

USE OF ENVIRONMENT FRIENDLY MEASURES TO CONTROL MOSQUITOES / DENGUE

By

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Abstract

It needs to be mentioned that environmentalists have already pointed out the ecological problems created by chemical insect control methods and their harmful effect on human health. Synthetic pesticides are more of a threat to man than the insects. As each generation of insects becomes more immune to the pesticides, stronger and more potent insecticides are released. Plant based repellent against mosquito borne diseases are recommended because synthetic repellents cause side effects like breathing problem, eye irritation, headache, cough, etc. Therefore, all of us must go to natural approach i.e. planting mosquito repellent plants in our yards or gardens. Not only it is an earth-friendly way of dealing with mosquitoes/pests as well as beautification to our gardens, and will not jeopardize our health and nature. The use of natural products for dengue control would protect the environment, reduce dependence on expensive synthetic repellents and may also generate local employment. Since botanicals are less harmful to the environment, a large number of plants have already been screened for mosquitocidal activity and a number of them are found promising that have the potential to fight the mosquito menace.

Key words

Environment, Menace, Mosquito, Pesticide, Repellent

Introduction

Mosquitoes are horrible creatures that swarm around you and suck your blood. They cause itchy rashes and can carry many diseases. The most common way of repelling or getting rid of mosquitoes involves spraying a large quantity of poisonous chemicals (insect repellent) in your yard and on yourself. An insect repellent is a substance applied to skin, clothing, or other surfaces which discourages insects (and arthropods in general) from landing or climbing on that surface. Insect repellents help prevent and control the outbreak of insect-borne diseases such as malaria, Lyme disease, dengue fever, bubonic plague, and West Nile fever.

These insect repellent contain DEET as its active ingredient. DEET is slightly yellow oil. The chemical formula for DEET is N, N-diethyl-3-methyl-benzamide. DEET was patented by the U.S. Army in 1946 for use in areas with heavy biting insect infestation. It is a broad-spectrum repellent that is effective against mosquitoes, flies, fleas, chiggers, and ticks. The commercial repellent sprays mostly use DEET, a nasty chemical that can cause rashes, swelling, eye irritation, and worse problems, though they're unusual - including brain swelling in children, anaphylactic shock, low blood pressure etc. As a precaution, manufacturers advise that DEET products should not be used under clothing or on damaged skin, and that preparations be washed off after they are no longer needed or between applications. In the DEET Registration Eligibility Decision (RED), the United States Environmental Protection Agency (EPA) reported 14 to 46 cases of potential DEET-associated seizures, including 4 deaths. The EPA states, it does appear that some cases are likely related to DEET toxicity.

Therefore all of us must go to natural approach i.e. planting mosquito repellent plant in our yards or gardens. These are attractive garden plants that repel mosquitoes. These are actually the plants on the market that are simply called Mosquito plants. They are advertised as a plant that repels mosquitoes. Planting those plants that repel mosquitoes is a great choice for our yards. Not only it is an earth-friendly way of dealing with mosquitoes/pests, it will add beauty to our gardens, and will not jeopardize our health. While all those plants that repel mosquitoes in

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our yards, we can also make natural mosquito repellent from them. Simply crush the leaves or flowers to release the oils and put them in a quantity of alcohol or vodka. Once the natural mosquito repellent oils have infused the liquid, you can use it just as you use the other harmful chemical repellants.

Specific qualities of mosquito/pest repellent plants. When selecting plants, you should be looking for plants that contain phenols, naphthalene, pyrethrum and citronella. All of these chemical components are replicated synthetically or derived naturally in quite a number of commercially available products that repel mosquitoes/pests.

Designing mosquito/pest repellent garden. Make a design that will ensure attractive plants arrangement in your garden, as well as easy access for harvesting. You may choose to deliberately design a plant garden space; or you may choose to plant the plants here and there throughout your garden, as space and design wishes permit. Take care with mint - it is probably best planted in a pot to cure its tendency to spread across your garden. Planting in pots is also fine and is especially useful when you would like to move the plants to different areas of the garden. And don't forget the value of growing these plants near your outdoor entertaining area - this will add extra punch to the work being done by your citronella candles.

Harvesting and use of mosquito/pest repellent plants. There are numerous ways to use the plants. These are just a few suggestions; it is likely you will come up with many more of your own:

Harvest, dry and use in sachets for drawers, wardrobes, storage boxes etc.

Harvest, dry and use hanging from curtain rods in the laundry, kitchen area or from clothes hanging rods.

Keep live herbs growing in pots near doorways to discourage the entrance of pests such as mosquitoes, flies and mice; plant mint near any areas of the house where you feel mice might be tempted to enter (and seal any holes). Make water-based sprays - follow a suitable recipe.

Mosquito Repellent – Herbs

Tansy, Pyrethrum, Feverfew (Tanacetum genus): Perennial. Height: 3-4 feet. Spacing: 12-18" apart. Light Requirements: Full sun to partial shade. Additional Uses: Nectar food plant for butterflies. Repels moths, flies, ants, mice, mosquitoes, cockroaches, mites and bedbugs.

Tansy ”



Pyrethrum 📷



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Feverfew 📷



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Lavender (*Lavandula angustifolia*): Perennial. Height: 18-24". Spacing: 12-18" apart. Light Requirements: Full sun to partial shade. Additional Uses: Nectar plant for butterflies, flowers can be dried, in potpourris and sachets. Lavender is amazing in any meat dish, as a tea, or as aromatherapy. Repels silver fish, fleas, flies, and mosquitoes.

Lavender 📷



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Mint - Peppermint (*Mentha piperita*): Perennial. Height: 24-36". Spacing: 12-18" apart. Light Requirements: Full sun to partial shade. Additional Uses: Leaves are used fresh in hot and iced teas, butterfly nectar and larval food plant. Repels mosquitoes, flies, fleas, mice, rats and ants. Mountain mint rubbed on pants can deter chiggers and ticks. **Horsemint** has a scent similar to citronella. Strong mosquitoes repellent. It can grow in sandy soils. It is also used as a treatment for colds and flu. It has natural fungicidal and bacterial retardant properties because its essential oils are high in thymol.

Peppermint 🔄🌿



Horsemint 🌿🚫



Catnip (*Nepeta cataria*): Perennial. Height: 2-3 feet. Spacing: 12-18" apart. Light Requirements: Full sun to partial shade. Additional Uses: Butterfly nectar plant and your cats will love it. Strong mosquitoes repellent. It is even said that the essential oil in catnip, nepetalactone is 10 times more effective than DEET. Catnip is an herb that is most commonly used to stuff in toys or feed to cats for their enjoyment. The leaves make a very soothing tea. And with catnip, you can simply crush a few leaves and rub on your skin and clothing to enhance the effect.

Catnip” 🌿



Citronella - Nard grass (*Cymbopogon nardus*): Perennial, treat as annual. Height: 5-6 feet. Spacing: 3-5 feet apart. Light Requirements: Full sun to partial shade. Additional Uses: The oil from the plant is used in citronella candles. **Lemon Grass** (*Cymbopogon citrates*): Perennial treat as annual elsewhere. Height: 2-3 feet. Spacing: 3-5 feet apart. Light Requirements: Full sun to partial shade. Additional Uses: The leaves are used in cooking.

Citronella is well-known natural mosquito repellent. It contains citronella oil. The oil from the plant is used to make lotions, sprays, and candles. This oil is put in candles and lanterns that can be burned in your yard to repel mosquitoes. Citronella grass is actually a tropic plant. Lemon Grass is a natural and effective mosquito repellent. It contains the natural oil, citronella, which is safe and effective and is considered more effective than true citronella as an insect repellent. Lemon grass is also effective in controlling dengue fever mosquito (*Aedes aegypti*). You can buy lemon grass at garden centers and supermarkets. It grows readily into a clump about 15" across and about 2ft tall. To use as a mosquito repellent, break a stalk off from the clump, peel off the outer leaves, until you find the scallion-like stem at the base. Bend the stem between your fingers, loosening it, and then rub it vigorously between your palms - it will soon become a pulpy, juicy mass. Rub this over all exposed skin, covering thoroughly at least once. You can also make a tincture using alcohol, for spray applications. Lemon Grass is the #1 recommended plant to grow in the landscape and in containers to use around your patio, deck or outdoor living spaces to repel mosquitoes during summer. Before having outdoor activities brush the Lemon Grass to release more of its fragrance.

Nard Grass 🌿



Lemon Grass



Basil (*Ocimum basilicum*): Annual. Height: 2 feet. Spacing: 18-24" apart. Light Requirements: Full sun to partial shade. Additional Uses: Butterfly nectar plant, the leaves are used in cooking for flavoring the food. Basil is also a mosquito repellent plant. Basil is among the herbs which emit its aroma without crushing it. To control mosquitoes, grow basil in pots and put in your backyard. To keep the mosquitoes at bay, rub a handful of crushed basil leaves on skin. You can use any variety of basil to control mosquitoes but **Cinnamon Basil**, **Lemon Basil** and **Peruvian Basil** seem to work best as they have the strongest fragrances. Basil is also a fly repellent; grow near outdoor seating areas.

Cinnamon Basil



Lemon Basil



Peruvian



Ageratum or Floss Flower (*Ageratum houstonianum*): Annual. Height: 6-12". Spacing: 6-8" apart. Light Requirement: Full sun to partial shade. Additional Uses: Butterfly nectar plant. This charming little plant contains coumarin, and coumarin has the horrible smell which repels mosquitoes. It is used in the perfume industry and is even in some commercial mosquito repellents. Don't rub pure ageratum on your skin, because it has some other undesirable elements.

Ageratum



Marigolds (*Tagetes* genus): Marigolds have peculiar odor that many insects, humans and animals dislike. Plant of marigold grows up to 6 inches to 3 feet high. There are two types of marigolds such as the African (*Tagetes erecta*) & the French (*Tagetes patula*) and they both are mosquito repellent. Marigolds are grown near vegetables as they also repel aphids and other insects. Marigolds blossom in different colors ranging from yellow to dark orange and red flowers. Marigolds are sun-loving that come in a variety of shapes and sizes for almost any landscape. They are quite easy to grow from seed. To control mosquitoes, grow marigold plants in yard, porch pots and in gardens. Organic gardeners have used marigolds as companion plants to keep aphids away.

African Marigold 🌿



French Marigold 🌿



Rosemary (*Rosmarinus officinalis*): Perennial herb or groundcover. Height: 4-5' Spacing: 2 feet apart. Light Requirements: Full sun to partial shade. Additional Uses: The leaves are used in lamb and fish dishes, butterfly nectar plant, drought tolerant plant. Rosemary herb contains oil which acts as a natural mosquito repellent. While they are attractive plants that both repel mosquitoes and can add interest to your cooking. They are truly tropical plants that are not hardy in cold climates. So grow rosemary in a pot and shift it indoors in winter.

Rosemary 🌿



Thyme (*Thymus vulgaris*): Thyme is best cultivated in a hot, sunny location with well-drained soil. It is generally planted in spring, and thereafter grows as a perennial. It can be propagated by seed, cuttings, or by dividing rooted sections of the plant. It tolerates drought well. Deters insect pests and also helps with preventing musty odors. It can be used in sachets, both flowers and leaves. In one study, carvacrol and alpha-terpinene, two compounds derived from the essential oil of thyme, were found to have significantly greater repellency than a commercial DEET repellent. The researchers suggest that a spray made with 2% alpha terpinene is a promising natural mosquito repellent.

Thyme 🌿📷📱



Lemon Balm (*Melissa officinalis*): Perennial. Height: 2-3 feet. Spacing: 12-18" apart. Light Requirements: Full sun to partial shade. Additional Uses: All leaves can be used in potpourris, flavor hot and iced teas, and used as a substitute for lemon peel in cooking. Lemon balm also keeps the mosquitoes at bay. Lemon balm plant grows fast and it requires room to spread. Lemon balm leaves contain citronellal compounds in rich amount. Citronella is used in several commercial mosquito repellants. There is up to 38% citronella contained in some varieties of lemon balm. To control mosquitoes, grow lemon balm in your yard. To keep mosquitoes at bay, you can also rub lemon balm crushed leaves on the skin.

Lemon Balm 🌿📷📱



Mosquito Repellent – Trees

Clove Tree (*Syzygium aromaticum*): Tree, Height: 20-30 feet. Spacing: 25 feet apart. Light Requirements: Full sun to partial shade. Additional Uses: The flower buds are the spice of commerce and attract wildlife to the garden. Two studies have found that undiluted topical clove oil is active against mosquitoes. However, like thyme oil, clove oil should not be applied undiluted to skin as a homemade repellent. In a 2005 study that compared the repellent activity of 38 different essential oils, researchers discovered that clove oil offered the longest duration of protection against all mosquito species.

Clove Tree 🌳



Neem (*Azadirachta indica*): Neem plant is among the strongest mosquito repellent plants. Neem plant contains insect repelling properties. The leaves, seeds and seed oil of the neem tree contain sallanin, a compound which has effective mosquito repelling properties. Neem oil has insecticidal compounds called azadirachtins. Neem oil is a natural product and is safe to use. There are many neem-based mosquito repellents and balms available in the market. To control mosquitoes, you can simply plant neem plant in your yard. You can also burn the neem leaves or add neem oil to kerosene lamps or citronella flares. To keep mosquitoes away, you can rub neem oil on skin. Natural mosquito repellent properties of neem are very effective to fight against malaria.

Neem 🌳



Lemon Eucalyptus (*Eucalyptus citriodora*): One species of Eucalyptus - known as Lemon Eucalyptus or *Eucalyptus citriodora* - may provide protection comparable to low concentrations of DEET. Several studies suggest that essential oil of Eucalyptus may help fend off insects, especially mosquitoes. Repellents containing oil of Lemon Eucalyptus [p-menthane 3,8-diol (PMD)], a plant-derived active ingredient, are also registered with EPA. However, volunteers criticized its odor.

Lemon Eucalyptus 👍



In addition to the plants that repel mosquitoes, the first line of defence against mosquitoes is to seal their point of entry. Mosquitoes are most active in the early morning and early evening. They seek areas of still air because they are hampered by breezes. Close windows and doors on the side of your house which are opposite the breeze. Moreover, avoid dark clothing as many mosquitoes use vision to locate hosts from a distance. Dark clothes and foliage are initial attractants.

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