

# Aussie meat ants may be invasive cane toad's Achilles' heel

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Ecologists in Australia have discovered that cane toads are far more susceptible to being killed and eaten by meat ants than native frogs. Their research - published in the British Ecological Society's journal *Functional Ecology* - reveals a chink in the cane toad's armour that could help control the spread of this alien invasive species in tropical Australia.

Professor Rick Shine and his colleagues Georgia Ward-Fear, Matt Greenlees and Greg Brown from the University of Sydney's Team Bufo (from the Latin name for the toxic toad) compared habitat use and activity patterns in meat ants, metamorph cane [toads](#) and seven native Australian frog species. They found that, unlike the native [frogs](#), cane toads are poorly equipped to escape the meat ants.

According to Shine: "The spread of cane toads through tropical Australia has created major ecological problems. The ideal way to control toad numbers would be to find a predator that kills and eats toads but leaves native frogs alone. However, bringing in a predator from overseas might have catastrophic consequences, like those that occurred when cane toads themselves were brought in. So we've explored an alternative approach - to see if we could use a native predator. Meat ants are abundant around tropical waterbodies, and we often see them eating small toads, so we suspected that there might be some kind of mismatch between the invader and its newly invaded range, for example something about the toads' behaviour that makes them vulnerable to a predator that poses little danger to native frogs."

Through a series of laboratory experiments, Team Bufo looked at when the ants, frogs and toads were most active, where they chose to live, and how good the frogs and toads were at escaping attacking meat ants. They found cane toads opt to live in open microhabitats and are active during the day, patterns that match those of meat ants. By contrast, native frogs are nocturnal and are safely ensconced in vegetation or other shelters during the day, when meat ants are on the hunt.

Cane toads are also less well equipped to escape attacking meat ants, Team Bufo found. Using a specially-built runway, they tested the frogs' and toads' sprint speed and endurance. They found that compared with the quick and nimble native frogs, cane toads' hops are shorter and slower due to their shorter shin bones. Native frogs were also more vigilant for meat ants than cane toads, they discovered.

The results are interesting not only because they reveal the cane toad's Achilles' heel - a weakness that could be exploited to help control the spread of the toxic toad - but because the same "evolutionary trap" could be used to snare [invasive species](#) elsewhere.

"The end result of this mismatch between traits of metamorph cane toads, which evolved in the Americas, and the ecological interaction between metamorph toads and meat ants in tropical Australia, is an 'evolutionary trap'. That is, characteristics that increased toad survival where they evolved in the Americas are now a disadvantage, because the toads are facing different challenges in Australia - challenges they have not evolved to deal with. Such evolutionary traps should be especially common for invasive species, because so many aspects of their environment differ from those in which the traits of that species evolved," says Shine.

[More information:](#) Georgia Ward-Fear et al (2009). Maladaptive traits in invasive species: in Australia, cane toads are more vulnerable to

predatory ants than are native frogs, *Functional Ecology*, doi:  
10.1111/j.1365-2435.2009.01556.x, is published online on 31 March  
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