

# Insect Repellents

## A Guide to Using Insect Repellents Safely

Environmental & Occupational Health Program • July 2014



Bites from insects such as mosquitos and ticks can transmit diseases such as West Nile and Lyme. Therefore it is important to reduce your exposure to these insects. Insect repellents have a role in keeping insects away from you and your family. However, they have chemical ingredients and so must be used correctly to be safe.

### Prevent Bites

- Stay inside during the early morning and late afternoon when mosquitos are most active.
- Stay out of wooded and brushy areas where ticks are more likely to be found.

### Choose an Insect Repellent Carefully

- Read the label to check the ingredients and directions for use.
- Look for one of the 3 main active ingredients used - DEET , Picardin, or IR 3535.
- Buy a product with the least amount of active ingredient for the type of insect of concern and the amount of time you plan to stay outdoors.

### Use the Insect Repellent Correctly

- Use a pump spray instead of an aerosol spray.
- Put only on exposed areas of skin or on outside clothing.
- Do not allow children to handle the product.
- Do not use too much product.

### SAFETY

Insect repellents are generally safe **IF used according to the directions and the precautions taken as stated on the label.** Pay attention to the safety precautions for children. The Environmental Protection Agency (EPA) registration of the product assures that the product has been reviewed and proven to be effective and safe.

## Reducing Your Exposure to Insect Bites

- For mosquitos: Remove items from the yard that can collect water such as old tires, wading pools, and buckets  
 Keep door and window screens repaired  
 Avoid wearing scents and bright colored/flowered clothing
- For ticks: Wear light colored shirts and pants tucked into boots when walking in wooded areas  
 Check for ticks and shower after coming indoors; check pets  
 Keep your yard free of leaf litter and tall grass

## Choosing an Insect Repellent

Insect repellents are pesticides that must be registered by the EPA and should be used with caution. They come in many forms including pump sprays, aerosols, lotions, creams, liquids, solids and towelettes. The active ingredients in most insect repellents are DEET, Picardin, or IR 3535, for exposed skin and permethrin, for clothing only. Read the product labels carefully to determine the:



- Kind of insect(s) that are repelled
  - Active Ingredient (main chemical)
  - EPA registration number
  - Concentration of the ingredient: Repellents containing a higher percentage of active ingredient provide longer-lasting protection. For example, to repel mosquitoes a product with a 10% concentration may last 2 hrs; a 20% concentration might last 5 hrs. Use the lowest concentration that will get you the protection time you need.
- Note: A higher concentration is often required to repel ticks than to repel mosquitoes.

### [Search for a Repellent that is Right for You](#)

#### The Active Ingredients Found in Insect Repellents:

**DEET** (N,N-diethyl-meta-toluamide) repels biting pests such as mosquitoes and ticks when applied to skin or clothing. If used as directed, DEET is generally of low toxicity and considered safe by most public health agencies. However, DEET can irritate the eyes and has a pungent odor. Do not use concentrations above 30%.

**Picardin** repels a wide range of pests when applied directly to exposed skin but does not irritate skin or eyes, and has no odor. It is a good alternative to DEET.

**IR 3535** (3-[N-Butyl-N-acetyl]-aminopropionic acid, ethyl ester) is effective against mosquitos, ticks and biting flies. It can be an eye irritant but is not a skin irritant. It is a good alternative to DEET.

**Permethrin** is a repellent and insecticide that is applied ONLY to clothing, not exposed skin. It is the ingredient used in treated clothing to repel ticks and mosquitoes. Clothes should be washed separately. These products continue to repel and kill insects after several washings. It can also be applied to outdoor equipment such as tents.

**Botanical** (plant-based) products such as oil of lemon eucalyptus or the synthetic version (PMD) do not provide the same level of protection and may contain allergens. They have not been tested or registered by EPA. They should not be used on children under the age of three.



Using the insect repellent correctly:

- Read and follow all directions and precautions on the product label
- Apply outdoors
- Apply to face by putting on hands first and then rubbing on face. Do not spray directly onto face
- Do not apply near eyes or mouth; apply only to exposed skin or outside clothing
- Do not apply over cuts, wounds, or irritated skin
- Do not apply near food
- Use just enough repellent to cover exposed skin and/or clothing.
- **Do not use under clothing**
- After returning indoors, wash treated skin with soap and water or bathe
- Wash treated clothing before wearing it again

**HEALTH EFFECTS**

If you (or your child) get a rash or other reaction from a repellent, stop using the repellent, wash the repellent off with mild soap and water, and call a local poison control center for further guidance. If you go to a doctor, it might be helpful to take the repellent with you.

Repellents with a concentration of DEET over 50% have caused skin reactions, eye irritation, and blisters; concentrations over 95% may cause serious side effects such as seizures.

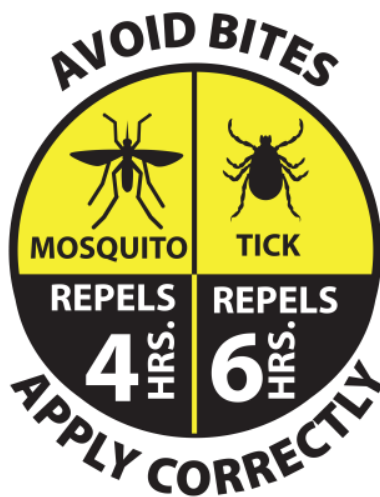
**Children and Insect Repellent**

- The American Academy of Pediatrics (AAP) recommends that insect repellents not be used on infants under the age of 2 months.
- Use a product with the lowest concentration of active ingredient that is effective for the length of time you will be out; if using DEET, keep the concentration to below 30% for children.
- When using on children, apply to your own hands and then put it on the child. Do not apply to the hands or near eyes and mouth of young children.
- Use netting on infant strollers and carriers.
- Always store insect repellents safely out of the reach of children.



**Other Considerations:**

- Do not use products that have insect repellent as part of sunscreen, lotions or other body products. Instead, apply sunscreen or lotion and then repellent.
- Do not use outdoor foggers, they contain toxic ingredients; do not use candles, they can be respiratory irritants and are only mildly effective as a repellent.
- Electronic bug zappers, treated wristbands and ultrasonic devices are ineffective.



Proposed EPA labeling for insect repellents

**For More Information:**

- [CDC Protection against Mosquitoes, Ticks, & Other Insects & Arthropods](#)
- [EPA Insect Repellents: Use and Effectiveness](#)
- [National Pesticide Information Center Choosing and Using Insect Repellents](#)
- [EWG's Guide to Bug Repellents](#)