Cross-Species Transmission of Drosophila melanogaster Nora Virus in Other Species of Insect and the Prevalence of Nora Virus in Insect Populations in Central Nebraska

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This study was performed to determine the cross-species transmission of the Drosophila melanogaster Nora virus in other species of insects and the prevalence of Nora virus in native insect populations in Central Nebraska. There are millions of known viruses, and new ones are discovered every year. A major source of new viruses is epizootic and enzootic animal viruses, seen when viruses typically occurring in animals adapt and mutate to infect humans. COVID-19 is an example of one of these host-switching viruses, as it originated in bats. The Nora virus is a picorna-like virus whose only known pathogenic effect is a geotaxis defect. The cross-species transmission of this virus can be used to help scientists better understand host-switching in other viruses. It was predicted that the virus would infect the other species and be present in native populations. To test this hypothesis, Nora virus-positive males were allowed to defecate on various combinations of fly food and dietary-specific foods. Once the flies were removed, insects of each species were added to the vials. Insects were also collected from the field to determine native virus presence. All insects were then tested via RNA analysis by RT-PCR using ORF1 gene-specific primers for detection of infection. In my previous study, Drosophila yakuba and Drosophila mercatorum showed positive infection, and while testing is ongoing, already the species Galleria mellonella, Tenebrio molitor, and Gryllodes sigillatus have shown positive infection. Learning more about cross-species transmission has increased importance in today's world as the number of zoonotic viruses increases.

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