

## Deet

Deet is by far the most commonly used insect repellent in the world. This is because it is the most effective repellent against mosquitoes and ticks. After researching hundreds of compounds, Deet (N, N-Diethyl-M-Toluamide) was selected by the USDA and the U.S. military as the most economical compound to use. After more than forty years of worldwide use, Deet has a remarkable record.

## Permethrin

Used by itself or with skin applied repellents to build the ultimate protective barrier. Permethrin (pyrethrin) is a contact insecticide. That is, it kills ticks or other insects when it comes in contact with them. It is used on clothing and materials. It uses the same active ingredient used in hair shampoos for head lice. When applied to clothing the Permethrin binds to the fabric eliminating the risk of over-exposure to the skin. Though FDA approved for use on skin, skin contact deactivates Permethrin within fifteen minutes.

## Deet & Permethrin

Studies have shown that when an effective Deet repellent is applied to the skin and Permethrin treated clothing is worn, almost 100% protection can be achieved against insect bites. In one recent study by the U.S. military in Alaska using full body coverage of clothing and mosquito netting in extreme density of mosquitoes, permethrin treated body covering alone kept the mosquitoes away a few inches. With the added spatial repellency of Deet, the pesky critters were kept away up to a foot, allowing the study participants to eat without swallowing insects. Deet and permethrin together offered 99.9% protection against mosquito bites even under these most rigorous conditions. In another study in the late 1980s, 100% protection was achieved against mosquito bites. In all studies, 100% protection has been shown against ticks when Deet and Permethrin are used in combination.

## Alcohol Sprays

Alcohol based sprays can increase the absorption of Deet by up to 67% when compared to straight undiluted Deet. Only Sawyer provides a non-alcohol reduced-Deet spray formula, Sawyer Gold composite. Some pediatricians have voiced concern about increased absorption in children, and the EPA recommends that children not use alcohol based sprays. In late 1998, the EPA stopped registering insect repellents marketed towards children. Most of these were alcohol based low Deet formulas, and the EPA was concerned about the increased absorption attributed to the alcohol and noted that because of the low Deet contents repellents would need to be reapplied more often, thereby increasing the overall Deet absorption over longer lasting higher Deet single applications.

## Clothing Protection

Clothing protection is dramatically increased when the fabric is sprayed or impregnated with a chemical that will either repel or directly kill any insect that alights on the fabric. Both DEET and permethrin are used as clothing treatments, but DEET has been largely replaced for this purpose by the more effective permethrin.

Stuart R. Rose, M.D., International Travel Health Guide, Tenth Edition, 1999.