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Lizards Facing Mass Extinction from Climate Change

Mar. 6, 2013 — Climate change could see dozens of lizard species becoming extinct within the next 50 years, according to new research published today. The often one-directional evolutionary adaptation of certain lizard species' reproductive modes could see multiple extinctions as the global temperature increases.

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historically cold habitats would result in their areas of distribution being significantly reduced. As a consequence, if global warming continues at the same rate, viviparous lizards are facing extinction in the next few decades.

Dr Daniel Pincheira-Donoso is one of the few people in the world who works on the ecology and evolution of these lizard species. He said: "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."

Overall the conclusion is that although viviparity allowed lizards in the past to invade and adapt to live in cold environments, and was therefore a key trait for evolutionary success, it will now ultimately lead to multiple events of extinction.

Dr Pincheira-Donoso said: "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."

Dr Dave Hodgson, from the University of Exeter, said: "Climate



Liolaemus nigriceps. (Credit: Image courtesy of University of Lincoln)

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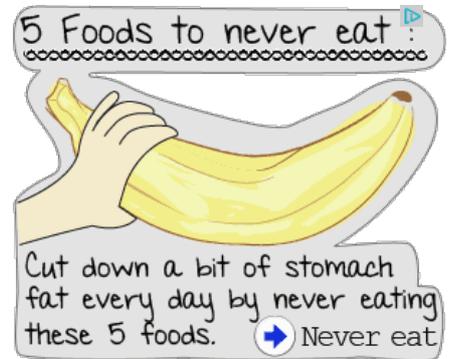
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change must not be underestimated as a threat to modern patterns of biodiversity. Our work shows that lizard species which birth live young instead of laying eggs are restricted to cold climates in South America: high in the Andes or towards the South Pole. As the 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 work formed part of Dr Pincheira-Donoso's post-doctoral work, which was funded by the Leverhulme Trust.

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1. Pincheira-Donoso, D., Tregenza, T., Witt, M.J. & Hodgson, D.J. **The evolution of viviparity opens opportunities for a lizard radiation but drives it into a climatic cul-de-sac.** *Global Ecology and Biogeography*, 2013

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