon image of worms, they have no eyes and cannot see. They are, however, sensitive to light, particularly at their front ends. If a worm has been in the dark and is then exposed to bright light, it will quickly try to move away from the light. A nightcrawler, for example, will immediately retract into its burrow if you shine a flashlight on it some wet spring night.

The sensory cells in a worm's skin are less sensitive to red light than to light of mixed wavelengths. If you want to observe worms under less intrusive conditions, you can take advantage of this fact by placing red cellophane or an amber bread wrapper over your light source. You can make further observations of earthworm behavior in a photographic darkroom using a red safelight. Your eyes will adapt to the lower level of light these aids provide, and the worm will move more naturally than it does under bright light.

Where is the worm's mouth?

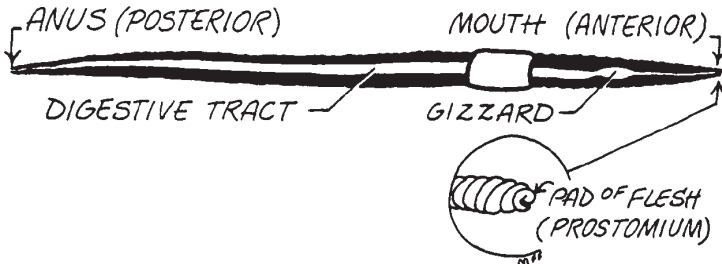
A worm's front and back ends are more technically known as anterior and posterior. The mouth is in the first anterior segment. A small, sensitive pad of flesh called the **prostomium** protrudes above the mouth. When the anterior end of the worm contracts, the prostomium is likely to plug the entrance to the mouth. When the worm is foraging for food, the prostomium stretches out, sensing suitable particles for the worm to ingest. I was amazed at how wide a nightcrawler can open its mouth when I first saw it on video. The worm curled its anterior segments upwards, revealing a wide-open mouth for a fraction of a second. Later, I saw the worm grab a leaf with its mouth and drag it towards its burrow.

Does a worm have teeth?

No. The mouth and pharynx are highly muscular, but they do not contain teeth.

How does a worm grind its food?

Because worms have no teeth, they have little capacity to grind their food. They are limited to food that is small enough to be drawn into the mouth. Usually this food is softened by moisture or by bacterial action. Bacteria, protozoa, and fungi undoubtedly help break down the ingested organic material. Every worm has one muscular **gizzard**, however, which functions similarly to gizzards in birds. Small grains of sand and mineral particles lodge in the giz-

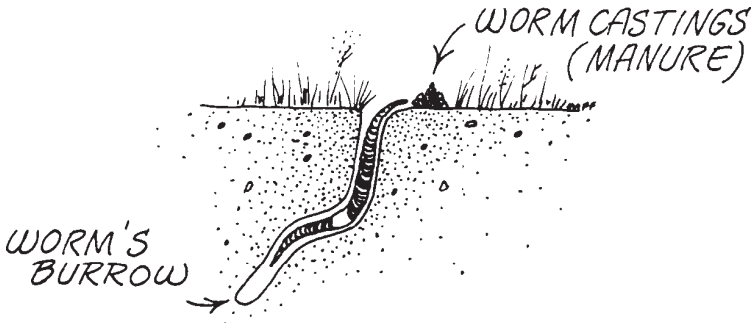


zard. Muscular contractions in the gizzard wall compress these hard materials against each other and the food, mix it with some fluid, and grind all into smaller particles. One

reason for manually spreading a handful of topsoil, rock dust, or lime into worm bedding is to provide worms with small, hard particles for their gizzards.

What happens to food once it leaves the gizzard?

The ground-up food enters the worm's intestine, which secretes digestive enzymes to chemically break down molecules of food nutrients. These simplified nutrients then pass through the intestinal wall for absorption into the bloodstream, and are carried where needed. Undigested material, including soil, bacteria, and plant residues, passes out of the worm through its anus as a worm casting.



Do worms need air?

Worms require gaseous oxygen from the air. The oxygen diffuses across their moist skin tissue from the region of greater concentration of oxygen (the air) to that of lower concentration (inside the worm). When water has been sufficiently aerated, worms have been known to live under water for a considerable length of time.

Carbon dioxide produced by the bodily processes of the worm also diffuses through its moist skin. Also moving from higher concentration to lesser concentration, carbon dioxide moves from inside the worm's body out into the surrounding bedding. A constant supply of fresh air throughout the bedding helps this desirable exchange of gases take place.

If a worm is cut in half, will both parts grow back?

Worms do have a remarkable capacity to regenerate lost or injured parts, but this capacity is limited.



The cutting-a-worm-in-half myth.

Depending upon where the worm was cut, the anterior end can grow a new tail. The tail, however, cannot regenerate a new head. The capacity to regenerate new tissue is a form of reproduction among some animal forms, but not among earthworms. On rare occasions you may find a worm with two tails, both at the same end. This condition can be caused by injury to the worm in the posterior end, which results in growth of a new tail adjacent to the original tail.

Do worms die in the bin?

Worms undoubtedly die in any home worm bin, but if your box is properly maintained, you rarely will see a dead worm. Their bodies quickly decompose and are cleaned up by the other organisms in the box, leaving few dead worms you can recognize.

If large quantities of worms seem to be dying, you should attempt to determine the cause and correct the problem. Is it too hot? Are toxic gases building up in the bedding that cause the worms to surface and get away? Did you stress the worms by adding too much salty, aromatic, or acid-producing food?

You'll need to make some educated guesses about what the problem is, and try to correct it. Adding fresh bedding to a portion of the box sometimes is enough to correct the situation, by providing a safe environment towards which the worms can crawl.

How long does a worm live?

Most worms probably live and die within the same year. Especially in the field, most species are exposed to hazards such as dryness, weather that is too cold or too hot, lack of food, or predators. In culture, individuals of *Eisenia fetida* have been kept as long as four and a half years, and some *Lumbricus terrestris* have lived even longer.

If reading this far has served merely to whet your appetite for learning more about earthworms, the publications listed in Appendix B: "Annotated references" are books with more detailed information.