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DEET best way to keep mosquitoes away: study



Canadian Press

TORONTO — Hate bug bites? Hate chemical bug sprays? You've got a bit of a problem. A new study that compared the efficacy of insect repellents found that only DEET-based products actually protect against mosquito bites for extended periods of time. The best of the non-DEET formulations offered about two

hours of protection, but most - including a popular skin softening product many people use as a bug repellent - offered mere minutes of protection, according to the study, published Thursday in the New England Journal of Medicine.

"Unfortunately they didn't cut the mustard," said lead author Dr. Mark Fradin, a dermatologist and professor of medicine at the University of North Carolina in Chapel Hill.

"I'm not saying that DEET is the greatest thing ever and that nothing could come along and supplant it. I think that it has flaws. (But) of the things that are currently available, it's the best of them."

Many consumers are nervous about using bug repellents made with N,N-diethyl-3-methylbenzamide, the synthetic chemical more commonly - but perhaps not more reassuringly - known as DEET.


Their concerns are not quelled when they read warnings on product labels cautioning to keep DEET-based bug formulas away from watch crystals, sunglasses and some artificial fabrics because DEET can eat through them.

Fradin admitted that's a serious image hurdle for DEET products.




"If you know that this stuff will dissolve a plastic polymer that you thought was pretty resilient like your eyeglasses . . . then you could look at it and go: 'Gosh, why should I put that on my skin?' "

Patients's questions about bug sprays - What works? What's safe? - are

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patients' questions about bug sprays - what works, what's safe. - are what spurred Fradin to start studying them. He realized he didn't know much about these products and had to seek out studies in publications doctors don't often read, such as the Journal of the American Mosquito Control Association.

Fradin eventually came up with armloads of studies but found he was no closer to knowing what worked. Four studies on one product might come up with four different estimates of how long it lasted. It all depended on how the study was conducted.

He decided it was time to do an apples-to-apples comparison, testing 16 insect repellent products head-to-head under identical conditions. The testing was done at the University of Florida - Fradin's co-author, John Day, is a medical entomologist there - using state funding.

Fifteen volunteers applied the various preparations or devices - they tested three repellent-soaked wristbands sold in the U.S. but not available in Canada - and inserted their arms into a cage containing 10 disease-free, unfed mosquitoes. They then measured how long it took before they were bitten.

Each repellent was tested three times on each volunteer, producing 720 tests.

DEET products, at concentrations of nearly 24 and 20 per cent, were the clear winners, offering five and nearly four hours of protection respectively. A soybean oil-based product - which is registered for use in Canada - offered 95 minutes of complete protection, making it a strong contender in the alternative-to-DEET class.

Also promising was an oil of eucalyptus based product which was introduced into the United States after the original study was completed. Though tested on fewer volunteers, it offered about two hours worth of bite-free time. (It is not available in Canada.)

But citronella-based products fared poorly, offering just minutes of protection. And three repellent-soaked wristbands (not sold in Canada) were virtually useless.

"We did everything possible to give the alternatives to DEET a fighting chance to demonstrate real efficacy," Fradin said of the design of the study. "I was a little surprised that there wasn't a greater degree of variation within the group."

Coincidentally, Health Canada has been re-evaluating the safety and efficacy of insect repellents approved for use in the last few years.

Last year it updated its recommendations on DEET, saying it is safe to use in low concentrations on children six months and older. It announced it would phase out products containing over 30 per cent DEET, explaining it is safer to reapply a 30-per-cent formulation in the run of a day than to apply a 95-per-cent formulation once.

Cheryl Chaffey, a toxicologist with the department's Pest Management Regulatory Agency, acknowledged some people are reticent to use DEET. But the review reconfirmed for the department that the product, which has been around for more than 40 years, is safe when used sensibly.

"To put it into context, we know that DEET is probably used by more than 50 million people every year in North America, largely without incident. So I think when you put it into that perspective we can say that DEET has a very good safety record."

a very good safety record.

Fradin said despite DEET's long history of use, there have been fewer than 50 reported cases of significant toxicity. Most involved excessive and repeated use of DEET products, he said.

Dr. Kevin Kain, director of Toronto General Hospital's centre for travel and tropical medicine, said the product's track record is hard to argue against.

"I'm a fan of science and things that work," Kain said when asked if he's a fan of DEET-based products.

He figures DEET's name has a lot to do with the resistance to it.

"Just the name of the thing - it sounds like it would make cancer sprout out of your skin," Kain said.

"If it was something sort of more holistic or more natural sounding about it, it wouldn't have nearly the PR problem that it does."

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Results of a study of the efficacy of U.S. insect repellents (some not available in Canada) published Thursday in the New England Journal of Medicine. Brand names are followed by the main active ingredient, its concentration, and the mean protection time:

- OFF! Deep Woods, DEET, 23.8 per cent, 5 hours.
- Sawyer Controlled Release, DEET, 20 per cent, 3.9 hours.
- OFF! Skintastic, DEET, 6.65 per cent, 1.87 hours.
- **Bite Blocker for Kids, soybean oil, two per cent, 95 minutes.**
- OFF! Skintastic for Kids, DEET, 4.75 per cent, 88 minutes.
- Skin-So-Soft Bug Guard Plus, IR3535, 7.5 per cent, 23 minutes.
- Natrapel, citronella, 10 per cent, 20 minutes.
- Herbal Armor, citronella, 12 per cent, 19 minutes.
- Green Ban for People, citronella, 10 per cent, 14 minutes.
- Buzz Away, citronella, five per cent, 13.5 minutes.
- Skin-So-Soft Bug Guard, citronella, 0.1 per cent, 10.3 minutes.
- Skin-So-Soft Bath Oil, uncertain, 9.6 minutes.
- Skin-So-Soft Moisturizing Suncare, citronella, 0.05 per cent, 2.8 minutes.
- Gone Original Wristband, DEET, 9.5 per cent, 18 seconds.
- Repello Wristband, DEET, 9.5 per cent, 12 seconds.
- Gone Plus Repelling Wristband, citronella 25 per cent, 12 seconds.

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