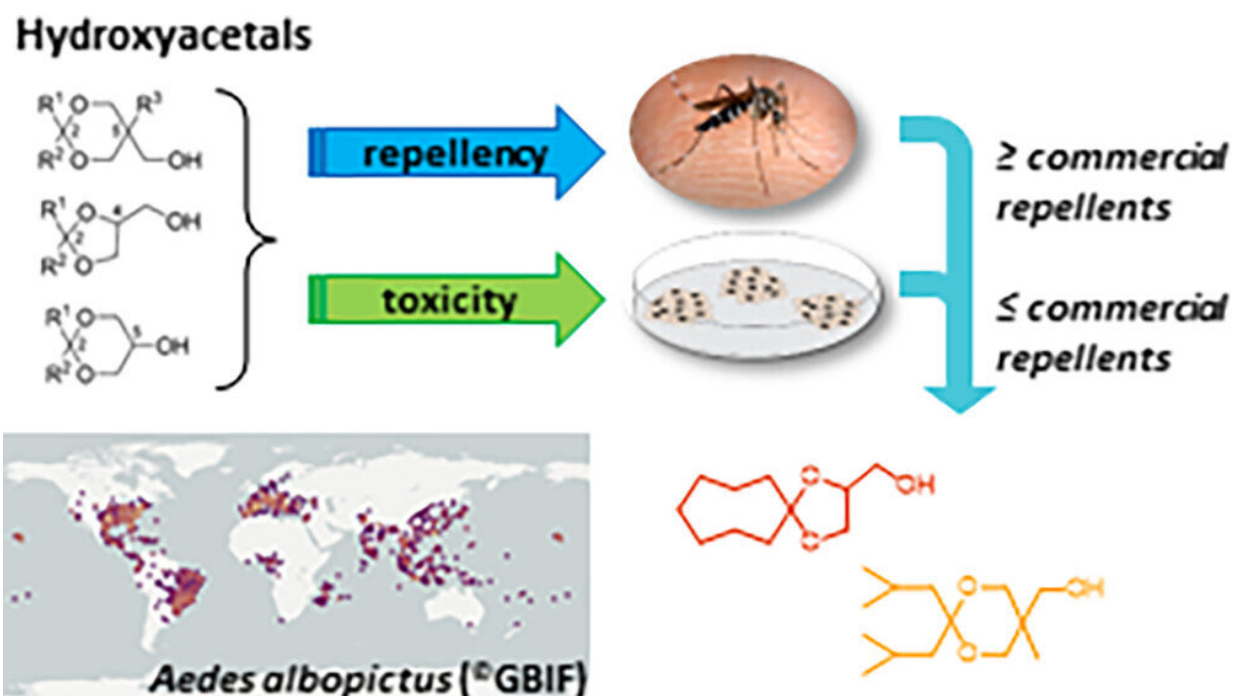


# New mosquito repellents that work better than DEET

January 24 2023



Graphical abstract. Credit: *Journal of Agricultural and Food Chemistry* (2023).  
DOI: 10.1021/acs.jafc.2c05537

In the age-old battle against mosquitos, DEET has proven effective at keeping this nemesis at bay, but the repellent is smelly and its protection is short-lived. Now, researchers report in the *Journal of Agricultural and Food Chemistry* that they have designed safe alternatives that have some advantages over DEET, including a nice smell and much longer

protection from bites.

DEET disrupts a mosquito's ability to locate humans. Until recently, it was considered the gold standard among topical repellents, but some find its strong odor offensive. It has to be reapplied frequently, and at high concentrations, it can damage synthetic fabrics and plastics. Another popular [repellent](#) known as picaridin is now regarded as a better alternative, since its protective effect lasts longer, and it doesn't have an odor or damage items. However, like DEET, it has to be reapplied after swimming or sweating.

So, Francesca Dani and colleagues wanted to look for alternatives to these established products. In prior work, the team used as starting materials two plant-based natural repellents that offered only short-term protection from mosquitos. The researchers converted these terpenoids into cyclic acetals and hydroxyacetals, thereby extending their protective timespan beyond that of DEET. But the researchers wanted to improve on these initial products.

In the current work, the team synthesized additional cyclic hydroxyacetals from inexpensive, commercially available carbonyls. The new cyclic compounds had pleasant, much fainter odors and were easier to dissolve in water, meaning they can be formulated without high concentrations of alcohol. Some were as effective as DEET and picaridin at repelling Asian tiger [mosquitos](#), which have spread widely in the U.S. and carry diseases, including encephalitis, dengue and dog heartworm.

And like picaridin, they provided human volunteers more than 95% protection from bites for at least eight hours, while DEET's protection rapidly declined below that level after just two hours. Toxicity of some of the most active new compounds was comparable to or lower than the traditional repellents.

Two hydroxyacetals were also less likely to cause immune reactions or to penetrate cell layers than picaridin. The researchers conclude that their compounds represent a new class of promising mosquito repellents that can compete favorably with DEET and picaridin in terms of efficacy and safety.

**More information:** Immacolata Iovinella et al, Cyclic Acetals as Novel Long-Lasting Mosquito Repellents, *Journal of Agricultural and Food Chemistry* (2023). [DOI: 10.1021/acs.jafc.2c05537](https://doi.org/10.1021/acs.jafc.2c05537)

Provided by American Chemical Society

Citation: New mosquito repellents that work better than DEET (2023, January 24) retrieved 22 May 2024 from <https://phys.org/news/2023-01-mosquito-repellents-deet.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.