

# HEALING ESSENTIALS AROMATHERAPY NEWSLETTER JULY 2016



## Issue #24 Featuring Bug Off Insect Repellent

### Mosquito Alert!!

Having been raised in the Tropics, mosquitos were perpetually swarming around us. As all children did then, we played in the island streets at twilight just when mosquitos arrived in hordes. We would run behind the truck that made its rounds spraying DDT; innocently playing in the toxic fog, believing it would protect us from the mosquitos. Thankfully DDT was banned in 1972 and we now know there are many plant products that can also be used as insect repellents. I have had a member of my family contract West Nile Virus in Colorado and my granddaughter has had serious reactions to mosquito bites, leaving her with huge itching red welts that last for days. These episodes prompted me to create an effective essential oil repellent that I call "Bug Off." As we are more active outdoors in the warm weather--gardening, camping, hiking, and going to the beach--, it is important to be aware of protecting against mosquitos which may carry some very serious diseases.

### Vector Borne Diseases

Vectors are living organisms that transmit diseases to humans, animals, and plants. Vectors include mosquitoes, ticks, flies, and fleas. According to the U.S. Centers for Disease Control, vector-borne diseases have been present in this country for years; others have recently emerged and include some of the world's most destructive diseases such as Zika Virus, Dengue and Malaria. Many of these diseases are due in part to global climate change and the globalization of trade and travel.

The American Mosquito Control Association states, "Mosquitoes cause more human suffering than any other organism. Over one million people worldwide die from mosquito-borne diseases every year. Not only can mosquitoes carry diseases that afflict humans, they also transmit several diseases and parasites that dogs and horses are very susceptible to. These include dog heartworm, West Nile Virus and Eastern equine encephalitis (EEE). In addition, mosquito bites can cause severe skin irritation through an allergic reaction to the mosquito's saliva causing the red and itching bite.

If you are unfamiliar with the diseases carried by vectors, here is a modified list.



A female *Aedes aegypti* mosquito which can carry the Zika virus.

**Zika Virus:** First discovered in 1947, it has rapidly spread to the South Pacific and South America from Uganda. The virus is almost undetected in adults causing flu like symptoms, however, cases of microcephaly, a congenital defect of cranium and brain size resulting in profound neurological defects in newborns usually resulting in death have been positively identified as being caused by Zika infection. An autoimmune condition called Guillain-Barre syndrome, causing damage to nerve cells resulting in muscle weakness and, on occasion, paralysis and death has also been linked to Zika infection. To date the few cases identified in the U.S. are from travelers returning from infected areas. CDC 02/16

- **Dengue Fever:** Dengue fever is found throughout the world, but mainly occurs in tropical and subtropical areas. It is widespread in regions of Africa, Central and South America, the Caribbean, the Eastern Mediterranean, South and Southeast Asia. Rarely occurs in the US, but there have been cases in Florida (May 2016). A serious disease affecting over 400,000 worldwide annually, Dengue causes very high fever, headaches and severe joint pain and can be fatal. CDC 03/16
- **Malaria:** Has been described as far back as 2,700 BC. Primarily occurs in tropical countries. Over 40 % of world population is exposed to Malaria. According to the World Health Organization 214 million cases of malaria were reported in 2015 with 438,000 fatalities. 90% of the deaths are children and occur in sub-Saharan Africa. One child dies every 40 seconds from Malaria. Once bitten by the Anopheles mosquito, the parasite enters the bloodstream causing severe bouts of fever, shaking chills, drenching sweats, and ultimately can cause anemia and damage to internal organs. This suffering and loss of life are tragically unnecessary because malaria is largely preventable, detectable, and treatable. Doctors Without Borders
- **West Nile Virus:** Originally from Africa but now found in all of U.S.A. and Canada. Causes West Nile Fever with severe headaches and West Nile Meningitis occasionally fatal. To date, approximately 42,000 cases and 1,700 deaths related to WNV have been reported in the U.S. CDC 12/15
- **Chikungunya:** Primarily occurs in Caribbean countries although several hundred cases diagnosed recently in U.S.A. Rarely fatal but excruciating joint pain lasting several weeks. CDC 11/15
- **Yellow Fever:** Primarily occurs in Africa, not in Western Hemisphere due to vaccination. Does not occur in Asia.
- **Japanese Encephalitis:** Occurs in all Asian countries and can be prevented by the J.E. vaccine. Symptoms include high fever and occasionally inflammation of the brain (encephalitis). Of these cases 1 out of 4 is fatal. CDC 08/15
- **Eastern Equine Encephalitis:** EEE is a rare illness in humans, and only a few cases are reported in the United States each year, most occurring in the Atlantic and Gulf Coast states. Most persons infected with EEEV have no apparent illness. Severe cases of EEE (involving an inflammation of the brain) begin with the sudden onset of headache, high fever, chills, and vomiting. The illness may then progress into disorientation, seizures, or coma. EEE is one of the most severe mosquito-transmitted diseases in the United States with approximately 33% mortality and significant brain damage in most survivors. There is no specific treatment for EEE; care is based on symptoms. CDC 04/16

### Prevention for Vector Borne Diseases

To protect against mosquito bites, the CDC recommends the synthetically chemical insect repellent DEET. Thankfully, the CDC also recommends products with an extract from Lemon Eucalyptus (*Corymbia citriodora*) known as PMD. The following notice is taken from the CDC website:

CDC has evaluated information published in peer-reviewed scientific literature and data available from EPA to identify several types of EPA-registered products that provide repellent activity sufficient to help people reduce the bites of disease-carrying mosquitoes. Products containing the following active ingredients typically provide reasonably long-lasting protection:

- **DEET** (chemical name: N,N-diethyl-m-tolua-mide or N,N-diethyl-3-methyl-benzamide). Products containing DEET include, but are not limited to, Off!, Cutter, Sawyer, and Ultrathon.

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- **Picaridin** (chemical name: 2-(2-hydroxyethyl)-1-piperidinecarboxylic acid 1-methylpropyl ester). Products containing picaridin include, but are not limited to, Cutter Advanced, Skin So Soft Bug Guard Plus, and Autan (outside the United States).
- **Oil of lemon eucalyptus (OLE)** or **PMD** (chemical name: para-menthane-3,8-diol), the synthesized version of OLE. Products containing OLE and PMD include, but are not limited to, Repel and Off! Botanicals. This recommendation refers to EPA-registered repellent products containing the active ingredient OLE (or PMD the chemically synthesized extract). “Pure” oil of lemon eucalyptus is not recommended; it has not undergone similar, validated testing for safety and efficacy, is not registered with EPA as an insect repellent, and is not covered by this recommendation.
- **IR3535** (chemical name: 3-[N-butyl-N-acetyl]-aminopropionic acid, ethyl ester). Products containing IR3535 include Skin So Soft, Bug Guard Plus, Expedition, and SkinSmart.

**CDC page reviewed 07/15**

#### **History of Plant Repellents**

The repellency of plant material has been exploited for thousands of years by man, most simply by hanging bruised plants in houses, a practice that is still in wide use throughout the developing countries. Plants have also been used for centuries in the form of crude fumigants where plants were burned to drive away nuisance mosquitoes and later as oil formulations applied to the skin or clothes, first recorded in writings by ancient Greek, Roman and Indian scholars. Plant-based repellents are still extensively used in this traditional way throughout rural communities in the tropics. For many of the poorest communities, plant repellents are the only available means of protection from mosquito bites, and indeed for some of these communities as in the Europe and North America, “natural” smelling repellents are preferred because plants are perceived as a safe and trusted means of mosquito bite prevention.



Moghul painting illustrating a man burning neem leaves near a river where biting insects would be present.

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#### **Repellent activity of essential oils:**

Currently, the use of synthetic chemicals to control insects and arthropods raises several concerns related to environment and human health. An alternative is to use natural products that possess good efficacy and are environmentally friendly. Among those chemicals, essential oils from plants belonging to several species have been extensively tested to assess their repellent properties as a valuable natural resource. Essential oils are volatile mixtures of hydrocarbons with a diversity of functional groups and in some cases, these chemicals can work synergistically, improving their effectiveness. Among the plant families with promising essential oils used as repellents, Citronella (*Cymbopogon nardus*), Basil (*Ocimum basilicum*), and Lemon Eucalyptus (*Corymbia citriodora*) are the most cited. Individual compounds present in these mixtures with high repellent activity include alpha-pinene, limonene, citronellal, camphor and thymol. Finally, although from an economical point of view synthetic chemicals are still more frequently used as repellents than essential oils, these natural products have the potential to provide efficient, and safer repellents for humans and the environment. PMD: 19729299

**Essential Oils used in Bug Off Formula:**



Citronella (*Cymbopogon nardus*)

**Citronella** (*Cymbopogon nardus*) Essential oils and extracts belonging to plants in the citronella genus (Poaceae) are some of the most commonly used repellents on the market, and should be used at concentrations of 5-10%. This is lower than most other commercial repellents but higher concentrations can cause skin sensitivity. It was used by the Indian Army to repel mosquitoes at the beginning of the 20<sup>th</sup> century. Citronella-based repellents only protect from host-seeking mosquitoes for about two hours although formulation of the repellent is very important. Initially, citronella, which contains citronellal, citronellol, geraniol, citral,  $\alpha$  pinene, and limonene, is as effective dose for dose as DEET but the oils rapidly evaporate causing loss of efficacy and leaving the user unprotected unless reapplied frequently. Combining with other insect repellent oils helps to increase the time of efficacy.

The second way to use volatile plant repellents is to continuously evaporate them. Citronella and geraniol candles are widely sold as outdoor bug repellents, however they do not provide significant protection against mosquito bites. For the time-being travelers to disease endemic areas should not be recommended citronella-based repellents. However, for those communities where more efficacious alternatives are not available, or are prohibitively expensive, the use of citronella to prevent mosquito bites may provide important protection from disease vectors.



Lemon Eucalyptus (*Corymbia citriodora*)

**Lemon Eucalyptus** (*Corymbia citriodora*) essential oil, though strongly insect repellent, is not recommended by itself to deter mosquitos. An extract from the plant, PMD, is made commercially and added to herbal repellents and is considered highly effective. Nevertheless, when combined with other essential oil repellents, Lemon Eucalyptus essential oil is effective for about 2 hours.

**Added to the Bug Off formula are:**

**Rosemary** (*Rosmarinus officinalis*) essential oil showed 93 % repellency to ticks. PMID: PMC3264233  
**Geranium** (*Pelargonium graveolens*) essential oil is a natural repellent due to its high 30% citronellal content.  
**Tea Tree** (*Melaleuca alternifolia*) essential oil has well documented anti-inflammatory and anti-microbial properties.

**Uses for Bug Off:**

- ❖ Bug Off comes in a convenient roll-on that can be carried in pocket, purse, or backpack.
- ❖ It should be applied on neck, behind ears, back of arms, back of legs, and around ankles.
- ❖ Avoid applying directly on face as extremely irritating to eyes. Do not rub eyes with blend residue on hands.
- ❖ May be dabbed sparingly on hair.
- ❖ It should be applied frequently; approximately every 1-2 hours when outdoors.
- ❖ Can be applied to tissue to keep near pillow at night.
- ❖ A few drops may be added to a candle or a small container of water at a picnic.

**Remedies for Treating Insect Bites:**

- ❖ Wash and dry area thoroughly. Apply a paste of baking soda and water. Leave on until completely dry. Draws out venom and reduces itching and pain.
- ❖ Apply ice pack to area but do not leave on more than 10 min.
- ❖ Apply undiluted Lavender essential oil to bite. Will also reduce swelling, itching, and pain.
- ❖ Apply Healing Essential Skin Relief spray, containing many healing essential oils, hydrosols, and witch hazel.

**In summary**

Although the Healing Essential Bug Off formula cannot claim to repel mosquitos 100% of the time, in using it for many years, I find it quite effective for all buzzing insects including bees. (Bear in mind that Lavender Essential Oil attracts bees.) Bug Off is safe for children and contains no toxic chemicals to pollute the environment.



**Bug Off comes in a 10 ml. glass roll-on:  
(\$7.00) special \$6.00**

**Contains Essential Oils Geranium,  
Lemon Eucalyptus, Citronella,  
Rosemary, Grapefruit and Tea Tree.**

**Effective for gardening, camping, and  
traveling to mosquito-infested areas.**

**Also available at  
[ojaihealingessentials.com](http://ojaihealingessentials.com)**

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References: Centers for Disease Control and Doctors Without Borders

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