



By Catherine Winter

Stranger than Science Fiction

Weirdly wonderful,
slime molds
are worth a closer look.

SLIME MOLDS seem like beings from a science fiction story. They creep across the forest floor like sheets of mucus, eating as they go. Then they stop traveling, ooze onto a dead log, a leaf, or a blade of grass, and transform.

Their new shapes are spectacular, beautiful, and weird. They may look like a cluster of shimmering balls, each perched on its own stick. They may look like a row of orange insect eggs, a clump of dark red honeycomb, cones full of pink cotton candy, or bouquets of skinny, brown corn dogs.

Some of those shapes have earned slime molds funny names, like moon poo, dog vomit, and wolf's milk. If you've got sharp eyes and a special magnifying tool called a *hand lens*—and you know where to look—you can spot them in the woods, and maybe even in your backyard.

Viewed under magnification, slime molds like this species from the Cribraria genus can look like life forms from another planet. This and many other types of slime molds live in Minnesota.

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Heterotrichia ferruginea, like many slime mold species, grows on decaying wood.

Sudden Slime

Slime molds are not *fungus* like mushrooms, but they are like mushrooms in a key way: They spend a lot of time being invisible or nearly invisible to humans, and then they pop into view. The strange shapes they make are called *fruiting bodies*. The fruiting bodies release reproductive cells called *spores*, just like mushrooms do. If all goes well for them, those spores eventually grow into new slime molds.

When and Where. It's not entirely clear what triggers the fruiting bodies to appear, but you may have good luck finding them when it's been warm and rainy. Try looking in damp, shady places where there is decaying wood. Kids can be especially good at finding fruiting bodies because they have sharp eyes and are closer to the ground, down where a lot of slime molds live.

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It's not hard to see why *Fuligo septica* is often called dog vomit slime mold.

Mega Molds. Fruiting bodies come in a mind-boggling variety of shapes and sizes. Some are big enough to be easily seen without a hand lens, which is basically a small magnifying glass.

For example, dog vomit slime mold (*Fuligo septica*) makes a bigger fruiting body than any other slime mold. It looks like a foamy mound. It may remind you of scrambled eggs or, well, dog vomit. You might even see it in your yard. It likes to grow on damp mulch, and sometimes homeowners who find it are freaked out and wonder what to do about it. Luckily, dog vomit slime mold doesn't hurt anything, and eventually it dries up and disappears.

Another slime mold, moon poo (*Reticu-*

laria lycoperdon), can be the size of a golf ball or larger. It's a whitish blob that looks like an insect egg sac or a puffball mushroom, which gives it another common name: false puffball. You can look for this slime mold on dead trees. If you touch it when it's young, it may sink a bit under your finger, like a plastic bag with dough inside it.

Closer to the ground, you may notice downed logs or tree stumps that have round, pink growths. These are commonly known as wolf's milk slime mold (*Lycogala*). They may be alone or in groups, and they may be as small as a pea or as big as a blueberry. If you find wolf's milk and come back again in a day or two, you may find it has changed to a silvery gray.

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Above: *Metatrichia vesparia*, sometimes called wasp nest slime mold, often grows on rotting wood. Below: Slime molds in the *Stemonitis* genus grow on slim stalks and are sometimes called chocolate tube slime mold.

Tiny Treasures

One way to look for tiny slime molds is to first notice other, larger slime molds on a fallen log and then look closely at that log. If it's good *habitat* for wolf's milk—in other words, if it's a good place for the slime mold to live—it may be good habitat for others.

Fungi can provide clues too. For example, a fungus called fairy cups, though not a slime mold, likes to grow on some of the same fallen logs that some slime molds favor—and its rows of little yellow or orange dishes are easier to spot.

Look at Logs. If you see fairy cups or wolf's milk on a log, look around the sides of the log and inside any cracks or holes. If you shine a flashlight into a crevice, you might discover a large group of push

pin slime molds (*Hemitrichia calyculata*). They look like tiny yellow goblets filled with fluff. The puffy tops release spores.



Another tiny slime mold you can find on fallen logs is chocolate tube slime mold (*Stemonitis*). The fruiting bodies look like thin cattail plants in a cluster. The clusters are quite small, no bigger than your fingernail.

Red raspberry slime mold (*Tubifera feruginosa*) is about the same size as chocolate tube slime mold. It's red when young and brownish when older, and it's bumpy like a raspberry.

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The fruiting body of *Physarum compressum* begins to crack open to release reproductive cells called spores.

Spore Showers. A species that's even smaller is wasp nest slime mold (*Metatrichia vesparia*). It may appear as a tiny red smear on a log, but look closer with a hand lens and you'll see smooth clusters of cones,

with a dome on top of each cone. If you find fruiting bodies that look like this, it's worth going back to see them after a few days. The tiny domes pop open like jack-in-the-boxes. Clouds of fluff burst out and release spores.

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Ceratiomyxa fruticulosa grows on a rotting log.

Confusing but Cool

Slime molds have been around since way before humans—before any animals, in fact. When humans came along and discovered them, they were puzzled. Some scientists thought they were animals, which makes some sense. For part of their life cycle, slime molds can move around like animals, and they eat other living things, or *prey*. They engulf *bacteria* and other one-celled creatures, covering them completely and consuming them.

Then again, slime molds are kind of like fungi. They like damp places and decaying plants, they make fruiting bodies, and they release spores, much

like mushrooms. However, their cells are not made of the same thing as fungi. Their cells are more like plants' cells. Unlike most plants, though, they don't have root systems or leaves, and they can move around.

Slime Mold Switcheroo. Over the years, scientists have moved slime molds from one category to another, calling them plants, animals, or fungi. But none of those categories quite fit, and now, scientists have decided that slime molds are their own thing—not plants, animals, or fungi, but a form of life called *protists*.

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Didymium squamulosum is covered in crystals.

Growing and Changing. During its life, a slime mold goes through astonishing changes. It starts as a spore, then turns into a one-celled creature like an *amoeba*. At that stage, it's too small to see without a microscope. But as it moves about, eating, it eventually takes on a new, larger form called a *plasmodium*.

Plasmodia come in many colors, in-

cluding brown, gray, yellow, red, and white. They may be slimy looking. They may make fanlike shapes that stretch out over soil, dead leaves, and decaying wood, looking for food. They can get big. Some slime mold plasmodia are large enough to cover a whole stump. But, amazingly, even when they are this big, they are still one-celled creatures.

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Physarum compressum grows on dead plant matter.

Eat and Be Eaten

“But what are slime molds *for*?” is a question people sometimes ask. Scientists are still studying slime molds to learn more about what role they play in the community of living things—the *ecosystem*. It’s clear they are involved in breaking down decaying matter such as wood and leaves. And it’s clear they’re part of a *food web*; they eat things and are eaten by other things.

What’s for Dinner? It can be hard to figure out exactly what slime molds are eating. Before a slime mold becomes a plasmodium, it’s so small you need a microscope to see it. You can’t sit in

the forest with a notebook and observe amoebas to see what they’re eating. Even large plasmodia may be hard to catch eating dinner, because they can be hidden under bark or other things on the forest floor.

Still, scientists know that slime molds eat algae, fungi, and other slime molds. They also engulf certain kinds of bacteria, so they probably help keep the amount of bacteria in the soil low. In the laboratory, scientists have found that some slime mold species will eat bits of plants. There are people who grow slime molds for fun, and sometimes they feed oats to their pet slime molds.

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Moon poo (*Reticularia lycoperdon*) can be the size of a golf ball or larger.

Moldy Meals. In the wild, slime molds are eaten by small forest creatures such as slugs, pill bugs, beetles, and flies. There are beetles and flies that depend on slime molds for survival. The insects may help spread the slime molds’ spores to other places, like birds carrying seeds.

Slime molds are also eaten by fungi, and in some parts of the world, they have even been eaten by people. In parts of Mexico,

the slime mold commonly known as false puffball or moon poo has popular names that translate to “moon excrement,” “wood mucus,” and “cheese mushroom” (though as we know, it is not a mushroom!). People cook it until it gets a texture like melted cheese. One scientific study describes the taste as “like almonds and mushroom.”

To be safe, though, don’t ever try eating a slime mold!

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Willkommmlangea reticulata can resemble a worm.

Unexpected Lessons

Until recently, slime molds didn't seem particularly useful to humans. Now, though, we're realizing that these protists have a lot to teach us. Slime molds are helping us rethink what it means to be intelligent.

Maze Masters. One of the most remarkable things about slime molds is that even though they don't have a brain, they can solve mazes. If you put a slime mold in a maze with food in a few places, soon enough it will grow along the paths that lead to food and stop growing along the paths that don't.

It will leave slime behind on the empty paths to remind itself not to go that way. Researchers put slime molds on a map of Japan with food on major cities. The slime molds developed structures that led from city to city. They built connections that could work as backup in case any of the links were disconnected. They basically designed a railway map like one a clever engineer would design. The researchers suggested that the slime molds might inspire people who create networks, like rail systems, that need to operate even if there's a failure somewhere on the line.

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Slime mold from the *Lycogala* genus, often known as wolf's milk, can be spotted on downed logs or tree stumps.

Slimes for a Cure. Slime molds may also prove useful in helping human beings treat diseases. Researchers have found that slime molds grow like cancerous tumors, so they're studying them to try to figure out how to stop cancer from spreading. Medical researchers are also studying slime molds to help them treat illnesses such as Parkinson's disease, bipolar disorder, and epilepsy. Other researchers are looking into whether slime molds might serve as a source for antibiotics.

True Admirers. Slime molds are also in-

spiring artists, especially photographers. In recent years, new camera and photo processing technology have allowed people to take spectacular, award-winning pictures showcasing slime molds' weird beauty. A Facebook page called Slime Mold Identification and Appreciation has nearly 82,000 members. Some of the members grow slime molds at home as a hobby.

Some people just love to hunt for them in the wild. Once you know that there could be a fascinating slime mold on any fallen log, a walk in the woods will never be the same. 

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