

Coconut oil compounds repel insects better than DEET

November 1 2018, by Sandra Avant



A Manila dwarf coconut palm on the grounds of the Tropical Agriculture Research Station in Mayaguez, Puerto Rico. Credit: Scott Bauer

Compounds derived from coconut oil are better than DEET at repelling

blood-sucking insects, according to a new U.S. Department of Agriculture (USDA) study.

Using repellents is one of the most efficient ways to prevent disease transmission and discomfort associated with insect bites. For more than 60 years, DEET has been considered the gold standard in insect repellents—the most effective and long-lasting available commercially. However, increasing regulations and growing public health concerns about synthetic repellents and insecticides like DEET have sparked interest in developing plant-based repellents that are more effective and longer lasting.

In recent research published in *Scientific Reports*, USDA's Agricultural Research Service (ARS) scientists identified specific coconut oil fatty acids that have strong repellency and long-lasting effectiveness against multiple insects—mosquitoes, ticks, biting flies and bed bugs—that can transmit diseases to humans and animals.

A team of scientists led by entomologist Junwei (Jerry) Zhu, with the ARS Agroecosystem Management Research Unit in Lincoln, Nebraska, found that the coconut oil compounds were effective against biting flies and bed bugs for two weeks and had lasting repellency against ticks for at least one week in laboratory tests. In addition, the compound showed strong repellency against mosquitoes when higher concentrations of coconut oil compounds were topically applied.

Some people refuse to use DEET and turn to folk remedies or plant-based repellents. Most currently available plant-based repellents work for only a short period, Zhu noted.

Coconut oil itself is not a repellent, Zhu emphasized. However, the coconut oil-derived free fatty acid mixture—lauric acid, capric acid and caprylic [acid](#) as well as their corresponding methyl esters—provides

strong repellency against blood-sucking insects. By encapsulating coconut fatty acids into a starch-based formula, field trials showed this all-natural formula could provide protection to cattle against stable flies for up to 96 hours or 4 days.

DEET was only 50 percent effective against stable flies, while the coconut oil compound was more than 95 percent effective.

Against bed bugs and ticks, DEET lost its effectiveness after about three days, while the [coconut](#) oil compound lasted for about two weeks. Coconut oil fatty acids also provided more than 90 percent repellency against mosquitoes—including *Aedes aegypti*, the mosquito that can transmit the Zika virus.

These [coconut oil](#)-derived [compounds](#) offer longer-lasting protection than any other known natural [repellent](#) against insect blood-feeding, according to Zhu.

More information: Junwei J. Zhu et al. Better than DEET Repellent Compounds Derived from Coconut Oil, *Scientific Reports* (2018). [DOI: 10.1038/s41598-018-32373-7](https://doi.org/10.1038/s41598-018-32373-7)

Provided by Agricultural Research Service

Citation: Coconut oil compounds repel insects better than DEET (2018, November 1) retrieved 19 April 2024 from <https://phys.org/news/2018-11-coconut-oil-compounds-repel-insects.html>

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