

Lyme Disease Prevention

Rebecca Snow, MS, CNS, RH(AHG), herbalist and nutritionist
443.315.5221, rebeccasnow@comcast.net

Tick Repellency: Arthropods can vary in their response to botanicals, botanical compounds and to varying concentrations of botanical compounds (Jaenson, Palsson, et al., 2005). Plant constituents valuable for arthropod repellency are secondary metabolites of the plant, secreted at sites of wounding to protect the plant from herbivorous organisms.

There are several botanical extracts that have been researched for their repellency of ticks. Hops and Cayenne both contain piperidine, a constituent that demonstrated 4 hours tick repellency, 1½ times longer than DEET (Schreck, Fish, et al., 1995). This constituent is best extracted from these plants in alcohol. Lemon Eucalyptus and citridiol extracted from this plant have been tested in vitro and in field studies. On day 6 after application, lemon eucalyptus extract was still active as a repellent up to 42% (Jaenson, 2006; Gardulf, Wohlfart, et al., 2004). Citronella demonstrated 83% repellency, 8 hours after application (Thorsell, Mikiver, et al. 2006). The Environmental Protection Agency recommends both citronella and lemon eucalyptus as approved insect repellents along with DEET and several other insect repellents (Katz, Miller, et al., 2008). Lavender, Clove and Geranium essential oils demonstrated repellency in vitro (Jaenson, 2006; Thorsell, et al., 2006).

DEET (*N,N*-Diethyl-*meta*-toluamide) is a common repellent used against mosquitoes and ticks. It has been shown to be effective against 20 genera of arthropods, demonstrating some basic similarity of chemo tactic systems (Rutledge, Gupta, et al., 1997). Thirty percent of the US Population uses DEET annually (November 2002). DEET has caused rare reports of severe reactions, (Jaenson, Garboui, et al., 2006; Jaenson, et al., 2005). In a review by the United Kingdom's Committee on Toxicity, 18 cases of neurotoxicity were found, predominantly in children under the age of 16. The chances are remote, estimating 1 in 100 million. DEET does not readily degrade and is a common pollutant in aquatic ecosystems (Jaenson, et al., 2006; Jaenson, et al., 2005)

In animal studies, dermal absorption upwards of 80% have been reported, as well as neurotoxicity and neuropathological lesions following repeated dermal application of DEET in rats at fairly low levels. The committee states that "in view of the methodological problems with these studies, and difficulties in assessing the results that additional studies to verify the results obtained represented the most appropriate course of action to take (November 2002)." The individual response to DEET is variable, partly due to individual variation in metabolism. Metabolism of DEET is dependant on cytochrome P450 enzymes (Usmani, Rose, et al., 2002).

In a placebo-controlled studies in military recruits, daily oral intake of concentrated garlic reduced number of tick bites (Stjernberg & Berglund, 2000; Stjernberg & Berglund, 2001).

How to Make Your Own Tick Repellent

Need Vodka OR an herbal tincture of Hops

And a blend of essential oils: lemon eucalyptus, citronella, lavender, geranium, and clove

Add essential oils to the vodka or herbal extract. For every ounce of vodka or herbal tincture base, add 30 drops of essential oils to get a 5% solution. Shake well.

Store in a spray bottle. Apply to clothing or skin. Test a small patch of skin first to make sure you are not sensitive to the essential oil.

Recommended Suppliers of Essential Oils

Simplers, (800) 652-7646, www.simplers.com for organic essential oils
Floracopeia, 530 470 9269 www.floracopeia.com/ for organic and ethically wildcrafted essential oils
Other suppliers of essential oils: Tisserand, Aura cacia, and Oshadhi

Minimizing Risk of Exposure at home

(Rhode Island Dept of Health <http://www.health.state.ri.us/diseases/lyme/>, www.ticktackler.com & http://www.tickencounter.org/prevention/protect_yourself)

- Restrict the use of groundcover and use plants that don't attract deer.
- Mice, deer and birds all carry ticks. Move firewood piles away from play areas because mice nest in them.
- Move birdfeeders away from the house because the mice eat the fallen seed.
- Keep cats and dogs out of the woods and brush. This prevents them from bringing ticks into the home.
- Always check your family and animals before they come inside. Inspect your body and clothes after being outdoors. Check groin, neck, armpits, crevices especially. Ticks do not wash off in the shower.
- Move children's play sets and sandboxes away from the woodland edge and place them on recycled rubber mulch.
- Remove leaf litter, mow your lawn and clear all tall grasses and brush from around your home.
- Ticks like moisture. Do not over water your lawn. Bright sunny areas are less likely to harbor ticks.
- Repellents play an integral part in your personal protection strategy. Repellents containing DEET are not sufficient to protect against tick bites. DEET only repels ticks to areas where they could bite and even that little protection does not last long.
- Tucking pant legs into socks is a good way to keep ticks on the outside where they may be seen or get brushed off. Ticks start low and crawl up. They do not jump, fly or drop from trees, they are down on the ground and crawl up until they find a good spot to attach.

Being Outdoors

- Try to avoid brushy areas, tall grass, leaf and woodpiles etc. during May – July.
- Walk in the center of trails
- Wear light colored clothing, so you can spot dark colored ticks
- Try to expose as little skin as possible.
- Tuck pant legs into socks or boots.
- Use insect repellent on clothes and skin.

How to Remove a Tick

(Rhode Island Dept of Health www.health.state.ri.us/disease/communicable/lyme/)

- Remove ticks as soon as spotted
- Don't use burnt match or alcohol or oil
- Use pointy tweezers, grasp as close to the skin as possible
- Pull the tick straight out with a firm, steady force.
- Wash the area of the bite thoroughly with soap and water. Consider using an antimicrobial tea tree or lavender wash.
- Place the tick in a closed jar to get the tick tested or dispose by flushing down toilet.
- Watch for a rash.

Priming the Immune System: The immune response at the time of a tick bite helps to prevent tick-transmitted infection (Wikel, 2006). There are several things you can do to keep the immune system healthy to help prevent infection.

- Get plenty of zinc, in zinc-rich foods such as liver, meat, leafy greens, sea vegetables, mushrooms, seeds and nuts (Hughes, Darlington, et al., 2004).
- Reduce allergies: Minimize food sensitivities and allergies. Minimize environmental allergens such as dust, mold etc.
- Optimize gut flora. Eat fermented foods and root vegetables. Consider taking a probiotic supplement (Bove, 2005).
- Minimize deficiencies in Vitamins A and D. Don't eat a low fat diet. Eat healthy fats like olive oil, fish, nuts and seeds, avocado, grass fed meats and eggs. Request a Vitamin D '25 test from your doctor to monitor your Vitamin D levels. Eat foods rich in Vitamin D, particularly eggs, fish and shellfish. Try to get a little sunlight every day.
- Eat medicinal mushrooms or consider using a supplement. They improve non-specific immunity, help to reduce allergies, reduce inflammation, and improve immune response to infectious organisms (Stamets, 2002). Shitake and Hen of the Woods are two mushrooms that can be found at the grocery store or farmer's markets. They can be added to soups and stir-fries. Sautéed with garlic and olive oil and a little soy sauce, they make an excellent topping for any meat. Other medicinal mushrooms taken as supplements, include Reishi, Coriolus and Cordyceps.
- Reduce your intake of sugar and high fructose corn syrup. Even a small amount of sugar can suppress the immune system for up to 4 hours.

Bibliography

- (November 2002). Statement on the Review of Toxicology Literature on the Use of Topical Insect Repellent Diethyl-m-Toluamide (DEET). United Kingdom, Committee On Toxicity: 1-21.
- Bove, M. (2005). Immune System Review and Herbs. Laurel, Tai Sophia Institute.
- Gardulf, A., I. Wohlfart, et al. (2004). "A prospective cross-over field trial shows protection of lemon eucalyptus extract against tick bites." *J Med Entomol* **41**(6): 1064-7.
- Hughes, D. A., L. G. Darlington, et al. (2004). *Diet and Immune Function*. Totowa, Humana Press Inc.
- Jaenson, T. G., K. Palsson, et al. (2005). "Evaluation of extracts and oils of tick-repellent plants from Sweden." *Med Vet Entomol* **19**(4): 345-52.
- Jaenson, T. G., S. Garbouï, et al. (2006). "Repellency of oils of lemon eucalyptus, geranium, and lavender and the mosquito repellent MyggA natural to *Ixodes ricinus* (Acari: Ixodidae) in the laboratory and field." *J Med Entomol* **43**(4): 731-6.
- Katz, T. M., J. H. Miller, et al. (2008). "Insect repellents: historical perspectives and new developments." *J Am Acad Dermatol* **58**(5): 865-71.
- Rutledge, L. C., R. K. Gupta, et al. (1997). "Evolution of repellent tolerances in representative arthropods." *J Am Mosq Control Assoc* **13**(4): 329-34.
- Schreck, C. E., D. Fish, et al. (1995). "Activity of repellents applied to skin for protection against *Amblyomma americanum* and *Ixodes scapularis* ticks (Acari: Ixodidae)." *J Am Mosq Control Assoc* **11**(1): 136-40.
- Stamets, P. (2002). *MycMedicinals*. Olympia, MycoMedicinals.
- Stjernberg, L. and J. Berglund (2000). "Garlic as an insect repellent." *Jama* **284**(7): 831.
- Stjernberg, L. and J. Berglund (2001). "Garlic as a tick repellent." *Jama* **285**(1): 41-2.
- Thorsell, W., A. Mikiver, et al. (2006). "Repelling properties of some plant materials on the tick *Ixodes ricinus* L." *Phytomedicine* **13**(1-2): 132-4.
- Usmani K, Rose RL, Goldstein JA, Taylor WG, Brimfield AA and Hodgson E (2002). In-vitro human metabolism and interactions of repellent N,N-diethyl-m-toluamide. *Drug Metabolism and Disposition*, **30** (3), 289-294.
- Wikel, S. (2006). *Tick Modulation of Host Immune Defenses*. Lyme and Other Tick-Borne Diseases:

Seeking

Answers Through Science, Philadelphia, PA, Lyme Disease Association, Inc.