

Researchers expand knowledge of mosquito metabolism

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New research from the Tulane University School of Public Health and Tropical Medicine reveals that mosquitoes use glucose to eliminate lethal concentrations of ammonia released during the digestion of a blood meal. This finding expands scientific knowledge of the mosquito metabolism process that may lead to innovative methods to control mosquito populations.

[Dr. Patricia Y. Scaraffia](#), assistant professor of tropical medicine, led the research team of the study.

Both adult female and male mosquitoes feed on sugars from plants. Female mosquitoes, however, require a blood meal in order to produce eggs and reproduce. It is during blood ingestion that disease-causing pathogens can be transmitted through the female mosquito's saliva. Blood meals can be twice the mosquito's own weight.

One of the by-products of digesting such a large amount of blood meal is ammonia. At high concentrations, ammonia is toxic and can be lethal. Researchers were already aware that *Aedes aegypti* mosquitoes had very efficient metabolic mechanisms to remove these high concentrations of ammonia in order to survive, but they didn't know just how that process occurred. *Aedes aegypti* mosquitoes are vectors, or carriers, of a number of diseases including Dengue and Zika viruses.

Using modern mass spectrometry techniques, the researchers were able to find that mosquitoes used glucose during ammonia detoxification. The glucose aids in producing uric acid, which is excreted as nitrogen waste.

“The experimental procedures developed in this study can be used to conduct detailed metabolic studies in other arthropods that are vectors of human diseases and in other biological systems,” says Dr. Scaraffia.

“This is a basic study that helps researchers to better understand how female mosquitoes metabolize a huge blood meal. Knowing how mosquitoes metabolize a large amount of blood meal can help researchers to find a target that can be useful to control mosquito populations.”

The study was published in the January 2018 edition of The [*FASEB Journal*](#), the journal of the Federation of American Societies for Experimental Biology.

Co-authors of this study include scientists from The University of Texas MD Anderson Cancer Center, Houston, TX and Israel Institute for Biological Research, Ness Ziona, Israel. Financial support came from the Corine Adams Baines Professorship Award and a grant from the US. National Institutes of Health, National Institute of Allergy and Infectious disease Grant (to PYS), Cancer Prevention Research Institute of Texas, and The University of Texas MD Anderson’s NCI Cancer Center Support Grant.