Antibiotic Treatment of Drosophila Simulans to Prevent Transmission of Wolbachia

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Wolbachia is a maternally transmitted intracellular symbiont that is mainly localized in the reproductive tissues of arthropods. Wolbachia is responsible for feminization, parthenogenesis, male-killing, and cytoplasmic incompatibility.The presence of Wolbachia in organisms is known to be key to the transmission of diseases such as dengue fever. When Wolbachia is removed from nematodes, they lose their fertility and die. Antibiotic treatment in host organisms is considered to be one of the most effective ways to eliminate the transmission of Wolbachia. Antibiotics like tetracycline have been proven to eliminate the presence of the endosymbiont in organisms. The objective of my experiment was to treat Drosophila Simulans (fruit fly) with antibiotics with the hope of eliminating the transmission of Wolbachia through subsequent generations. Infected flies containing Wolbachia strains wRi and wAu and un-infected flies were obtained and crossed. Infected females were crossed with un-infected males, and infected females were crossed with infected males. Crosses were organized into pairs with one culture tube treated with an ampicillin solution. Fly culturing involved fly sexing and attainment of virgin females. DNA extraction of the new offspring was the first step after culturing the flies. PCR (polymerized chain reaction) was used to observe the transmission of Wolbachia and the effects of the antibiotic. Tubes containing chemicals and DNA were placed in a thermal cycler that went through initialization, denaturation, annealing, and elongation. Electrophoresis which allows one to visualize the DNA was completed. The ampicillin solution at that concentration did not reduce the transmission of Wolbachia, but all the crosses absent the ampicillin yielded the expected results.

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