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## Lady MacBee

Young queens in one stingless species often usurp their thrones

By Susan Millius

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**ENLARGE**

### ROYAL ACT

A queen stingless bee (with green mark) settles her rear into a cell to lay an egg. Stingless bee colonies routinely overproduce potential replacements, and genetic analysis shows that the spares can take over other colonies.

DENISE ALVES

In a chronically tough job market for stingless bee queens, those with no prospects at home try stealing a crown elsewhere.

Genetic analysis reveals that even when Mom still holds the throne in a colony of Brazil's *Melipona scutellaris* bees, the roughly 20 percent of her daughters who are maturing as candidate queens still have a chance to rule their own colonies, says evolutionary biologist Tom Wenseleers of the Catholic University of Leuven in Belgium. Excess junior royalty spreads out and on occasion manages to usurp other colonies of the same species, he and his colleagues report in a paper posted online the week of October 18 in *Biology Letters*.

Like their cousins the honeybees, the *Melipona* stingless bees of the tropics form highly social colonies where a queen lays the eggs and relies on her many daughters to do the rest of the work. But stingless bees go about replacing their queens in a very different way from the European honeybee familiar in North America, Wenseleers explains. European honeybee workers put a youngster on the road to royalty by expanding her nursery cell to queen size and feeding her what's called royal jelly instead of worker rations. Honeybees raise few candidate queens, and only when needed.

Among the species of *Melipona* stingless bees in the tropics, however, the queen lays all eggs in cells of the same size, with each individual allotted the same amount of baby food. So, perhaps controlling their own destiny, an unusual number of adult stingless bees emerge physically ready to mate and turn into the egg layers for the colony, Wenseleers says.

He has observed that sister workers attack the unnecessary contenders for the throne. "Often it was hive workers pulling on their legs and another one chopping off their head before putting them on

the rubbish dump," Wenseleers says.

But an estimated half of these candidates manage to escape their birth colonies intact. Wenseleers and his colleagues discovered by accident what happens to escapees. In a three-year project at the University of São Paulo in Brazil to monitor the genetics of queens and broods over time, the researchers found that a new queen did not always seem to come from the colony she took over. By artificially removing queens, the researchers found that an escapee could in fact outcompete resident candidates for a vacant throne in another hive.

The young stingless wannabees' usurpation of other colonies could be a reproductive strategy that evolved under pressure from the species' habitual excess of royalty, says Ben Oldroyd of the University of Sydney in Australia, who calls the study a fine example of genetic exploration turning up something unexpected.

#### **SUGGESTED READING :**

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#### **CITATIONS & REFERENCES :**

T. Wenseleers et al. Intraspecific parasitism in a highly eusocial bee. *Biology Letters*. Posted online the week of October 18. doi: 10.1098/rsbl.2010.08198.