Benefits of Geraniol

Medicinal benefits of geraniol, found in natural plant essential oils, have been used for many common health conditions. Geraniol is an antioxidant, an anti-inflammatory agent, antibacterial and antiseptic, and has analgesic properties to relieve pain. It is a natural insect repellent. It helps prevent certain types of cancers and inhibits cancer cell growth.

Due to its sweet rose aroma it is often used in the fragrance industry. It is also used as a flavor enhancer in candy, ice cream, bakery products and cigarettes.

Geraniol is found in significant quantites in:

- Geranium oil
- Palmaarosa oil
- Citronella oil
- Rose oil

Research Confirms the Benefits of Geraniol

Here are just a few research studies that confirm the benefits of genaniol in human health.

Benefits of Geraniol: Controls Bacteria Growth

An article (Antibacterial effect of some essential oils administered alone or incombination with Norfloxacin) appearing in the journal *Phytomedicine* demonstrated that reduced levels of the antibiotic Norfloxacin can be used to stop the growth of several bacteria when used in combination with geraniol.

The problem with antibiotics is that, while they stop the growth or kill bad bacteria, they also harm good bacteria in

the gut's microbiome. In addition, antibiotics such s Norfloxacin have addition side effects such as headache, abdominal pain, vomiting and systemic toxicity. Any way to reduce the amount of antibiotics taken and still be affected against the bad bacteria would be helpful.

The researchers used various concentrations of Norfloxacin and geraniol (as well as other compounds) against 5 common bacterial strains. They found that a significantly reduced amount of antibiotic was needed when used in combination with geraniol in order to control bacteria growth.

Another study (Geraniol Restores Antibiotic Activities against Multidrug-ResistantIsolates from Gram-Negative Species) reported in the journal *Antimicrobial Agents and Chemotherapy* reports that geranoil was very effective in restoring antibiotic susceptibility (with Ampicillin, Penicillin, and Norfloxacin) in a strain of otherwise resistant gram-negative bacteria.

Benefits of Geraniol: Makes Chemotherapy More Effective

An article (Geraniol, a Component of Plant Essential Oils, Sensitizes Human Colonic Cancer Cells to 5-Fluorouracil Treatment appearing in the *Journal of Pharmacology and Experimental Therapeutics* reported on the effectiveness of geraniol and chemotherapy.

Colorectal cancer cells (Caco-2) were cultured in l Petri dishes. They were treated with a chemotherapy drug 5-Fluorouracil (5-FU) alone, geraniol alone, and 5-Fluorouracil in combination with geraniol.

Cancer cells normally get their energy from sugars. The addition of geraniol to the Caco-2 cells inhibited the increase in sucrase activities by 90% and lactase activities by 70%.

The effects of the chemotherapy drug 5-Fluorouracil was greatly enhance when combined with geraniol. 5-Fluorouracil alone produced a 25% cell loss. But in combination with geraniol the cell loss was 55%.

Another trial showed that to achieve a 50% cell loss 25 µM (a concentration of 25 micro-Moles) of 5-Fluorouracil alone was required. But, in combination with geraniol, only 1 µM of 5-Fluorouracil was required.

The authors conclude that "the combination of geraniol and 5-FU may offer a promising approach for optimizing the treatment of colorectal cancer."

Benefits of Geraniol: Repels Mosquitoes

Photo by Oregon State University

An article (Efficacy of the botanical repellents geraniol, linalool, and citronella against mosquitoes) in the *Journal of Vector Ecology* describes testing several substances against mosquitoes.

While DEET is the most popular insect repellent, this synthetic mosquito control compound can produce toxic reactions in certain people. This research investigated various naturally occurring organic substances for their effect in candle or diffuser form both indoors and outside on mosquitoes.

For this series of indoor experiments, *Aedes aegypti*

mosquitoes were bred and used. In the indoor trials the exposed legs (from knee to ankle) of the authors were used as the test area. Other skin areas were covered by clothing. Before each trial, the exposed skin was cleaned with 70% isopropyl alcohol. 200 *Aedes aegypti* female mosquitoes were released in a sealed area and allowed to disperse. A candle or diffuser was placed on one chair in the room and an author with leg exposed sat in another chair and “landings” were counted.

For diffusers, all provided highly significant protection from feeding attempts compered to the control (1,103 feeding attempts). Both geraniol (38 feeding attempts) and linalool (74 feeding attempts) provided significantly more protection ($p<0.05$) than citronella (355 feeding attempts) equipped units. The geraniol candle also provided the maximum protection. In the outdoor tests, the range of the repellents was determined. Diffusers were hung on tripods in a square. Lentek MK01 Mosquito Trap was placed in the center of the square. These operated from an hour before sunset to an hour after sunrise. The number of mosquitoes caught in the trap determined how repellent the substances in the diffusers were. Outdoors, geraniol, linalool, and citronella significantly reduced mosquito capture in the central area. Again, geraniol worked best, reducing the number of mosquitoes caught by 90.5% compared to linalool's 88.4% or citronella's 65.6%. The authors conclude that "geraniol repelled significantly more mosquitoes than citronella or linalool, both indoors... and outdoors."

Continuing Research on the Benefits of Geraniol

Additional research on the benefits of feraniol continues. At this time several additional studies are planned including:

- Lipid-lowering Effects of Gefarnate in Statin-treated

Coronary Heart Disease Patients With Residual Hypertriglyceridemia (Geraniol is the main components of Gefarnate Tablets which are used for anti-ulcer and gastritis treatment)

- Impact of AV2 Antiviral Drug on the Treatment of HPV-associated Lesions of the Uterine Cervix (KINVAV) (The virucide AV2 spray a mixture of natural essential oil components: Carvone, Eugenol, Geraniol, Nerolidol)