

THE TROPICAL GECKO—A CEILING WALKER

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Ever since man of tropical climates lived in rooms with smoothly plastered ceilings or walls he has been fascinated by geckos as they rapidly scamper across such surfaces. These mostly tropical lizards are nocturnal, usually less than six inches long and with a vertical pupil of the eye. Their ability to capture insects in inaccessible places after dark suggests they may be of some benefit to mankind.

The author is indebted to Joseph F. Gennaro, Jr. and his article "The Gecko Grip" in *Natural History* magazine¹ for the following information on the Malayan *Gekko gekko*. This species moves rapidly on undersides of ceilings that may be polished, or of glass, plaster, concrete, etc. For years scientists have sought a satisfactory explanation for its amazing ability to cling so tightly and also to release so quickly.

The presence of suction cups was assumed but microscopic examination revealed only many fine filamentous mop-like structures. This led to the belief that the thread-like structures clung to rough places on any surface. This idea was not entirely satisfactory.

Detailed Examination

Detailed explanation was found only when the submicroscopic structures were examined with the electron microscope. The ventral surface of each toe has V-shaped cross ridges with the "V" pointing toward the palm of the foot. Along the outer ridge is a fringe of very fine bristle-shaped structures, each with a tremendous number of branches.

Gennaro reports that each bristle has 2,000 or more extremely small branches. Careful examination with the electron microscope demonstrates a thin-walled suction cup apparently attached slantwise near the tip of each. The actual diameter of each suction cup is listed as 2,000 Angstroms or 0.2 of a micron, which is slightly below the size such objects can be seen clearly with the best light microscope.

Obviously the combined strength of thousands, or possibly millions of suction cups, accounts for the effective "grip" that has been demonstrated. Probably parts of some suction cups may adhere partly to others, thus providing a combined effect.

Release Method Required

However, an efficient release method must be provided, or else the cups would be severed and lost. The explanation is found in that each branch supports its suction cup somewhat slant-

wise at the time the grip is made. Thus if the branch and bristle is drawn to an erect position or in an opposite angle the suction cup will be readily pulled loose from one side first.

Superficially it is observed that during release the tips of all toes are first lifted and gradually curved upwards and backwards. The details of the extensor muscle attachments were studied by the German zoologist Dellit in 1949. He found that the extensor muscles (that lift tips of toes) which originate on the dorsal sides of the digital bones have their attachments on the inside of the skin at the tip of each toe. This explains the lifting of each toe which provides release of suction cups successively as indicated previously.

Obviously such submicroscopic suction cups and their control is referred to as a highly specialized adaptation. How could such structures and their functioning and control ever have developed by mere chance mutations from the simple scaly feet of supposed ancestors? Only a few suction cups, or even several on each toe would be of no value without an adaptation providing simultaneous rapid release of all cups on all toes, considering the speed geckos run on smooth ceilings.

Only One Unchanging Answer

The inspired Word of God provides the only satisfactory explanation for not only the origin, but also for the functioning and control of such grasping feet. In Genesis 2:19a we read, "And out of the ground the Lord God formed every beast of the field and every fowl of the air." Psalm 94:9b says, "he that formed the eye, shall he not see." Surely the human eye is even more complex than probably most if not any other organ of either man or lower animals.

The steps in the process of special creation of the human body such as forming substances of the body from raw materials forming them into organs and organ systems according to pattern are stated clearly in Psalm 139:15, 16: "My substance was not hid from thee, when I was made in secret and curiously wrought in the lowest parts of the earth. Thine eyes did see my substance, yet being unperfect; and in thy book all my members were written, which in continuance were fashioned, when as yet there was none of them."

Surely the master mind of God and His skilled hands were essential for creation of everything that now exists, both small and great. (John 1:9)

Reference

¹Gennaro, Joseph F. Jr., August-September, 1969. *Natural History*, 78 (7): 36-43.

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