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## Aussie bees fight 'hive wars'

**By Jonathan Webb**  
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**Bee colonies in Brisbane are waging war for months on end, sending waves of workers who collide, grapple and die.**

A genetic analysis of the battlefield fatalities showed that two different species of stingless bees were fighting for control of a single hive.

The attacking swarm eventually took over the hive entirely, placing a new queen of its own in the usurped nest.

The study, published [in the American Naturalist journal](#), suggests that such usurped nests are surprisingly common.

Ecologists from Brisbane, in Australia, and Oxford, in the UK, looked in detail at one particular hive.

It was inhabited by a bee species native to the area around Brisbane, called *Tetragonula carbonaria*.

"They live in the hollows of trees and other cavities, so they're quite common in and around the city," said the study's lead author Dr Paul Cunningham, from the Queensland University of Technology.

"And around this time of year, people see these big swarms outside the trees or around their houses. They're fighting swarms," Dr Cunningham told BBC News.

"If you stand under the swarm, you can see these bees dropping out of the air. They've grabbed hold of each other in this death grip - they're locked together, and both the bees die."

### **Game of drones?**

These battling bees are the workers - the female members of a colony that cannot reproduce but collect pollen and, apparently, sometimes wage war.

Dr Cunningham said around 600 households in Brisbane keep these stingless bees as pets, and had expressed concern about the "carnage" they were seeing outside their hives.

So when Dr Cunningham's team found a hive playing host to such a skirmish, they monitored it over a period of several months - observing the bees' behaviour and collecting the carcasses for genetic analysis.

Between July and October 2008, the researchers witnessed three successive waves of invasion.

Unexpectedly, they all came from a single, rival colony of an entirely different species, called *Tetragonula hockingsi*.

"The first thing we found was that it was two species fighting," Dr Cunningham explained. "The attacking bees are a species that's

much more common further north."

The next intriguing result came from the final outcome of the war.

The attacking *hockingsi* bees eventually won the "numbers game" and overcame the nest completely - and moved in.

"They actually started dragging out the workers and youngsters from the hive," Dr Cunningham said.

"A few months later we opened it up and looked at the genetics of the brood. There was a new queen in residence, and she was a daughter of the attacking colony's queen.

"These bees were playing a Game of Thrones."

This type of large-scale insect warfare is well-known in ants, but less so in bees.

To figure out how often it was happening, Dr Cunningham's team also did a survey of 260 hives around the city, for a further five years.

During that time, they saw 46 examples of a switch between the characteristic building styles of the two different species: *carbonaria* bees construct orderly, spiral-shaped nests, while those of the invading northerners *hockingsi* are less organised.

"[Those 46 changes suggest] this is probably quite a common behaviour," Dr Cunningham said.

He hopes the research will encourage people to look closer at native, stingless bees, which can be a more resilient alternative to honey bees.

"If we're going to really use and manipulate these bees in the future, we need to understand what their behaviour is and how they maintain territories and things."

#### **If the hive fits**

Prof Francis Ratnieks, a bee behaviour expert from the University of Sussex, said this was another example of fascinating, complex behaviour shown by stingless bees all over the world.

"Stingless bees have incredibly interesting biology and there's about 1,000 species," he told the BBC.

He said "robber bees" in South America, which steal honey and other resources, are particularly known for their ability to wipe out colonies of rival species. Up to 50% of the nests of one common bee species in Brazil are killed by robber bees annually.

But the fact that the invaders in Brisbane were making a home of the conquered hives was interesting, Prof Ratnieks said.

In the South American examples, he explained, the vanquished nests are probably too small for the robber bees. The Australian rivals' hives are more compatible.

"If you've defeated the victim colony and stolen its food, you may as well take over its nest," Prof Ratnieks said.

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