ARTICLE

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Use of plant extracts as a mosquito repellent and their insecticidal properties

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Natural Products are safe for human when compared to that of synthetic compounds. Certain natural product have been investigated for repellent activity against mosquitoes and other house insects. So they are directly extracted from proper plant species are sprayed over crops to control insects pest. The plant extracts that control pest are named botanicals or botanical insecticides. Botanical insecticides are naturally occurring toxins extracted from plants, there are several advantages to use botanicals rather than synthetic insecticides. Plant derived insecticides breakdown quickly in the environment, resulting in little risk of residues on food crop and less risk to beneficial insects.Botanical insecticides are mainly used in organic form. They do not give residual effect in plant products. Some common botanical insecticides and repellents are mentioned here.

Neem :

Botanical name of neem is *Azadirecta indica*, family- Meliaceae. The whole plant is used as a insecticidal and repellent. Azadiractin is an alkaloid present in neem tree. It is responsible for the insecticidal property of neem extract. Neem oil extracted from seed kernels and leaf extract are rich in Azadiractin , looks like a safe, natural product and is a great solution for plant owners with any type of pest problems, broad spectrum pesticide, insecticide, fungicide and minicide. It is used to control insects and mites like whitefly, aphid and scale. Neem oil diluted with emulsified water and sprayed over the crops. The leaf extract is filtered through a fine cloth and then used for spraying. Neem extracts control about 300 insects pests many namatodes and pathogens of crop.

Phyrethrum:

Its botanical name is *Crysanthemum cinerariaefolium* and family- compositae. The word phyrethrum is the name for the crude flower dust it self and the term pyrethrin refers to the insecticidal compounds that are extracted form pyrethrum. Phyrethroids are not botanical insecticides but synthetic pesticides that are very similar in structure to the pyrethrin. Pyrethrum is a contact insecticide and must be applied directly to the insect to be effective.

Pyrethrum rapidly paralyzes pests but may not kills them. Because in pyrethrum, mammalian toxicity is very low so, it can be applied to food crops close to harvest. Pyrethrum has high contact toxicity for common beneficial insects.

Garlic :

Its botanical name is *Alium sativum*, family Liliaceae. Garlic cloves are used for insecticidal and as a repellent. Garlic crushed with water to prepare garlic extract. It contains an antifungal compound called ajoene. Garlie extract successfully controls ergot disease of sorgum caused is marketed in several products intended to repel insects , much as capsacin does. Products are labeled to repel a wide variety of pests on ornamental plants . But garlic may also repel beneficial insects . To date there is little research showing effectiveness or garlic insecticides.

Tobacco:

Its botanical name is *Nicotiana tobacum* and family Solonacae. The active principle of plant leaves extract is an alkaloid called nicotine . Nicotine is one of the most toxic botanicals. It is a fast acting nerve toxin and is highly toxic to mammals. It is easily absorbed through the eyes, skin and mucous membranes. Because of its high toxicity it is no longer registered for use as a pesticide. Home brewed nicotine preparations can also be quite toxic, less harmful products will produce equal results. Its flower heads are used to make probably the best natural pesticide available. Black leaf 40 is a spray mixture formulated by

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mixing tobacco extract and copper sulphate. It is more toxic to insects and even human being too.

Lavender:

Its botanical name is *lavendula angustifoli*, family - Labiateae. Beautiful lavender flowers on long stem and narrow green leaves, sawin fall or spring when planted in the garden. It will deter pests with, its fragrance, when dried and placed in closets and drawers with clothes. Its oil is used as a insect repellent.

Ryania:

Its botanical name is *Ryania speciosa*, family-Flacourtiaceae. This is taken from root, stem and leaves dried powder. It is sprayed to control codling moth (in apples), European corn borer and some other insects. It is older botanical insecticides that are easily available. No *Ryania* products could be found that are currently registered for use in South carollna.

Chilli:

Its botanical name is *Capsicum annum* family-Solanaceae. Chilli fruits are used for insecticidal repellent. Capsaicin is present in chilli. It is important to note that capsaicin containing products are primarily used to reper insects, rather than to kill existing infestations.

Rotenone:

Rotenone is one of the most toxic of the commonly used botanical insecticides. Rotenone acts as a nervous system poison. It is highly toxic to fish and aquatic life and is commonly used as fish poison. Rotenone can be toxic to mammal through inhalation and may cause skin irritation. Rotenone will also kill many beneficial insects and should only be used to control severse insect infestations. In most cases other safer pesticides should be used in preference to rotenone.

Sabadilla:

Its botanical name is *Schoennocaulon officinale*, Family- Liliaceae, Sabadilla's seeds are used for insecticidal and as a repellent. Sabadilla is a older botanical insecticides that are rarely available. Mainly it is used in South.

Tomato:

Its botanical name is *Lycopersican isculentum*, family-Solanaceae, Tomato leaves are used for a repellent and prevents egg laying.

Turmeric:

Its botanical name is *Curcuama domestica* and family-Zingiberaceae. Rooted part is used as a insecticidal and repellant.

Pudina:

It is extracted from leaves of *Mentha piperan*ta and *Mentha arvensis.* It is used to control the germination of fungal spores on stored grains.

Pavettia:

Its botanical name is *Adhotoda vasica,* family - Acanthaceae. It is also called Malabar nut. Its leaves are used as a insecticide and fungicides.

Sweet flage:

Its botanical name is *Acorcus calamus,* family-Araceae. Oil produced from rhizome is used as an insecticide and repellent.

Black sesame:

It belongs to Laminaceae family and its botanical name is *Hyptis spicigera.* whole plant is burnt as a mosquito repellent.

Bullock's heart:

Its botanical name is *Annona reticulata,* family-Annonaceae. Leaves are used as an insecticides.

Basil:

Its botanical name *Ocimum basilicum,* family-Lamiaceae. Basil leaves and ripe seeds are used as inseticidal repellent growth inhibiting against ticks.

Nirgundi:

Its botanical name is *vitex negundo,* family Verbenaceae. Nirgundi plant leaves are used for insecticidal properties used agaist storage pests.

Other different type plant extracts are also used as a insecticides and repellent. That is *Adhatoda Zeylanica, Andrographis paniculante, Carica papaya*, (Melontree), (Oleander), Nerium *Oleander, Artemisia vulgaris, Mugwortt, Lantana cumara* (wild stage), *Melia azedarach*, (persianlilac), and *Quarsia amera* (Quarsia) and seed extract of *Pongamia globra, Annnona reticulanta, Mammea americana,* (mammey), *Annona, lupinus mutabilis*, (Andean lupin), *Chenopodium ambrosioldis*, (sweet-pigweed), *Jatropa curcus* (Physic nut), *Pongamia pinnara* (Karanja), *Lavendula, angustifoli* (Lovender), Caster plant seeds etc. are also effective against certain pests.

Conclusion:

An insect repellent of plant origin ought to be well defined and harm less to human and other nontarget organisms. Therefore, use of these different types of plant extracts in mosquito control instead of synthetic insecticides could reduce the cost and environment effects. The result of the preliminary screening of evaluation of repellent properties of different type plant extracts confirmed their broad-spectrum mosquito repellent and insecticidal properties. Further studies on identification of active compounds toxicity and field trials are needed to recommend the active fraction of these plant extracts for development of ecofriendly chemicals and indigenous plant base oil for protection against the bites of haematophagous insect.