Skin Repellents

Insect repellents containing DEET (abbreviated name for the chemical N, N-diethyl meta-toluamide) are the most common mosquito repellents used. DEET provides short-term protection when applied to skin and clothing and is effective against blackflies, biting flies, fleas, and ticks. Organic “natural” repellents, such as citronella, have little effectiveness and do not offer adequate protection. Skin-So-Soft, a popular lotion, also has very limited effectiveness (about one-half hour) and is not recommended. All U.S. repellents must be labeled with their DEET content. Some repellents have DEET concentrations of up to 100%; however, high concentrations may cause increased toxicity and should be avoided. Travel experts as well as the CDC recommend applying DEET on the skin no stronger than 30-35% for adults and 10% or less for children. Repellents with DEET should be used sparingly on children 2-6 and not at all on children younger than 2 years of age.

DEET is effective in relatively small amounts, provided it is spread evenly and completely over all exposed skin. DEET has little “spatial activity” meaning that nearby untreated skin is vulnerable.

Insect repellents typically work for about 3-4 hours, possibly up to 12 hours for some products. Also the effectiveness of any particular product varies with the individual, since some people attract insects more than others do. The length of protection varies with ambient temperature, perspiration, water exposure, abrasive removal and other factors.

- 33% DEET Provides 12 hours protection
- 20% DEET Provides 4 hours protection
- 6.65% DEET Provides 2 hours protection
- 4.75% DEET + 2% soybean oil Provides 1 + ½ hours protection

Personal Protective Measures to Avoid Insects

- Read instructions carefully before use and use insect repellant containing DEET 30-35%.
- Wear loose fitting, light-colored clothes that cover most of your body, ie. arms, legs, ankles. (long sleeves, long pants, hats) Mosquitoes can bite thru clothes so avoid sheer, tight fitting ones.
- Sleep inside well-screened areas or under mosquito netting.
- Avoid use of perfume, cologne, hair spray, or after-shave lotions; the scent may attract insects.
- Use unscented soaps, shampoos, and deodorants.
- Remain in well-screened areas when possible.
- Use pyrethroid containing flying insect spray (ie. Raid or Doom) 1-2 hours before dusk in living and sleeping areas and avoid inhaling the spray.
- Spray permethrin on clothing and bed nets. Bed nets are more effective if they are treated with permethrin.
- Wear shoes or boots, (not sandals) and socks. Tuck pants into your socks. (Some parasites can invade through intact skin.)
- Perform a complete body check for imbedded insects (ticks) every day.
- Don’t sit directly on sand or ground – put a towel or blanket first.
- Don’t wear jewelry or bright colors. Those tend to attract insects.
- Avoid outdoor activity at dawn and dusk.
- Pay attention to eating and sleeping rooms. Check for cleanliness and make sure that rooms without air
conditioning have window screens and/or netting around the bed, in good condition.

**DEET Toxicity**

Some DEET is absorbed into the body through the skin, and there have been instances of allergic or toxic reactions in adults and children. Symptoms can include itching, swelling, blistering, or redness of the skin; and burning or stinging of the lips, tongue, and mouth. If larger quantities penetrate the skin or are swallowed, serious side effects such as slurred speech, staggering, lethargy, and seizures can occur. Drinking DEET can be fatal. Avoid putting the repellent on children’s’ fingers and hands to prevent them from swallowing it. Apply repellent sparingly and only to exposed skin or clothing. Avoid applying high concentration products to the skin. Do not inhale or get repellent in the eyes. Do not use repellent on a wound or irritated skin and wash repellent treated skin after coming indoors. If a reaction to insect repellent is suspected seek medical attention.

**Examples of Insect Repellents and DEET Content**

<table>
<thead>
<tr>
<th>Product</th>
<th>% of DEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxi DEET</td>
<td>100</td>
</tr>
<tr>
<td>Muskol – Pump Spray</td>
<td>100</td>
</tr>
<tr>
<td>Muskol – Aerosol</td>
<td>40</td>
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<tr>
<td>Cutter Cream Lotion</td>
<td>35</td>
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<tr>
<td>Ultrathon Lotion</td>
<td>32</td>
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<tr>
<td>Deep Woods Off Spray for Sportsmen</td>
<td>29</td>
</tr>
<tr>
<td>Ben’s Backyard Lotion</td>
<td>24</td>
</tr>
<tr>
<td>Deep Woods Off Spray</td>
<td>24</td>
</tr>
<tr>
<td>Off Pump Spray</td>
<td>15</td>
</tr>
<tr>
<td>Skedaddle</td>
<td>9.5</td>
</tr>
</tbody>
</table>

**Other Repellents**

**Permethrin** is a highly effective insecticide and repellent recommended for use on clothing, shoes, bed nets and camping gear. Permethrin-treated clothing repels and kills ticks, mosquitoes, and other arthropods and retains this effect after repeated laundering. The insecticides should be reapplied after every 5 washing per the CDC.

Impregnation of cotton or nylon mosquito nets will usually provide protection for 1 year. Nylon tends to retain permethrin and deltamethrin better than cotton. The benefits given by nets depends on the mosquitoes biting habits, the size and constitution of the nets and if they have been treated with insecticides. It is important to tuck the nests in under the mattress.

Travelers should use a pyrethroid-containing flying-insect spray in living and sleeping areas during evening and nighttime hours. In addition, persons who will not be staying in well-screened or air-conditioned rooms should take additional precautions, which include sleeping under mosquito netting, ie. bed nets. Remember to do a complete body check for imbedded insects/ticks every day. Prompt removal can prevent some infections.

You may visit the Center for Disease Control (CDC) website at: [www.cdc.gov/travel](http://www.cdc.gov/travel), or the Olin Travel Clinic website at: www.msu.edu/~travel.

Sources:  CDC Health Information for International Travel – 2001-2002.
Shoreland Inc. Traveler Information Sheet
Manson’s Tropical Diseases 20th edition