



Defense Health Agency (DHA) Clinical Communities Speaker Series

Resource List – July 2020

Health Innovations and Promising Practices

Operational Entomology in the Department of Defense

The [National Institute of Health](#) supported a research team that was exploring alternate insecticides for mosquitoes. Insecticide Resistance is a concern when utilizing chemical insecticides. Therefore, this team's progress with using a genetically engineered fungus is potentially revolutionary. The fungus *Metarhizium pingshaense* is a slow acting natural enemy of mosquitoes. Researchers engineered this fungus to make it even more deadly and toxic to mosquitoes. Mosquitoes are the deadliest animals in the world and trials of this genetically modified fungus resulted in successful and safe reduction of the insect in just 45 days.

Army Lt. Col. Jeffrey Clark was reported as saying the best way to prevent illness from ticks or mosquitoes is to prevent bites. He discusses some of the best ways to protect yourself in the article "[Army entomology expert: Don't get bitten.](#)" The first line of defense is an insect repellent containing DEET, picaridin or IR3535 for use on the skin. Individuals can also utilize clothing material that is treated with permethrin. The Army issues factory-treated uniforms containing permethrin to soldiers to provide maximum protection during deployments or operations. Lt. Col. Clark also discussed the importance of performing tick checks and removing clothing that you wore outdoors and putting them in to a hot cycle in the dryer to prevent a stowaway tick from taking its time finding a place to bite you.

As this session discusses, mosquitoes are extremely dangerous for humans, due to their ability to spread various diseases. The U.S. Environment Protection Agency (EPA) released a list of active ingredients that may be used as pesticides in the early 1990s, which pose minimal risk to humans and are exempt from submitting to the EPA for registration. The study [Efficacy of Active Ingredients From the EPA 25\(B\) List in Reducing Attraction of *Aedes aegypti* \(Diptera: Culicidae\) to Humans](#) explored how effective the active ingredients are at reducing mosquitoes' attraction to human odor. It discovered that cinnamon oil, peppermint oil, spearmint oil, lemongrass oil and garlic oil all reduced attraction to human odor. One of the commercial products that was tested demonstrated reduction in attraction for more than 30 minutes.

The World Health Organization (WHO) has a Department of Control of Neglected Tropical Diseases. In 2017 there was a progress report regarding lymphatic filariasis (LF). LF is a vector borne tropical disease that disrupts normal lymphatic vessel function and results in chronic disabling conditions, caused by three different species of filarial parasites. [The Global Programme to Eliminate Lymphatic Filariasis \(GPELF\)](#) by WHO aims to eliminate transmission of this condition and provide relief to those that suffer from this condition. In 2017 efforts targeted mass drug administration, which included preventative chemotherapy regimen to eligible individuals within the endemic areas to prevent transmission. Disability prevention and management were also a goal of the GPELF.



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