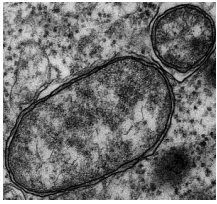


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By: Stefan Anitei, Science Editor



## [How Can a Parasite Influence the Evolution of a Host Species When it Does Not Even Infect it?](#)

*By changing sexual behavior*

A new study revealed how a parasite can change the behavior of a host even when it doesn't infect the host. Previous study showed that pathogenic bacteria *Wolbachia* (photo) induced the split of a wasp species in two distinct species. Moreover, the current study shows how bacteria change the sexual behavior in a not infected species. "Darwin's model of evolution is based on genetic variation that causes differences in survival and reproduction," says John Jaenike, professor of biology at University of Rochester. "However, this apparently simple scheme can operate in very complex and indirect ways." Two very closely related species of fly in North America have been found to differ in that one was thoroughly infected with *Wolbachia*, while the other was *Wolbachia*-free. Each species lives in coniferous forests on opposite sides of North America and their ranges overlap only in a stretch of forest in Canada. The scientists collected individuals of both species altogether from this forest. The flies were kept into common spaces where hundreds of individuals from both species could mix and mate. The males of both species mated with females from both species, and the females from the infected species mated with both kinds of males. But the females from the uninfected species mated only with males from their own species. Moreover, they were rejecting some males of their own species. "This could be a first step on the road to the uninfected species splitting into two new, individual species." "In that area in Canada where the two species overlap, the uninfected females' mating practices have changed dramatically," says Jaenike. "When we mixed males from the west coast with the females from the same species in central Canada, the females would often refuse to mate. This could be a first step on the road to the uninfected species splitting into two new, individual species." "*Wolbachia*'s species-splitting effect came before any other evolutionary pressure. *Wolbachia* - which infects 20 % of all insect species - prevents uninfected females from reproducing. The infection with the parasite provokes changes in the sperm of the host and mating between infected males and uninfected females renders infertile. This change doesn't affect mating between two infected flies, which leads to viable offspring. This way, the infection spreads to the all members of the species. "Those females willing to mate with infected mates would produce no young, while the females that only mated with their own, uninfected males, would pass on their genes," says Jaenike. "Eventually, the genes from all those uninfected females that were willing to mate indiscriminately would be weeded right out of the population." "We found that the central Canadian females often won't mate with the males from the west-coast population, even though they're from the species and they're all uninfected," says Jaenike. "Those central Canada females have apparently become so selective that the slight differences that characterize males from other populations make them unacceptable. It's interesting that the west-cost females, which never encounter males of the infected species, are much less choosy when it comes to mate choice. It's even possible that this *Wolbachia*-induced behavioral isolation could contribute to splitting this species, even though *Wolbachia* doesn't infect it at all."