Tropical lizards can't take the heat of climate warming – Radiocápsula CPR/RCP. [1]

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Calificación:

Eurekalert - From geckos and iguanas to Gila monsters and Komodo dragons, lizards are among the most common reptiles on Earth. They are found on every continent except Antarctica. One even pitches car insurance in TV ads. They seemingly can adapt to a variety of conditions, but are most abundant in the tropics. However, new research that builds on data collected more than three decades ago demonstrates that lizards living in tropical forests in Central and South America and the Caribbean could be in serious peril from rising temperatures associated with climate change. In fact, those forest lizards appear to tolerate a much narrower range of survivable temperatures than do their relatives at higher latitudes and are actually less tolerant of high temperatures, said Raymond Huey, a University of Washington biology professor. "The least heat-tolerant lizards in the world are found at the lowest latitudes, in the tropical forests. I find that amazing," said Huey, lead author of a paper outlining climate warming's threat to lizards published in the March 4 Proceedings of the Royal Society B. The Royal Society is Great Britain's national academy of science. It has often been assumed that tropical organisms are much better at dealing with high temperatures than those in colder climates because the lowland tropics are always warm. But that assumption is only true to a point, Huey said, because those in the tropical forest experience a much narrower range of temperatures during the year and are rarely, if ever, exposed to extreme high temperatures. A lizard in Washington, for example, might experience a temperature range of 40 degrees or more between summer and winter, while one in Puerto Rican

forests might only experience a range of 20 to 25 degrees. Forest conditions tend to keep lizards living there at temperatures that allow them to function at or close to their physical peak. A temperature change of just a few degrees can reduce their physical performance greatly. Lizards are ectotherms, regulating their body temperature by exchanging heat with their surroundings. Huey originally collected data on body temperatures of lizards in a Puerto Rican forest in 1973, and later measured how fast they can sprint at various body temperatures. Sprinting relates directly to survivability because it affects a lizard's ability to hunt or elude predators. He found that even at the coolest and warmest parts of the day the forest lizards functioned at least at 90 percent of their maximum ability, because the temperatures varied so little and were optimal then for these lizards. Subsequent laboratory work by Huey and others tested the sprinting speeds for more than 70 species of lizards at varying body temperatures. "In the 1970s a bunch of us were running around the Caribbean with thermometers taking lizard body temperatures for reasons totally unrelated to climate warming. But we can use our data from a third a century ago as a baseline to now predict how lizards at different latitudes would respond to climate change," Huey said. His co-authors are Curtis Deutsch of the University of California, Los Angeles; Joshua Tewksbury of the UW; Laurie Vitt of the University of Oklahoma; Paul Hertz of Barnard College; Héctor Álvarez Pérez of the University of Puerto Rico; and Theodore Garland Jr. of the University of California, Riverside. The work was funded by the National Science Foundation and the UW Program on Climate Change. Huey's lizard studies in the early 1970s included a species called Anolis gundlachi that lived in a forest at about 1,000 feet elevation near El Verde, Puerto Rico. The shaded forest was an ideal environment for Anolis gundlachi, but was too cool for another species, A. cristatellus, that favored the warmer conditions found in unforested habitats nearby. But since the early 1970s, Huey said, the average temperature in the forest has risen from just less than 80 degrees Fahrenheit to nearly 83.5 F, which should be stressfully warm for A. gundlachi and almost warm enough for A. cristatellus. Scientists believe the tropics could warm by another 5 degrees F by the end of this century. "That may not sound like much, but we think gundlachi is going to get hammered because it will suffer heat stress from the warmer temperatures," Huey said. To make matters worse, if temperatures become warm enough A. cristatellus could well move into the forest, forcing A. gundlachi to deal with a formidable competitor that it doesn't have now. The assessment does not look at potential effects of climate change on the forest canopy, Huey said, and that could make matters worse. If warming stresses the trees so that the leafy canopy at the top of the forest becomes more open, then the amount of solar radiation reachng the forest floor will further increase the ambient temperature. This will add to the stress of species such as A. gundlachi. It also is possible the lizards could adapt evolutionarily to the warmer conditions, Huey said, "but we don't think it's likely because of their long generation times." The scientists also believe the same concerns apply to other ectotherms, such as snakes, insects and spiders, that live on land in tropical forests. "Because tropical forest lizards aren't very heat tolerant and they live in environments that are already warm, any further warming could push them over the edge," Huey said. Reference: Raymond B Huey, Curtis A Deutsch, Joshua J Tewksbury, Laurie J Vitt, Paul E Hertz, Héctor J Álvarez Pérez and Theodore Garland, Jr (2009). Why tropical forest lizards are vulnerable to climate warming. Proceedings of the Royal Society - Biological Sciences. doi: 10.1098/rspb.2008.1957 For more information, contact Huey at 206-543-1505, 206-543-0835 or hueyrb@u.washington.edu [2]. Contact: Vince Stricherz vinces@u.washington.edu [3] 206-543-2580 University of Washington

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Links
[1] https://www.cienciapr.org/en/external-news/tropical-lizards-cant-take-heat-climate-warming-radiocapsula-cprrcp [2] mailto:hueyrb@u.washington.edu [3] mailto:vinces@u.washington.edu