

For mosquito repellents, stick with the spray

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Credit: CDC

In a crowded marketplace of products advertised to repel mosquitoes, consumers are wise to trust spray-on repellents containing DEET or PMD, say researchers at New Mexico State University. In a comparison study of several mosquito-repellent products, "wearable" devices such as bracelets or sonic repellents were found to be largely ineffective in repelling *Aedes aegypti* mosquitoes.

"These findings are extremely important for consumers because they

need to be aware that there are mosquito [repellent](#) products available that are ineffective," says Stacy Rodriguez, laboratory manager at the Molecular Vector Physiology Laboratory at NMSU. "While the labels of many products make strong claims, some products simply don't work."

The results of the study by Rodriguez and colleagues are soon to be published in the Entomological Society of America's *Journal of Insect Science*. They tested five [wearable devices](#) (OFF! Clip-On, PIC Personal Sonic Mosquito Repeller, Mosquitavert Repellent Bracelet, Mosquito-No! Repellent Bracelet, and Invisaband™), one candle (Cutter Citro Guard), and five sprays (Cutter Lemon Eucalyptus, All Terrain Kids Herbal Armor, Avon Skin-So-Soft Bug Guard Plus Picaridin, Repel Sportsmen Max Formula, and Ben's Tick & Insect Repellent).

Each was worn by, used, or applied to a human subject in a wind tunnel near a three compartment cage containing *Ae. aegypti* female mosquitoes. Each repellent was tested for a 15-minute period, during which time mosquitoes were free to wander from the middle compartment of the cage into either the compartment closer to the human or the one further away. Then, the [mosquitoes](#) were counted in each compartment to determine how attracted they were—or weren't—to the human wearing the repellent being tested.

The only wearable device that fared well in the study was OFF! Clip-On, which features a nebulizer to vaporize its repellent chemical, Metofluthrin. The sonic repeller and bracelets showed no significant reduction in mosquito attraction.

"Although the active ingredients in some bracelets may be mosquito repellents, we hypothesize that the concentrations that are emitted by all of the bracelets that we tested were too low to have an effect," the researchers note in the study.

The five spray-on repellents tested showed significant, though varying, levels of reduction in mosquito attraction in the test. Cutter Lemon Eucalyptus (30 percent oil of lemon eucalyptus, known by its chemical acronym, PMD) and Ben's Tick & Insect Repellent (98 percent DEET) were the most effective. "This finding confirms the findings of several other studies that found DEET and PMD the most effective and longest lasting mosquito repellents currently available," the researchers write.

Rodriguez and her colleagues say consumers should seek out the most effective repellents to avoid mosquito bites. "At a time where vector-borne disease like Zika is a real threat, the most egregious danger to the consumer is the false comfort that some repellents give them protection against *Ae. aegypti* when they actually offer none," they write.

More information: Stacy D. Rodriguez et al, Efficacy of Some Wearable Devices Compared with Spray-On Insect Repellents for the Yellow Fever Mosquito, *Aedes aegypti* (L.) (Diptera: Culicidae), *Journal of Insect Science* (2017). [DOI: 10.1093/jisesa/iew117](https://doi.org/10.1093/jisesa/iew117)

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