Wolbachia Effects on the Fecundity of Drosophila mauritiana

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Maternally transmitted Wolbachia bacteria infect the cells of most insects on the planet, yet it remains unknown how infections rapidly spread to become common. This is crucial because Wolbachia that naturally infect Drosophila flies are being used for biocontrol of vector-borne diseases like Dengue and Zika. Effects of Wolbachia on insect fecundity is a possible contributor to the rapid spread of Wolbachia from low frequencies and may improve the efficacy of Wolbachia biocontrol efforts. The wMau Wolbachia strain that infects Drosophila mauritiana on the island of Mauritius is a particularly interesting candidate as one lab line has been shown to dramatically increase host egg lay. Here, it is demonstrated that 34% of D. mauritiana on Mauritius are infected with wMau. Two infected D. mauritiana genotypes were reciprocally crossed with an uninfected genotype and the fecundity of their F1 offspring measured, which controlled for host background effects. Across both experiments, it was found that infected females did not lay more eggs than uninfected females. Together, these results suggest that not all wMau variants increase host fecundity, but also that host-Wolbachia interactions may contribute to variation in this trait. Ongoing experiments will determine if and when wMau influences D. mauritiana fecundity and the genetic basis that produces such effects, and they will also determine if variables such as age and tetracycline treatment influence wMau effects on fecundity as well.

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