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[The Sex Booming Parasite](#)

From castrating to fertilizing hosts

We know that parasites are the bad guys that trigger diseases. Some are lethal, like malaria, others just decrease fitness (like gut worms). Those attacking the sexual apparatus affect fertility. Wolbachia is a bacterium encountered in over 20 % of all insects and known to decrease female fertility. But a new research found that parasites can experience an extremely rapid evolution that turns them helpful, due to an opposite effect of boosting host fertility, a process meant to spread further the parasites themselves. It's a type of example showing how parasites can turn into symbionts, the way mitochondria, involved in cell's oxygen respiration, turned from an infectious bacterium into a crucial organelle. "It may be that the Wolbachia in this case is well on the way to having a relationship that will eventually develop into a dependency by the host on the Wolbachia for survival," said evolutionary biologist Andrew Weeks at the University of Melbourne in Australia. Wolbachia already parasitizes a human parasite worm, which cannot reproduce without these bacteria; this is also the situation of certain wasps. The insects get Wolbachia bacteria from their mothers, but usually the bacteria induce a wide array of reproductive impairments, like turning males to females, parthenogenesis (virgin females lay eggs), higher female promiscuity and male sexual exhaustion, lowered female fertility (eggs number). But the bacteria would rather necessitate higher number of host offspring to flourish themselves. "We had a very thorough theoretical analysis which suggested that this could and should evolve, but we had no idea of the timeframe that this might take," said Weeks. His team investigated the populations of the Californian fruit fly *Drosophila simulans*. Wolbachia was detected in this species 20 years ago and have monitored the disease's spread, which occurred over 400 miles (640 km) from south to north. In the lab the bacteria decrease female fertility by 15 to 20 %. But now, the parasite was found to cause an average 10 % increase in fertility in the lab. By now, researchers can just guess that the parasites could deliver to their hosts some nutritional benefits. The researchers were shocked by the rhythm of this evolution, thought to take thousands to millions of years and not in just two decades, "although it is becoming clearer that evolution does work on such short time scales," Weeks said. "The fact that Wolbachia can alter itself so quickly might also help explain why the germs have such a diversity of effects on their hosts," he explained.