



FOR IMMEDIATE RELEASE

Date: May 4, 2009

Contact: Carolyn Belardo 215 299-1043, belardo@ansp.org

Download release and images: www.ansp.org/press

Get RSS: www.ansp.org/feeds/ansp_media_rss.xml

HOW GECKOS GET A GRIP

Local scientists are featured in new, live geckos exhibit, starting May 30

PHILADELPHIA—Of all the remarkable—some say bizarre—characteristics of geckos, it is their ability to “stick” to virtually any surface without losing their grip that has captivated people for centuries, dating back to Aristotle. Researchers now have some answers, and scientists are working to develop new products for humans that are inspired by geckos.

So how do the little lizards do it? How can they scale a sheer vertical surface—and stay there—without falling? “The ability to stick is a mechanism that geckos evolved millions of years ago, and it provided geckos with a distinct advantage over other animals,” said Anthony Geneva, a biologist at The Academy of Natural Sciences who studies geckos. “It probably allowed geckos to live and thrive in habitats where other animals couldn’t.” Geneva is featured in one of the videos in the exhibit “Geckos—Tails to Toepads,” at the Academy from May 30 through Sept. 7. In the video, Geneva explains how scientists use DNA to assist in the discovery of new species.

The main attraction in the exhibit, though, is more than 75 live geckos representing 18 species out of some 1,250 known species. And many of them stick.

How geckos get a grip

Geckos don’t have suction cups or glue on their toes. Instead, their toe pads are covered in tiny bristles, each branching into a thousand or so smaller “hairs.” The flattened tips of the hairs, called spatulae, are so small they are attracted to surfaces by the same molecular forces that hold solid objects together. Up to 50 million spatulae on a single toe mean these molecular attractions add up to one powerful grip. If all the spatulae were bonded at once, the feet of one gecko could support the weight of two people!

Oddly enough, one thing that doesn’t stick to a gecko’s feet is dirt. Scientists have discovered that the toe pads contain a self-cleaning adhesive that causes dirt to fall off after a few steps. Researchers also have developed new products inspired by the gecko, including glue-free adhesives and a bandage for use on internal injuries and surgical patches as well as external wounds.

There is much to be learned from geckos. Here is a short list of some area research taking place:

- Dr. Aaron Bauer, a Villanova University biology professor and an Academy research associate, is among the world’s foremost experts on geckos. He studies the evolutionary history of geckos and has described more than 70 species, including an extinct giant gecko from New Zealand that was

-more-

known only by a single specimen in a French museum. He also is focusing on the evolution of adhesive toe pads and the gecko's specialized visual system. Bauer served as scientific advisor for the exhibit.

- Anthony Geneva, an Academy biologist, uses molecular tools to study convergent evolution in Pacific island gecko species. His work is similar to well-known research on Darwin's finches in the Galapagos.
- The Academy cares for one of the world's oldest collections of gecko specimens and continues to catalog new species as they are discovered. Museum collections are important because they are permanent records of biodiversity. When properly cared for, preserved specimens can last hundreds of years and be studied by generations of scientists.
- University of Pennsylvania researchers built a robot, dubbed DynoClimber, to emulate the force patterns of geckos and other climbing animals in hopes of generating rapid, stable vertical locomotion. See a video at: <http://kodlab.seas.upenn.edu/DynoClimber/Home> and <http://kodlab.seas.upenn.edu/>
- Bioengineering scientists at Lehigh University in Bethlehem, Pa., are conducting experiments to measure the gecko's adhesion and friction while also seeking to fabricate gecko-like adhesives using polymers.
- Researchers at the University of California, Berkeley reported last year in *Proceedings of the National Academy of Sciences* that when a gecko does start to slip, it uses its tail to help recover. See a video at: <http://www.nytimes.com/2008/03/18/science/18obgeck.html?scp=1&sq=When%20a%20Sticky%20Gecko%20Starts%20to%20Slip,%20Observatory%20by%20Henry%20Fountain&st=cse>

"Geckos—Tails to Toepads" was created by *Peeling Productions* at Clyde Peeling's REPTILAND. The exhibit is **free** with museum admission.

###

The Academy is located at 1900 Benjamin Franklin Parkway and is open Monday through Friday from 10 a.m. to 4:30 p.m. and weekends until 5 p.m. Admission is \$12 for adults, \$10 for children ages 3-12, seniors, college students and military personnel, and free for Members and children under 3. There is a \$2 entry fee for "Butterflies!"

Founded in 1812, The Academy of Natural Sciences is the oldest natural science research institution and museum in the Americas and is a world leader in biodiversity and environmental research. The mission of the Academy is the encouragement and cultivation of the sciences.