

Species at risk from cane toads

Hope for northern bluetongue lizards against invasive cane toads?

The invasion of the cane toad has prompted new studies into ways to protect bluetongue lizards from the deadly invader.



Aims of the study

The study is aimed at assessing whether a technique known as 'conditioned taste aversion' (CTA) can work to train bluetongue lizards to avoid eating cane toads. CTA occurs when an animal associates the taste or smell of a novel food with illness, and avoids consuming that food during subsequent encounters. If animals can learn to avoid toads and have a higher survival rate than untrained toad-naïve animals, then we will have a powerful tool for minimising the impact of cane toads on large predators.

The study also aims to:

- Determine the geographic variation in the resistance of bluetongue lizards to cane toad toxins.
- Examine the movement patterns and habitat use of two species of bluetongue lizard that co-occur in north-western Australia.
- Examine the movement patterns and habitat use of the northern bluetongue lizard in an agricultural environment.
- Determine if CTA increases the survival of bluetongues at the invasion front of cane toads.

Results so far

- This research has found that numbers of bluetongue lizards encountered during field surveys in the Darwin region dramatically declined soon after toads arrived. Outcomes of laboratory trials indicate that this decline appears to be the direct result of fatal ingestion of toxic cane toads.
- GPS tracking has enabled fine-scale data on movements and habitat use of two species of bluetongue lizards, the northern bluetongue (*Tiliqua scincoides intermedia*) and the centralian bluetongue (*T. multifaciata*). Such information will not only not increase our limited knowledge of these species, but also provide vital information for developing appropriate management strategies.
- Under lab conditions bluetongues have proved capable of CTA learning, with captive animals more likely to avoid the 'unpalatable' toad baits presented. This indicates that CTA might provide a feasible management option to reduce the impact of cane toad invasion on these native predators. Field-based trials are ongoing.

Future work

We are continuing to monitor the populations.

Methods

This research has been conducted at three locations throughout the Top End: in the laboratory at The University of Sydney Tropical Ecology Research Facility, Middle Point, Northern Territory, and in the field at Keep River National Park in the NT and Kununurra (Packsaddle Road) in Western Australia. The research had several components:

Conditioned taste aversion (CTA) trials

- This aspect of the study aimed to determine whether bluetongues can rapidly learn to avoid cane toads by using CTA to induce illness following ingestion.

Toxin tolerance trials

- This experiment evaluated the consequence of consuming cane toads by testing for non-lethal performance effects of toad toxin. Locomotor performance was assessed by swimming lizards from various locations within the range invaded by cane toads (NSW, NT, QLD and WA).

GPS tracking

- This aspect of the study used a GPS tracking system to examine the habitat use and movement patterns in northern bluetongue lizards. GPS tracking allows fine-grained observation of natural behaviour that has previously been difficult to obtain with conventional radio tracking. The impact of cane toads on the conservation status of bluetongue lizards means that we need quantitative data on the ecology of this genus, particularly in the northern regions of Australia.



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