

Effect of intracellular *Wolbachia* on interspecific crosses between *Drosophila melanogaster* and *Drosophila simulans*

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ABSTRACT. *Wolbachia* are bacteria that live inside the cells of a large number of invertebrate hosts and are transmitted from infected females to their offspring. Their presence is associated with cytoplasmic incompatibility in several species of *Drosophila*. Cytoplasmic incompatibility results when the sperm of infected males fertilize eggs of uninfected females, causing more or less intense embryonic mortality (unidirectional incompatibility). This phenomenon also appears in crosses between populations infected with different *Wolbachia* strains (bidirectional incompatibility). The influence of *Wolbachia* infection on host populations has attracted attention as a potentially rapid mechanism for development of reproductive isolation and subsequent speciation. We examined the influence of this bacterium on reproductive isolation in interspecific crosses between *Drosophila melanogaster* and *D. simulans*. We found that *Wolbachia* infection negatively affected these two species in homospecific crosses. However, in interspecific crosses, it only influenced sexual isolation, as infected females more frequently hybridized than females free of infection; postzygotic reduction of fitness (bidirectional cytoplasmic incompatibility) was not detected. This would be explained by the existence of several modes of rescue systems in these two species, reducing cytoplasmic incompatibility

between them. *Wolbachia* does not appear to cause reproductive isolation between these two species.

Key words: *Wolbachia*; Interspecific crosses; *Drosophila melanogaster*; *Drosophila simulans*