

## Why are there no male queen bees?

After mating with the female bee, the male bee's abdomen will burst and kill him. Meanwhile, the queen bee will continue to mate with other males to collect genes for her nest.

But even if the queen's first mate doesn't die, she still can't become a "queen."

The queen bee is not 'queen' in the sense of making the rules, but is queen because she lays all the eggs, being the mother of all the bees in the hive.



Bee genetics are very strange, female bees put half of their chromosomes into each egg, while male sperm contribute an equal number of chromosomes. Fertilized eggs with full chromosomes become offspring.

But this is where things start to get weird. Honey bee eggs can develop into baby bees even without the contribution of chromosomes from the drone. Unfertilized eggs, with only one set of chromosomes, become drones. Fertilized eggs, with two sets of chromosomes and a full complement of bee genes, develop into female bees. Any of these females can become a new queen under the right conditions.

So, male bees only receive genes from their mothers. And male bees can only have daughters, not sons. Of course, biological sex is complicated, honey bee eggs with two sets of chromosomes can still become males, but they will be sterile and worker bees will also kill them when they are young.

But even if you accept that the queen bee only gives birth to daughters, the male bee still cannot father the entire hive. The reason is that the male bee passes all, not just half, of his genes to his daughters, unlike the female queen bee, so all of his daughters are genetically very closely related. If all the daughters inherited the same fatal mutation from their father, then this would have extremely serious consequences for the hive.

This genetic diversity issue may be one reason why the queen has multiple mates, in addition to the fact that the first male died.

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