



## Chemistry

# Natural Mosquito Repellents



From [Anne Marie Helmenstine, Ph.D.](#),  
Your Guide to [Chemistry](#).  
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## Strategies That Work

When I was pregnant, I wanted to avoid using toxic chemical insect repellents, yet the mosquitoes seemed to find me tastier than ever. My solution at that time was to wear what I called my 'DEET sheet', which was an old cotton sheet that had been sprayed with S.C. Johnson's Off! Deep Woods formula. While this was highly effective, it wasn't practical for use around kids, so I did research into safer, natural mosquito repellents. I learned that many so-called natural mosquito repellents don't repel mosquitoes (e.g., ultrasonic electronic devices), but some are backed by reputable research and really work.

Mosquitoes have complex methods of detecting hosts and different types of mosquitoes react to different stimuli. Most mosquitoes are active at dawn and dusk, but there are also mosquitoes that seek hosts during the day. You can avoid being bitten by making sure you aren't attracting mosquitoes, using attractants to lure mosquitoes elsewhere, using a repellent, and avoiding actions that diminish the effectiveness of the repellent.

### Mosquito Attractants

Use this list of items and activities that attract mosquitoes as a list of things to avoid or that can be used as bait to lure mosquitoes away from you.

- Dark Clothing

Many mosquitoes use vision to locate hosts from a distance. Dark clothes and foliage are initial attractants.

- Carbon Dioxide

You give off more carbon dioxide when you are hot or have been exercising. A burning candle or other fire is another source of carbon dioxide.

- Lactic Acid

You release more lactic acid when you have been exercising or after eating certain foods (e.g., salty foods, high-potassium foods).

- Floral or Fruity Fragrances

In addition to perfumes, hair products, and scented sunscreens, watch for the subtle floral fragrance from fabric softeners and dryer sheets.

- Skin Temperature

The exact temperature depends on the type of mosquito. Many mosquitoes are attracted to the slightly cooler temperatures of the extremities.

- Moisture

Mosquitoes are attracted by perspiration because of the chemicals it contains and also because it increases the humidity around your body. Even small amounts of water (e.g., moist plants or mud puddles) will draw mosquitoes. Standing water also allows mosquitoes to reproduce.

### Natural Repellents

These natural products will effectively repel mosquitoes, but they require more frequent reapplication (at least every 2

hours) and higher concentrations than [DEET](#). Because of the differences between types of mosquitoes, products that contain multiple repellents tend to be more effective than those containing a single ingredient. As you can see, natural repellents tend to be volatile plant oils.

- Citronella Oil
- Castor Oil
- Rosemary Oil
- Lemongrass Oil
- Cedar Oil
- Peppermint Oil
- Clove Oil
- Geranium Oil
- Possibly Oils from Verbena, Pennyroyal, Lavender, Pine, Cajeput, Cinnamon, Basil, Thyme, Allspice, Soybean, and Garlic

Another plant-derived substance, pyrethrum, is an insecticide. Pyrethrum comes from the flowers of the daisy *Chrysanthemum cinerariifolium*.

#### Things that Lower Repellent Effectiveness

- Many Sunscreens
- Dilution from Rain, Perspiration, or Swimming
- Absorption into the Skin
- Evaporation from Wind or High Temperatures

Keep in mind that 'natural' does not automatically imply 'safe'. Many people are sensitive to plant oils. Some natural insect repellents are actually toxic. Therefore, although natural repellents provide an alternative to synthetic chemicals, please remember to follow the manufacturer's instructions when using these products.

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