FUNCTIONAL BLOCKS OF NEEM OIL

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Why Neem Oil is better than Azadirachtin alone?

The first thing that science has done for Neem is to identify the active ingredients and what conditions they address. Here under is the list of the more common compounds that have been identified and what conditions they address. However AgriNeem research is ongoing and our scientists feel that there are many more compounds yet to be identified. Based on the olden technology reviews and properly match with latest technology is the best solution for using botanicals efficiently in animal and crop care. We are adopting T3's approach meaning - **T**raditional **T**echnology **T**ransfer

Nimbin: anti-inflammatory, anti-pyretic, anti-histamine, anti-fungal

Nimbidin: anti-bacterial, anti-ulcer, analgesic, anti-arrhythmic, anti-fungal

Ninbidol: anti-tubercular, anti-protozoan, anti-pyretic

Gedunin: vasodilator, anti-malarial, anti-fungal

Sodium nimbinate: diuretic, spermicide, anti-arthritic

Quercetin: anti-protozoal

Salannin: insect repellent

Azadirachtin: insect repellent, anti-feedant, anti-hormonal

More details are discussed under the following headings:

What's in a Neem

Neem protects itself from the multitude of pests with a multitude of pesticidal ingredients. Its main chemical broadside is a mixture of 3 or 4 related compounds, and it backs these up with 20 or so others that are minor but nonetheless active in one way or another. In the main, these compounds belong to a general class of natural products called "triterpenes"; more specifically, "limonoids."

LIMONOIDS

So far, at least nine neem limonoids have demonstrated an ability to block insect growth, affecting a range of species that includes some of the most deadly pests of agriculture and human health. New limonoids are still being discovered in neem, but azadirachtin, salannin, meliantriol, and nimbin are the best known and, for now at least, seem to be the most significant.

Azadirachtin

One of the first active ingredients isolated from neem, azadirachtin has proved to be the tree's main agent for battling insects. It appears to cause some 90 percent of the effect on most pests. It does not kill insects—at least not immediately. Instead it both repels and disrupts their growth and reproduction. Research over the past 20 years has shown that it is one of the most potent growth regulators and feeding deterrents ever assayed. It will repel or reduce the feeding of many species of pest insects as well as some nematodes. In fact, it is so potent that a mere trace of its presence prevents some insects from even touching plants.

Azadirachtin is structurally similar to insect hormones called "ecdysones," which control the process of metamorphosis as the insects pass from larva to pupa to adult. It affects the corpus cardiacum, an organ similar to the human pituitary, which controls the secretion of hormones. Metamorphosis requires the careful synchrony of many hormones and other physiological changes to be successful, and azadirachtin seems to be an "ecdysone blocker." It blocks the insect's production and release of these vital hormones. Insects then will not molt. This of course breaks their life cycle.

On average, neem kernels contain between 2 and 4 mg of azadirachtin per gram of kernel. The highest figure so far reported—9 mg per g—was measured in samples from Senegal.

Meliantriol

Another feeding inhibitor, meliantriol, is able, in extremely low concentrations, to cause insects to cease eating. The demonstration of its ability to prevent locusts chewing on crops was the first scientific proof for neem's traditional use for insect control on India's crops.

Salannin

Yet a third triterpenoid isolated from neem is salannin. Studies indicate that this compound also powerfully inhibits feeding, but does not influence insect molts. The migratory locust, California red scale, striped cucumber beetle, houseflies, and the Japanese beetle have been strongly deterred in both laboratory and field tests.

Nimbin and Nimbidin

Two more neem components, nimbin and nimbidin, have been found to have antiviral activity. They affect potato virus X, vaccinia virus, and fowl pox virus. They could perhaps open a way to control these and other viral diseases of crops and livestock.

Nimbidin is the primary component of the bitter principles obtained when neem seeds are extracted with alcohol. It occurs in sizable quantities—about 2 percent of the kernel.

Others

Certain minor ingredients also work as antihormones. Research has shown that some of these minor neem chemicals even paralyze the "swallowing mechanism" and so prevent insects from eating. Examples of these newly found limonoids from neem include deacetylazadirachtinol. This ingredient, isolated from fresh fruits, appears to be as effective as azadirachtin in assays against the tobacco budworm, but it has not yet been widely tested in field practice.

Chemical structures of neem's main ingredients. The complexity of these compounds demonstrates that nature is still the greatest chemist. Of the numerous pesticidal agents isolated so far from neem kernels, azadirachtin is the most active against insects. In addition to inhibiting their growth, it interferes with their powers of taste. Many leaf eating insects are repelled by plants to which even small amounts of azadirachtin have been applied.

Azadirachtin, salannin, and nimbin all have the same basic limonoid structure. This differs from, but is not unlike, that of the sterols to which the insect molting hormones ("ecdysones") belong. An insect ingesting traces of these compounds is deeply affected because these "hormone mimics" block the parts of the brain that produce the hormones necessary to growth and development. In many cases, for instance, the insect's body may be ready to change while the hormones to complete the molt are not available. These deep-seated hormonal effects are the reason for neem's subtle, powerful, and yet insect-specific influences. Two compounds related to salannin, 3-deacetylsalannin and salannol, recently isolated from neem, also act as antifeedants.

To explore the benefit of each limnoids and other phytochemicals in neem oil is strongly recommending using neem oil than any individual limnoids.