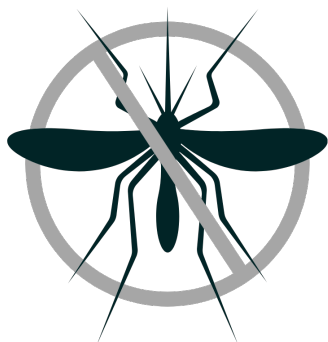


Bug Repellent: Active Ingredient Alternatives

Bug sprays can be filled with pesticides and chemicals associated with human and ecosystem harm. The more it's applied, the greater the exposure to any potentially harmful ingredients. Conventional insect repellents contain active ingredients to repel bugs, and oftentimes these ingredients are harmful to humans and the environment. The great news is that there are plant-based alternatives that can repel insects. Check out these alternative ingredients below!



Plant-Based Active Ingredient Alternatives to Conventional Repellents

Thankfully, some plants have pharmacological and biological properties making their extracts an effective insect repellent and can be used in lieu of the harsh pesticides and chemicals found in conventional bug repellents. It is important to note that, because of their strength, some botanical-based repellents and essential oils can be irritating to the skin, so be sure to test a small area before using a new product. If experimenting on your own be sure to work with an herbalist and always dilute essential oils appropriately into a carrier oil.

A note about *inactive* ingredients.

While active ingredients in bug repellents will always be listed on the label, there are also other components that make up the product. These components are referred to as “inactive ingredients” and they may or may not be entirely disclosed on the product label.

At MADE SAFE we certify products that meet the rigorous Ecosystem Screening standard which prohibits and restricts more than 6,500 Banned Ingredients. We require 100% transparency about what goes into products. Shoppers deserve to know what is (or is not!) included in a product.

This means that when you shop MADE SAFE Certified products you are not only avoiding known high-risk pesticides, behavioral, developmental, neurological or reproductive toxins, but you can also be confident that there are no substances in a given product that are unaccounted for.

Clove Oil

In a study that tested the efficacy of five oils and various combinations of those oils, clove oil was found to be one of the two most effective mosquito repellents. Clove oil is also effective when mixed with other oils. When mixed with geranium oil or thyme oil, the mixture protected against bites for up to 2.5 hours. Clove can cause irritation and is listed as an established contact allergen by the European Commission. One study stated that clove is considered safe at concentrations up to .5%.

Geraniol

Geraniol is considered one of the most effective botanical repellents, repelling malaria, filarial and yellow fever vectors for a period of 60-180 mins. This chemical can be derived from some essential oils like rose oil and can also be synthesized. Geraniol is one of the most common fragrance allergens found in personal care products. Some people find geraniol irritating and it is considered an allergen by the European Commission.

Lemongrass

Lemongrass oil can also be listed as cymbopogon citratus or schoenanthus oil. One study found that lemongrass oil was 74% and 95% effective against two species of mosquitoes, respectively, for up to 2.5 hours.

In laboratory studies, the oil was 78.8% effective against one species of mosquito for 12 entire hours, but another study found it 100% effective for only 30 minutes. This oil has been established as a contact allergen in humans by the European Commission. Some people might find using this oil to be irritating or to cause allergic reactions.

Lemon Eucalyptus

Oil of lemon eucalyptus can be naturally derived through hydro-distillation, or it can be synthetically produced and listed as p-menthane-3,8-diol or PMD, which is the synthesized version. The EPA has approved PMD as an effective insect repellent. One study found that a eucalyptus-based repellent containing 30% PMD gave 96.89% protection for 4 hours, where DEET gave 84.81% protection. The CDC advocates for the use of PMD.

Linalool

This chemical can be derived from lavender or synthesized. Some people can experience allergic reactions to linalool. It is a skin sensitizer.

Neem

Efficacy studies of neem have yielded variable results. According to one source, several field studies have shown neem to be an effective repellent. It is important that neem is diluted properly as it can cause irritation if used in very high concentrations.



Thyme

One study that tested the efficacy of five oils independently and in various combinations found thyme oil to be one of the most effective mosquito repellents, providing 1.5 to 3.5 hours of protection and repelling malaria, filarial and yellow fever vectors for a period of 60-180 mins. One study stated that thyme is considered safe at concentrations up to 2%. Thyme can be slightly irritating to the skin, but has a very low toxicity profile.

Citronella

Citronella works best as part of a skin-applied mixture; studies show that candles only reduce bites by 50%. This oil is also volatile and evaporates quickly and so must be combined with another ingredient that can slow evaporation in order for it to be effective. Some studies document citronella as having a low toxicity profile whereas others have deemed it

problematic. For example, the EU Commission lists citronella as an established contact allergen. Health Canada, a Canadian federal public health agency, proposed the phase out of citronella for use in bug sprays in 2004 because of suspected carcinogenicity. (Though citronella is commonly mentioned as an alternative bug repellent, we do not recommend its use.)

Carrier Oils

Using a carrier oil is important with plant-based repellents. Many essential oils are very volatile, which means that they can evaporate quickly. Carrier oils can decrease the rate at which an essential oil evaporates, helping the finished product to repel mosquitoes longer. Coconut and andiroba oils both contain unsaturated fatty acids and natural emulsifiers that help volatile essential oils to evaporate much more slowly.

Alternative Ways to Help Keep Bugs at Bay

Time of day: Mosquitos are typically the worst at dusk and dawn in the United States.

Use mosquito netting: Netting works great for camping, strollers, baby carriers, and on the porch.

Cover up: Cover exposed skin with long sleeves, pants and socks.

Apply plant-based products to clothing as opposed to skin, reapply to fabric frequently or as needed. Remove sprayed clothing when indoors.

Keep the yard clear of places where mosquitoes like to breed, which can help reduce the need for yard foggers. Mosquitos like to breed in open water so cover anything that's not in use: buckets, pools, unused flower pots, etc. The rain gutters, if not in good repair and flowing properly, can also provide a breeding ground for mosquitoes.