How rain evolved its distinct scent — and why animals and humans love it

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Image 1. The distinct scent of rain might actually be a chemical signal used by bacteria to attract this tiny arthropod called a springtail. The springtail eats the bacteria and then spreads the bacteria's spores. Photo: Ryan Hodnett/Flickr. Licensed under CC BY-SA 2.0

What do you smell when it rains? Some people say the air smells like wet dirt. Scientists say the smell is a mix of chemicals. Bacteria make the chemicals. The mix attracts animals.

The chemicals cause the fresh rain smell. It is called geosmin.

Scientists have known about geosmin since the 1960s. Now, they think they know geosmin's purpose.

Humans Know The Smell Of Rain

Many animals can smell wet rain. Humans can too. We notice geosmin even in small amounts.

The bacteria that make geosmin are all part of a group. It is called Streptomyces.

Streptomyces bacteria are important. They make chemicals used in medicines. Scientists studied 122 species of Streptomyces. Nearly all of them could make geosmin.

Animals Help To Spread The Spores

Mark Buttner a scientist. He studies tiny living things like bacteria. He helped lead the study on geosmin. He believes the chemical must help the Streptomyces bacteria survive. That is why so many of them can make it.

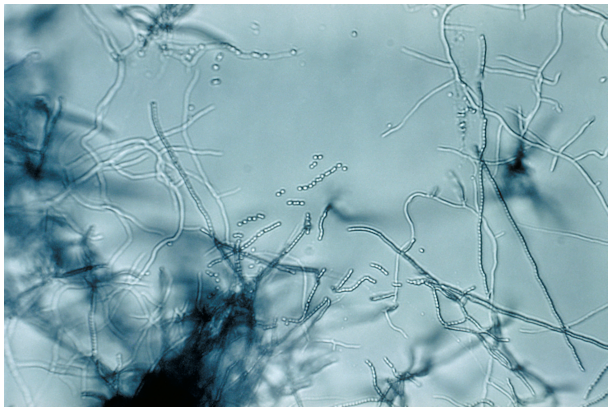
Bacteria is all over the world. Bacteria make spores. The spores are cells. They help bacteria reproduce. Geosmin comes with the spores of bacteria.

Sticky Traps And Springtails

The scientists wanted to learn more about geosmin. They did an experiment in Sweden. It is a country in Northern Europe. They set out sticky traps in the woods. Some traps had the bacteria Streptomyces. Others had soy flour.

The Streptomyces released geosmin. They also released another chemical. Both attracted springtails.

Springtails have six legs. They are arthropods, a kind of bug. A spider is also an arthropod.



Scientists think springtails and Streptomyces developed together. They came to depend on each other over millions of years. The geosmin attracts the springtails. It tells them where to find food. The springtails eat the bacteria. In return, the springtails spread the bacteria's spores. The spores travel through the springtails' poop.

An Ancient Relationship

The bacteria and the springtails have a relationship. Buttner compared the relationship to birds and fruit. The fruit attracts the birds, who eat it. Then the birds spread the seeds.

This relationship is probably hundreds of millions of years old. The fresh rain smell that we know is the same rain smell that was on ancient Earth.

Springtails are key to Streptomyces' survival, Buttner says.

Quiz

1 Read the section "Humans Know The Smell Of Rain."

Which sentence from the section explains why Streptomyces bacteria are important?

(A) We notice geosmin even in small amounts.

(B) The bacteria that make geosmin are all part of a group.

(C) They make chemicals used in medicines.

(D) Scientists studied 122 species of Streptomyces.

2 How does geosmin help Streptomyces bacteria survive?

(A) Geosmin has a smell that even humans can notice.

(B) Geosmin makes a smell that keeps animals away.

(C) Geosmin tells animals that the bacteria are bad to eat.

(D) Geosmin attracts animals that spread bacteria spores.

3 Read the list of steps in the study done by scientists.

1. *Scientists set out sticky traps in the woods.*
2. *Scientists put Streptomyces in some traps and flour in others.*
3. *?*
4. *The chemicals attracted springtails.*

Which answer option goes third?

(A) The Streptomyces released geosmin.

(B) The springtails ate the Streptomyces.

(C) The scientists watched birds eat fruit.

(D) The Streptomyces created new spores.

4 Why do Streptomyces bacteria release geosmin for springtails?

(A) Springtails and birds work together to help spread the bacteria.

(B) Springtails eat geosmin and spread spores to help the bacteria survive.

(C) Springtails and Streptomyces are found only in Northern Europe.

(D) Springtails need geosmin so they can make the smell of rain.