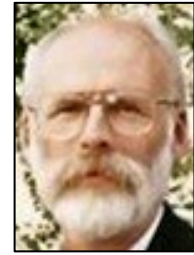


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Family disputes create rebel bees



Workers can rebel against their queen

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Worker bees rebel when faced with the prospect of raising their nephews and nieces, research has found.

Scientists in Poland have studied post-swarm bee colonies to understand how workers react to a change in queen.

They discovered that when a daughter replaces her mother as head of the colony, some worker bees reproduce instead of caring for their monarch's offspring.

The findings are published in the journal *Current Biology*.

Prof **Michał Woyciechowski** from the Institute of Environmental Sciences at Jagiellonian University in Poland led the research.

During the summer in a honey bee colony there is a single fertile queen and several hundred fertile male drones, all supported by the queen's sterile daughters, which are known as workers.

Swarming is a natural occurrence in which the queen and part of her colony leave en masse to find a new nest site.

Before she leaves, the queen bee lays a number of eggs, one of which will develop into a new fertile queen supported by the remaining workers.

In this case, Prof **Woyciechowski** explained, rather than rearing their brothers and sisters, "workers are obligated to rear nieces and nephews".

"This drop in relatedness causes the old queen's workers to lay their own eggs."

The scientists say this is not simply a behavioural switch, but a fundamental change in the workers' biology.

To analyse changes in the bees, the team split a bee colony, causing the temporary lack of a queen that occurs naturally after a swarm. They also examined a natural swarm.

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Rebel strategy probably gives the workers a better chance to multiply their genes"

Professor **Michał Woyciechowski** Institute of Environmental Sciences, Jagiellonian University, Poland

For both experiments the researchers found that, before a new queen developed, the worker larvae actually grew ovaries - forming egg-producing tubes in place of the food-producing glands they use to "nurse" the colonial brood.

"Most investigators of honey bees strongly believe that the number of [egg-producing tubes] in workers' ovaries is determined genetically," said Prof **Woyciechowski**.

"This is of course true, however, none of them expected that, during workers' development, larvae have a possibility to switch from nursing to rebel strategy."

But the observed rebellion was brief: once the new queen's own workers hatched they were able to suppress the reproducing rebels.

Prof **Woyciechowski** suggested that, among animals well-known for their altruism, the motivation for the workers development is surprisingly "selfish".

"Rebel strategy - direct reproduction and an increase in personal fitness - probably gives the workers a better chance to multiply their genes than indirect reproduction via [the] sister-queen," he said.