

New study analyses multiple-tailed lizards

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An image of an Australian barred wedgesnout skink lizard (*Ctenotus schomburgkii*) with two tails. Credit: Mr Damian Lettoof, Curtin University

Ph.D. Candidate James Barr, from Curtin University's School of Molecular and Life Sciences, said while the phenomena of multiple-tailed lizards are widely known to occur, documented events were generally limited to opportunistic, single observations of one in its natural environment.

"This limited available research about multiple-tailed [lizards](#) has made it

difficult for biologists to fully understand their ecological importance, and our study helps to highlight this knowledge gap," Mr. Barr said.

Many species of lizards have the ability to self-amputate a portion of their tail, an event known as caudal autotomy, as a defense mechanism when they are being attacked by a predator.

Most commonly the tail grows back as a single rod of cartilage, but Mr Barr explained that sometimes an anomaly occurs, resulting in the regeneration of more than just one tail.

"Sometimes following an incomplete autotomy event, when the lizard's original tail does not fully separate from its body, a secondary tail regenerates, resulting in the lizard having two separate tails," Mr Barr said.

"There have even been records of lizards re-generating up to six tails.

"Our study indicates that this phenomenon may actually be occurring more frequently in lizards than previously thought. We analyzed the available two-tailed lizard data from more than 175 species across 22 families, from 63 different countries. Contrasting this data with all comparable lizard population numbers, our findings suggest an average of 2.75 percent of all lizards within populations could have two tails or more at any one time. This is quite a surprisingly high number, and it really begins to make us wonder what ecological impacts this could have, especially noting that to the lizard, an extra tail represents a considerable increase in body mass to drag around."

Co-researcher Curtin University Associate Professor Bill Bateman explained that while there is a significant lack of studies to understand these potential ecological impacts, his team believes that having two tails might affect the overall fitness and life history for individual lizards, and

their overall populations.

"Shedding a tail to escape a predator and then regenerating it seems like a good tactic; however, when this regeneration goes awry and results in multiple abnormal tails, this is likely to have an effect on the lizard.

"It could affect a range of things, such as their kinetic movements, restrictions they might have when trying to escape a predator, their anti-predation tactics, and socially speaking, how other lizards might react to them," Professor Bateman said.

"For example, could having two tails potentially affect their ability to find a mate, and therefore reduce opportunities for reproduction? Or on the contrary, could it potentially be of benefit? Behaviourally testing out these hypotheses would be an interesting and important future research direction, so biologists can learn more about the lifestyles of these multiple-tailed lizards."

The research paper, When one [tail](#) isn't enough: abnormal caudal regeneration in lepidosaurs and its potential ecological impacts, was published in *Biological Reviews*.

More information: James I. Barr et al. When one tail isn't enough: abnormal caudal regeneration in lepidosaurs and its potential ecological impacts, *Biological Reviews* (2020). [DOI: 10.1111/brv.12625](https://doi.org/10.1111/brv.12625)

Provided by Curtin University

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