

How does mosquito repellent work?

Mosquitoes are attracted to people by skin odors and carbon dioxide from breath. Repellents contain an active ingredient which repels mosquitoes, making the person unattractive for feeding. It does not kill mosquitoes; it just makes them unable to locate us. Repellents are effective only at short distances from the treated surface, so you may still see mosquitoes flying nearby. As long as you are not getting bitten, there is no reason to apply more. The more of these active ingredients that a repellent contains, the longer time it can protect you from mosquito bites. A higher percentage of them in a repellent does not mean that your protection is better—just that it will last longer.

What are effective active ingredients in mosquito repellent?

The most effective repellents contain active ingredients of DEET (N,N-diethyl-m-toluamide) or Picaridin (KBR 3020), which repel pests like mosquitoes and ticks. Oil of eucalyptus [p-methane 3,8-diol (PMD)], a plant based repellent, has been shown to provide similar protection to lower concentrations of DEET. Recently, IR3535 was approved as an effective active ingredient. Repellents containing these ingredients have been tested against a variety of biting insects and have been shown to be very effective.

How should you choose a mosquito repellent?

When choosing repellent, you should consider how long you will be outdoors, the time of day, the temperature, the type of activity that you will be doing, and the location. Repellents offer protection for a limited time. It is important to re-apply repellent as needed. Mosquitoes are most active in the early morning when the sun rises and in the late evening when the sun sets. They breed in areas where standing water collects. Sweat or water wash repellent off, so if you will be working outdoors or swimming, it may be necessary to re-apply repellent more often.

What products contain approved active ingredients?

There are many products available that provide protection against mosquito bites. The table below offers different options based on the length of time that they offer protection.

Protection Times by Concentration of Various Active Ingredients in Commercial Mosquito Repellents

Products	Active Ingredient	Protection Time
Ultrathon Insect Repellent	31.5% DEET	**12 hours
Repel 100% DEET	100% DEET	**10 hours
Ben's Tick and Insect Repellent	100% DEET	**10 hours
Repel Sportsmen Max	40% DEET	**10 hours
Cutter Backwoods	23% DEET	**8 hours
Bite Blocker	3% Soybean Oil	**8 hours
Ultrathon Insect Repellent Aerosol	25% DEET	**8 hours
Cutter Advanced Sport	15% Picaridin	**8 hours
Repel Sportsmen	29% DEET	**8 hours
Ben's Tick and Insect Repellent Wilderness	30% DEET	**8 hours
Sawyer Insect Repellent, 30% DEET	30% DEET	**7 hours
Repel Lemon Eucalyptus	Oil of lemon eucalyptus	**6 hours
Off! Active	15% DEET	**6 hours
Burt's Bees Herbal Insect Repellent	40% Rosemary Oil; 3.2% Lemongrass Oil; 0.4% Citronella Oil	**6 hours
OFF! Deep Woods	23.8% DEET	*5 hours

*Summary of effectiveness of mosquito repellents reported by Fradin, M. S. and J. F. Day. 2002. Comparative efficacy of insect repellents against mosquito bites. New England Journal of Medicine 347: 13 - 18.

**Protection time listed on the product label

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Protection Times by Concentration of Various Active Ingredients in Commercial Mosquito Repellents

Products	Active Ingredient	Protection Time
Repel Family	23% DEET	*5 hours
Sawyer Controlled Release	20% DEET	*4 hours
Off! Skintastic Clean Feel	5% Picaridin	*4 hours
Natrapel Plus	5% Citronella	**4 hours
Cutter Advanced	7% Picaridin	**4 hours
Badger Anti-bug Balm	5% Citronella	**4 hours
Buzz Away Extreme	3% Soybean Oil	**3 hours
Jason Quit Bugging Me	3% Soybean Oil	**3 hours
Cutter Wipes	7% DEET	**2 hours
Off! Skintastic	5% DEET	**2 hours
Cutter Family Skinsations	7% DEET	**2 hours
Off! Family Care Wipes	5.6% DEET	**2 hours
OFF! Skintastic	6.65% DEET	*2 hours
Repel Lemon Eucalyptus Insect Repellent	40% Oil of lemon eucalyptus; p-menthane 3,8-diol (PMD)	*2 hours
Bite Blocker for Kids	2% Soybean Oil	*1.5 hours
OFF! Skintastic for Kids	4.75% DEET	*1.5 hours
Bite Blocker Repellent Herbal Wipes	2% Soybean Oil	*1.5 hours
Skin-So-Soft Bug Guard Plus	7.5% IR3535	*23 min.
Natrapel	10% Citronella	*20 min.
All Terrain Herbal Armor	12% Citronella; 2.5% peppermint oil; 2% cedar oil; 1% lemongrass oil; 0.05% geranium oil	*19 min.
Green Ban for People	10% Citronella; 2% peppermint oil	*14 min.
Buzz Away	5% Citronella	*14 min.
Skin-So-Soft Bug Guard	0.1% Citronella	*10 min.
Skin-So-Soft Bath Oil	Active Ingredient not known	*10 min.
Skin-So-Soft Moisturizing Suncare	0.05% Citronella	*3 min.

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