

Climate Change Puts Lizards On The Path The Extinction

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Alan McStravick for redOrbit.com – Your Universe Online

One adage has held true throughout the whole of global history for every living organism on earth; When faced with a challenging situation, a species must either adapt or die.

Researchers from the University of Exeter (UoE) and the University of Lincoln (UoL) believe they have discovered a dire situation for one specific species where its earlier adaptation will likely lead to its eventual death and ultimate extinction.

In what may be the earliest theorized extinction due to our rapidly advancing change in climate, scientists believe dozens of species of lizards will suffer through extinction within the next 50 years. And they say it is an adaptation that allowed them to take advantage of their environments initially that could be their undoing.

Globally, scientists have observed lizards that opted for viviparous reproduction are being threatened by changes in weather patterns in the regions in which they live. Viviparous reproduction refers to gestation that occurs within the mother's body rather than within the egg.

The researchers directed their investigation of the hypotheses that historical invasions of cold climates by Liolaemus lizards were only ever possible due to their reproductive adaptation. The Liolaemus lizard is considered to be one of the most diverse groups of vertebrates on earth. It was their adaptation to live birth from egg birth, known as oviparity, which made them suited to living in colder climates. Unfortunately, as the researchers note, once an organism makes the switch to live birth from the mother, the process is mostly irreversible. This fact restricts them to requiring a colder climate in which to live.

The team, taking into account the evolutionarily necessary transition in the lizards' reproductive ability combined with models detailing the future impact of climate change, theorized an increase in temperature would significantly reduce the area of distribution for the species. As the areas in which they can survive become fewer and fewer, the researchers claim viviparous lizards will face extinction in just the next few decades.

According to Dr. [Dave Hodgson](#) from Biosciences at the UoE, "Climate change must not be underestimated as a threat to modern patterns of biodiversity. Our work shows that lizard species which birth live young instead of laying eggs are restricted to cold climates in South America: high in the Andes or towards the South Pole. As the

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climate warms, we predict that these special lizard species will be forced to move upwards and towards the pole, with an increased risk of extinction.”

The study benefitted from having Dr. [Daniel Pincheira-Donoso](#) of the UofL's School of Life Sciences as its lead author. This is because Pincheira-Donoso is one of only a few people in the world who work on the ecology and evolution of these lizard species.

Pincheira-Donoso states, “Lizards’ reproduction is largely linked to climatic temperatures and viviparous species are usually found in cold environments. When reptiles initially moved to colder areas they needed to evolve emergency measures to succeed in these harsh places, and we believe viviparity is one of these key measures. However, this transition is mostly one-directional and unlikely to be reversed. Rapid changes in the environment’s temperature would demand rapid re-adaptations to secure the species’ survival. Through the research we found that over the next 50 years nearly half of the area where these species occur may disappear, causing multiple extinctions due to climate change.”

The research team noted the tragic irony of the situation. The adaptive need to provide a gestational environment for their offspring was instrumental in their being able to invade and live in colder environments. This was, therefore, a key trait for the lizards’ evolutionary success. Unfortunately for the lizards, according to the team, this will ultimately lead to multiple events of extinction.

Pincheira-Donoso commented, “These lizards are one of the most diverse groups of animals and are able to adapt to remarkably diverse conditions. Unfortunately, a reduction in cold environments will reduce their areas of existence, which means that their successful evolutionary history may turn into a double-edged sword of adaptation. Their extinctions would be an atrocious loss to biodiversity.”

Their study, to be published in the peer-reviewed journal *Global Ecology and Biogeography* is entitled ‘The Evolution of Viviparity Opens Opportunities for a Lizard Radiation But Drives It Into a Climatic Cul-de-Sac’. Funding for the study was provided by the Leverhulme Trust.

Source: Alan McStravick for redOrbit.com - Your Universe Online

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