EPA-Registered Products (Recommended)

EPA registration of repellent products indicates that they have been evaluated and approved for human safety and effectiveness when applied according to instructions on the label.

### Active Ingredient
- **DEET**
  - Type: Synthetic chemical compound
  - Duration of Effectiveness: 2–8 hours
  - Number of EPA-Registered Products: >500
  - Recommended for use on children 2 months and older
  - Concentration: 25–40%

- **Picaridin**
  - Type: Synthetic chemical compound
  - Duration of Effectiveness: 3–10 hours
  - Number of EPA-Registered Products: 40
  - Recommended for use on children 2 months and older
  - Concentration: 10–20%

- **IR3535**
  - Type: Synthesized equivalent of β-alanine (biorepellent)
  - Duration of Effectiveness: 4–6 hours
  - Number of EPA-Registered Products: 45
  - Recommended for use on children 2 months and older
  - Concentration: 20%

- **Oil of Lemon Eucalyptus**
  - Type: Synthesized plant oil from lemon-scented gum tree
  - Duration of Effectiveness: 2–5 hours
  - Number of EPA-Registered Products: 6
  - Recommended for use on children 3 years old and older
  - Concentration: 30%

- **2-Undecanone**
  - Type: Synthesized chemical derived from wild tomato
  - Duration of Effectiveness: 2–4 hours
  - Number of EPA-Registered Products: 1
  - Consult the product label
  - Concentration: 7.75%

*Oil of lemon eucalyptus is a synthetic concentration of para-menthane-3,8-diol (PMD), which repels some insects and ticks. Lemon eucalyptus essential oil does not have the same repellent effects due to its very low concentration of PMD.*

Unregistered Products

- **EPA Minimum Risk Determination**
  - Citronella oil, cedar oil, geranium oil, peppermint oil, soybean oil
  - These active ingredients posed minimal risk to human health in the percentages found in products on the market and are exempt from registration. Repellents that do not bear an EPA registration number have not been evaluated for effectiveness or safety.

- **Essential Oils/Other Ingredients**
  - Products that are not registered with the EPA or do not have ingredients that qualify as minimum risk have not been evaluated for safety or effectiveness and are not recommended as tick and mosquito repellents.


This guide is for informational purposes only. Always read and follow the label of individual repellents for precautions and proper application instructions. To find a repellent that is right for you, visit [https://www.epa.gov/insect-repellents/find-repellent-right-you](https://www.epa.gov/insect-repellents/find-repellent-right-you).

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