

Spiders' Spinning Secrets

Scientists are close to unraveling the secret wrapped up in silk.

Which frightens you more—a scary ghost story or a spider dangling from the ceiling? Spiders scare many people, but most spiders are harmless. In fact, spiders have a secret that may be very helpful to humans.

The secret is that spiders spin silk that is stronger than any other known material. Spider silk is so strong, say scientists, that a web woven of spider silk the thickness of a pencil could stop a jet in mid-flight!

The strength of spiders' silk has stumped humans for over a century. But scientists have recently come one step closer to unraveling the spider's secret. This discovery is expected to help humans figure out how to make artificial spider silk.

The Power of Silk

Spider silk is the material that spiders use to build webs and catch food. They also use it to climb and to protect their eggs.

Spiders have been spinning silk for about 380 million years—that's 150 million years before the first dinosaurs roamed the earth!

Although the appearance and size of each kind of spider varies greatly, all spiders have the ability to spin silk.

Now humans want to learn how to spin silk like spiders. Over the last 10 years, scientists have been working to make artificial spider silk, but they haven't created anything as strong as the real stuff.

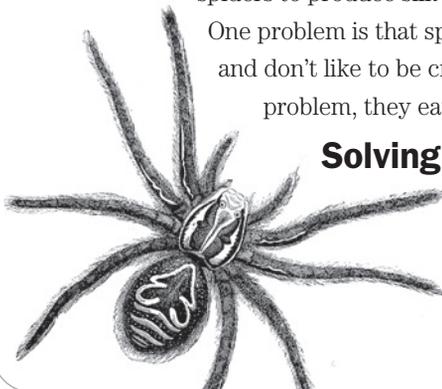
Learning how to copy spider silk could help humans because of the material's unique combination of strength and stretch. Spider silk is tougher than steel and more flexible than rubber.

Why not use real spider silk? Raising thousands of spiders to produce silk would be difficult.

One problem is that spiders are territorial and don't like to be crowded. To solve this problem, they eat one another!

Solving the Silk Secret

A new finding is making scientists hopeful that they will soon solve



the spiders' silk secret. Scientist David Kaplan has figured out how spiders mix water and silk proteins in their bodies to create threads of silk.

"This finding is expected to help scientists copy the process spiders' bodies go through when they make silk," says Kaplan.

If scientists can do this, they should be able to figure out how to create artificial silk as strong as a spider's silk.

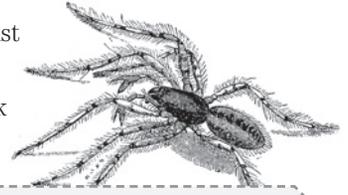
Think About It!

Spiders live in just about every habitat on earth because they have learned to adapt to different environments. For example, some spiders build tents that they use as retreats or hiding places to find shelter from rain or enemies.

"Spider silk is a science wonder," says Jeffrey Turner, whose company is working to make artificial silk.

Some of the products Turner's company may be able to improve with artificial silk include: lighter and tougher bulletproof vests, bridge cables that can withstand earthquakes, and car bumpers that resist dents.

Maybe spiders and cobwebs aren't so creepy after all!



So Many Spiders!

There are more than 30,000 known species of spiders. But scientists believe there may be 20,000 to 70,000 species that have not yet been discovered. Find out about some of the spider species below.

- **THE JUMPING SPIDER** can leap 10 to 40 times its body length. Jumping spiders feed on insects and other web-building spiders.
- **THE WOLF SPIDER** is a ground-dwelling, hunting spider. It has a short body and long, thick legs.
- **THE TARANTULA** is a large, hairy spider that lives in warm areas around the world. The biggest known tarantula had a leg span of about 13 inches.